

# TECHNICAL BUREAU GRIEB

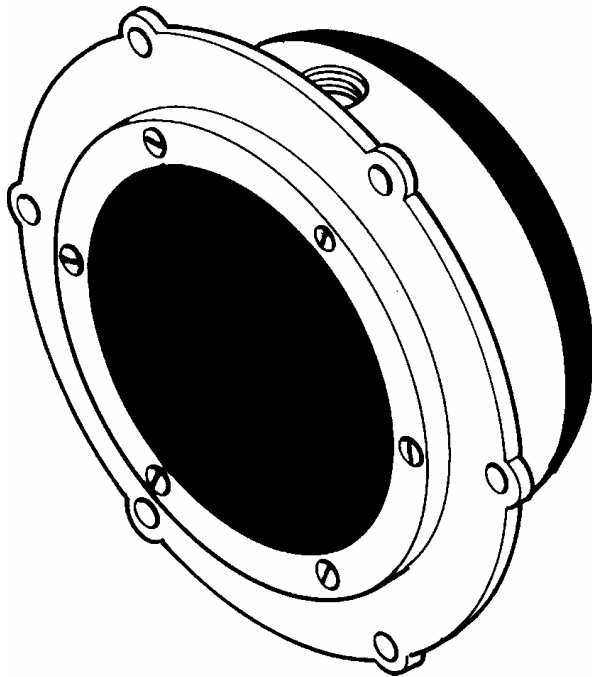
- LEVEL INDICATORS -

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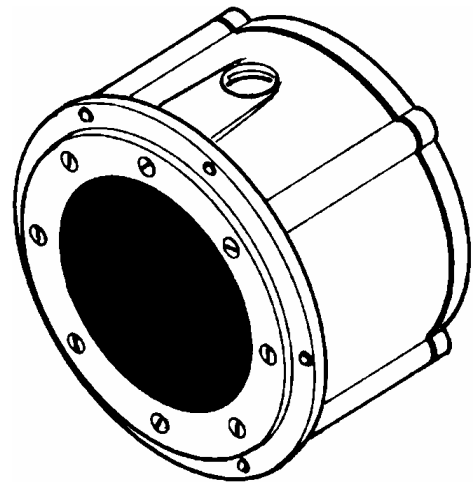
## INSTRUCTION MANUAL



**Please read before use!**



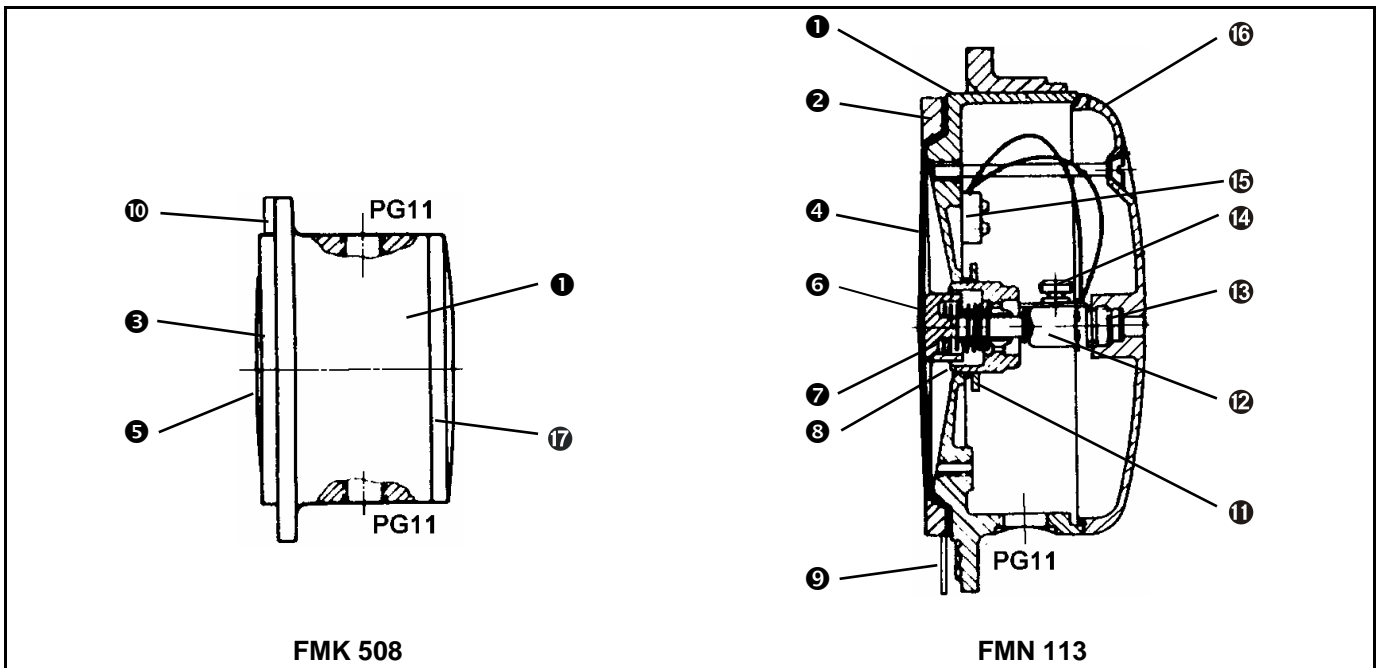
FMN 113



FMK 508

### Level Indicator **FM** Type **FMN** and **FMK**

## Component Parts



- |                            |                       |
|----------------------------|-----------------------|
| ① Body                     | ⑩ Gasket FMK          |
| ② Diaphragm guard ring FMK | ⑪ Locking ring        |
| ③ Diaphragm guard ring FMN | ⑫ Micro switch        |
| ④ Flat diaphragm FMN       | ⑬ Balancing filter    |
| ⑤ Flat diaphragm FMK       | ⑭ Knurled nut         |
| ⑥ Tapped / Ram             | ⑮ Connecting terminal |
| ⑦ Reset spring 20-60-250p  | ⑯ Housing cover FMN   |
| ⑧ Adjustable lining        | ⑰ Housing cover FMK   |
| ⑨ Gasket FMN               |                       |

## Packaging Content

### Standard contents

- 1 level indicator,
- 1 exchange spring.....60 p,
- 1 exchange\_spring....250 p,
- 1 instruction manual,
- 1 gasket.

## Intended application and Security

- The level indicator is to be assembled following approved safety guidelines.
- The level indicator is intended exclusively for the indirect display of container / silo levels. Another use is not intended. The manufacturer is not responsible for damage resulting from inappropriate use. That risk is carried by the user
- Follow the instruction manual.
- Electrical installations may only be done by trained personnel.
- Only work on the equipment if it is powered off.

## Assembly

You can install this level indicator in any orientation provided it is adjusted appropriately (see chapter **adjustment**).

Installation in silo walls:..... FMN 113 ... to approx. 10 mm

FMK 508 ... to approx. 6 mm

Location:..... Fitted tightly to the inner wall

You will achieve this for thin-walled containers / silos by

- \* Applying additional gaskets and / or
- \* Adjusting the flange.



**The fixing bolts must not project into the inside of the silo! This will avoid a possible accumulation of the filling material**



**The level indicator must not lie in the filling flow of the material! This prevents damage to the level indicator and especially to the diaphragm**

### The electrical conductions

- \* To be installed on the outside wall of the silo,
- \* Insert into the housing of the level indicator by the **tapped holes PG11**.



**Seal unnecessary tapped holes with plugs! This prevents the penetration of dust and humidity**

| Installation pattern                        |                         |                    | Explanation   |
|---|-------------------------|--------------------|---|
| Preferably granular, dusty filling material | Floury filling material |                    |   |
| <p>Annex</p>                                | <p>Installation</p>     | <p>With filter</p> | <p><b>A</b> = level indicator<br/> <b>B</b> = conduction, if necessary steel tube</p> |

### Installation at higher temperatures

| Allowed temperature | Materials in level indicator   |
|---------------------|--|
| max. 120°C          | <b>Standard version:</b> <ul style="list-style-type: none"> <li>■ Plastic tappet</li> <li>■ BUNA-N diaphragms</li> </ul> |
| max. 200°C          | <b>Exchange into</b> <ul style="list-style-type: none"> <li>■ Metal tappet</li> <li>■ Viton diaphragms</li> </ul>        |

## Installation with high pressure

### Installation with slightly high pressure:

- \* Use a stronger spring.  
The level indicator will then function perfectly

### With stronger high pressure:

- \* Always manage a pressure balance between silo and indicator interior.  
You will reach pressure balance, if you:
  - + Install a steel tube,
  - + Attach the steel tube to the tapped holes PG 11,
  - + Install the conductions within the steel tube,
  - + Lock the rear cover of the level indicator FMN 113 hermetically.



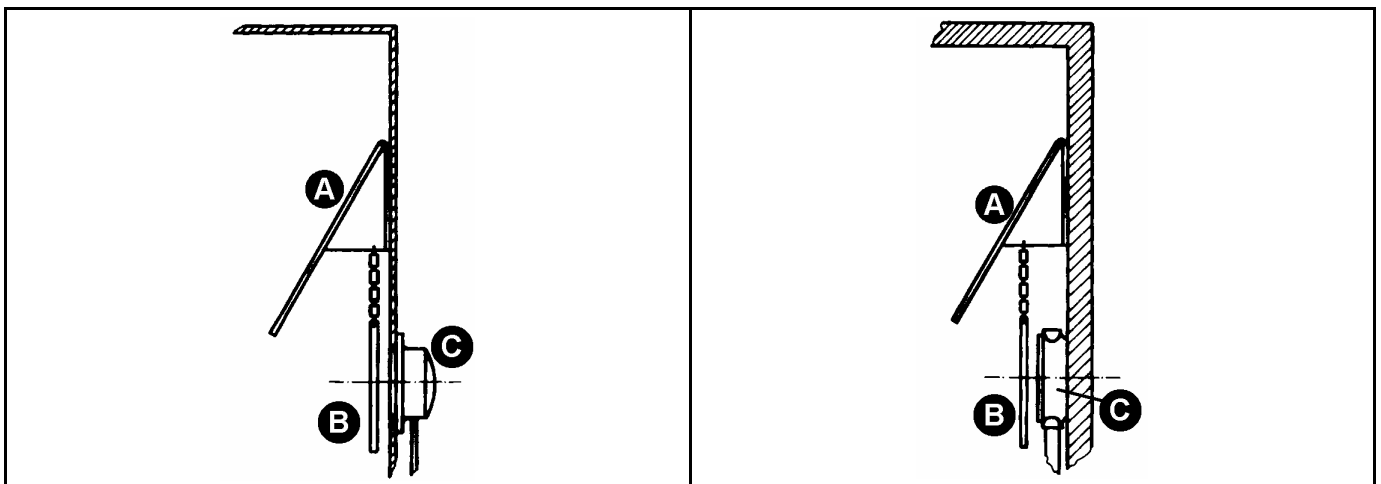
**Install a small filter at the end of the open tube, if you utilize the level indicator with granular goods. This protects from the material.**

### Installation with very coarse-grained and sharp edged filling material

Install a rejection device with

- | Filling material with rough granulations,
- | Filling material with sharp edges,
- | Filling material with high density.

The diagram shows an example:



**A** = Rejection device      **B** = Curtain made of rubber      **C** = level indicator or plastic

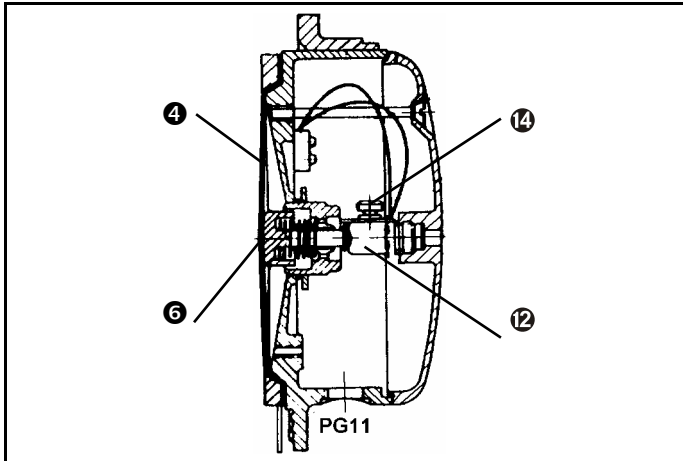
- The rejection device protects the level indicator and diaphragm from damages caused by falling filling material.
- The curtain protects the diaphragm against high abrasion, because it lies over the diaphragm, if the filling level increases.



**The indicator may not lie in the flow of the filling material, otherwise the indicator and diaphragm will be damaged rapidly!**

## Adjustment

The level indicators are adjustable for optimal sensitivity when delivered.



**You must readjust your level indicator according to the different installation positions:**

- \* Detach knurled nut ⑭ .
  - \* Turn micro switch ⑫ and
  - \* Press tappet ⑥
- Until the micro switch ⑫ produces an audible “click” (working point) when pressing slightly on the diaphragm ④ .

**The optimal operating point also depends on the filling material. During the micro-adjustment, pay attention:**

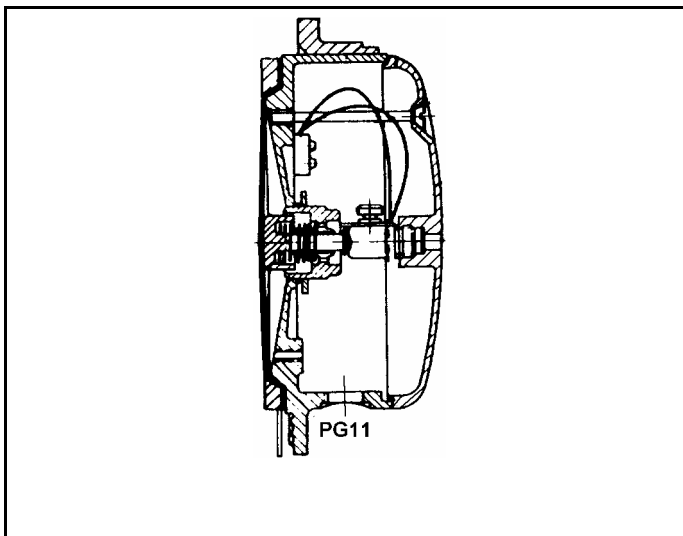
**The micro switch ⑫ must switch back into its resting position, if the filling material decreases.**

- \* Now tighten knurled nut ⑭ .

## Exchange the reset spring

The standard reset spring force is 20p.

The two reset springs provided in addition have a resetting force of 60p and 250p.



**You should install a stronger reset spring for:**

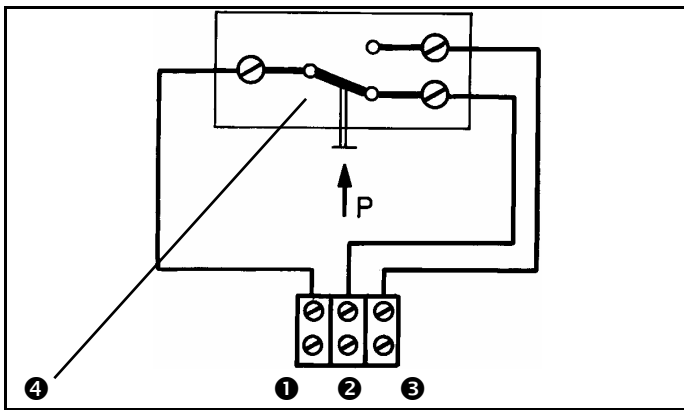
- | "Empty indicators" in the lower part of larger silos,
  - | Level indicators in silos with filling materials of higher density (sand, gravel etc.).
  - \* Remove locking ring ① ,
  - \* Completely unscrew adjustable lining ③ , reset spring ⑦ and tappet ⑥ .
  - \* Now remove tappet ⑥ from adjustable lining ③ .
- (The reset spring is now removable)

- \* Reassemble in the reverse order.

**During reassembly, pay attention to:**

- The adjustable lining ③ should fit almost flush with the metal wall behind the diaphragm ④ , if you reinstall ③ , ⑦ , ⑥ again.
- \* Adjust the level indicator afterwards.

## Circuit diagram



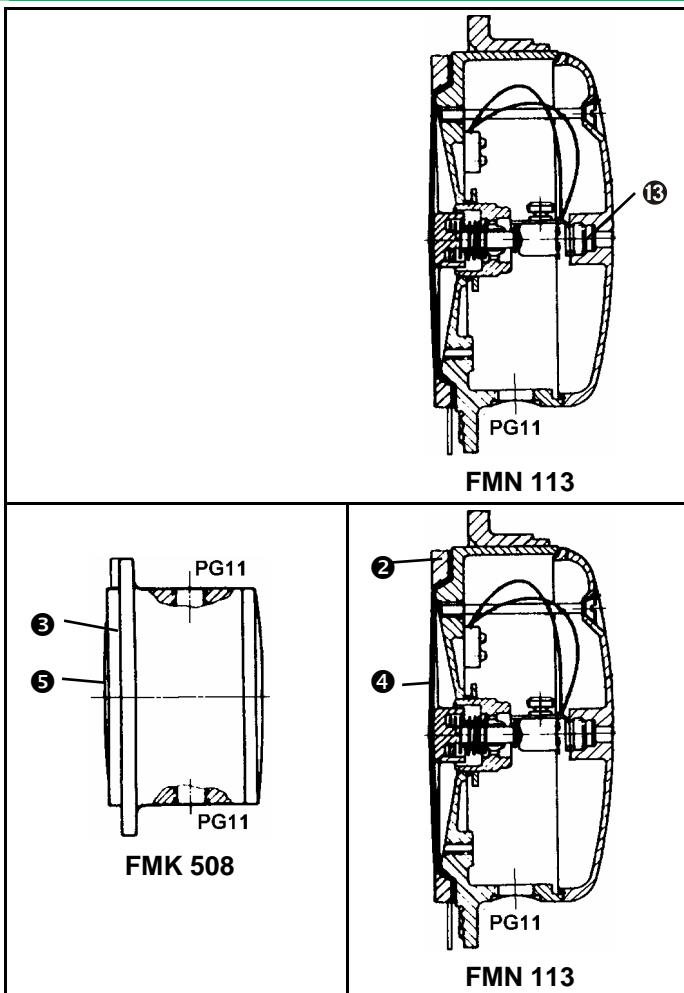
- ❶ = Input lead
- ❷ = Normally closed contact (e.g. empty alarm)
- ❸ = Normally opened contact (e.g. full alarm)
- ❹ = Micro switch

The single-pole two-way contact of the micro switch is loadable up to max. 15 A with an operating voltage of 220V alternating current.

### You can use level indicators:

- | To generate optical and acoustic signals, if a certain level is reached,
- | To control switches (automatic on/off-switching of transportation equipment).
- | To automatically refill a silo after an empty alarm.
- | To automatically stop the filling after a full alarm.

## Maintenance



### Dust deposits

Can make the balancing filter ❸ of level indicator FMN 113 ineffective after a long operation time:

- \* Clean the dust collectors regularly (if necessary replace them).

### Sharp edged filling material

Can cause abrasion of the diaphragm

- \* Regularly check the diaphragms (if necessary replace them).

### Exchanging diaphragms

- \* Detach and remove the screws of the diaphragm guard ring ❷ (❸).
- \* Exchange diaphragm ❹ (❺).
- **The plane surface of the diaphragm must be outside**
- \* Plug the screws into the holes of the new diaphragm and the guard ring and tighten adequately.
- **The bolt circle on the flat diaphragm is deliberately a little larger than the guard ring.**

**Thus the initial tension of the diaphragm isn't too high.**

- \* Readjust the level indicator afterwards

## Use of ENICONTROL level indicators in ex-areas

The ENICONTROL level indicators can be used in explosive II designated areas in accordance with VDE 0165

**Zone II** Covers areas, within which it is possible that a dangerous explosive atmosphere appears momentarily due to whirled up deposited dust.  
(excerpt from VDE 0165)

**The operational funds used in zone II do not require a special inspection certificate. The operational funds must be built so that neither explosive dust, air mixtures, or dangerous dust deposits can reach the inside. These conditions are fulfilled if the operational funds meet at least protection class IP 54.**  
(excerpt from VDE 0165)

The ENICONTROL level indicator fulfills the conditions of the protection class IP 54. In addition, the installed micro switch meets the higher protection class IP 65.

|                                   | <b>ENICONTROL level indicator protection class IP 54</b> | <b>Micro switch contacts protection class IP 65</b> |
|-----------------------------------|--|---|
| <b>Protection against contact</b> | against contact with devices of all kinds                | against contact with devices of all kinds           |
| <b>Scope of protection</b>        | against damaging dust deposits on the inside             | perfect dust shield                                 |
| <b>Water protection</b>           | no damaging effect of splash-water                       | no damaging effect of spout-water                   |

For increasing the operational safety further, ENICONTROL level indicators can be operated with intrinsically safe relays of the type GNU-ex.

The intrinsically safe electric circuit avoids the emergence of explosive sparks and heat. In addition the necessary mains voltage cannot be carried off.