

# MSR

## The Continuous Measurement of Filling Levels according to the Potentiometric Measuring Principle

The MSR sensor supplies information on filling levels of tanks. As a continuous level measurement or separating layer measurement it creates quality assurance and safety in the process.

### Application

The sensor MSR is especially designed for use in continuous filling level measurement and continuous separating layer coverage. Due to its modular structure it can be optimally adapted to any process requirement. It is designed for use in all electrically conductive liquids of  $>1 \mu\text{S cm}^{-1}$ .

### Advantages of FAFNIR's Technology

- Measuring precision better than  $\pm 1 \text{ mm}$
- Independent of pressure, temperature, density and conductivity (if  $>1 \mu\text{S cm}^{-1}$ ) of liquid
- Optimal for separating layer coverage
- Very short measuring times in ms range
- Application in all electrically conductive liquids  $>1 \mu\text{S cm}^{-1}$
- Durability due to robust structure
- ATEX-Certification zone 0

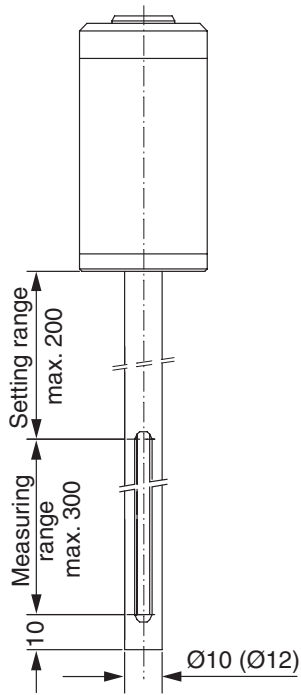
### Function

The sensor MSR operates according to the potentiometric measuring principle. It consists of two stainless steel probes.

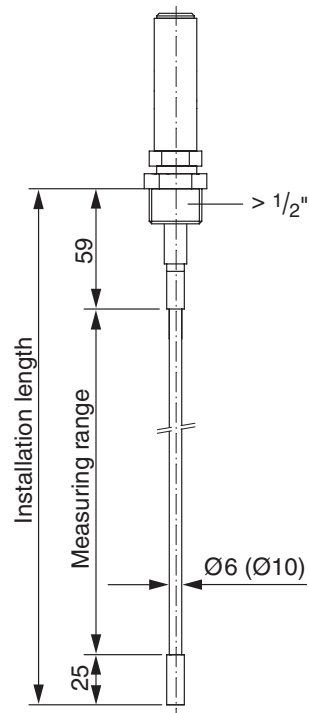


If a voltage is applied to one of the stainless steel probes a current will flow through it. This leads to a linear voltage drop on the electrical self-resistance of the probe material. If the two stainless steel probes are dipped into a conductive liquid ( $>1 \mu\text{S cm}^{-1}$ ), a potential difference is created on the live stainless steel probe and the liquid. This potential difference is measured via the second stainless steel probe. The potential difference is proportional to the filling level. Since the self-resistance of the stainless steel probes is always much smaller compared to the medium, all liquids ( $>1 \mu\text{S cm}^{-1}$ ) can be measured without any readjustment.

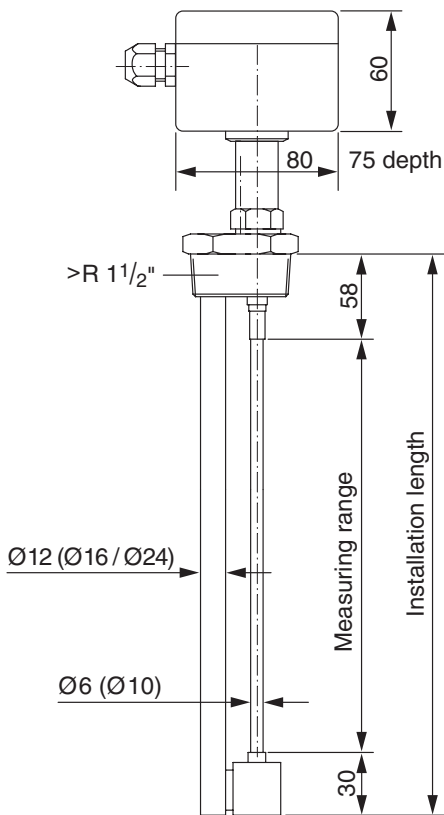
MSR 1.1 SP Plug connection



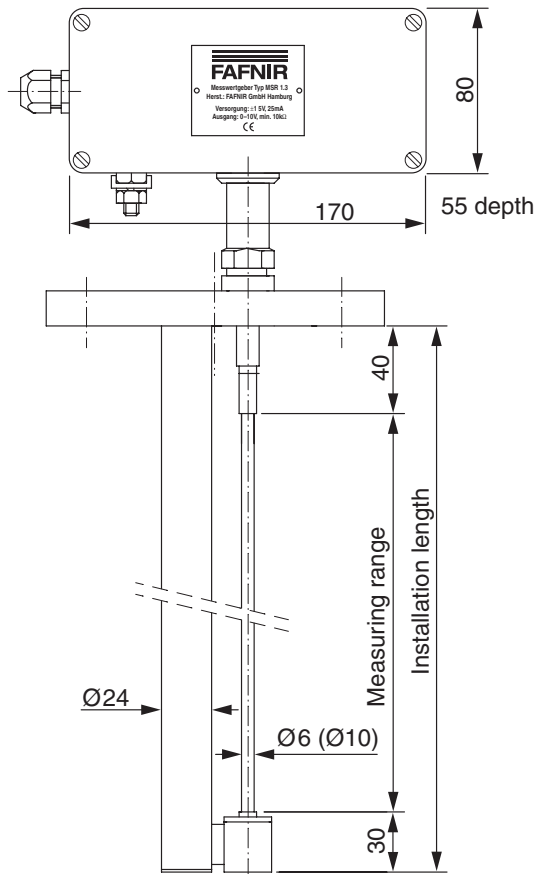
MSR 1.2 Plug connection



MSR 1.3 E DU external



MSR 1.3 F DU



Dimensions in mm

## Installation

The appropriate installation and gauge lengths of the probes with flange or other process connections for the corresponding tanks will be manufactured according to customer measurements.

## Design

Transducer Type MSR 1. ... consists of:

- Transducer housing
- Probe tube stainless steel (or special f. e. material Hastelloy)
- Process connection as per requirement (e.g. screw-in unit, flange)
- Probe length according to customer measurements

## Technical Data

Transducer Type MSR 1. ...

- Process connection: as per requirement (e.g. screw-in unit, flange,..)
- Housing: protection type IP 68

- Functional range: conductivity of measuring medium must be  $>1 \mu\text{S cm}^{-1}$
- Measuring precision Filling level: better than  $\pm 1 \text{ mm}$
- Separating layer Recognition: continuous (the accuracy depends on the property of the separating layer)
- Ambient temperature:  $-25 \text{ }^\circ\text{C}$  to  $+80 \text{ }^\circ\text{C}$
- Media temperature:  $-40 \text{ }^\circ\text{C}$  to  $+150 \text{ }^\circ\text{C}$
- Pressure range: up to 300 bar

### non Ex-execution

- Voltage supply:  $-15 \text{ V } 0 \text{ V } +15 \text{ V}$
- Output:  $0 - 10 \text{ V}$

### ATEX-execution

- Voltage supply:  $-11 \text{ V } 0 \text{ V } +11 \text{ V}$
- Output:  $0 - 5 \text{ V}$
- Only for the connection at the MSR 2. ... Ex

## Measurement Analysis

Type MSR 2. ...

- Auxiliary power:  $24 \text{ V}$ ;  $230 \text{ V}$ ,  $50 \text{ Hz}$ ;  $24 \text{ V DC}$

## non Ex-execution

- Housing:  $\text{H } 110 \times \text{W } 50 \times \text{D } 110$ , IP 40
- Europe card:  $160 \times 100$
- Output:  $0 (4) - 20 \text{ mA}$ ;  $-15 \text{ V } 0 \text{ V } +15 \text{ V}$  connected to MSR 1. ...
- Input:  $0 - 10 \text{ V}$

## ATEX-execution

- Housing:  $\text{H } 130 \times \text{W } 180 \times \text{D } 60$ , IP 54
- Europe card:  $160 \times 100$
- Output:  $0 (4) - 20 \text{ mA}$ ;  $-11 \text{ V } 0 \text{ V } +11 \text{ V}$  connected to MSR 1. ... Ex
- Input:  $0 - 5 \text{ V}$

## Materials of Parts

### in Contact with Media

- Stainless steel 1.4571
- PTFE
- Special materials for parts in contact with media: flange (plated on stainless steel 1.4571), screw-in unit, probe tube, f. e. Hastelloy C4/C22; B2/B3

## Purchase Order Codes

In order to make you an offer, please fill in the following gaps:

### Transducer Type MSR 1. ...

|                                      |                              |
|--------------------------------------|------------------------------|
| Ex-execution                         |                              |
| Process connection                   |                              |
| Installation lengths                 |                              |
| Fitting position                     | (at the top / at the bottom) |
| Pressure range                       |                              |
| Temperature range                    |                              |
| Medium                               | (Conductivity)               |
| through separating layer measurement | Conductivity Medium 1        |
|                                      | Conductivity Medium 2        |
|                                      | which Medium is up           |

### Measurement Analysis Type MSR 2. ...

|                             |  |
|-----------------------------|--|
| Ex-execution                |  |
| Housing non Ex-execution    | $\text{H } 110 \times \text{W } 50 \times \text{D } 110$ , IP 40       |
| Housing ATEX (Ex)-execution | $\text{H } 130 \times \text{W } 180 \times \text{D } 60$ , IP 54       |
| Europe card                 | $160 \times 100$   |
| Auxiliary power             | $24 \text{ V}$ ; $230 \text{ V}$ , $50 \text{ Hz}$ ; $24 \text{ V DC}$ |

For further information contact us: [www.vaf-technik.de](http://www.vaf-technik.de) - [info@vaf-technik.de](mailto:info@vaf-technik.de)

VAF Fluid-Technik GmbH - Gottfried-Schenker-Str.12 - D-09244 Lichtenau - Tel.+49 (0)37208 81410 - Fax+49(0)37208 81455