

Online moisture measurement for solids

PROCESS MONITORING SYSTEMS FOR SOLIDS

Product Information



FEATURES:

- Moisture ranges 0 ... 65 % (depending on material)
- Measurement accuracy 0.1 %
- Online moisture measurement
- Independent of the material colour
- Temperature-resistant up to 120 °C
- ATEX-certified
- Recording of surface moisture and capillary moisture



certified to **ATEX**

TECHNOLOGY

USE

M-Sens 2 is especially designed for continuous moisture measurement of solids during batching. This includes as well discontinuous measurement.

M-Sens 2 is used for online moisture measurement of:

- all types of dust, powder, granulates and other bulk solids
- in different mounting positions

M-Sens 2 is characterized by its uncomplicated installation as well as by its simple calibration. Due to its hygrostability and its resistance to mechanical shocks and abrasion the entire sensor is very fail-safe and allows a long service life. The sensor window is protected by a ceramic disc being very resilient with regard to abrasion and pressure.



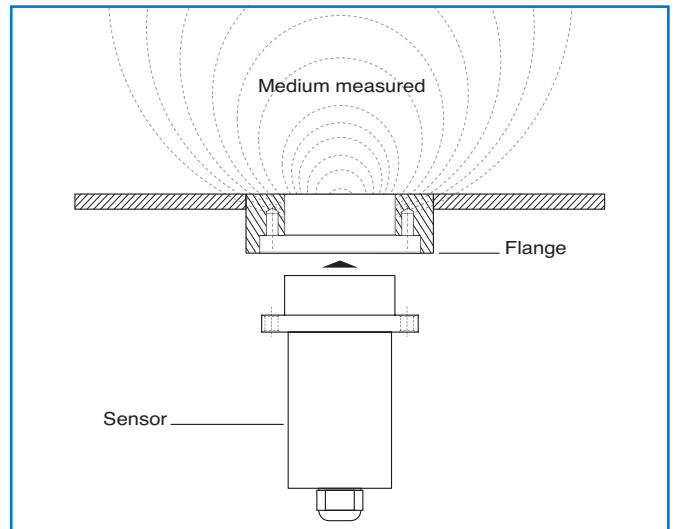
FUNCTION

The M-Sens 2 sensor functionality is based on precise high-frequency measurement and direct digitalization of measured values, where from results a high resolution.

As the materials surface and capillary moisture influences strongly its specific conductive capacity, the moisture can be measured exactly by a constant averaged bulk density.

The calibration can be done very simply by the operator by pressing the button and entering the referenced moisture contents.

In this context it is convenient that measured value fluctuations by bulk density variations are balanced by an internal filter function. Additionally, measured value fluctuations by temperature variations are compensated automatically by the sensor.

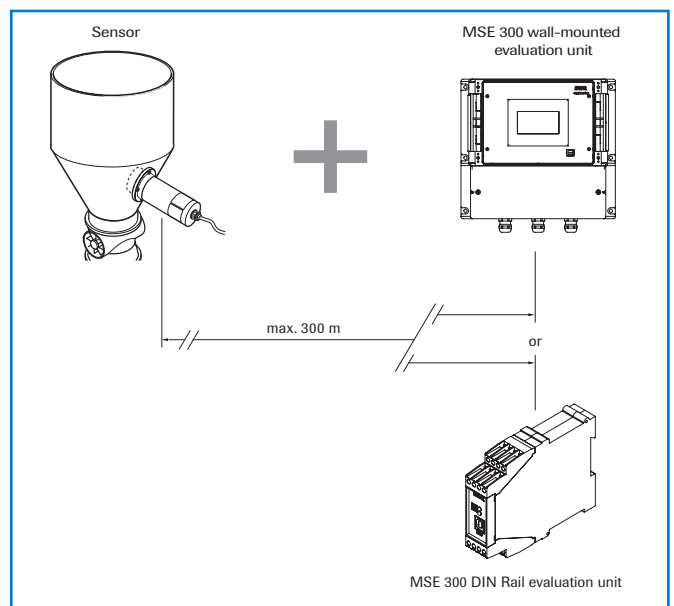


SYSTEM

A complete measurement unit consists of the following components:

- welding flange
- 1 to 3 sensors, each with a 2 m connection cable
- MSE 300 evaluation unit in a wall-mounted housing or a DIN Rail format unit.
- CI-Box for the connection between sensor(s) and evaluation unit

The sensor probe is connected to the evaluation unit by a shielded, 4-wired cable. The maximum distance between the two components can be up to 300 m.

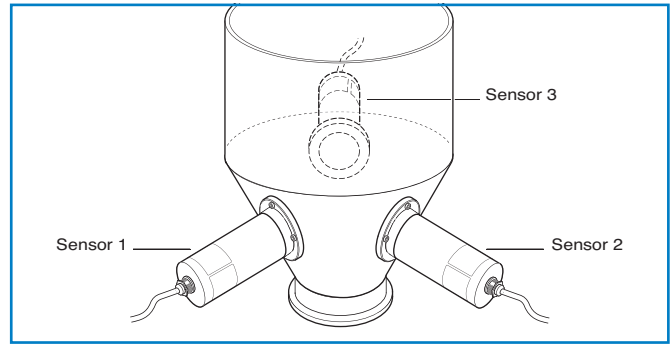


APPLICATION

USING OF MORE THAN 1 SENSOR

Due to the use of up to 3 sensors, connected to a MSE 300 evaluation unit, induced measurement inaccuracies, caused by the materials inhomogeneity, can be reduced.

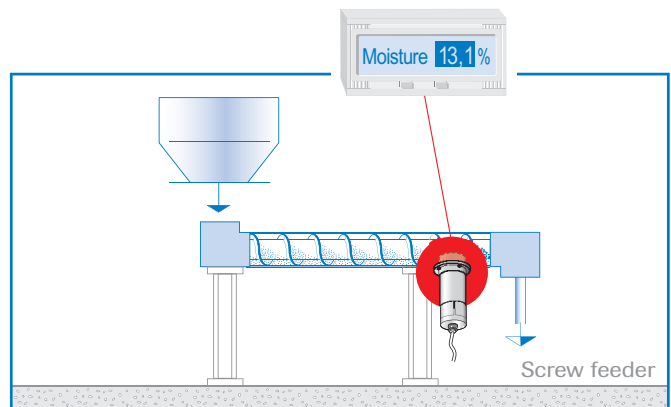
At the same time there is reduction of the influence of bulk density variations which normally exist over the whole measurement zone.



APPLICATION EXAMPLES

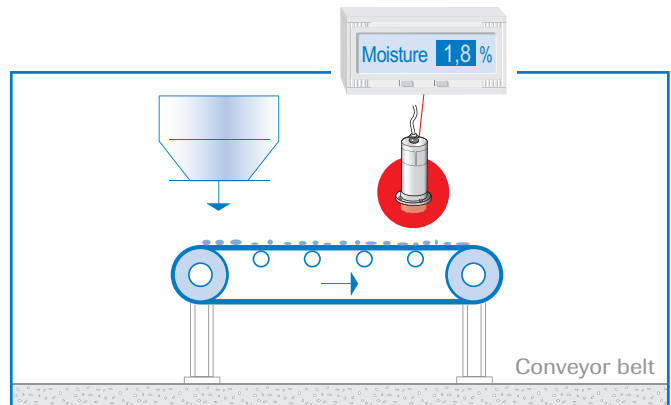
• Installation in screw feeders

The installation of a moisture sensor in screw feeders proved to be very advantageous, since the material passes by the sensor window in even intervals and with relatively constant bulk density.



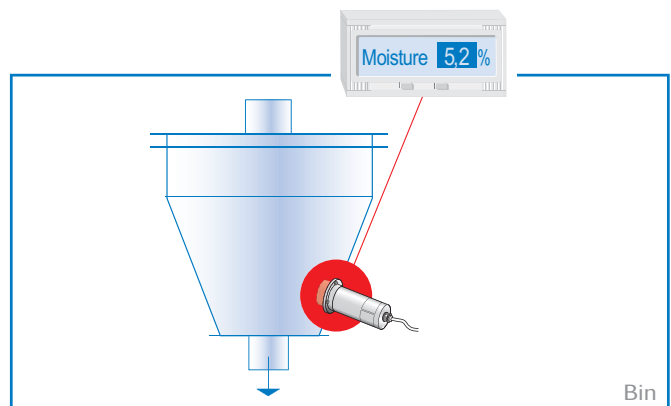
• Installation on conveyor belts

By means of the online moisture measurement of solids on a conveyor belt, the operator can react in due time if the material is too humid or too dry. In consequence, plugging of subsequent aggregates can be prevented.



• Installation in bins

Another installation alternative is to mount a sensor at a bins outlet. Due to constant bulk density in case of a filled bin, the sensor finds an almost unchanging measuring field for monitoring the residual moisture. Thus, M-Sens 2 avoids that too damp material reaches the next production level or arrives into the loading.



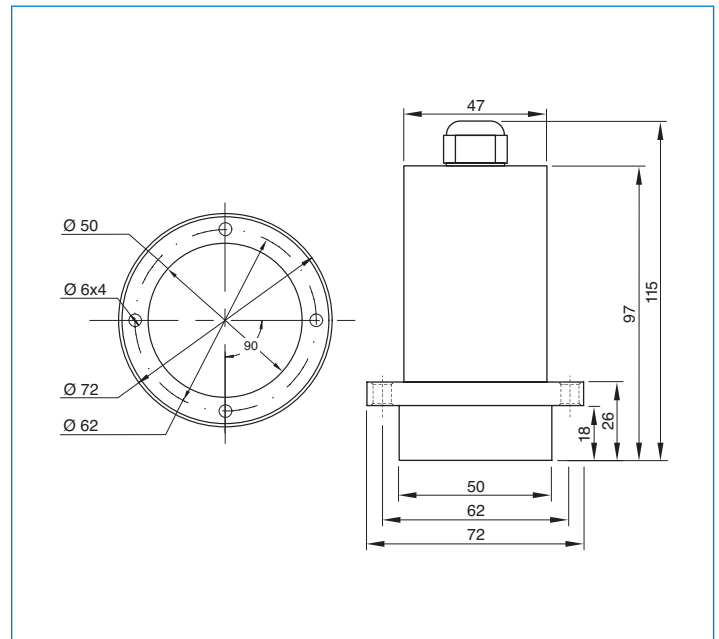
TECHNICAL DATA

Sensor

| | |
|------------------------------|--|
| Housing material | Stainless steel 1.4571 |
| Sensor surface | Ceramic |
| Ex-protection (optional) | Zone 20 (Dust), Zone 0 (Gas) |
| Protection category | IP 67 according to EN 60529 |
| Material ambient temperature | 0 ... + 80 °C, optional 120 °C |
| Working pressure | Max. 10 bar |
| Power consumption | 0.6 W |
| Responsive time | 0.1 sec. |
| Weight | 1.3 kg |
| Measuring range | 0 ... 65 % residual moisture (depending on material) |
| Accuracy | 0.1 % absolutely in the calibrated measuring range |
| Connection cable | Shielded cable 4-wired, 0.25 mm ² |

Evaluation unit (DIN Rail)

| | |
|--|---|
| Power supply | 24 V DC ± 10 % |
| Power consumption | 20 W / 24 VA |
| Protection type | IP 40 to EN 60 529 |
| Ambient operating temperature | -10 ... +45 °C |
| Dimensions | 23 x 90 x 118 mm (W x H x D) |
| Weight | Approx. 172 g |
| DIN rail fastening | DIN 60715 TH35 |
| Connection terminals cable cross-section | 0.2 - 2.5 mm ² [AWG 24-14] |
| Current output | 1 x 4 ... 20 mA (0 ... 20 mA), load < 500 Ω (Active) |
| Interface | ModBus RTU (RS 485) / USB |
| Pulse output | Open Collector - max. 30 V, 20 mA |
| Relay contact | Max. rated load: 250 V AC Max. peak current: 6 A Max. rated load 230 V AC: 250 VA Max. breaking capacity DC1: 3/110/220 V: 3/0.35/0.2 A Min. switching load: 500 mW (10 V / 5 mA) |
| Data backup | Flash Memory |



Evaluation unit (field housing)

| | |
|--|---|
| Power supply | 110 / 230 V AC 50 Hz (optional 24 V DC) |
| Power consumption | 20 W / 24 VA |
| Protection type | IP 65 to EN 60 52910.91 |
| Ambient operating temperature | -10 ... +45 °C |
| Dimensions | 258 x 237 x 174 mm (W x H x D) |
| Weight | Approx. 2.5 kg |
| Interface | RS 485 (ModBus RTU) / USB |
| Cable screw connectors | 3 x M20 (4.5 - 13 mm Ø) |
| Connection terminals cable cross-section | 0.2 - 2.5 mm ² [AWG 24-14] |
| Current output | 3 x 4 ... 20 mA (0 ... 20 mA), load < 500 Ω (Active) |
| Pulse output | Open Collector - max. 30 V, 20 mA |
| Relay contact | Max. rated load: 250 V AC Max. peak current: 6 A Max. rated load 230 V AC: 250 VA Max. breaking capacity DC1: 3/110/220 V: 3/0.35/0.2 A Min. switching load: 500 mW (10 V / 5 mA) |
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