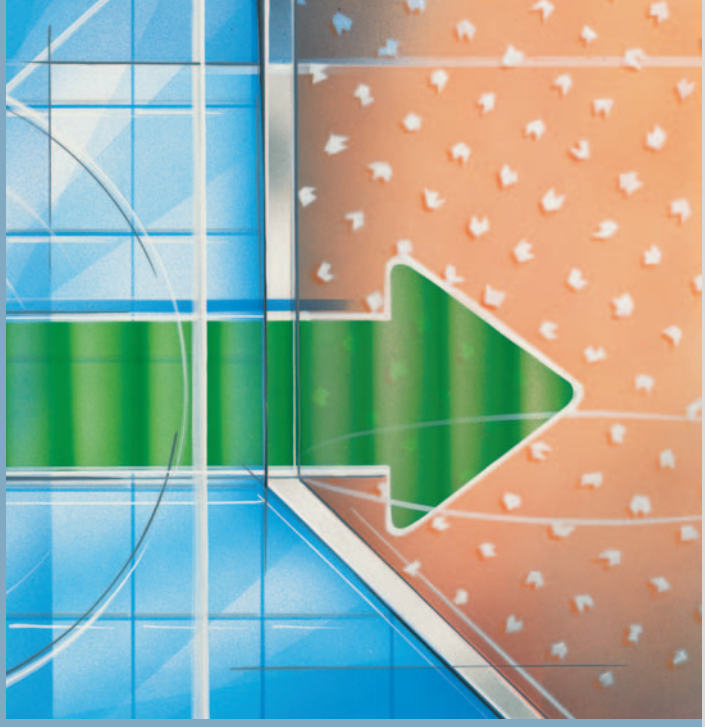


PROCESS CONTROL

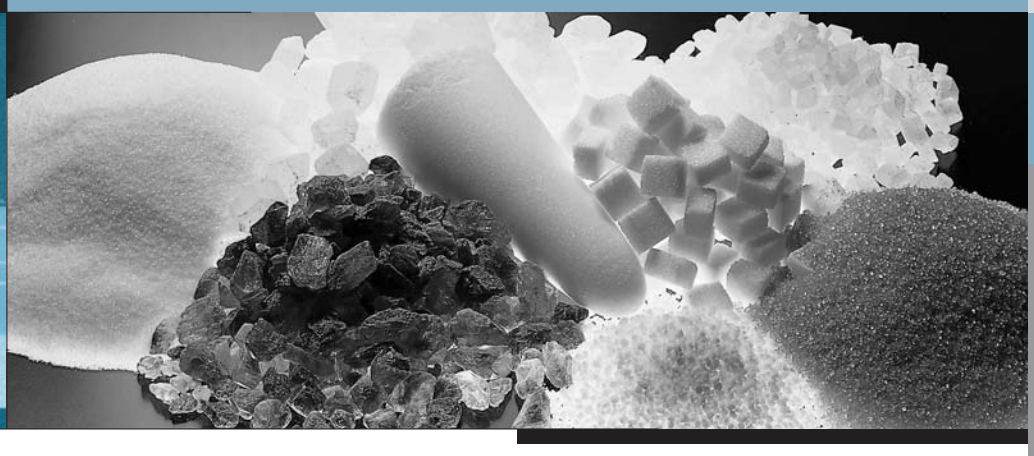
CONCENTRATION

DRY SUBSTANCE-

BRIX-CONTENT

measured by microwaves

Micro-Polar Brix™ LB 565

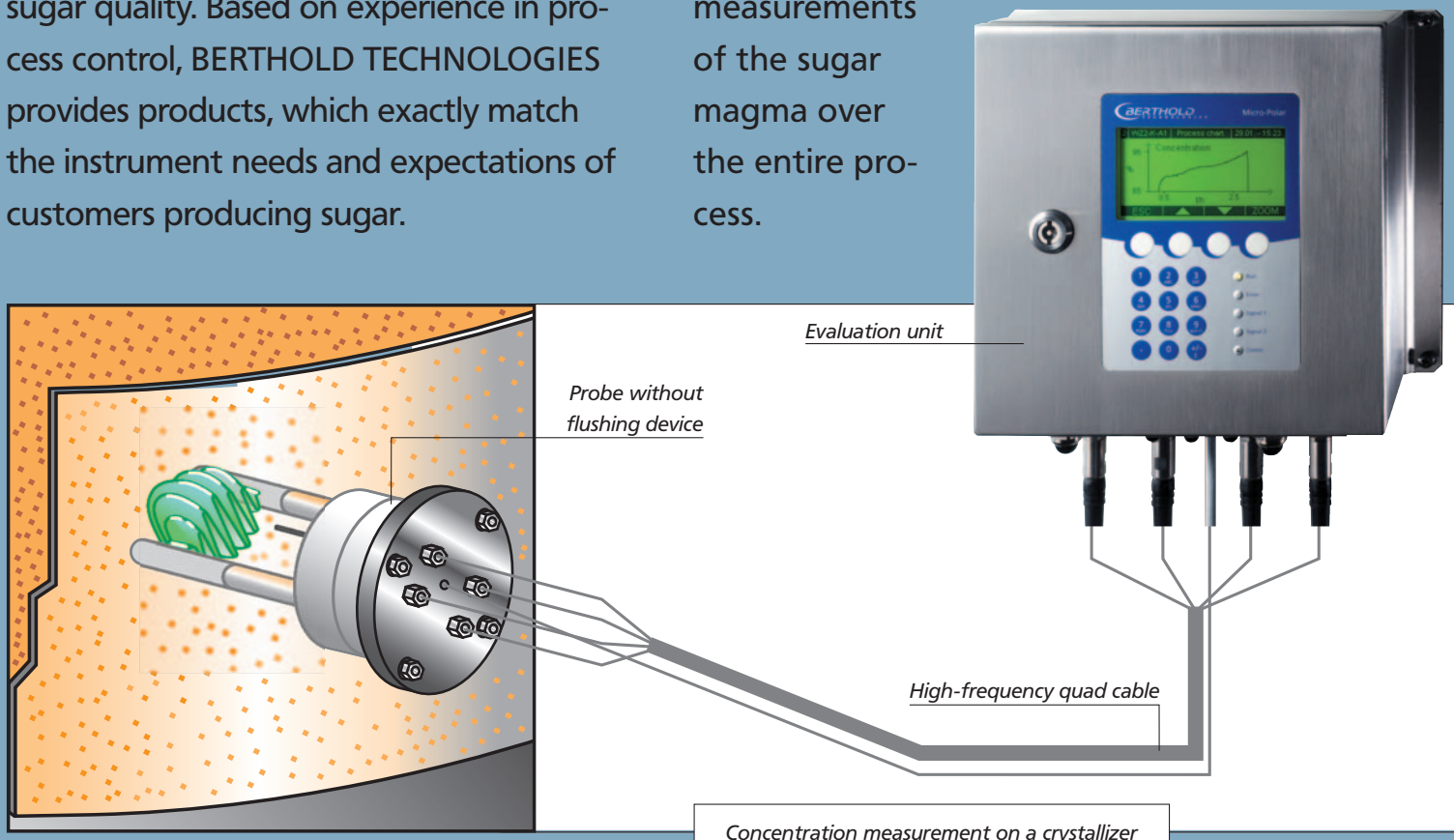


BERTHOLD TECHNOLOGIES

Micro-Polar Brix LB 565

An important parameter for the **extraction of sugar** is the concentration of the sugar massecuite. Measurement of the **dry substance content,** usually represented as Brix is absolutely essential in order to optimize, control and improve the sugar quality. Based on experience in process control, BERTHOLD TECHNOLOGIES provides products, which exactly match the instrument needs and expectations of customers producing sugar.

We offer specially designed microwave sensors for measurements in product pipelines, dissolved sugar containers, crystallizers and at other process locations. The **Micro-Polar Brix** provides accurate, reliable on-line concentration measurements of the sugar magma over the entire process.



Concentration measurement on a crystallizer

Measuring Arrangement

The pan probe is fastened to the assembly flange of the crystallizer and/or integrated into the existing pipeline. The probe is connected to the evaluation unit by a high frequency multi-care cable up to a distance of 10 m. The reference line integrated in this cable provides drift compensation.

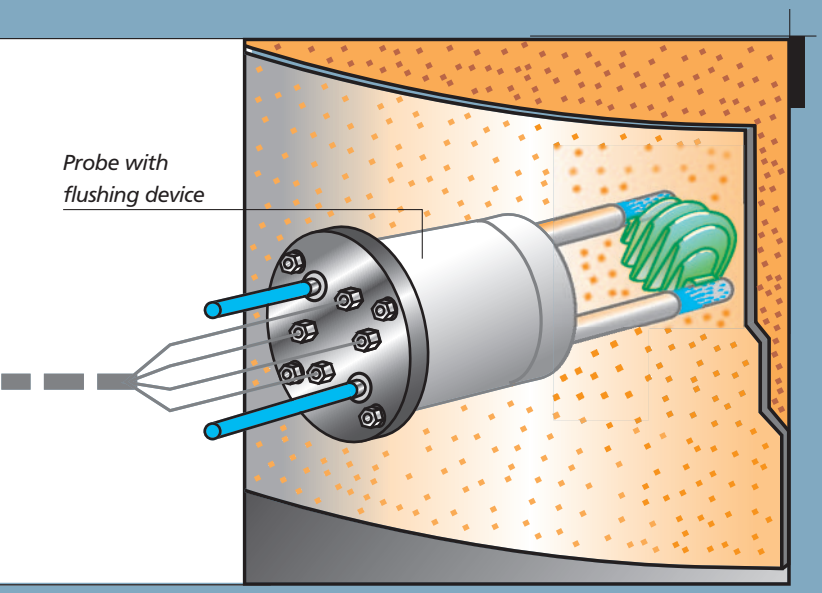
The pre-calibrated Micro-Polar Brix supplies very exact measurement values after a simple start-up and automatic reference calibration. The final calibration is automatic and graphic displays of results are provided. In a crystallization process samples may be taken before or after the seed point and the system stores a record of each sample.

Measuring Principle

Microwaves penetrate the product to be measured, causing free water molecules to rotate, resulting in phase shift and an attenuation of the transmitted microwaves. Micro-Polar Brix uses these two parameters to determine the concentration while compensating for influences of different products and for variations in the purity of the sugar concentrate.

Our multi-frequency technology employs a range of frequencies per measurement cycle to ensure repeatable measurements.

Typical installation on an evaporation crystallizer



Your Advantages

■

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

■

High safety of operation through accurate and direct DS display during the entire process, separate evaluation unit per measuring point, recognition of pauses between two crystallization processes

■

Contactless measuring cell without installed measuring antenna

■

Competence based on 25 years experience in the sugar industry

■

High Quality Standards through ISO 9001

Cont. pan probe

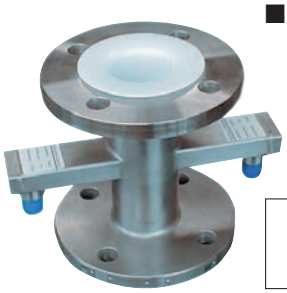
Batch pan probe

System Configuration

Micro-Polar Brix 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
- Batch pan probe
- Continuous pan probe with flushing device



Microwaves measuring cell nominal width 50 mm

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Technical Data Micro-Polar Brix LB 565

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
Interface	RS 232 for measuring data output and easy software update

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, output freely selectable as concentration, dry substance and/or Brix and density
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, 4, 6 and 10 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

Pan Probe

Material	Plastic, stainless steel 1.4301
Product temperature	10 … 120 °C (283 … 393 K)
Flange	DIN EN 1092 Typ 05: DIN 65 / PN 6 DN 80, DN 100, DN 150/PN 16 ASA 2.5", ASA 3"/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	
Batch pan probe	without flushing device, with PT 100
Cont. pan probe	with flushing device 2 x 3/8" flush connection

The Micro-Polar Brix has a frequency licence approved by both the FCC (Federal Communications Commission) and ETSI (European Telecommunications Standards Institute).

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

BERTHOLD TECHNOLOGIES

ISO 9001 BERTHOLD Quality you can trust

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