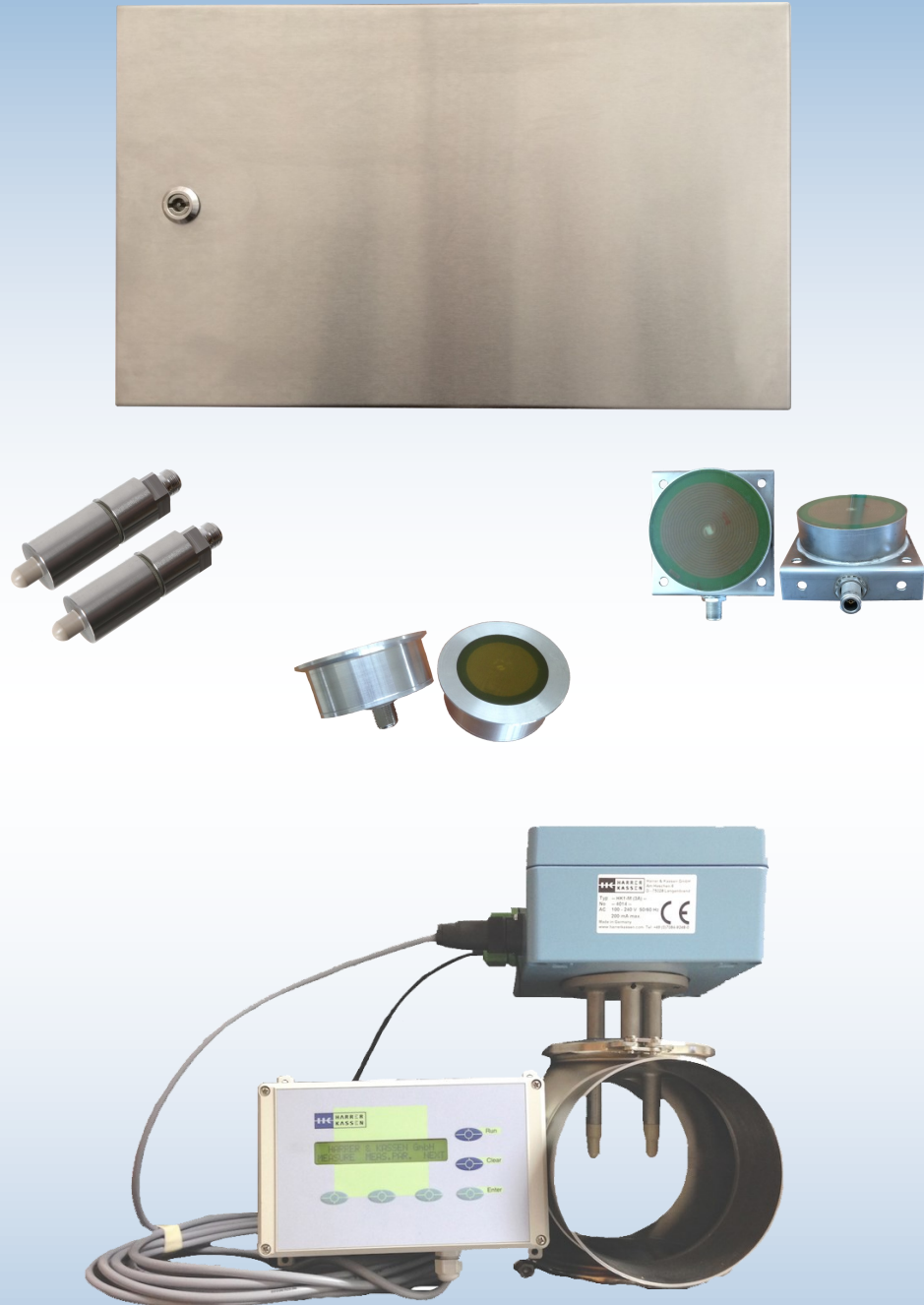


# HK1 Series

Microwave measurement device  
Continuous In-Line measurement of dry matter



Harrer & Kassen GmbH  
Am Heschen 4 - 6  
D - 75328 Schömberg—Langenbrand

Tel.: +49 (0)7084/9248-0  
Fax: +49 (0)7084/9248-29  
[www.harrerkassen.com](http://www.harrerkassen.com)  
[info@harrerkassen.com](mailto:info@harrerkassen.com)

## Description:

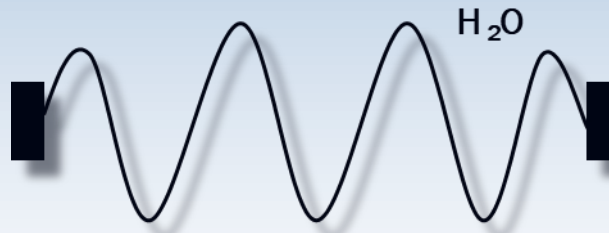
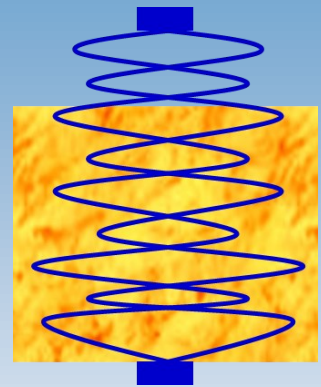
At the microwave measurement technology an electromagnetic wave with very low energy is generated. This signal is coupled via an antenna into the product (Cheese, Milk, Curd, etc.).

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 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 and there is NO  
METAL between the antennas!**

The measurement is contactless, the measured values of the  $H_2O$ - or dry-matter content are available as digital and analogue values.

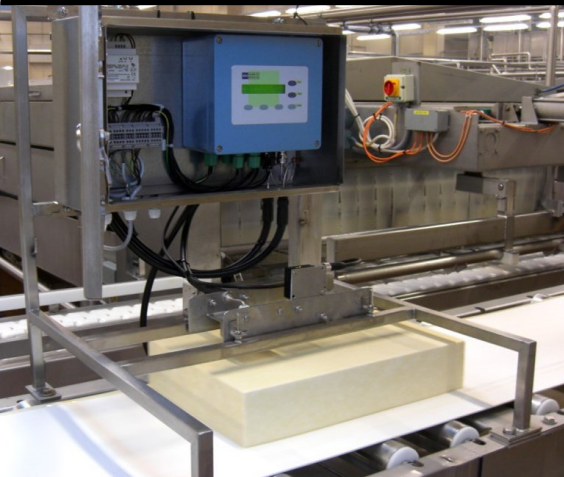
The HK-instruments are applicable in different production processes and in different production lines for milk processing as continuous In-Line-measurement.

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-MC for cheese measurement



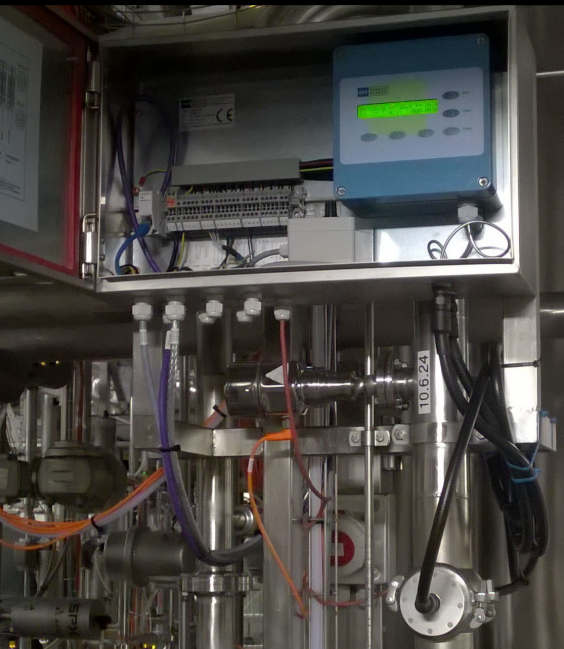
#### For projecting:

- 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

### 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

#### The HK1-M is available with different antennas:

- 3A Spiral antennas
- short 3A Stabsensoren

### 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

# Evaluation unit

# Antennas

## 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:	6 in membrane keypad integrated soft keys
Display:	2x24 Sign LCD, LED– backlight
Environmental temperature:	-20°C - +85°C

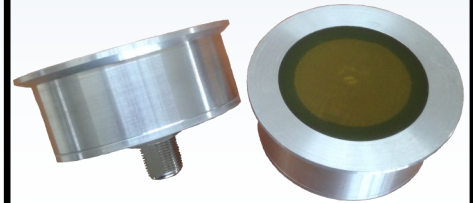
## Short 3A-Stabsensoren

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



## Technical data evaluation unit HK1-C-3A:

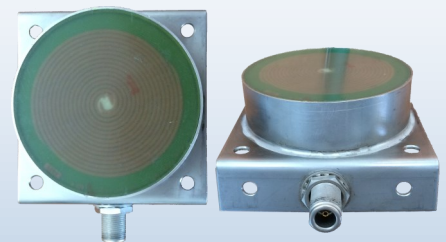
Housing:	Aluminum die casting
Size H x W x D:	180 x 180 x 100 mm
Weight:	ca. 7 kg
Protection Type:	IP65 / NEMA 4
Power supply:	100 - 240 V/AC optional 24V/DC – 50/60 Hz – max. 200mA
PC– interface:	RS232 or RS485
2 Analog outputs:	0/4 - 20mA / isolated 1500V
PROFI-BUS-DP:	optional
Environmental temperature:	-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:	6 in membrane keypad integrated soft keys
Display:	2x24 Sign LCD, LED– backlight

## Spiral antennas

Size antennas:	Ø 80 x 25 mm
Mounting:	84 x 84 x 36 mm
Material:	Stainless steel, FR4
Connection:	HF-Cables



## 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.