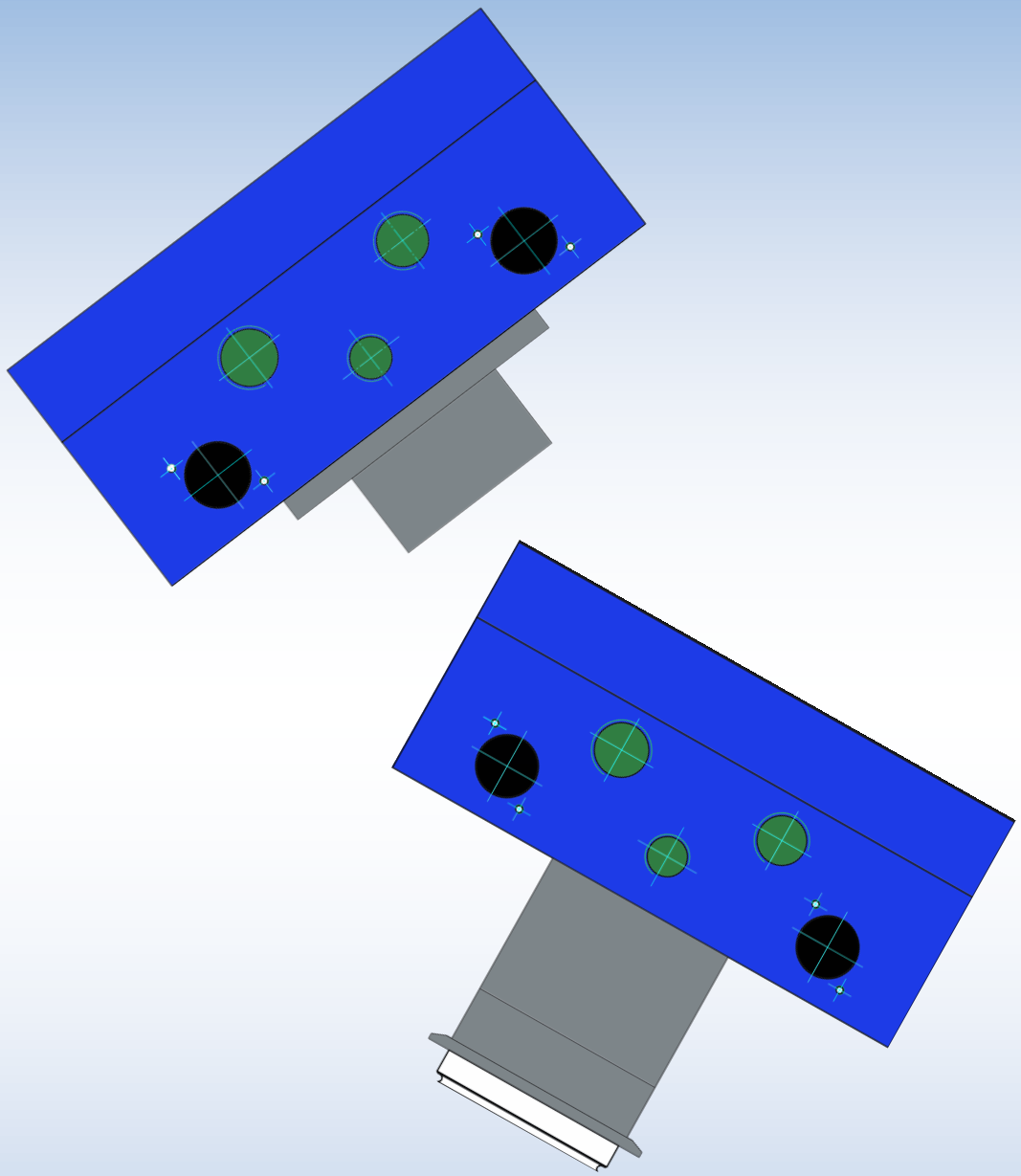
HK13

Microwave Resonator
Continuous In- Line Moisture measurement



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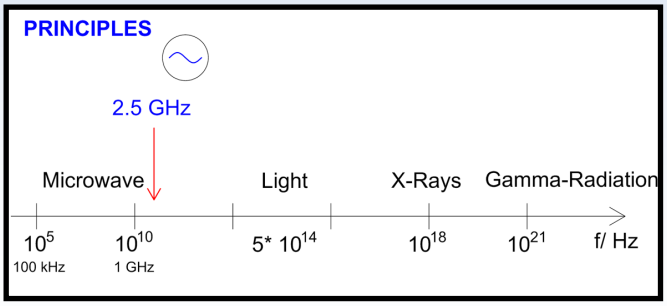
Description:

The microwave resonance measurement uses the electromagnetic energy stored inside a resonator to determine the water content of a product.

Via a non conducting window, the resonator field is coupled into the material located in front of the resonator. This so called leakage field is not radiated.

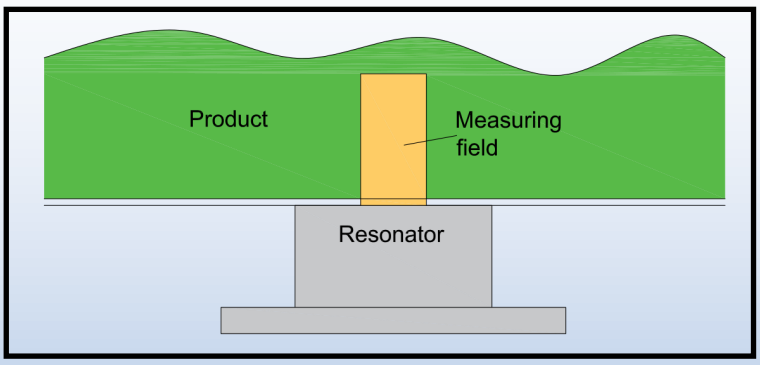
Depending on the dielectric properties of the product, the shift of resonance frequency and bandwidth of the resonator is used for measurement.

The ratio of bandwidth and frequency shift is density independent. The measurement is highly suitable for bulk material.



Conditions for a successful measurement:
The product contains NO METAL in front of the sensor!

The measurement is independent of flow rate and particle size.



Due to the sensor's distance dependency it is recommended to place the sensor as close as possible to the product, the measured values are available as $\%H_2O$.

A „good" calibration is based on „good" laboratory values. I.e. accurate sampling and analysis of the calibration samples.

Applications:

- **Pet food**
- **Cement/Sand**
- **Pellets**
- **Wood fibre**
- **Wood chips**
- **Wood plates (MDF Board, Chipboard, etc.)**
- **Breadcrumbs**
- **Muesli**
- **Fertilizer**
- **Corn rice**
- **Cereals**
- **Etc.**

The Harrer & Kassen microwave instrument can be installed at vessels, hopper and slides.

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:

- No radioactive radiation
- No health impairment
- Density independent measurement
- Installation at a difficult accessible place is easy to handle with remote control
- Vibrations do not effect the measurement results
- Non- destructive measurement
- No moving parts
- Wear- free
- Maintenance- free

Customer Benefit:

- Real time measurement
- Continuous monitoring over the whole production
- Production with constant and documentable quality
- Early detection of fail production
- Easy calibration through one point calibration
- Multipoint calibration with extra software
- Menu in different languages
- Sensitive data are in a protected menu
- After commissioning the user interface can be locked

Evaluation unit

Technical data HK13:

System:	Microprocessor with NV-memory
Housing:	Die-cast Aluminum
Size H x W x D:	200 x 140 x 90 mm
Weight:	ca. 4 kg
Protection Type:	IP65 / NEMA 4
Power supply:	100 - 240 V/ AC optional 24 V/ DC – 50/60 Hz – max. 200mA
PC-interface:	RS232 optional RS485
2 Analog outputs:	0/4 - 20mA / isolated 1500V
Relay contact:	max. 5A / 250 V/ AC (Start / Stop)
Power consumption:	50 VA
PROFI-BUS-DP:	optional
Temperature sensor:	NTC
Environmental temperature:	-20°C - +85°C
Storage temperature:	-30°C - +95°C

Operation with remote control:

Size H x W x D:	200 x 120 x 64 mm
Membrane keypad:	6 integrated soft keys
Display:	2x 24 Sign LCD, LED– backlight
Connection:	male socket

Directives:

The HK13 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

Antennas

Technical data antennas:

Sensor:	2,45 GHz planer microwave resonance senor
Penetration:	ca. 40 mm
Measuring range:	0 - 70%
Measuring interval:	50 ms
Material:	Aluminum
Sensor standard:	Ø 60 x 39 mm
Sensor Tuchenhagen:	Ø 70 x 76 mm
Sensor cover:	Standard: PP up to 120°C
	On request: Teflon up to 170°C
	PEEK up to 250°C
	Ceramic up to 250°C