

M-Sens 2 WR

Online moisture measurement
for solids



Use

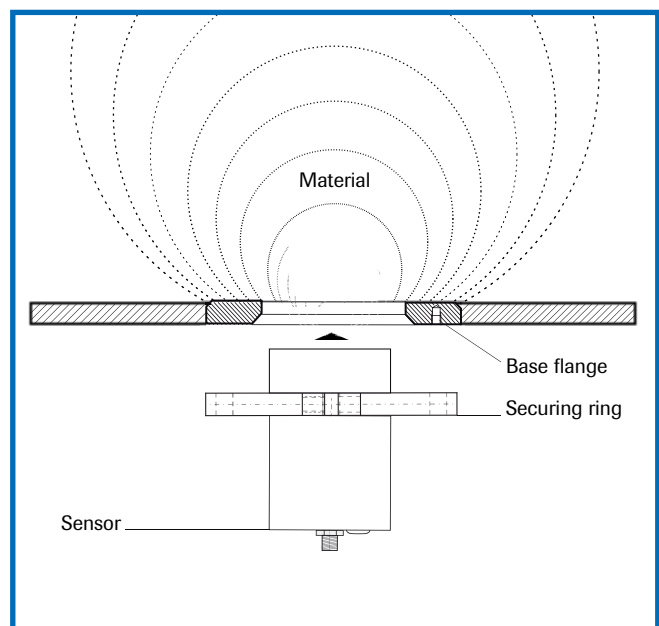
The M-Sens 2 WR sensor has been specially developed for measuring material moisture content in solids with large measuring ranges and high moisture contents. The M-Sens 2 WR is a robust sensor for the online moisture measurement of dust, powder, granulates, wood chips and other bulk goods.

The M-Sens 2 WR is easy to install and very simple to calibrate. 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 2 WR sensor's function is based on a high frequency capacitive process, which evaluates the difference between the dielectric constant of water ($\epsilon_r = 80$) 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.



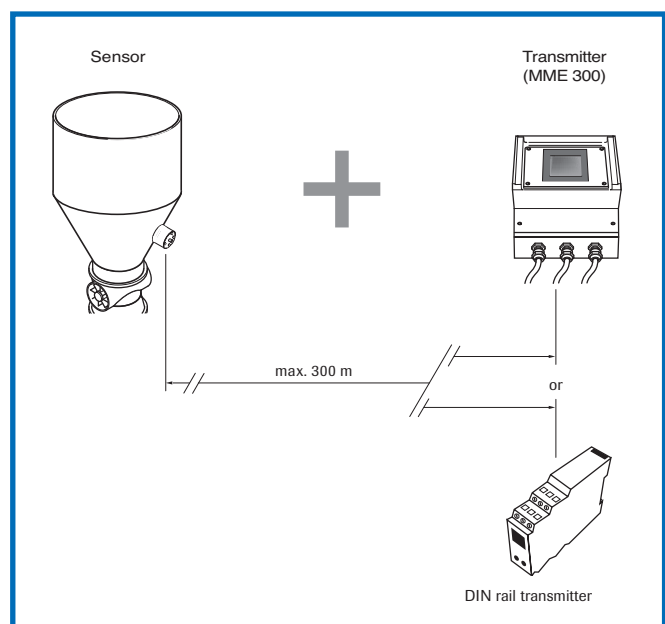
System

A complete measuring system comprises the following components:

- Welded flange with securing ring
- Sensor with plug connector
- MME 300 transmitter in a wall-mounted housing

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

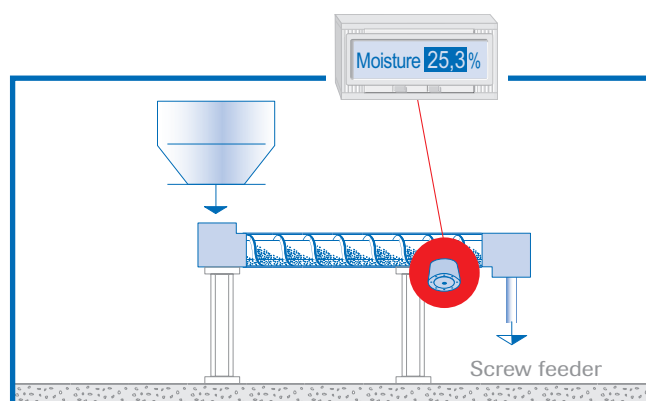
The transmitter may take the form of a wall-mounted housing including touch screen control and display or a DIN rail version. In the latter case a software package is supplied for calibration.



Sample applications

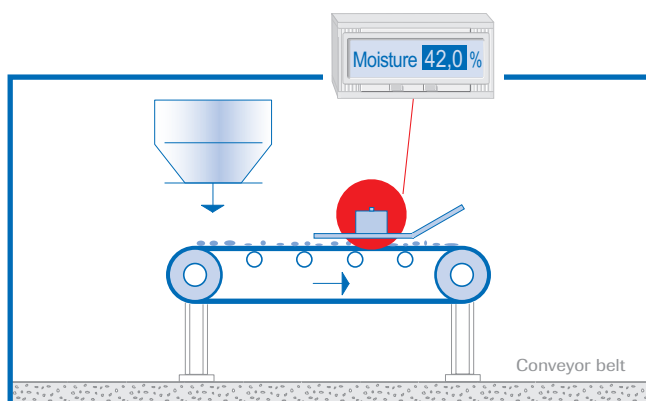
■ Installation in a screw conveyor

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.



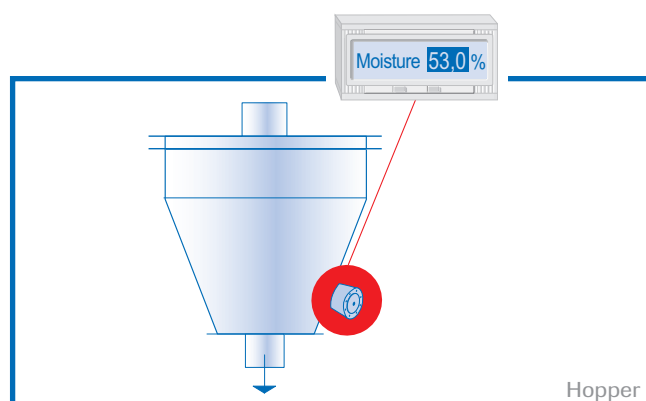
■ Installation on a conveyor belt

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 materials surface.



■ Installation in a hopper

Another possible installation for the M-Sens 2 WR 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.

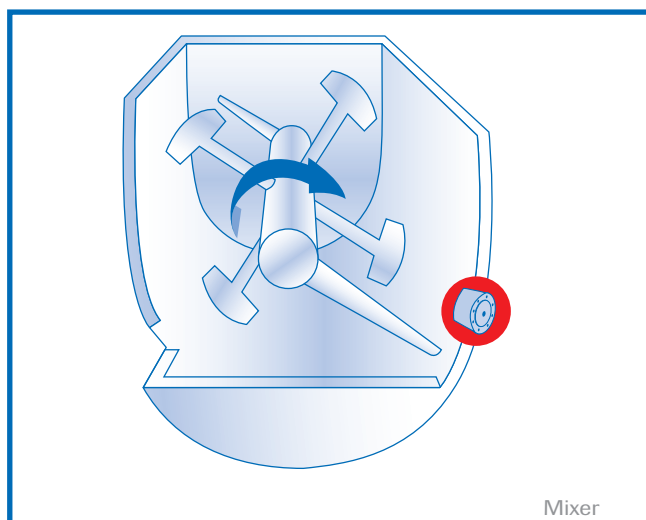


■ Moisture measurement in a mixer

The M-Sens 2 WR can be installed on all conventional mixer types. The measurement is taken during the mixing process.

The moisture measurement from the material in the mixer can then be used to adjust process parameters such as mixing time and amounts of added liquids.

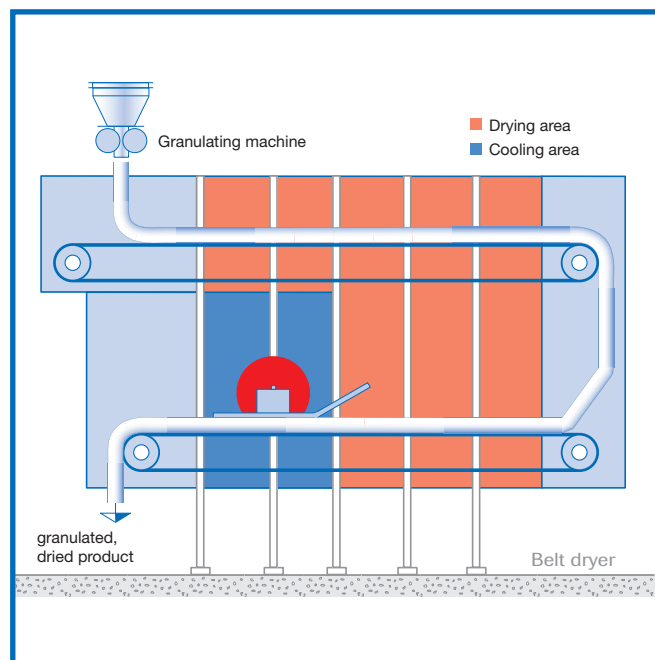
The M-Sens 2 WR can be connected to PLC or process controller for this purpose.



▪ 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 2 WR 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.



Straightforward commissioning

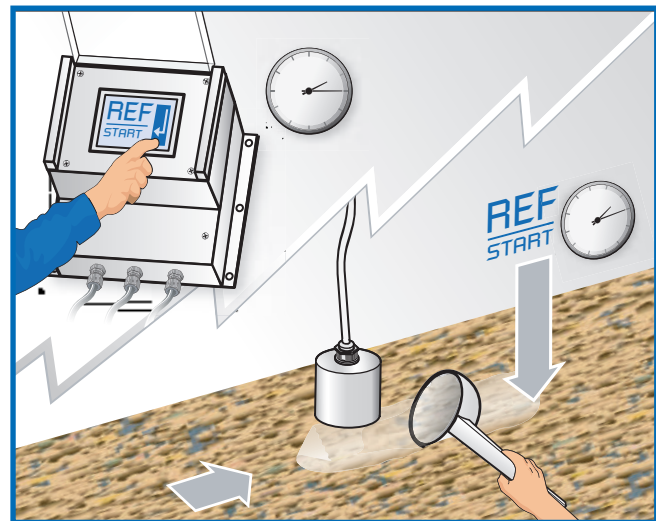
The M-Sens 2 WR is calibrated using an arbitrary number of easy to enter reference points.

In fact if you only enter a single reference point the sensor will supply an adequate accurate residual moisture content value. The more reference points you enter, the more accurately the M-Sens 2 WR transmitter will automatically calculate the current residual moisture value of your product.

1 Sampling procedure

Start the reference point entry process using the control panel on the transmitter to calibrate the M-Sens 2 WR. This will take one minute.

If the material is moving, for example on a conveyor belt, take a material sample from the flow of material downstream of the sensor.



2 Laboratory test

The sample taken from the process is tested in a laboratory and the residual moisture is measured. The sample taken for testing must be similar to that measured by the M-Sens 2 WR.



3 Entering the moisture value

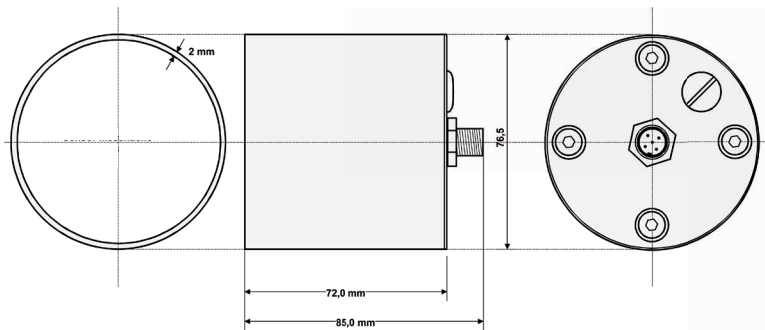
After the end of the reference point measurement which, lasts one minute, the transmitter will wait for the operator to enter the residual moisture value measured in the laboratory.

Enter this value into the transmitter. This concludes the calibration of one reference point.

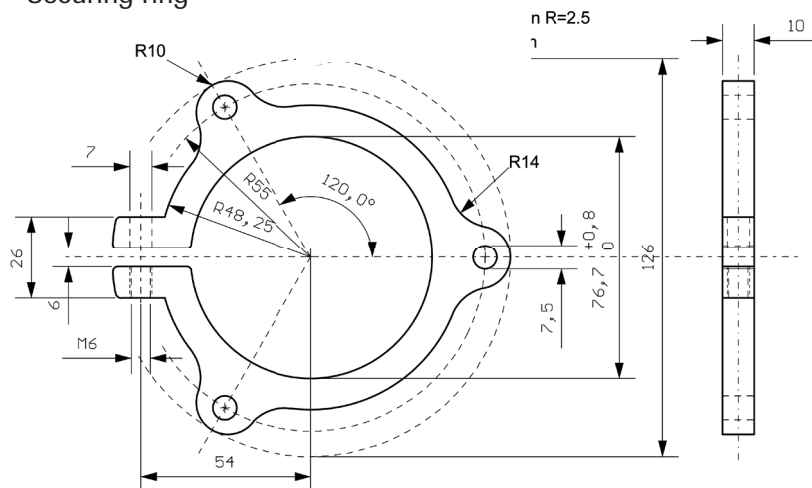


Technical data

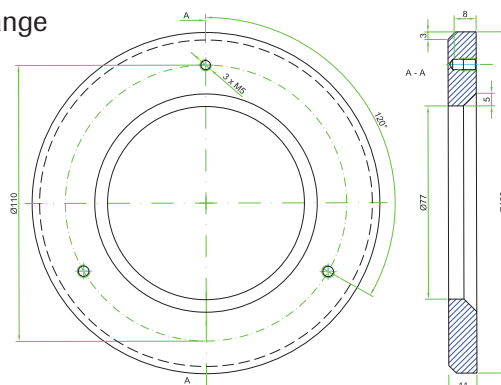
Probe



Securing ring

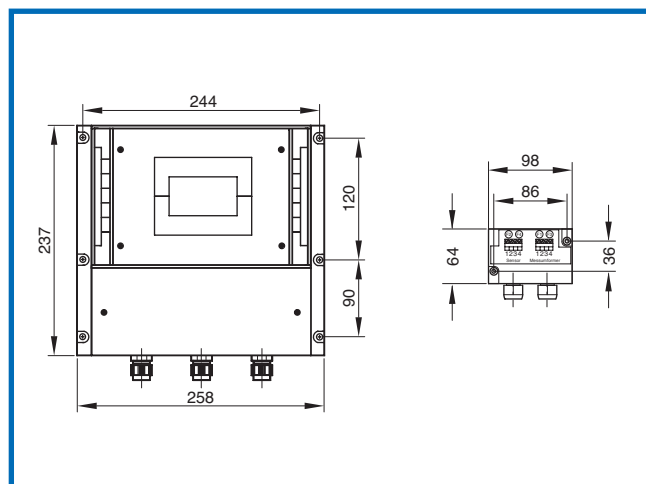


Base flange

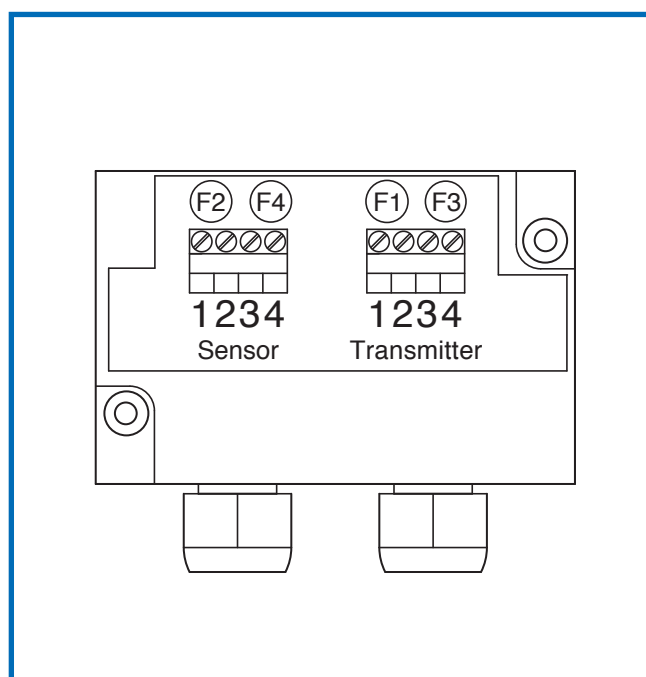


Technical data

Sensor	
Housing	Stainless steel 1.4571
Sensor surface area	Mixed ceramic
Protection type	IP 67 to EN 60529
Material temperature	0 ... +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)
Measuring accuracy	0.5 % absolute in the calibrated measuring range
Connection cable	Shielded, 4-core cable, 0.25 mm ²



Transmitter	
Supply voltage	110/230 V AC (50 Hz) / 24 V DC
Power consumption	20 W / 24 V
Current consumption	Max. 1 A at 24 V
Protection type	IP 65 to EN 60529/10.91
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 232, RS 485
Cable glands	3 x M16 (4.5-10 mm Ø)
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 < 700 Ω
Measurement alarm switch output	Relay with switchover contact Max. 250 V AC, 1 A
Digital inputs	2 inputs for active external control signals
Data backup	Flash



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