

## PRODUCT INFORMATION

Moisture measurement systems

Moisture measurement sensors

Integration kits



FEUCHTEMESSUNG  
MOISTURE MEASUREMENT



# EXPERTS FOR MOISTURE MEASUREMENT

## Every material has a certain moisture.

By knowing that moisture the production, the storage and the quality of this material can be optimized. ACO sensors determine the moisture of several kind of material in real-time.

[www.acoweb.de](http://www.acoweb.de)



# Moisture measurement in the field

The place of installation is a significant consideration. Directly, it takes influence on the quality of the measurement. Take advantage of our long-term experience.



## Analogue and digital measurement systems for all operation sites

The key products of our delivery range are three sensor families called DMMS, AMMS and MMS. For many applications it is necessary using one of ACO's various Integration kits. And last but not least, we are also able to offer you a wide range of hand held and laboratory measuring devices.

Your application has turned out to be really tricky or special? We are convinced we will be able to solve it! Our highly qualified and open minded developing team turns your guidelines into feasible and application-oriented solutions.

### MEASURING PRINCIPLE

ACO sensors are mainly used for continuous measurement to determine the residual moisture in real-time. The sensors function in accordance to the capacity measurement. The surface of the sensor is directly in contact with the material.

### SENSORS

The very robust ACO sensors are made of high-grade steel. They are designed to cope with the toughest application. With little mechanical effort it can be additionally added to existing plants. We offer several construction forms depending on the intended purpose.

### OUTPUT SIGNAL

Depending on the kind of ACO moisture measuring system or sensor you will have the opportunity to use an analogue output signal and/or Profibus DP measuring signal. Thus it should be compatible with every existing process control system (PLC) and also with the newest ones.



# DMMS Digital Moisture Measuring System

The DMMS by ACO combines great flexibility, easy installation and high comfort.

## PROPERTIES

- Capacitive moisture measurement
- Up to 16 sensors per signal processing unit
- Temperature range of measuring material: 4...80 °C
- Measured-value transfer: Profibus DP or optional analogue standard signal (e.g. 4...20mA)
- Switch material curve of sensor
- Continuous measurement or batch operation

## VERSIONS

- Certification for explosion-risk area (ex zone 22)
- Sensor extended temperature range, up to 100°C
- Sensor for measurement in silo
- Sensor for measurement in mixer
- Sensor housing made of acid proof stainless steel



DMMS is especially **suitable for challenging applications**. Up to 16 sensors are able to communicate digitally with a central evaluation unit. Wiring becomes easy by using bus-technology. That makes it simple to upgrade the measuring points. The bus-system can manage a max. length of 1.200 meters which allows you to cover even spacious estates. The calibration is made on-line within the process, so after the sensor has already been implemented. As a result the influences caused by the assembly situation can be immediately detected and compensated. The kind of measurement can be chosen between continuous and batch operation (via start and stop signal). It is also possible to switch the material curve (up to 16 different material curves per sensor). The transfer of the measuring values can be done digitally by Profibus DP or by standard signal (e.g. 4...20mA, 0..10V). If the sensor has to be exchanged the calibration curves can be completely adopted - there is no additional effort.

# AMMS Compact system

The AMMS sensor combines the advantages of calibration in the process with a direct measured-value transfer (e.g. 4...20mA) brought together in a compact version

## PROPERTIES

- Capacitive moisture measurement
- Temperature range of measuring material: 4...70°C
- Temperature compensation of sensor electronic
- Direct measured-values transfer from the sensor
- Multi-point calibration
- Integrated averaging
- Comfortable, clear calibration software, optional
- Alternative: "direct" calibration without software possible

## VERSIONS

- Integrated temperature sensing device (Pt100)
- Several analogue standard signals like 4...20mA / 0...20mA / 0...10V
- Sensor for measurement in silo
- Sensor for measurement in mixer



The AMMS sensor **with its integrated microprocessor** establishes a transition between the DMMS system and the analogue moisture measuring sensor MMS. Beside a power supply this sensor only needs a display or a PLC

which is waiting for its measuring value. The AMMS sensor has been designed for applications which do not need a multi-pieced system but benefit of a precise on-line calibration that is able to compensate the influences

of the installation. It is also possible to calibrate the AMMS sensor directly by an integrated rotary encoder. This work actually takes place before the sensor has been installed.

# MMS Universal sensor

The MMS (Moisture Measuring Sensor) by ACO stands for **universal usage, easy installation and best price-performance ratio.**

This universal usable moisture measuring sensor has an analogue measuring arrangement and uses the capacitive measuring principle for determining the moisture content of material. By standardized analogue signals (e.g.4...20mA, 0...20mA or 0...10V) the measure values are delivered to a PLC or a controller. The calibration of the sensor has to be done by rotary potentiometer, beyond the actual process.



# Sensor integration easy and precise

„The best sensor does no good if it has been placed in the wrong position.“ That’s the reason why we take special care to achieve the best solution for the various location sites with the collaboration of our customers. Based on our long term experience and our application-oriented ACO integration kits, e.g. sensor slides or compaction units, we are very well prepared for this job.

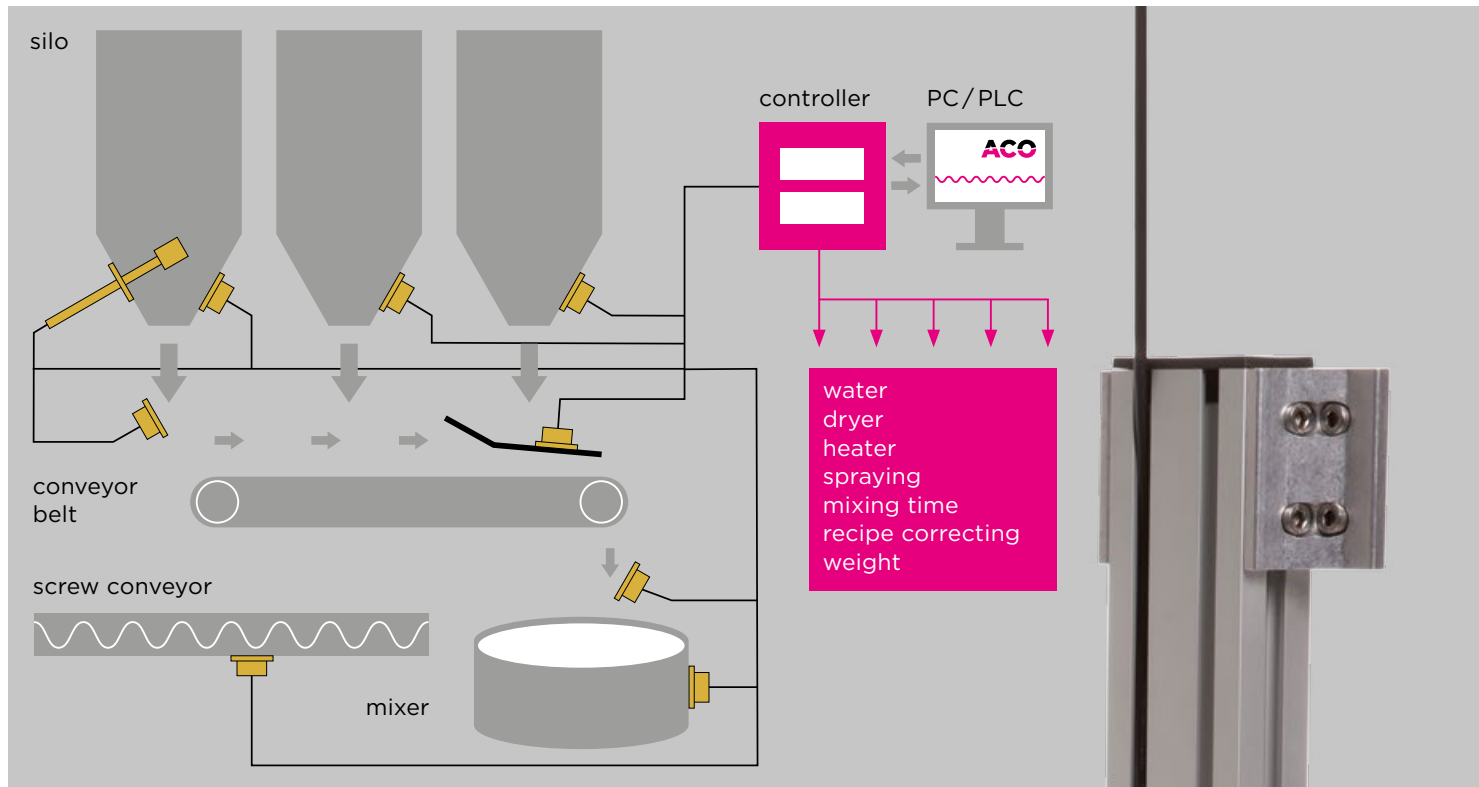


fig.: Feasible mounting positions of moisture measuring sensors



Our universal sensors determine the moisture of the most different material and are able to cope successfully with various operating conditions.

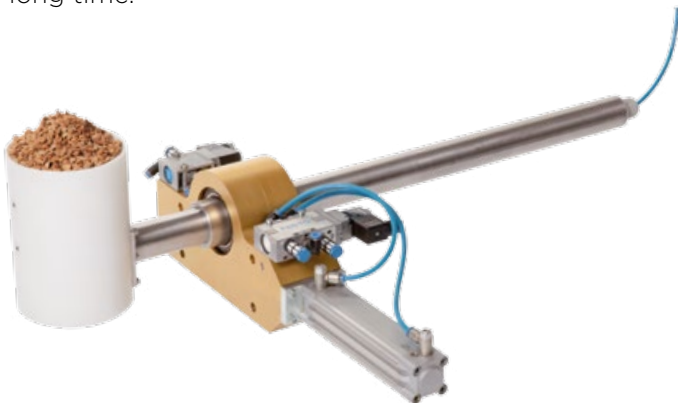


# Integration kits The perfect solution

Our tailor-made integration kits enable a feasible integration of the sensor within the process.

## TFM1 Compaction unit

The compaction unit TFM1 is specially designed for the **determination of the residual moisture of clay and loam**. Its hydraulic cylinder gives the compaction unit the power to work successfully for a long, long time.



## PN1 Sampler

The PN1 Sampler has to be **mounted in a free fall situation**, e.g. in a drop shaft. A part of the falling down bulk good is trapped in the cup. The bottom of this cup consists of the measuring surface of the ACO moisture measuring sensor.

## SFM1\_HACK Compaction unit

The compaction unit SFM1\_HACK is specially designed for the **determination of residual moisture of coarse material** in the free fall. While the pneumatic cylinder moves the „back panel“ of the SFM1\_HACK the falling down material can be compacted and pushed across the ACO moisture sensor in constant conditions.



## SFM4 Screw compaction unit

The SFM4 screw compaction unit has to be placed in a free fall situation of material, e.g. in a drop shaft. A partial flow of this material is trapped in the first section of the compaction unit. The screw compactor compresses the material and conveys it right across the installed ACO moisture sensor for **precise measuring results under constant and equal conditions** (density, dumping height, etc...).