

Microwave measurement device

Continuous In-Line measurement of dry matter or consistency

HK1 Series



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Description:

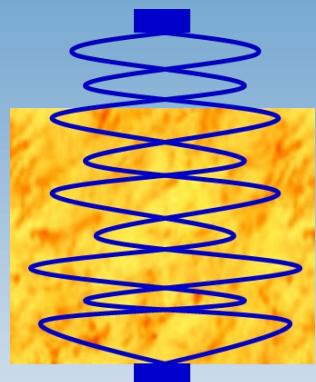
At the microwave measurement technology an electromagnetic wave with very low energy is generated. This signal is coupled via an antenna into the product (Cellulose, Cheese, Milk, Curd, etc.).

Depending on the dielectric properties of the product the signal propagates in the product. After the signal has passed the product a second antenna receives the signal (Transmission).

Amplitude and phase shift of the received signal are an expression for the consistency, water content or dry matter of the product.

The microwave measurement is very stable and it has a quick response to product changes.

Transmissions signal passes through an in-homogenous product



Conditions for a successful measurement:
The product contains NO SALT, NO METAL and
conductivity < 1mS between the antennas!

The measured values of the H₂O- or dry-matter content are available as digital and analogue values.

The HK-instruments are applicable in different production processes and in different production lines as continuous In-Line-measurement.

Because of further increasing quality requirements after ISO and EU standards, the industries have an enhanced demand for improved quality control, standardization and In-Line-trend observation.

Advantages:

- State-of-the-art microwave technology
- Real time measurement
- Continuous monitoring over the whole production
- Production with constant and documentable quality
- Modular design provide robust measurement
- Early detection of fail production
- Vibrations do not effect the measurement results
- Remote from PC or with separate remote control
- Easy calibration through one point calibration
- Non-destructive measurement
- No moving parts
- No wear
- Maintenance free

HK1-Mp for Consistency measurement



For projecting:

- Belt speed V (must be constant)
- Size of the cheese (Length or Diameter)
- Minimal and maximal dry matter of cheeses

Real time measurement of:

- Dry matter / Water content
- Cheese height

Pin-Antennas:

Size: Ø 16 x 195 mm

Flange:

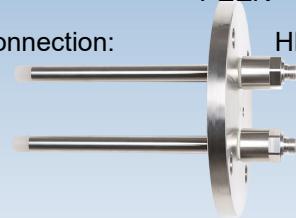
Standard DN65 / PN6

Cleaning: DN65 / PN16

Other Flange on request

Material: Stainless steel, PEEK

Connection: HF- Cables



HK1-M for Milk, Curt, Topfen measurement



For projecting:

- Pressure in the pipe
- Minimal and maximal dry matter of the product
- Riser is necessary

Real time measurement of:

- Dry matter / Water content

Antennas:

- 3A Spiral antennas
- short 3A Pin-Antennas

Short 3A-Stabsensoren

Size : Ø 30 x 86 mm

Material: Stainless steel, PEEK

Connection: HF-Cables

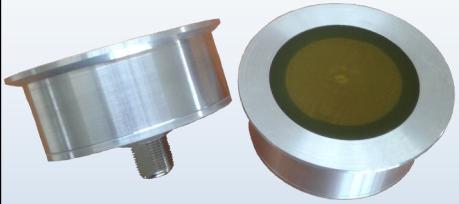


3A Spiral antennas

Size: Ø 75 x 33 mm

Material: Stainless steel, FR4

Connection: HF-Cables



HK1-C-3A for Butter, Mozzarella measurement



For projecting:

- Pressure in the pipe
- Minimal and maximal dry matter of the product
- Riser preferred
- Minimum diameter pipe DN125

Real time measurement of:

- Dry matter / Water content

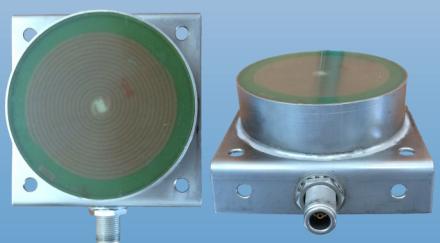
Spiral antennas

Size: Ø 80 x 25 mm

Mounting: 84 x 84 x 36 mm

Material: Stainless steel, FR4

Connection: HF-Cables



Evaluation unit

Technical data evaluation unit HK1-MC und HK1-M:

| | |
|----------------------|---|
| Housing: | Stainless steel |
| Size H x W x D: | 500 x 300 x 170 mm |
| Weight: | ca. 15 kg |
| Protection Type: | IP66 / NEMA 4 |
| Power supply: | 100 - 240 V/AC optional 24V/DC – 50/60 Hz – max. 200mA |
| PC-interface: | RS232 or RS485 |
| 2 Analog outputs: | 0/4 - 20mA / isolated 1500V |
| 1 Analog input: | 0/4 - 20mA / isolated 1500V |
| 1 Relays contact: | max. 5A / 250V |
| Digital - input: | Ext. selection: 16 Products / Start / Stop |
| PROFI-BUS-DP: | optional |
| Operating: | membrane keypad |
| Display: | 2x24 Sign LCD, LED– backlight |
| Environmental temp.: | -20°C - +85°C |

Technical data evaluation unit HK1-C-3A:

| | |
|----------------------|---|
| Housing: | Aluminum die casting |
| Size H x W x D: | 180 x 180 x 100 mm |
| Weight: | ca. 7 kg |
| Protection Type: | IP65 / NEMA 4 |
| Power supply: | 100 - 240 V/AC optional 24V/DC – 50/60 Hz – max. 200mA |
| PC– interface: | RS232 or RS485 |
| 2 Analog outputs: | 0/4 - 20mA / isolated 1500V |
| PROFI-BUS-DP: | optional |
| Environmental temp.: | -20°C - +85°C |
| Product temperature: | 0°C - 130°C |

Remote control:

| | |
|-----------------|----------------------------------|
| Size H x W x D: | 200 x 120 x 64 mm |
| Operation: | membrane keypad |
| Display: | 2x24 Sign LCD, LED– backlight |

Directives:

The HK1 is CE- conform, according to the followings directives:

- EMC directives 2014/30/EU:
 - generic standards EN 61000-6-2
 - generic standards EN 61000-6-4
- Low- voltage directives 2014/35/EU
- RoHS directives 2011/65/EU

Scope of supply:

All HK1 are supplied with sensors / antennas and evaluation unit.
At the commissioning, the operating personal gets a device instruction / training.

Technical data evaluation unit HK1-Mp:

| | |
|----------------------|---|
| Housing: | Aluminum die casting |
| Size H x W x D: | 230 x 200 x 100 mm |
| Weight: | ca. 5 kg |
| Protection Type: | IP65 / NEMA 4 |
| Power supply: | 100 - 240 V/AC optional 24V/DC – 50/60 Hz – max. 200mA |
| PC-interface: | RS232 or RS485 |
| 2 Analog outputs: | 0/4 - 20mA / isolated 1500V |
| 1 Analog input: | 0/4 - 20mA / isolated 1500V |
| 1 Relays contact: | max. 5A / 250V |
| Temperature sensor: | TP100 |
| Digital - input: | Ext. selection: 16 Products / Start / Stop |
| PROFI-BUS-DP: | optional |
| Operating: | 6 in membrane keypad integrated soft keys |
| Display: | 2x24 Sign LCD, LED– backlight |
| Environmental temp.: | -20°C - +85°C |