

Microwave

Concentration Density
Dry Substance Brix Content

Transmitter



proMtec
highly concentrated know how

Microwave Concentration Measurement in clarification and biogas plants

| The advantages at a glance:

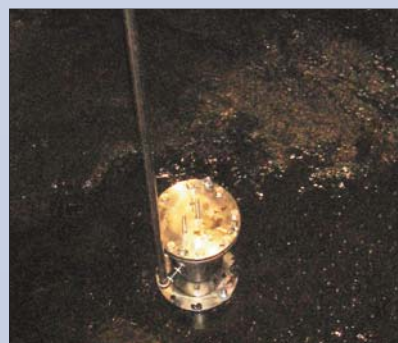


| Microwave insertion sensors

- Representative Inline Measurement
- Maintenance free
- No Bypass is needed



| Insertion sensors in an immersion
trickle filter



| Installation in a sludge tank



Concentration measurement in clarification and biogas plants

After successful introduction of the microwave concentration measurement in many different sectors of industry proMtec also offers an innovative possibility to detect the dry substance in several process steps of clarification and biogas plants. Therewith proMtec makes a contribution to improve the online process control.

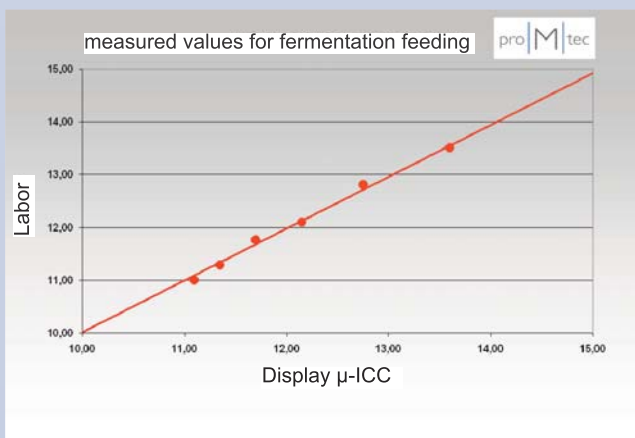
The unique advantage of microwave measurement is the direct detection of free water molecules within a hydrous medium. Therefore proMtec uses the typical transmission method, which permits a detection of the whole material stream between the sensor probes. In order to that it results in a high representativeness.

After a first calibration the measurement remains stable, only in exceptional cases there has to be a correction of this calibration.

A further advantage is the resistance to contamination of the sensor probes. Impurity or respectively tarnish has no influence on the accuracy, herewith there is no maintenance required.

Additionally there is no limitation of optical influences, viscosity, pressure or fibre length differences.

Temperature fluctuations are compensated by an integrated Pt 100 sensor.



Online dry substance measurement

In case of the correlation of dry substance/ organic dry substance with the volumetric loading, gas production rate and organic decomposition the measurement can improve this process essentially. For example the organic dry substance is a parameter for digestion tank charge and so, important for balancing the solid matter stream. Already before fermentation it is important to achieve an optimal consistency of compounding in the mixing tank.

In clarification plants the dry matter substance is needed for charging the flocking agents exactly.

For both of these applications there may be installed an additional measurement to optimize the drying process.





| One measurement - many opportunities

Depending on the specific requirements the measurement can be installed in a main pipe line, in a vessel or in an immersion trickle filter.

proMtec offers a modular 3 component system, which consists of the controller, the microwave module and the sensors. It allows a high flexibility and so a high customer's specification.

Thanks to the great variety of sensor types proMtec can define an individual solution according to special requirements.

Furthermore proMtec has developed an immersion trickle filter with the whole hardware integrated for application in a sludge tank.

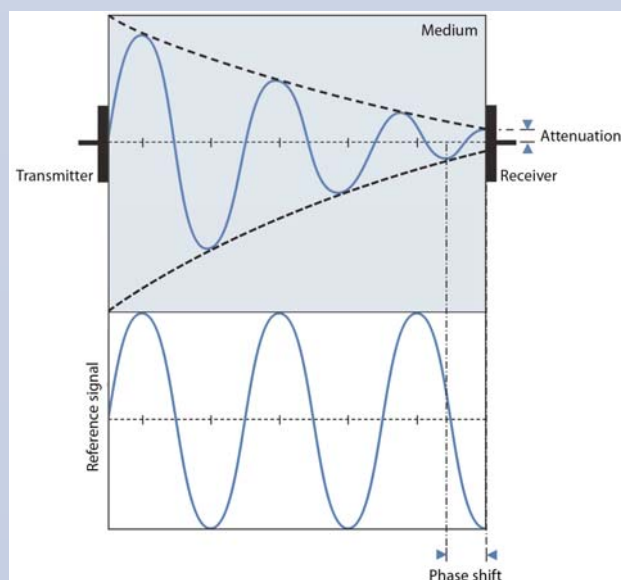
This immersion trickle filter is stationary installed inside the tank. The controller, which is necessary for calibration and monitoring, can be installed at a easily accessible place.



| Measuring principle

The microwave concentration measurement is based on the fact, that the microwaves are absorbed by free water molecules. Thus the received signal gets a phase shift compared to the transmitted signal respectively a attenuation of the amplitude. That means the measurement is correlates with the water content of the medium.

With this values the μ -ICC 2.45 calculates the water content, the density or the dry matter content of any liquid, paste or suspension.



Technical Data

Controller μ -ICC 2.45	
Housing	Aluminium wall housing, robust design, protection IP 65, 240 x 240 x 120 mm, approximately 5.5 kg
Mounting	4 holding flaps H x B = 142.5 x 273 for \varnothing 5
Power supply	AC: 90 – 270V, 45 – 68 Hz; max. 45 VA alternative DC: 18 – 36V DC max. 1000 mA for 1 to 2 sensors DC max. 1800 mA for 3 to 4 sensors
Display	Monochrome-LC 1/4 -VGA, 320 x 240 pixel, illuminated. Large display of the measurement result and drag pointer with analogue bar graph displays of deviation of the measurement in its defined scale.
Handling	Foil keyboard with 4 soft keys. Well-structured multilingual menu.
Status display	3 LEDs for operational signal, status of the measurement and access-PIN for parameter.
Outputs	4x 0/4 – 20 mA isolated outputs for concentration, range can be set for each channel specifically. Load max. 500 Ω .
Data interface	RS 232, 9600 Bd for data communication or comfortable software-update.
Data memory	EEProm - data memory for 30 calibration and parameter data sets. All data are absolutely saved in case of power failure. Option: additional changeable memory module for back-up of 30 data sets.

Inputs	4x TNC-plugs for 50 Ω coaxial cable, RG 58, max. 150 m each for simultaneous running of 4 separated microwave modules. Digital data transmission on carrier frequency 10 MHz.
Temperature	Environment 0 to 50 $^{\circ}$ C.
Microwave module μ -ICC 2.45	
Housing	Aluminium wall housing, robust design, protection IP 65, 166 x 100 x 81 mm, approximately 1.4 kg
Mounting	4 holding flaps H x B = 87 x 123 for \varnothing 5
Power supply	DC 24V through coaxial cable from the controller
Microwave	Extremely stable phase and attenuation measurement with PLL-synthesizer; 2.45 GHz. Transmission performance 10 mV, 10 dBm.
Microwave cable	2x N-plugs for coaxial cable 50 Ω , typical 1 to 2 m (max. 3 m)
Data memory	EEProm-data memory for reference point, in case of power failure all data absolutely saved.
Output	1x TNC-plug for coaxial cable 50 Ω , RG 58 for data transmission to the controller.
Input	Pt 100/ Pt 1000 two-wire connection. Range -50 to 200 $^{\circ}$ C
Temperature	Environment 0 to 60 $^{\circ}$ C.



The innovative Microwave Transmission Technology of proMtec:

- Controller μ -ICC 2.45 (see figure)

additional to the controller:

- Microwave module μ -ICC 2.45
- Microwave cable
- Transponder (if amplification is needed)
- Protected housing
- Microwave insertion- or flat-sensors
for adaption corresponding specific requirements

Alternatively to this concept there is the **μ -ICC 2.45 compact** available. It combines the controller, module and amplifier in a compact housing. It is appropriate for a single measurement point (please contact us for detailed information).