tech-info

► *DynFAS MW*

Microwave density measurement for

determining dry substance content.

Brix value measurement for

sugar,

milk of lime, and

molasses.

BMA

Microwave density measurement

Microwave density measurement for determining dry substance content

For many years, microwave measuring technology has been a well-established, reliable and precise method to determine dry substance content. The measured value is immediately available online and can be processed directly by a higher-level automation system.

Fields of application

The measuring system can be used to determine the dry substance content of any substance (dissolved or solid) in aqueous solutions, such as:

- Sugar solution (Brix)
- Milk of lime (Baumé)
- Molasses (dry substance content in %)

A measuring system comprises several components:

Measuring probe

The measuring probe combines the emitting and receiving aerials with a conventional connection system. The measuring probe is selected as appropriate for the place of installation. There are three basic types available:

- Pan probe without flushing device
- Pan probe with flushing device
- Pipe-installed probe

The type of probe is also selected depending on the measuring task. Usually, pan probes without flushing device are used for batch-type crystallisation (batch-type vacuum pans), and flushed probes for continuous crystallisation (VKT). Pipe probes are installed downstream of mixers.

Analysing unit

The analysing unit consists of microwave measuring components and a micro-computer, which manages the analysing process and the human-machine interaction (HMI). Two basic types of unit are available, which are distinguished only by the dynamics of the microwave measuring technique. The analysing unit with high dynamics is used for analysing media with a low dry substance content. The engineering design will be carried out by us.

Connecting cables

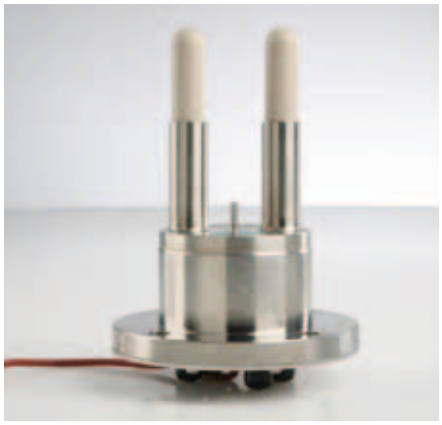
Four paired microwave connecting cables are needed to connect the measuring probe to the analysing unit. These special-purpose cables are sturdy and specially shielded.

Options

A memory tool can be used for easy management of the calibration data stored in the unit. In this way the data can be simply read from and written back to the unit. The data can be processed on a PC using a free standard software application.

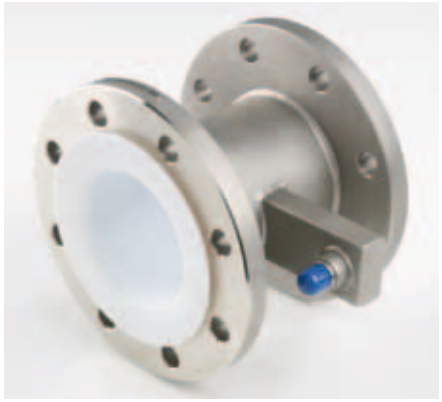
Where there is little room for installation, angle connectors can be used.

Pan probe without flushing device



Pan probe with flushing device

Pipe-installed probe



Operation

The measuring device offers multi-language operation via function keys and a user-friendly menu guidance. To avoid operating errors, sensitive areas are password-protected. Calibration is performed directly on the device and the measuring system is then ready for use.

Physical measuring principle

The measuring principle utilises the specific physical properties of molecules. Owing to its atomic structure, each molecule has a more or less strongly developed electric polarity (dipole character). Unlike most other molecules (e.g., sucrose), the water molecule has very strongly developed dipolar properties. This difference is utilised and can be measured.

Measuring, i.e. microwave transmission measuring is performed directly inside the product. The microwave is emitted from one aerial, penetrates the medium to be measured, and reaches the receiving aerial. The change in the intensity and the phase position of the microwave on its way through the medium is determined electronically. This change can be converted by calibration, so that the dry substance content of the medium to be measured is obtained as measured output value.

Benefits

- Reliable inline density measurement in real time
- Simple calibration directly at the device
- Precise measured value with excellent repeatability
- Can be easily integrated into existing automation systems

Flange dimensions	***Pan probe without flushing device***	***Pan probe with flushing device***	***Pipe-installed probe***
DN 50			PN 16
DN 65	PN 6	PN 6	PN 40
DN 80	PN 16	PN 16	PN 16
DN 100	PN 16	PN 16	PN 16
DN 150	PN 16	PN 16	PN 16
ASA 2″			150 PSI
ASA 2.5″	150 PSI	150 PSI	300 PSI
ASA 3″	150 PSI		150 PSI
ASA 4″			150 PSI
ASA 6″			150 PSI

Available measuring probes

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