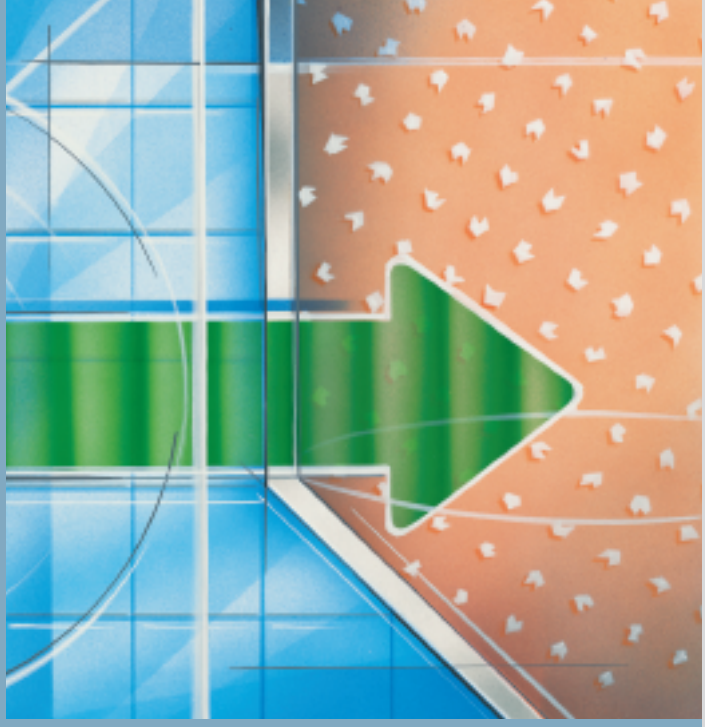


CONTACTLESS MEASUREMENT

CONCENTRATION

WATER CONTENT

DRY SUBSTANCE

measured by microwaves

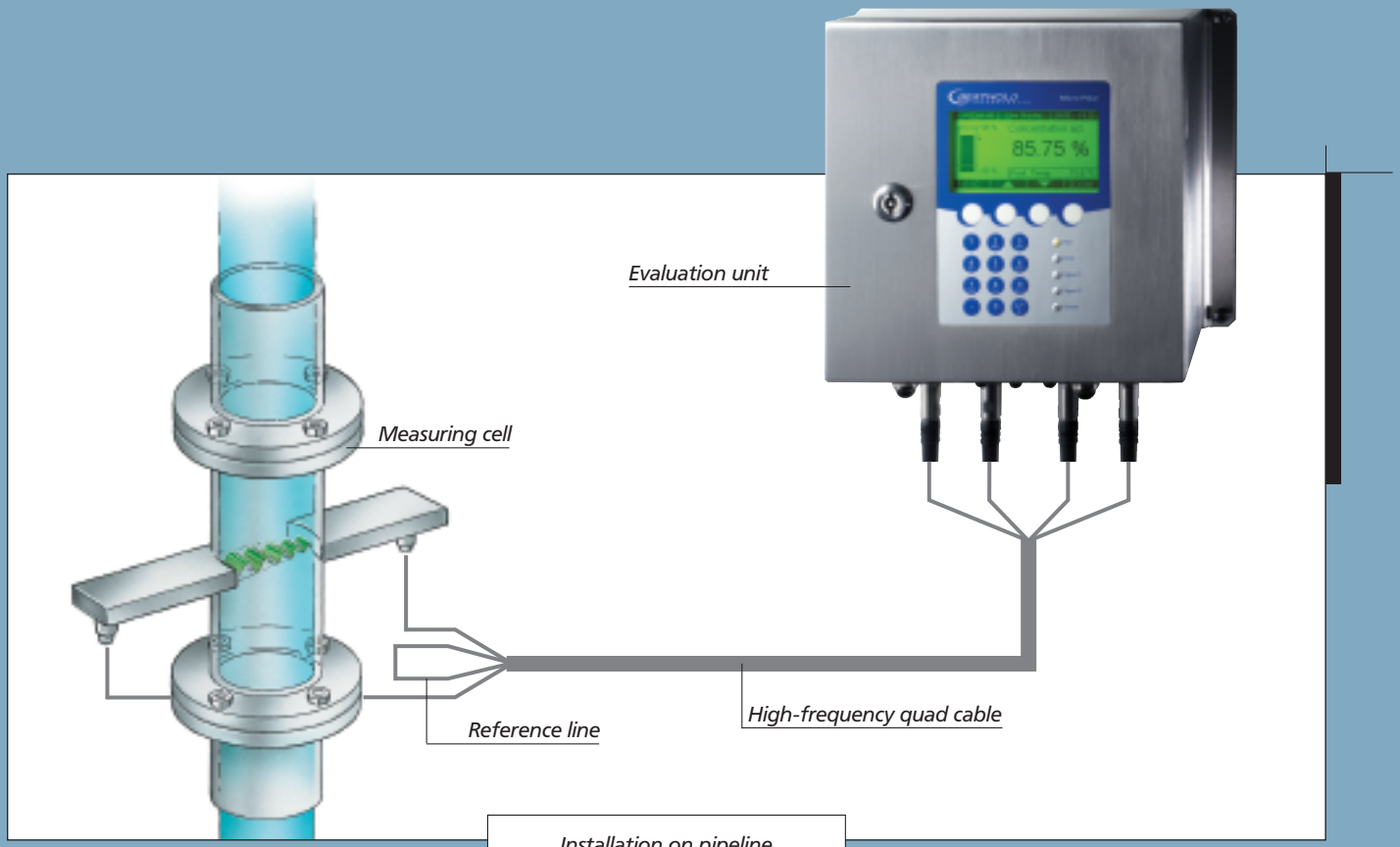
Micro-Polar™ LB 566

BERTHOLD TECHNOLOGIES

Micro-Polar LB 566

An important parameter in many areas of process control is the measurement of concentration, dry substance or water content for **optimization** and **control,** as well as for **improving quality.** Interfering factors such as colour, inhomogeneity, deposits etc. should have none or only a negligible effect on the measuring value.

BERTHOLD TECHNOLOGIES is aware of these demands from years of experience in the industry and has developed the microwave system Micro-Polar. With its special sensors, the Micro-Polar detects the concentration, dry substance or the water content on-line reliably and accurately.



Installation on pipeline

Measuring arrangement

The illustration shows a typical arrangement; the measuring cell is integrated in the pipeline. All material flowing through the pipeline is detected. The evaluation unit is installed near the measuring cell and connected by a special HF cable. The integrated reference line in this cable allows a very accurate system and cable drift compensation.

Areas of Application

Using the Micro-Polar, the concentration, the dry substance or the water content is measured. The product can be in fluid, suspension, paste or powder form. Measuring can take place in pipelines, vessels or in other process related system parts using the different sensors.

Typical areas of application are amongst others, measurement of cream cheese, butter, milk of lime, gypsum suspension, silicic acid etc.

Your Advantages

■ **High selective sensitivity to water**
High accuracy and long-term stability
even for difficult products

■ **Simple installation,** insertion directly
on the existing pipelines, vessels, chutes etc.

■ **Simple start-up,** system supported sample taking,
automatic calibration and graphic display

■ **Accurate and reliable measurement**
due to two highly stable PLL-synthesizers
and multi-frequency technology

■ **Durable sensor** measuring cells with wear resistant
smooth walled PTFE lining

■ **Contactless** measuring cell without installed
measuring antenna

■ **High operational safety and standards of quality**

Measuring Principle

In the tried and tested transmission technology, microwaves penetrate the product which causes different strengths of polarisation of the material components. Especially, water molecules can be measured very selectively and accurately, since the free water molecules are polarised due to their natural structure.

As a result, the propagation velocity of the microwaves is slowed down (phase shift) and their intensity is weakened (attenuation). Both effects are measured by Micro-Polar and are used as an indication of concentration or water content.

The multi-frequency technology allows the measurement at a variety of individual frequencies per measuring cycle, therefore a very stable and reliable measu–rement can be guaranteed after plausibility analysis.

The modern technology applies very weak microwaves which are completely harmless for humans and the environment.

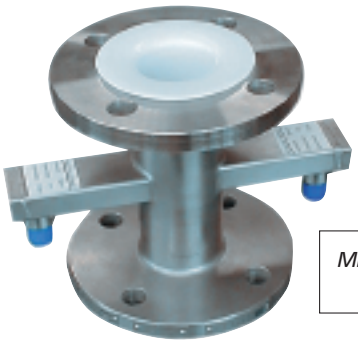
System Configuration

Micro-Polar consists of the evaluation unit, the microwave sensor and a high frequency quad cable.
The microwave sensor can consist of:

■ Measuring cell of various nominal widths
■ Container probe
■ Container probe with flushing device

Container flush probe

Container probe



Microwaves measuring cell nominal width 50 mm

Technical Data Micro-Polar LB 566

Evaluation unit

Assembly	Wall housing made of stainless steel H x W x D: 300 x 323 x 140 mm protection class IP65, Weight: approx. 6.5 kg
Auxiliary energy	Depending on instrument version: 1.) 90 … 265 V AC, 45 … 65 Hz 2.) 24 V AC/DC; DC: 18 … 36 V; AC: 24 V +5 %, -20 %, 40 … 440 Hz
Power consumption	max. 30 VA (AC/DC)
Transmitting power	max. 0.1 mW
Temperature range	Operating temperature: - 20 ... + 60 °C (253 ... 333 K), no condensation Storage temperature: - 20 ... + 80 °C (253 ... 353 K), no condensation
Attainable accuracy	≤ ± 0.2 % DS (Standard deviation) depending on product and sensor
Display	Graphic LC display with back-lighting 114 x 64 mm, automatic contrast setting
Keyboard	Freely accessible foil keypad, alphanumeric keyboard and 4 soft-keys, multi-language dialog, data protection through freely selectable password
Interfaces	RS 232, RS 485

Inputs

Analog inputs	2 x 0/4 … 20 mA, load 50 Ω 1 x insulated, 1 x instrument ground
Digital inputs	Configuration options: DI1: measurement start/stop DI2: measurement hold, product selection DI3: sample measurement, product selection
PT-100 connection	Measuring range - 50 ... + 200 °C (223 ... 473 K) Measurement tolerance < 0.4 °C

Outputs

Analog outputs	1 x 4 … 20 mA, 1 x 0/4 … 20 mA load max. 800 Ω, insulated
Digital outputs	2 x relay (SPDT), insulated Configuration options: – collective error message – measurement hold – threshold (min. and max.) – no product
Loading capacity	AC: max. 400 VA, DC: max. 90 W AC/DC: max. 250 V, max. 2 A non-inductive, ≥ 150 V: Voltage must be grounded

HF Sensor connection

Signal channel	Connection for the HF sensor 2 x N connectors (Tx, Rx), 50 Ω
Reference channel	Connection for the HF reference cable 2 x N connectors (Tx, Rx), 50 Ω
HF cable quad	Measurement and reference cable lengths 2 m and 4 m (distance sensor – evaluation unit), N-connectors, 50 Ω

Sensors

Measuring cell

Material	PTFE-lining, stainless steel 1.4301
Product temperature	10…130 °C (283…403 K)
Pressure range	nominal pressure up to 40 bar, depending on nominal width and type of flange
Flange	Choice of DIN EN 1092 Typ 05 and ASA Option: screw necks, clamping devices
Varieties	Pipe nominal widths: 50…150 mm

Container Probe

Material	Plastic, stainless steel 1.4301
Product temperature	10 … 120 °C (283 … 393 K)
Flange	DIN EN 1092 Typ 05: DN 65 / PN 6 DN 80, DN 100, DN 150/PN 16 ASA 2.5"/150 PSI others on request
Process connection	minimum insertion hole size Ø (mm) for DN 65 / PN 6: 100 ± 0.2 other: 102 ± 0.5
Design	with integrated reference path
Varieties	1. without flushing device, with PT 100 2. with flushing device 2 x 3/8" flush connection

BERTHOLD TECHNOLOGIES reserves the right to implement technical improvements and/or design changes without prior notice.

ISO 9001 BERTHOLD Quality you can trust

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