Magnetically controlled level indicator, type MNA

The product line MNA is used wherever fluid level has to be monitored, indicated, and controlled in a reliable way, especially with corrosive, toxic, and inflammable fluids.

The MNA level indicators offer a reliable, accident-free, and maintenance-free usage, through a simple and break-resistant construction at a maximum process pressure of 320 bar and a temperature range from -50 through 400 °C. The fluid level is indicated directly with a separation of the measurement and indication area. The magnetic transfer of the fluid level from the tank to the indicator is continuous and vibration-resistant, even in the case of fast changing levels.

It is possible to mount the indication rail in any position on the pipediameter. There is no corrosion of the indication system. The MNA instruments may be used in open or closed vessels. A definite level measurement without any power supply is guaranteed because of a continuous rotation of the wafers, even if a power loss in the plant occurs.

Functioning:

A float chamber (2) is connected (1A and 1B) to the tank (1), and following the law of communicating tubes, the level in the float chamber is equal to the level in the tank. The float (3) follows the fluid level and transmits its movements contact-free to the indication rail (4) mounted on the outside. The float has a special magnet, which rotates the wafers by 180° as it passes them. This gives a clearly defined level indication, with the level shown in a continuous red stripe strongly contrasted to the white above. At increasing levels the color of the wafer changes from white to red and vice versa.

The indication rail and the wafers are made of macrolon so that there will never be a problem of corrosion in humid and aggressive atmosphere. Each wafer has a permanent magnet, that is why the indicator is shock proof. Moreover, as there is no turbidness because of product contamination of the UV-radiation, the readability remains unobjectionable even after some years.

All models are available with electronic alarms, that can be mounted at any position during the operation of the system, which renders possible an optimal definition of the min. and max. data points. The indicator can be equipped with a scale for volume or height (depending on the customer specifications).

1) Indicating the fluid level
2) Monitoring the level with alarm contacts
3) Transferring the level using measurement value sensors (analog signal 4 - 20 mA) to electrical display units
4) Interface level measurement
Advantages

Switches / alarm contacts

No risk of glass breakage as a result of the separation of the measurement and indicator areas. The float principle means that changes of the density in the medium have very little influence on the indication accuracy.

Magnetic level indicators can be equipped with an arbitrary number of switch contacts. In contrast to electric float switches, switch contacts may be installed at any position of the stand pipe. Wherever additional float chambers are for float switches, magnetically controlled level indicators offer a considerable price benefit.

Electrical level measurement transducers which use the displacement principle must be recalibrated each time the fluid density has changed. The price of a magnetically controlled level indicator with integral electrical measurement transducer is considerably lower than level measurement transducers. The reed chain with an R/I measurement transducer can be changed without interrupting the operation.

The measurement chamber is hermetically sealed - there is no contact between the fluid chamber and the reed chain.

Floats

The construction of the float requires a great amount of technical know-how. The float with its special magnet can rotate freely in the float chamber. This construction avoids a guide wire and other devices. The float materials are stainless steel, 1.4571, 1.4435 (316L) or titanium (PVC, PP, PVDF in case of the plastics level gages). Floats without gas-prestressing are used from a minimum density of 0.35 kg/dm³. The maximum process pressure for sealed floats is 250 bar; at higher pressures the floats must be relieved from pressure (not to be used for condensing media).

The switches / alarm contacts are secured with pipe clips, and can be adjusted to any desired height. The connection is using a 3-core cable or casing terminals. The changeover contact can be used as opener or closer. The switches are also available as explosion-proof version.
**Indication rail**

The MNA level gauges can be delivered with indication rails made from 2 different materials. Macrolon indication rails are resistable to breakage. The max. per-missible media-temperature is 120°C, with 20°C ambient temperature and natural convection as test conditions. The rails are resistable to UV-radiation and aggressive atmosphere and are sealed against dust by two seal-caps. Aluminium indication rails can be delivered as a one part rail up to a length of 6m. The sight cover material depends on the temperature, up to 150°C the material is macrolon and up to 400°C it is glass. The surface of the indication rail can be coated with Säkaphef if required, the standardized surface is brown-anodized.

**Materials**

The gauge chamber and the floats are made of stainless steel (1.4571), 254SMO (1.4529), 1.4435 (316L), titanium, hasteloy, PVC, PP, PVDF, and PTFE. Other material on request.

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**Table: MNA Levelgauge type MNA**

| Principle | Communicating tubes with magnetic float |
| Mounting position | vertical |
| Measuring range | max. 5000 mm (one part) |
| Pipe size | > 5000 mm 2- or multi parts |
| | 60.3 x 2 mm welded, 60.3 x 2 mm seamless, |
| | 2" sch10 |
| | Butt weld construction with t-pieces |
| Process connections | to specify: |
| | Flanged DN15-40 (¼"-1½" 150# RF) |
| | Welding or threaded stud |
| | Flanged DN50 o. 2" 150# RF |
| Vent/drain connections | Plugged R1/4" |
| (see, Code F) | |
| Pipe material | 316 Ti |
| | Hasteloy C4 (2.4610), |
| | Inconel 625 (2.4856) |
| | Inconel 825 (2.4858) |
| | Titanium (3.7035) |
| | other materials also available |
| | as pipe material, |
| Flange material | 316Ti |
| Float material | Titanium, Titanium/E-CTFE coated |
| Op. temperature | -50 bis +400 °C |
| Op. pressure | max. 16 bar |
| Density | 0,7374 kg/dm³ * |
| | min.: 0,3371 kg/dm³ (depending on float type) |
| Bolts, Nuts | A193/A194 B7/2H |
| | A193/A194 B8/M8 |
| | CS hot dipped galvanized |
| | SS |
| Gaskets | PTFE up to 100 °C |
| | Klingserril up to 400°C |
| | Makrolon up to 120 °C |
| | Aluminium up to 400 °C |
| | 316SS up to 400 °C |
| Indication rail | Cylindrical, sealed type |
| Length | 270 mm |
| | 130 mm |
| | 150 mm |
| | 210 mm |
| | 330 mm |
| | 430 mm |
| | 530 mm |
| | 630 mm |
| Float types | |
| Dimensions | A=240 * |
| | B=130 |
| | C=40 |

* For densities < 0,7374 kg/dm³ enlarge the scale A
Principle: Communicating tubes with magnetic float
Mounting position: vertical
Measuring range:
max. 5000 mm (one part)
> 5000 mm: 2- or multiparts
Pipe size:
60,3 x 2 mm welded,
60,3 x 2 mm seamless,
2" Sch10 builtweld construction with t-pieces
Process connections:
to specify:
Flanged DN15-25 (½"-1" 300# RF)
Welding or threaded stud
Flanged DN50 o. 2" 300# RF
Vent/drain connections:
Plugged R½" (see code F)
Pipe material: 316Ti
Hasteloy C4 (2.4610),
Inconel 625 (2.4856)
Inconel 825 (2.4858)
Titanium (3.7035)
other materials also available
Flange material: as pipe material,
Float material: 316Ti
Titanium, Titanium/E-CTFE coated
Op. temperature: -50 bis +400 °C
Op. pressure: max. 40 bar
Density:
0,639 kg/dm³ * up to 20 bar process pressure
min.: 0,3987 kg/dm³ up to 40 bar process pressure
(depending on float type)
Bolts, Nuts: A193/A194 B7/2H
A193/A194 B8/8M
CS hot dipped galvanized
SS
Gaskets:
PTFE up to 100 °C
Klingersil up to 400°C
Indicationrail:
Makrolon up to 120 °C
Aluminium up to 400 °C
316SS up to 400°C
Float types:
Cylindrical, sealed type
Length: 270 mm
130 mm
150 mm
210 mm
330 mm
430 mm
530 mm
630 mm
Dimensions:
A=240 *
B=130
C=40

Base equipment printed bold!
* For densities < 0,75 kg/dm³ enlarge the scale A
Magnetic Levelgauge type MNA

Armaflex--isolation and heating tape MNA

Indication rail with scale for MNA

Indication rail, material Makrolon

Indication rail, material Aluminium

1. Sealing cap
2. Indication lamina with magnet
3. Rectangular profile
4. U-profile

1. U-profile
2. Indication lamina with magnet
3. Transparent covering

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JLSO Tec Trade GmbH
Südring 41
76761 Rülzheim

Daniel H. Meckel
Fon: 0721 – 51 658-64
info@jlso-tec-trade.de
http://jlso-tec-trade.de

FAX: 0721 – 51 658-71
http://jlso-tec-trade.de

www.jlso-tec-trade.de
Magnetic Levelgauge type MNA

Switch LMS-A

Switch LMS-AH

Switch 1690 / 1690 Ex

Switch MS 09 K

Switch MS 10 EExd

Switch LMS-A-EExd
Magnetic Levelgauge type MNA

Armaflex--isolation and heating tape MNA

Indication rail with scale for MNA

Indication rail, material Makrolon

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