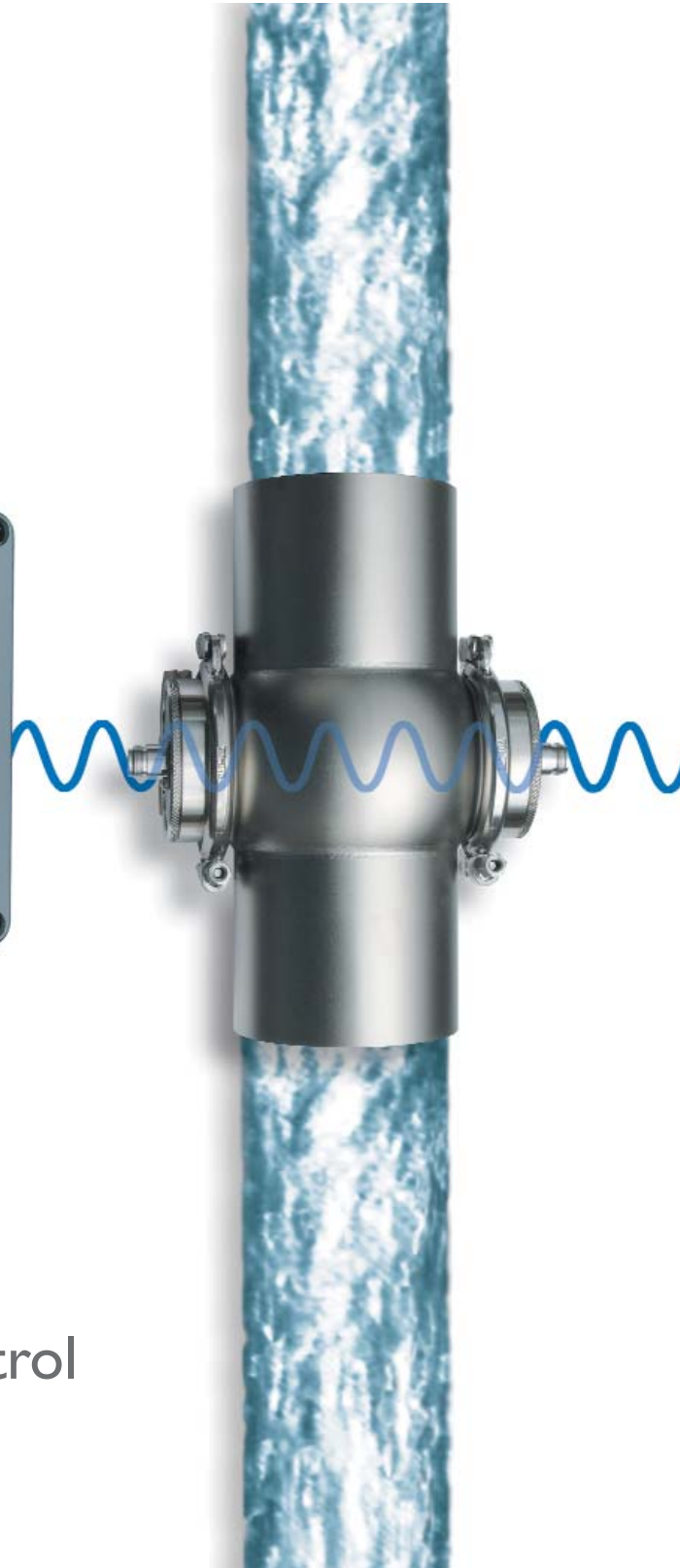


Contactless measurement
of the concentration
in processing



Inline Concentration Control
μ-ICC 2.45

The superior concept

The Inline Concentration Control μ -ICC 2.45 measures the concentration, the density, the dry matter content or the water content of a liquid product during processing.

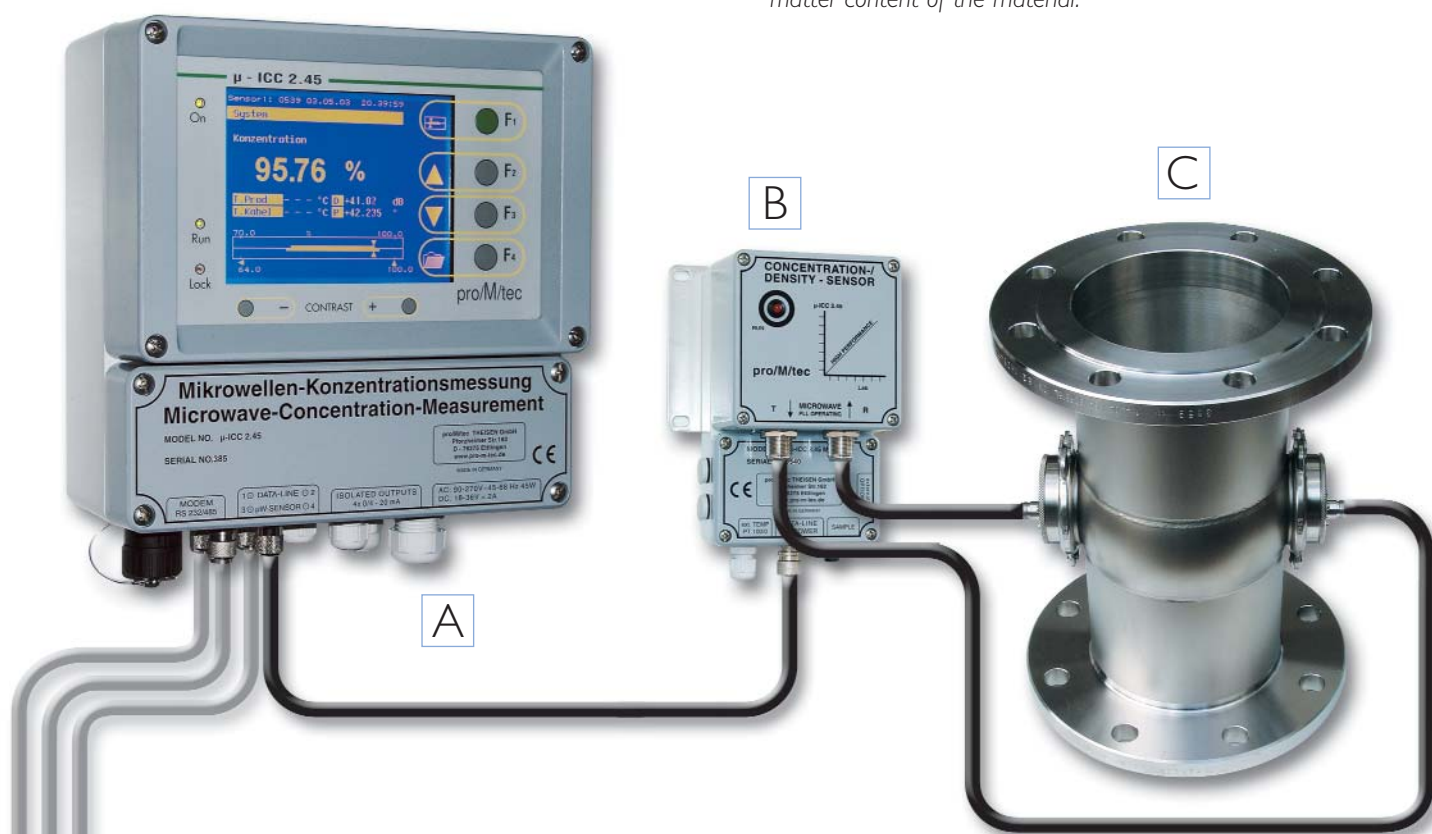
The product can be liquid, a kind of paste or a suspension.

*Look out for the new possibilities.
Look into your process!*

With microwaves you “radiate through” the whole cross-section of a pipeline from which you get a representative measurement.



While radiating through a liquid product with microwaves they suffer a phase shift and attenuation change which directly correlates with the water content i.e. with the dry matter content of the material.



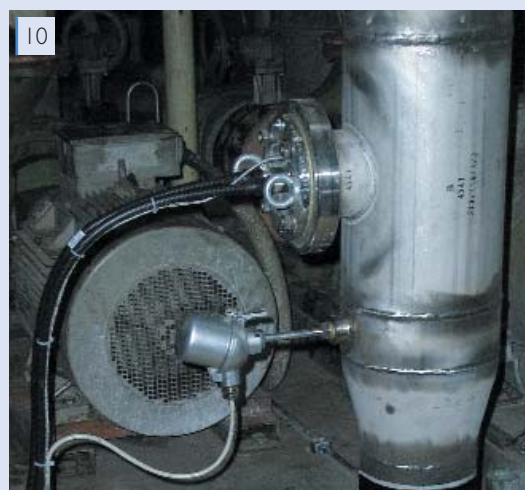
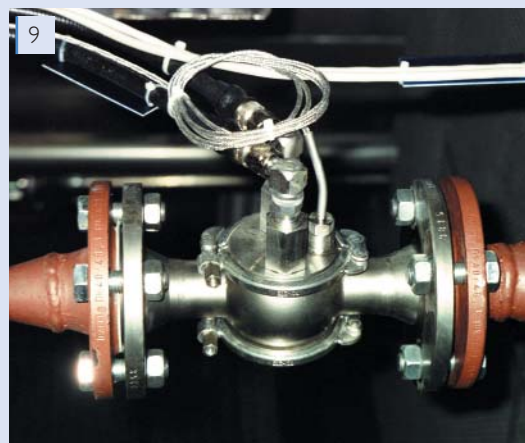
Inline Concentration Control μ -ICC 2.45

The controller **A** is the central evaluation unit for between one to four measuring points. In the display you can see measurement values such as concentration, density or other concentration units with the related process temperature. All measurement values are digitally available through the RS 232 interface. The main measurement value for the concentration is transferred to the process control system by the classical 0/4 – 20 mA current interface.

You can adapt the system parameters and the calibration data to your specific measuring task by using the well-structured multilingual menu of the controller.

The complete microwave electronics are mounted in the extraordinarily compact microwave module **B** which is installed close to the sensor **C**. The microwave module gets its power supply from the controller by using a coaxial cable (with a max. length of 150 m) which also guarantees the digital transmission of the measured data between module and controller. This concept allows a flexible choice for installation places for the components **A**, **B** and **C**.

Born in practice
Matured during the rough industrial process



Modular extension for 4 measurements

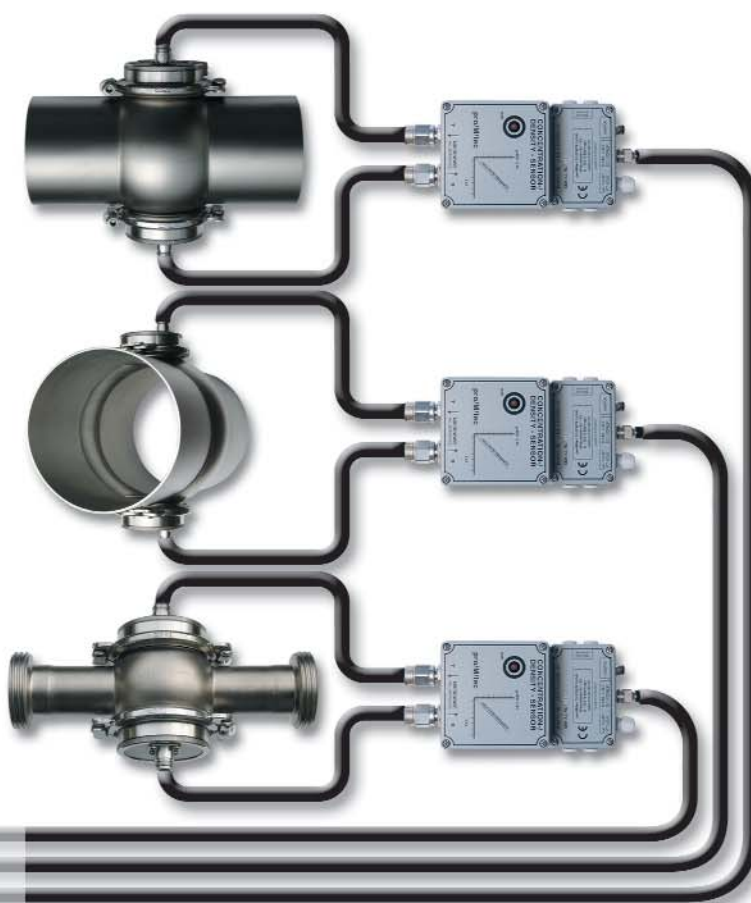
- 1
Typical installation in a vessel. Here: Microwave insertion sensor DN 100 with integrated temperature sensor PT 100 at the bottom of the crystallizer.
- 2
Inline-pipeline DN 125 installed in a vertical process pipeline. Microwave insertion sensor and temperature registration are installed compactly in a varivent flange.
3.
10 measurements distributed between 5 controllers installed inside an electrical cabinet.
4.
Installation of the controller onto the crystallizer wall for on-site visualization of the measured values .
- 5
Inline pipeline DN 80 in a vertical process pipeline. Microwave transmission through the complete cross-section of the pipeline.
- 6
Compact inline pipeline DN 40 in a vertical bypass.
- 7
The easiest installation form for a crystallizer: The microwave insertion sensors are set directly into the pan wall. Additional registration of the process temperature by a PT 100.
- 8
Inline pipeline DN 150 in a vertical process pipeline. Microwave transmission through the complete cross-section of the main stream. Additional registration of the process temperature by a PT 100 for temperature compensation .
- 9
Compact inline pipeline DN 40 in a bypass.
- 10
Alternative installation for pipelines with large cross-sections: A microwave insertion sensor DN 100 is flanged to the pipeline. A PT 100 temperature sensor has been installed separately.

The controller μ -ICC 2.45 has 4 isolated outputs 0/4 – 20 mA. For the realisation of more than one measurement up to 4 microwave modules can be connected. Each module has its own settings and calibration to measure independently from the other modules. The calibration and setting of each measurement can be effected without interference from the measuring channels which are already used for process control.

Each measurement and its settings can be shown separately on a big display or you can choose all 4 measuring values in the display together.

Even if you only operate one measurement: the remaining measuring channels can be used for different ranges or different calibrations (product specific multiple calibrations).

The power supply of the module and the digital data communication between each microwave module and the controller is effected by a coaxial cable with a max. length of 150 m. Hereby you always find the optimal installation place for the controller.



The superior idea: Measurement of concentration with pro|M|tec μ -ICC 2.45

Theoretically it is perfect.

But theory doesn't actually count, it is the practice which counts.

It is about the responsibility to keep the process running.

It is about the permanent and precise registration of specific measurement values.

What does the measurement of concentration by microwaves achieve for your process?

- The measurement is **contactless**, therefore the attrition of the sensors is absolutely minimal. There is practically no maintenance.
- The measurement is adequate for the **main material stream in pipelines** and for **vessels**, i.e. **inline** in your process. Such a measurement values the real process as it is. Therefore you don't have to rely on a measurement installed in a bypass which doesn't often represent main material stream.
- Because of the transmission through a **representative cross-section of the product stream** you measure "correctly", you measure what counts.
- The measurement does not depend on an optical transparency of the product and therefore it is almost **independent of contamination and deposition** on the sensors. So you have chosen a secure measuring procedure.
- Depending on the application you obtain a **precision in the process** measurement which is comparable to your laboratory analysis. You get the quality of your laboratory control continuously in the process.

What does pro|M|tec achieve for you?

- If you speak with us, you can profit from the **experience** of thousands of realised measurements. Each measurement available on the market has to be inserted carefully into the existing measurement conditions, and to be calibrated: all concentration measuring instruments available on the market at the moment do not measure concentration directly but comparatively. i.e. by a calibration received from standards the measurement is adapted to the given application in your industrial process. This way we go along with you.
- The installation: we make ourselves a comprehensive picture of your measuring task before we **recommend the optimal installation point**.
- pro|M|tec is **operating** with this measuring system **world-wide in all continents**. i.e. you can trust in a measuring system which has worked and has been accepted under the toughest conditions on-site.
- pro|M|tec works on **installing instruments in industrial processes** only, i.e. you can be sure, we know about what you are talking about. We know your problem already.
- pro|M|tec is **100 %** focused on the concentration **measurement by microwave**. i.e. as soon as there is further progress in this technology we have thought about the advantages you will get.

What does μ -ICC 2.45 achieve for you?

- Measuring system is appropriate for the rough **industrial process**. You will get a long-life, reliable measurement.
- The measurement parameters are set to the controller by a **user-friendly menu**, i.e. you will soon get used to the system and make adjustments very fast.
- The controller can be installed at a distance of up to **150 m from the measuring point** because we set the microwave electronics into a separate housing. This gives you great flexibility in the selection of the optimal installation place for the controller.
- The measuring system can have one to max. **4 separate sensors**. By using one common controller for several measuring points the costs can be reduced.
- Depending on the application **insertion sensors are available for vessels and inline pipelines while integrated sensors** are available to be installed in tubes in order to ensure the optimal measuring conditions for reliable measured values.

With our μ -ICC 2.45 you will get the highest standard for precise inline concentration measurement in the contactless measurement technique currently available on the world market



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 W = 142.5 x 273 for \varnothing 5 |
| Power supply | AC: 90 – 270 V, 45 – 68 Hz; max. 45 VA alternative DC: 18 – 36 V DC max. 1000mA for 1 to 2 sensors DC max. 1800mA 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 | 4 x 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 °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 W = 87 x 123 for \varnothing 5. |
| Power supply | DC 24V through coaxial cable from the controller. |
| Microwave | Extremely stabile phase and attenuation measurement with PLL-synthesizer; 2.45 GHz. Transmission performance 10 mW, 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 W, RG 58 for data transmission to the controller. |
| Input | PT 100 / PT 1000 two-wire connection. Range -50 to 200 °C. |
| Temperature | Environment 0 to 60 °C. |



An innovative feature for the backing-up of your valuable setting data: Save all calibration data and instrument parameters on a mobile memory chip. This chip can safely remain in the controller or you can keep it in another secure place. 30 data sets can be saved.

Technical modifications reserved!