HUMY 300

Continuous inline moisture measurement of bulk materials

Application

The moisture in solids is an important parameter which strongly influences the quality of the product and the efficiency of the production. However, the common measurement method is still the examination of samples in the laboratory, which is time-consuming and the results of which are only available with a delay.

Our inline moisture measurement system HUMY 300 is the better alternative. It allows immediate reaction to moisture changes, e.g. by regulating a dryer, an automatic humidification system or other process parameters.

Scope of use

Animal food
Building materials
Chemical industry
Coal processing
Fertilizer industry
Food industry
Metal processing
Pharmaceuticals
Plastics
Power plants
Pulp and Paper
Recycling
Steel industry
Tobacco
Wood
etc.

Main Benefits

- Continuous and exact real-time recording of moisture
- No waiting time for time-consuming lab sampling
- Ensures the product contains not more or less than the maximum permissible water content, therefore improves product quality and reduces production costs
- Saves energy during drying
- Most accurate device of its class, accuracy up to 0,1 % (depending on the product)
- Measures total water content, not only the water on the surface
- Very robust, suitable for a harsh environment
- Encapsulated sensor with vibration-proof design, can even be used in vibration channels
- Best ATEX-rating (dust zone 20 and gas zone 0)
- Easy mounting and retrofit on conveyor belts, screw conveyors, pipes, chutes, etc. with multiple fixtures

Function

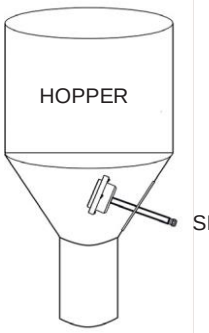
The HUMY 300 is a capacitive measuring system. This offers numerous advantages, e.g. compared to NIR sensors (sensitive to ambient light and contamination) and microwave sensors (limited at high humidity). The basic principle of the measurement is simple: The sensor of the HUMY 300 generates an electromagnetic field. During the measurement, the relative permittivity and the high-frequency recession of the solid is measured in the high-frequency range. Since the permittivity of water and most bulk solids are very different, the water content of a material can be indirectly derived from this.

The HUMY 300 takes readings of its sensor in real time. The result represents the total water content of a material – not only of the surface, as the sensor penetrates material up to 200 mm deep. For best results, the measurement should happen in contact with the material and while it is flowing and passing the sensor.

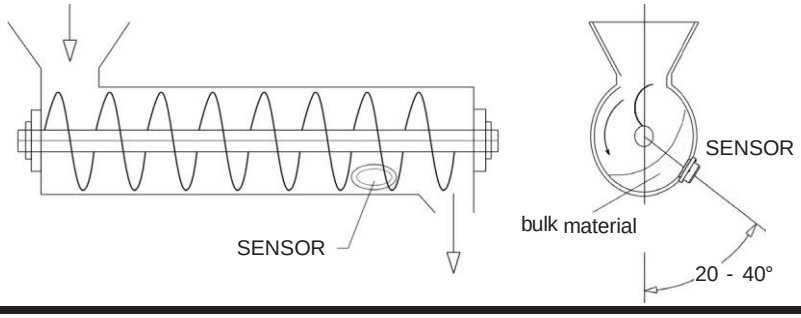
The measurement has an accuracy of up to 0,1 % – depending on the bulk material. It is not impacted by changes of electrical conductivity, pH value, surface structure, color, steam, dust or by foreign light. The density, height and velocity of the material should be kept constant. Multiple calibrations can be taken and saved for different materials or material characteristics.

Examples for installation

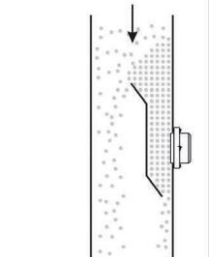
Installation in hopper



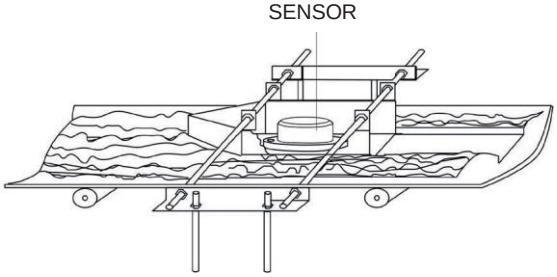
Assembly of the moisture measurement sens or at the screw conveyor‘s exit



Installation in a free fall application



Installation on a conveyor belt



Features

The sensor of the HUMY 300 is very robust and flexible. A sensor surface out of POM, Teflon or ceramic is available to handle abrasive or aggressive materials. A high temperature and an ATEX option for zone 20 or zone 0 are available.

The device is equipped with an analog output and RS485 Modbus interface. A Windows software is used for calibration. Up to 24 calibration data sets can be stored, and two of them can be selected directly via digital inputs.

The whole device is optimized for reliability and long lifetime. Each sensor is sealed and tested under extreme temperatures. A self-monitoring function supervises the device itself. Therefore, it is no surprise that HUMYs are used in the most extreme environments, e.g. vibration channels.

Successful installations (extract)

Wheat / Corn

Malt

Sugar beet

Gelatine

Powdered milk

Animal food

Cement

Sand

Limestone

Fertilizer

Wood pellets

Cellulose

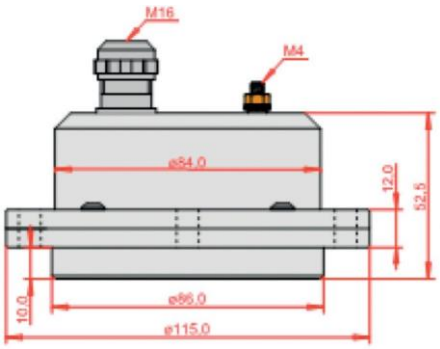
Plastic granulate

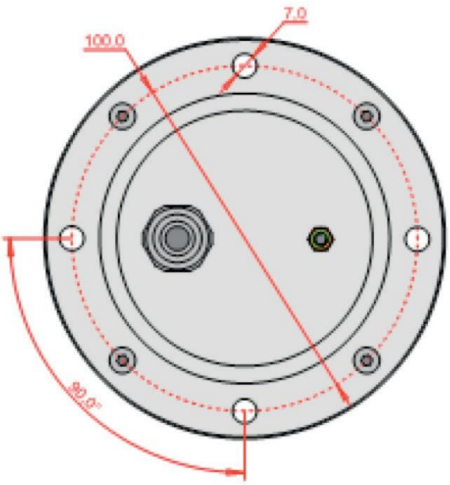
Coal & coke iron ore

Aluminium oxide

Technical Data Sensor

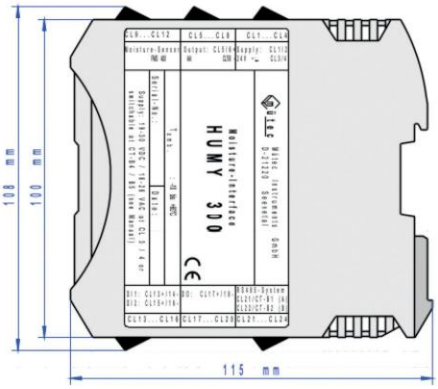
Housing material	Stainless steel (1.4301 or 1.4307 as option)
Sensor surface	K = POM C = Ceramic (optional) T = Teflon (optional) S = Ceramic+Teflon (optional)
Ambient temperature	0°C to +70°C (K/C vers.) 0°C to +80°C (T/S vers.)
Process temperature	0°C to +90°C (Non ATEX) 0°C to +120°C (Non-ATEX with high temperature option) 0°C to +70°C (ATEX with K/C) 0°C to +90°C (ATEX with T/S)
Process pressure	6 bar (10 bar temporarily)
Protection class	IP67
Output	RS485 to connect with transmitter
Cable length	Shielded 4-pole cable, 3 meters as standard, any length up to 1000 meters on request
Dimension and weight	D100 mm x 51,5 mm, 1300 g





Technical Data Transmitter

Measured moisture	0-85 % residual moisture or 15-100 % dry substance (TR)
Indicator	Percentage value with max. 3 decimal places
Accuracy	Up to 0,1 % (depending on the product)
Average & Filter Value	0 - 999 seconds
Savable Calibration	Up to 24 calibration curves
Supply voltage	24 VAC (50-60 Hz) with +15 % / -20 %; 24 VDC with +/- 25 %; max. 1,5 W
Input	1x RS485 (from FMS 410 sensor), 2x digital input (8 – 36 VDC; 2 – 14 mA)
Output	1x Analog output for moisture value (0/4-20 mA; 0-10 V), 1x Transistor output for max alarm (<1,4 W, <28 VDC, <50 mA) with free configurable delay (0-9,9 sec) and hysteresis (0-99,9 %), NO or NC 1x USB 2.0 for programming 1x RS485 with MODBUS protocol for connection with PLC
Electrical connection	TE-1 to TE-24: Screw-plug connection with 2.5 mm² TE-B1 to TE-B5: TBUS connection with 2.5 mm²
Dimension & weight	22,5 x 114,5 x 99 mm without clamps; 250 g



Mütec Instruments – Your safe choice

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