CONCENTRATION

DRY SUBSTANCE-BRIX-CONTENT

measured by microwaves

Micro-Polar Brix™ LB 565
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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.

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.

Your Advantages

- Easy start-up: instrument supported taking of samples, 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 intervening measuring antenna
- Competence: based on 20 years experience in the sugar industry
- High Quality Standards: through ISO 9001

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
- Container pan probe with flushing device
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

**Display**
RJ 232

**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, 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 2527 Form B 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 2527 Form B: DIN 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**
Batch pan probe without flushing device, with PT 100
Cont. pan probe 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.

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