M-Sens WR3

Online Moisture Measurement for Solids

PROCESS MONITORING SYSTEMS FOR SOLIDS

Product Information

FEATURES:

- Extended moisture range measurement
- Online instant accurate moisture measurement
- Extremely resistant
- For all types of material
- High temperature version 190 °C in option

TECHNOLOGY

USE

The M-Sens WR3 sensor has been specially developed for measuring material moisture content in solids with extended measuring ranges and high moisture contents.

The M-Sens WR3 is a robust sensor for the online moisture measurement of dust, powder, granulates, wood chips and other bulk goods.

The M-Sens WR3 is easy to install and provide an accurate measurement. Its resistance to impacts, water and abrasion ensures that it is extremely reliable and durable.

The sensor's measuring window is protected by a ceramic disc which gives it very good resilience to abrasion.

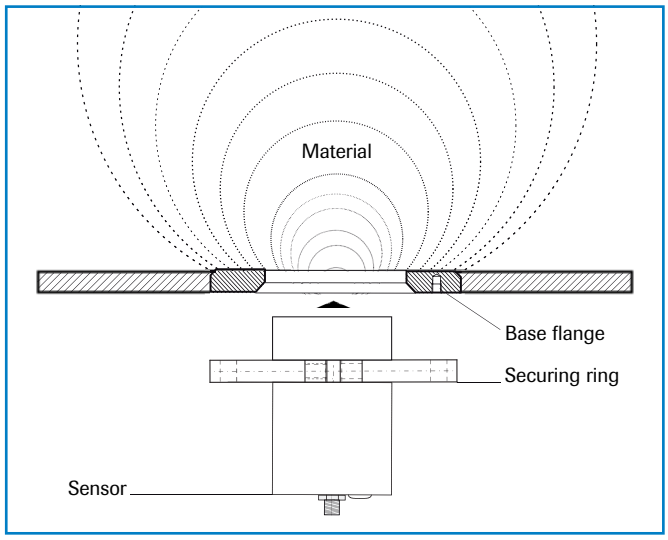
FUNCTION

The M-Sens WR3 sensor's function is based on a high frequency capacitive process, which evaluates the difference between the dielectric constant of water (DC = 80) and that of the material being measured.

Since the surface and capillary moisture of a material has a significant influence on its dielectric constant, the moisture can be measured precisely as long as the average bulk density remains constant.

To help the process, any fluctuations in the measurements caused by the bulk density are compensated by an internal filter function.

The system can be calibrated by the user with a very straightforward method. This process is performed at the touch of a button and by entering the reference moisture content without having to remove the system.



SYSTEM

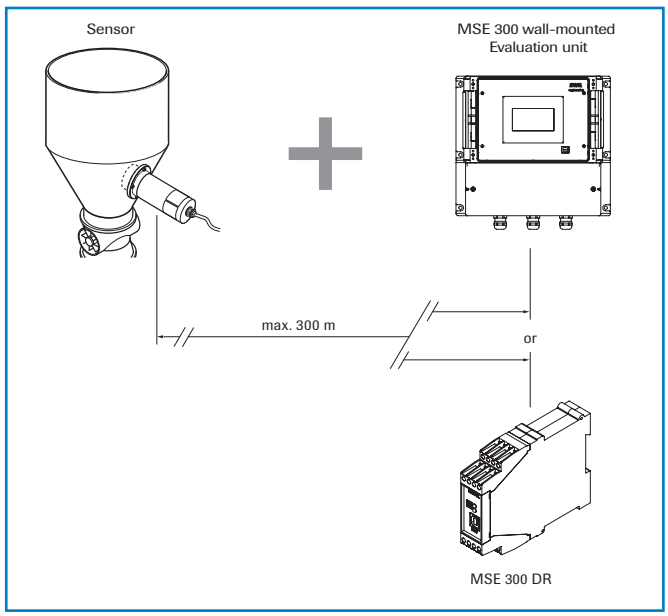
A complete measuring system comprises the following components:

- Welded or screwed flange with securing ring
- Sensor with plug connector
- MSE 300 Evaluation unit in a wall-mounted housing or a DIN Rail format unit.

The measuring probe is connected to the Evaluation unit using a shielded 4-core cable whose maximum length may be up to 300 metres.

The Evaluation unit may take the form of a wall-mounted housing including touch screen control and display or a DIN rail version.

A software package is supplied for calibration.

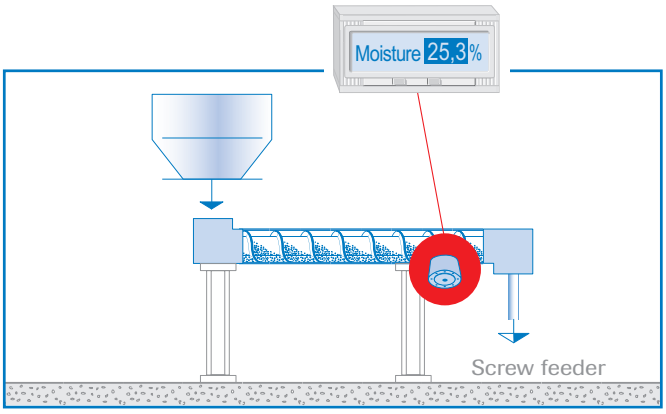


APPLICATION

APPLICATION EXAMPLES

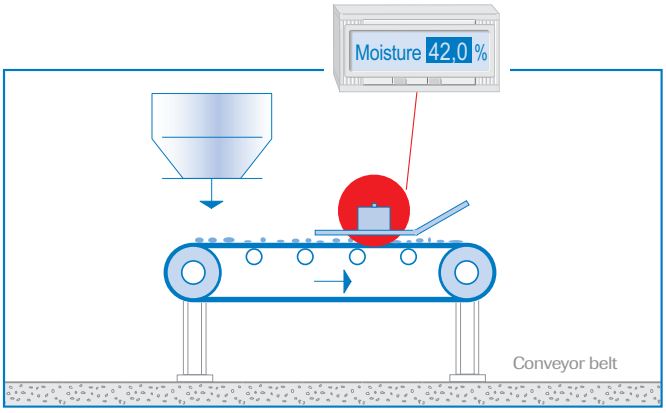
- **Installation on a screw conveyor**

Installing the moisture probe in screw conveyors has proved to be ideal since the product passes over the probe at identical intervals and at a relatively constant bulk density.



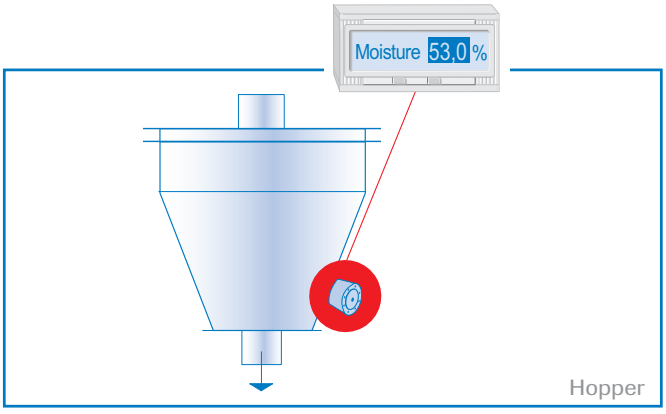
- **Installation on a conveyor belt**

The sensor can be fitted to a device that is forced on to the material on the conveyor belt. This ensures that the sensor is always in contact with the material surface.



- **Installation in a hopper**

Another possible installation for the M-Sens WR3 is in the conical discharge section of hoppers. As a result of the constant material density when full, the sensor occupies an almost constant measuring zone in which to measure the residual moisture. The sensor is installed flush with the internal wall of the hopper.



- **Drier control using online moisture measurement**

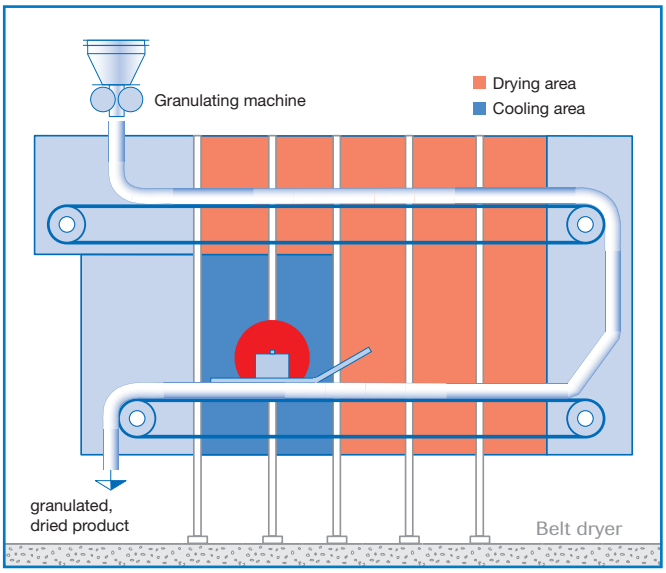
After the product on the belt has passed through the drier tunnel it is removed from the hot air zone. At the end of the belt the dried material falls into a discharge screw conveyor which takes it to the next process.

However, process managers face the following question:

Has the product actually achieved the required residual moisture content? In other words, has the correct processing time and temperature been selected?

The M-Sens WR3 supplies accurate, reliable online moisture values to the process controller which enables it to ensure a constant initial moisture level within tight tolerances.

This process makes it possible to achieve high potential savings as well as improving quality.

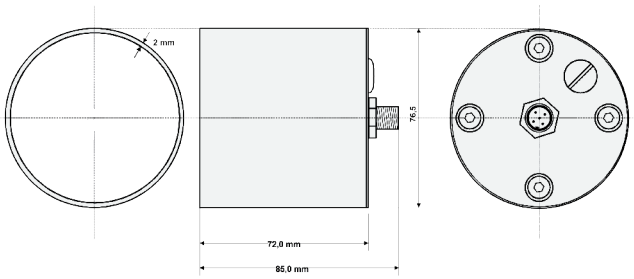


SPECIFICATIONS

TECHNICAL DATA

Sensor	
Housing material	Stainless steel 1.4301
Sensor surface	Ceramic
Protection category	IP68
Material temperature	0.5 ... + 80 °C (optional 190 °C)
Operating pressure	1 bar
Power consumption	0.6 W
Weight	0.8 kg
Measuring range	0 ... 85 % residual moisture (depending on material)
Accuracy	0.1 % absolutely in the calibrated measuring range
Connection cable	Shielded cable 4-wired, 0.25 mm²

Probe



MSE 300-DR	
Power supply	24 V DC ± 10 %
Power consumption	20 W / 24 VA
Protection type	IP40 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
Interface	ModBus RTU (RS 485) / USB
DIN rail fastening	DIN 60715 TH35
Connection terminals cable cross-section	0.2 - 2.5 mm² [AWG 24-14]
Current output	1 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)
Data backup	Flash Memory

MSE 300-FH	
Power supply	110 / 230 V AC 50 Hz (optional 24 V DC)
Power consumption	20 W / 24 VA
Protection type	IP65 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 mm² [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)
Data backup	Flash Memory

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