

# TECHNICAL INFORMATION



Pictuer: Fill level monitoring in silo outlets of an automatic processing plant

## Level Indicators Typ **FMN** and **FMK**

## Application

Level indicators with a membrane and micro contact are used to display the level of storage vessels / silos.

### Range of application:

- Powdered, granular, crystalline material of different kinds.

## Function

- The bulk material forces the membrane downwards.
- The membrane presses then on the two-way contact (normally open and closed contact) of the integrated micro switch.

The micro switch can be charged up to 15 amp (operational voltage 220V; 50 Hz)

The level indicators work with easily flowing bulk materials with big enough pour angle. Only such bulk materials generate an appropriate activation pressure on the membrane. The level indicators are usually installed at or in the silo wall.

The necessary activation pressure depends on the design of the installed compression spring. The standard spring (20p) requires an operating pressure of approx. 20p to 50p.

If stronger return springs are installed, the necessary activation pressure is accordingly higher. Two stronger return springs / exchange springs (60p; 250p) will be delivered free of charge with the level indicator

## Structure

A light metal case supports the membrane. The membrane is held by a ring of non-corroding material screwed onto the case. The membrane is pre-stressed by a spiral spring.

The pre-stressing of the membrane can be increased if you exchange the spiral spring inserted with one of the stronger spiral springs..

### This is important for:

- Bulk materials with particularly high specific weight,
- Bulk material with a certain aggressiveness,
- Conveyance with low pressure.

If you convey with higher pressure within the silo, a simple pipe can adjust the lower air pressure which prevails behind the membrane in the level indicator.

The operating point of the micro switch can be changed as the micro switch is movable.

### Advantage: The sensitivity of the level indicator can be adjusted to the:

- Character of the bulk material,
- Installation conditions.

The **FMN 113 level indicator** can also be used for **wet bulk materials**. Use a **metal diaphragm retaining ring** here.

Different membranes should be used depending on the special characteristics of the bulk materials used. The weaker and less abrasion-resistant membranes are naturally somewhat more sensitive. They are particularly appropriate

- For bulk materials with particularly low specific weight
- Or in small containers.

## Variants

The available membranes are:

| Material  | Used for   |
|---|--|
| <b>Perbunan (PB 08) or<br/>Perbunan (PB 13)</b> | <b>powdered materials with low specific weight:</b><br>grime, chalk, PVC granulates, food (milk powder, flour, cocoa), semolina, rolled oats, rice, sugar, cacao beans, leguminous plants, salt, coffee, grain and bulk materials of similar structure |
| <b>Viton (VT 08) or<br/>Viton (VT 13)</b>       | <b>powdered bulk materials at higher temperatures.</b><br><br><b><u>Moreover for:</u></b><br>Cement, gypsum, fertilizer, dry sand, gravel and filling materials with stronger abrasion.  |

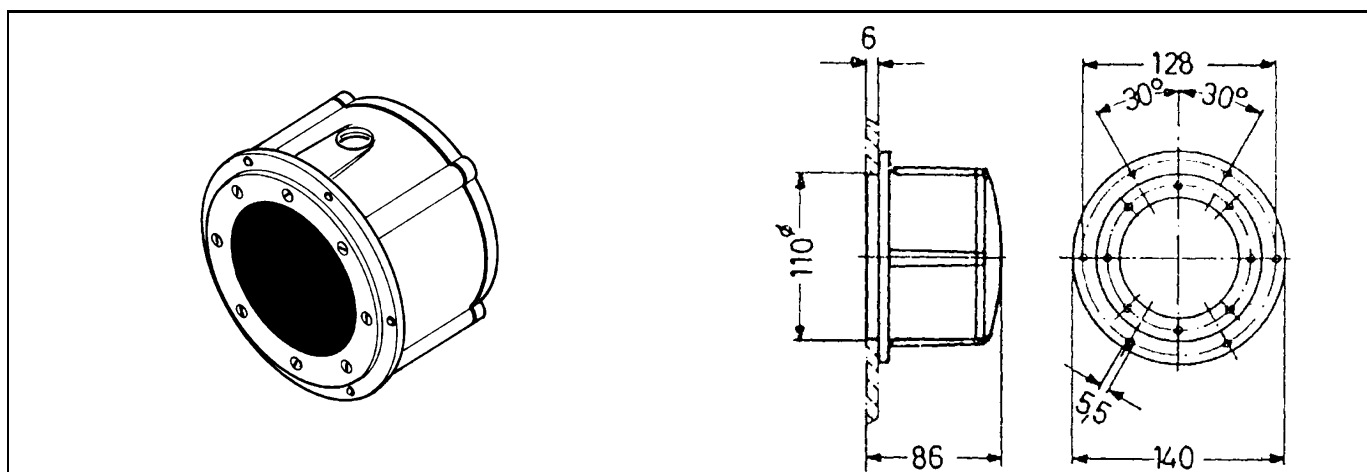
**diaphragm - characteristics:**

| Typ diaphragm      | Typ            | Device sensitivity | Abrasion resistance | Food       | Temp. Range in °C   | Fat constancy    |
|--------------------|----------------|--------------------|---------------------|------------|---------------------|------------------|
| <b>PB 08 (05*)</b> | <b>FMK 508</b> | <b>Very high</b>   | <b>Average</b>      | <b>Yes</b> | <b>-20 ... +100</b> | <b>Good</b>      |
| <b>PB 13 (10*)</b> | <b>FMN 113</b> | <b>Very high</b>   | <b>Average</b>      | <b>Yes</b> | <b>-20 ... +100</b> | <b>Good</b>      |
| <b>VT 08 (05*)</b> | <b>FMK 508</b> | <b>High</b>        | <b>Very high</b>    | <b>No</b>  | <b>-20 ... +200</b> | <b>Very good</b> |
| <b>VT 13 (10*)</b> | <b>FMN 113</b> | <b>High</b>        | <b>Very high</b>    | <b>No</b>  | <b>-20 ... +200</b> | <b>Very good</b> |

\* old designation

**Always choose the larger level indicator type**

- For bulk materials with greater grain size and stronger internal friction,,
- If the bulk materials tend to form crusts or bridges.



#### Basic data:

- Diaphragm surface: 80 mm
- Housing: Light metal cast aluminum incl. lid
- Cable entry: 2x Screw connection PG11
- Response delay: none
- Protection class: IP 54
- Weight: 1.150 g
- Installation position: any
- Signal contact: Potential-free changeover contact
- Switching voltage: 16 A / 250 V to AC12  
5A / 250 V to AC 15  
2A / 250 V to DC12
- Ambient temperature: -20°....+80°

#### Area of application:

- Flat or slightly curved silo walls
- Wall thickness of max. 6mm
- Mounted from outside.

Tight fitting to the silo inner wall possible with several gaskets between flange and external wall.

#### Variant

| Typ          | Diaphragm guard ring | Tapped / Ram    | Diaphragm | Temperature material °C | Temperature ambient °C |
|--------------|----------------------|-----------------|-----------|-------------------------|------------------------|
| FMK 508 PB   | Plastic              | Plastic         | PB        | -20 ... +100            | -20 ... +80            |
| FMK 508 VT   | Plastic              | Plastic         | VT        | -20 ... +100            | -20 ... +80            |
| FMK 508 VT * | Plastic              | Stainless steel | VT        | -20 ... +130            | -20 ... +80            |

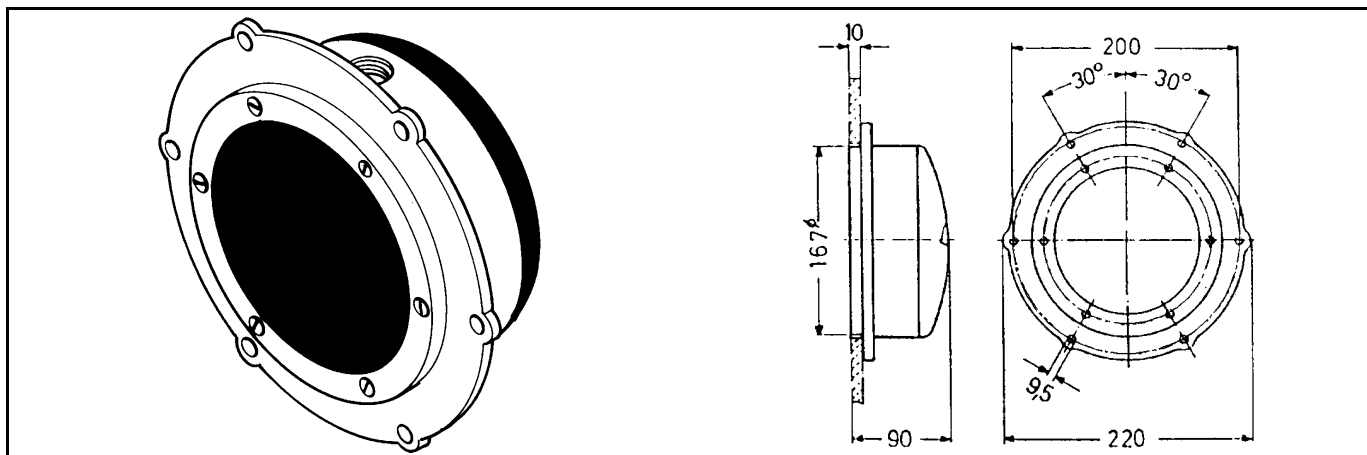
\*on request

#### Level indicator is identical in construction to the former manufacturers:

- Technisches Büro Grieb (TB Grieb – Germany)
  - Emil Niethammer GmbH (Germany)
- The supply of spare parts is ensured by ZIMSOTEC.



## Typ FMN 113



### Basic data:

- Diaphragm surface: 130 mm
- Housing: Light metal cast aluminum incl. lid
- Cable entry: 2x Screw connection PG11
- Response delay: none
- Protection class: IP 54
- Weight: 1.637 g
- Installation position: any
- Signal contact: Potential-free changeover contact
- Switching voltage: 16 A / 250 V to AC12  
5A / 250 V to AC 15  
2A / 250 V to DC12
- Ambient temperature: -20°....+80°

### Area of application:

- Wall thickness of max. 10mm
- Mounted from outside (reaching the inside of the silo)
- Conductions mounted outside of the silo

Tight fitting to the silo inner wall possible with several gaskets between flange and external wall.

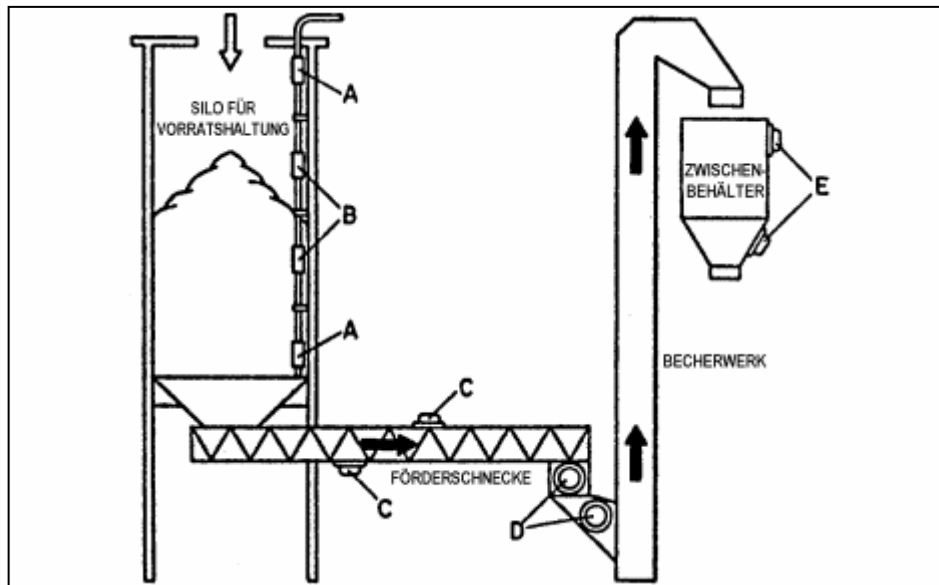
### Variant:

| Typ              | Diaphragm guard ring | Tapped / Ram    | Diaphragm | Temperature material °C | Temperature ambient °C |
|------------------|----------------------|-----------------|-----------|-------------------------|------------------------|
| FMN 113 PB       | Plastic              | Plastic         | PB        | -20 ... +100            | -20 ... +80            |
| FMN 113 VT       | Plastic              | Plastic         | VT        | -20 ... +100            | -20 ... +80            |
| FMN 113 VT Metal | Plastic              | Stainless steel | VT        | -20 ... +200            | -20 ... +80            |

### Level indicator is identical in construction to the former manufacturers:

- Technisches Büro Grieb (TB Grieb – Germany)
  - Emil Niethammer GmbH (Germany)
- The supply of spare parts is ensured by ZIMSOTEC.





- A** Level indicator for interior assembly in a concrete supply silo showing full or empty levels by optical signal.
- B** Additional level indicators enable the display of any level between the full and empty signal.
- C** Installed on the upper and/or lower wall of an enclosed conveyor system, a level indicator can:
  - Indicate a blockage by an optical or acoustic signal.
  - switch off the motor by a switching signal.
  - warn of idle operation by optical or acoustic signal.
  - control a smooth material-flow with appropriate electrical devices
- D** Level indicators in the supply to the bucket conveyor indicate optically or acoustically:
  - smooth material flow..
  - blockage through excessive feeding causing electrical control equipment to switch of the automatic feeding.
- E** Level indicators for exterior mounting at an intermediate surge tank:
  - To optically or acoustically announce the highest and/or deepest possible level.
  - To automatically refill by appropriate electrical switching and control systems.

**All weights and measures are approximated.  
Changes of specification, specifically weights and measures are reserved.**