Harrer & Kassen GmbH

PROCESS MEASUREMENT TECHNOLOGY

CATALOG

Version 1

MEASUREMENT METHODS:

- MICROWAVE TECHNOLOGY
- NIR - SPECTROMETER
- NIR - LED - SPECTROMETER
- SPECTRALPHOTOMETER
- LABORATORY INSTRUMENT

HARRER KASSEN

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HK1-Modular - Concentration - and moisture measurement

Application area:

The microwave measuring instrument HK1-M is suitable for the measurements of **concentration** and **moisture** in the food, primary and chemical industry.

Technical data:

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 230 x 200 x 110mm
Weight:	about 5kg
Voltage:	100 - 240 VAC ±10%; 47 - 65Hz
Power consumption:	50 VA
Current output 1:	0/4 - 20mA active output, isolated, max. load 500 Ohm
Current output 2:	0/4 - 20mA active output, isolated, temperature or 2'nd output for process value, max. load 500 Ohm
Current input:	0/4 - 20mA, not isolated, load 125 Ohm
COM1 output:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
COM2 bi-directional:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
Relay:	AC 250VA, DC 30V 1A
Display:	2x24 characters LCD, LED-backlight
Microwave frequency:	2,45GHz ISM-Band
Maximum power:	0 dBm, 1mW
Sensitivity:	-80 dBm, 1nW
Operating temperature:	-20 - 85 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Teil B
Noise immunity:	EN50082/1
Safety:	IEC1010-1

HK1-Modular - Concentration - and moisture measurement

Suitable antennas:

- pin antennas
  pin antennas / elongated pin antennas with PT100 (other sizes on request)
  for measurement in pipes and tanks
- 3A-spiral antennas for Tuchenhagen flow cell
- short 3A-pin antennas for 3A-flowcell
- mini-spiral antennas
  for measurement in pipes
- spiral antennas / horn antennas
  for measurement on conveyor belt

Options:

- product selection switch
- remote control by separate operating device
- PROFIBUS (other bus systems on request)
- stainless steel enclosure

HK1-Modular Paper - Consistency measurement

Application area:

The microwave measuring instrument HK1-Mp is especially designed for the measurement of **consistency** in the paper industry.

Technical data:

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 230 x 200 x 110mm
Weight:	about 5kg
Voltage:	100 - 240 VAC ±10%; 47 - 65Hz
Power consumption:	50 VA
Current output 1:	0/4 - 20mA active output, isolated, max. load 500 Ohm
Current output 2:	0/4 - 20mA active output, isolated, temperature or 2'nd output for process value, max. load 500 Ohm
Current input:	0/4 - 20mA, not isolated, load 125 Ohm
COM1 output:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
COM2 bi-directional:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
Relay:	AC 250VA, DC 30V 1A
Display:	2x24 characters LCD, LED-backlight
Microwave frequency:	2,45GHz ISM-Band
Maximum power:	0 dBm, 1mW
Sensitivity:	-80 dBm, 1nW
Operating temperature:	-20 - 85 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Teil B
Noise immunity:	EN50082/1
Safety:	IEC1010-1

HK1-Modular Paper - Consistency measurement

Suitable antennas:

- pin antennas / elongated with PT100 and flange DN80 PN6 for measurement in pipes and tanks.
- 3A-spiral antennas for Tuchenhagen flow cell
- mini-spiral antennas for measurement in pipes

Options:

- product selection switch
- remote control by separate operating device
- PROFIBUS (other bus systems on request)
- stainless steel enclosure

HK1-Modular Cheese

Concentration- and moisture- measurement in hard and semi hard cheese

Application area:

Our microwave measuring instrument HK1-Mc is especially designed for the measurement of the water content of cheese blocks on a conveyer belt.

Technical data:

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 230 x 200 x 110mm
Weight:	about 5kg
Voltage:	100 - 240 VAC ±10%; 47 - 65Hz
Power consumption:	50 VA
Current output 1:	0/4 - 20mA active output, isolated, max. load 500 Ohm
Current output 2:	0/4 - 20mA active output, isolated, temperature or 2'nd output for process value, max. load 500 Ohm
Current input:	0/4 - 20mA, not isolated, load 125 Ohm
COM1 output ：	RS232, 4800, 9600 Baud, 8 data bit, 1 stop bit, no parity
COM2 bi-directional:	RS232, 2400, 4800, 9600, 19200 Baud, 8 data bit, 1 stop bit, no parity
Relay:	AC 250VA, DC 30V 1A
Display:	2x24 character LCD, LED-backlight
Microwave frequency:	2,45GHz ISM-Band
Maximum power:	0 dBm, 1mW
Sensitivity:	-80 dBm, 1nW
Operating temperature:	-20 - 85 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Part B
Noise immunity:	EN50082/1
Safety:	IEC1010-1

HK1-Modular Cheese

Suitable antennas:

- 2 Spiral antennas

Options:

- product selection switch
- remote control by separate operating device
- CheeseMaster Calibration- / administration software
- PROFIBUS (other bus systems on request)

HK1-Compact

Concentration- moisture- and consistency- measurement

Application area:

The microwave measuring instrument HK1-C is a compact version of our HK1-M. The instrument is direct installed to a DN80 PN6 counter flange. It is applicable for measurement of concentration, moisture and consistency in the construction-, chemical- and paper industry.

Technical Data:

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 230 x 200 x 110mm
Weight:	about 5kg
Voltage:	100 - 240 VAC ±10%; 47 - 65Hz
Power consumption:	50 VA
Current output 1:	0/4 - 20mA active output, isolated, max. load 500 Ohm
Current output 2:	0/4 - 20mA active output, isolated, temperature or 2'nd output for process value, max. load 500 Ohm
Current input:	0/4 - 20mA, not isolated, load 125 Ohm
COM1 output:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
COM2 bi-directional:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
Relay:	AC 250VA, DC 30V 1A
Display:	2x24 characters LCD, LED-backlight
Microwave frequency:	2,45GHz ISM-Band
Maximum power:	0 dBm, 1mW
Sensitivity:	-80 dBm, 1nW
Operating temperature:	-20 - 85 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Teil B
Noise immunity:	EN50082/1
Safety:	IEC1010-1

HK1-Compact

Suitable antennas:

- pin antennas with integrated PT100 , flange DN80 PN6 for measurement in pipes and tanks

Options:

- product selection switch
- remote control by separate operating device
- PROFIBUS (Other bus systems on request)

HK2-Modular - Concentrations - and water content measurement

Application area:

The microwave measuring instrument HK2-M is especially designed for the sugar, sewage plant- and building material industry.

Technical data:

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 180 x 180 x 100mm
Weight:	about 5kg
Voltage:	100 - 240 VAC ±10%; 47 - 65Hz
Power consumption:	50 VA
Current output 1:	0/4 - 20mA active output, isolated, max. load 500 Ohm
Temperature input:	NTC (10 kOhm) input
COM2 bi-directional:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
Display:	2x24 characters LCD, LED-backlight
Microwave frequency:	2,45GHz ISM-Band
Maximum power:	0 dBm, 1mW
Sensitivity:	-80 dBm, 1nW
Operating temperature:	-20 - 85 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Teil B
Noise immunity:	EN50082/1
Safety:	IEC1010-1

HK2-Modular - Concentrations - and water content measurement

Suitable antennas

- pin antennas for any size flange to measure in Pipes and tanks
- mini spiral antennas for the measurement in pipes
- short pin antennas for the measurement in pipes

Options:

- remote control by separate operating device
- cleaning flange DN65 PN16 for sensor cleaning
- PROFIBUS (other bus systems on request)

HK5 - Moisture measurement

Applications area:

The HK5 is especially designed for the measurement of moisture in very thin layers. It will be installed at paper, cardboard and chip boards. The sensors can be installed either directly on the paper machine or on the conveyor belt.
Depending on the measured area there are up to 4 pairs of sensors used. It is able for moisture measurement in thin layers from 1,0mm to 10,0 mm.

Technical data:

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 230 x 200 x 110mm
Weight:	about 5kg
Voltage:	230 - 115 VAC ±15%; 47 - 65Hz
Power consumption:	50 VA
Current output 1:	0/4 - 20mA active output, isolated, max. load 500 Ohm
Current output 2:	0/4 - 20mA active output, isolated, temperature or 2'nd output for process value, max. load 500 Ohm
Current input:	0/4 - 20mA, not isolated, load 125 Ohm
COM1 bi-directional:	RS232, 4800, 9600 Baud, 8 data bit, 1 stop bit, no parity
Relay:	AC 250VA, DC 30V 1A
Display:	2x24 character LCD, LED-backlight
Operating temperature:	-20 - 85 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Teil B
Noise immunity:	EN50082/1
Safety:	IEC1010-1

HK5 - Moisture measurement

Options:

- product selection switch
- remote control by separate operating device
- PROFIBUS (other bus systems on request)
- stainless steel enclosure

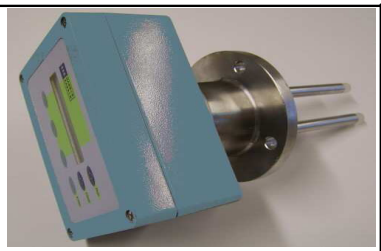
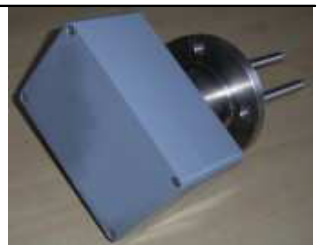
HK6 - BRIX measurement

Applications area:

The microwave measuring instrument HK6 is especially designed for the measurement of **BRIX** in the sugar industry.

The measuring instrument HK6 is available in 2 product variants:

- HK6-C Compact
- HK6-F Field

HK6-C		HK6-F	
			

Technical data:

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 200 x 140 x 90mm
Weight:	about 5kg
Voltage:	85 - 270 VAC; 47 - 65Hz
Power consumption:	50 VA
Current output:	0/4 - 20mA isolated, max. load 500 Ohm
RS232 interface:	4800, 9600 Baud, 8 data bit, 1 stop bit, no parity
Display:	2x24 character LCD, LED-backlight
Microwave frequency:	2,45GHz ISM-Band
Maximum power:	0 dBm, 1mW
Sensitivity:	-80 dBm, 1nW
Operating temperature:	-20 - 85 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Teil B
Noise immunity:	EN50082/1
Safety:	IEC1010-1

HK6 - BRIX measurement

Antennas:

2 integrated pin antennas

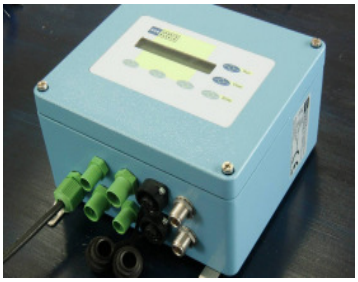
with NTC and flange DN65 PN6

Options:

- RS485 to the remote control up to 16 HK6 instruments over an RS485 BUS
- PROFIBUS (other BUS systems on request)
- Cleaning flange DN65 PN16
- remote control employed separate operating device

PRODUCT INNOVATION

HK9 - Density independent Moisture measurement



Technical data:

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 230 x 200 x 110mm
Weight:	about 5kg
Voltage:	100 - 240 VAC ±10%; 47 - 65Hz
Power consumption:	50 VA
Current output 1:	0/4 - 20mA active output, isolated, max. load 500 Ohm, output for process value calculated by<CONST1>.
Current output 2:	0/4 - 20mA active output, isolated, max. load 500 Ohm, output for process value calculated by<CONST2>.
Current input:	0/4 - 20mA, not isolated, load 125 Ohm, input for height measurement.
COM1 output:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
COM2 bi-directional:	RS232, 2400, 4800, 9600, 19200, 38400, 57600, 115k Baud, 8 data bit, 1 stop bit, no parity
Temperature input:	input to connect a PT100 sensor
Relay:	AC 250VA, DC 30V 1A
Digital input:	active TTL input, start/stop for batch measurement or external halt.
Display:	2x24 characters LCD, LED-backlight
Microwave frequency:	2,45GHz ISM-Band
Maximum power:	-10 dBm, 0.1mW
Sensitivity:	-80 dBm, 1nW
Operating temperature:	-20 - 85 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Teil B
Noise immunity:	EN50082/1
Safety:	IEC1010-1

PRODUCT INNOVATION

HK9 - Density independent Moisture measurement

Applications area:

Using the latest microwave technology, the product density and moisture can be measured at the same time. Due to the robust and modular design the microwave measuring instrument HK9 is suitable for the measurements of moisture and density at bulk cargo and bale on a conveyor belt.

Suitable antennas:

- Vivaldi antennas

Options:

- product selection switch
- remote control by separate operating device
- PROFIBUS (other bus systems on request)
- stainless steel enclosure

HK3 - Continuous online–measurement at bulk material

HK3-Versions

Standard with 1 calibration
Option with 4 switchable calibrations

Application area:

The HK3 is a continuous NIR reflection measurement with infrared LED's. The LED-NIR-Spectrometer HK3 is a modular unit, evaluation and sensor system are mounted in separate housings.
The distance between sensor system and evaluation unit could be up to 50 meters.

Advantages:

In contrast to conventional IR or NIR systems from other suppliers, the HK3 does not work with filters and halogen lamps. Improved stability of the measurement is reached through LED technology. The lifetime of the LED's is up to 10 years. The drift of the measurement value, as is the case with other IR / NIR instruments, has been fully compensated. Colour variations of the product have no influence on the measuring result. Also uneven surfaces of the product, such as coarse bulk materials, can be measured. The HK3 has a very high reliability and very low maintenance costs.

Measurement design:

The sensor is mounted above the product surface. The product (e.g. paper webs, width of material and any kind of bulk material) is moving on a conveyor belt under the sensor system.

HK3 - Continuous online–measurement at bulk material

Technical Data:

Evaluation unit

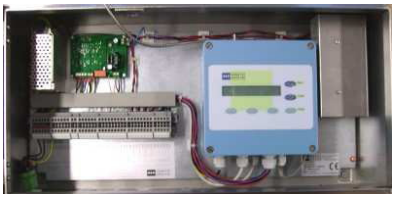
System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 180 x 180 x 100mm
Weight:	about 2,5kg
Voltage:	85 - 260 VAC; 47 - 65Hz
Power consumption:	50 VA
Current output:	0/4 - 20mA isolated, max. load 500 Ohm
RS232 interface:	19200, 38400 Baud, 8 data bit, 1 stop bit, no parity
Display:	2x24 character LCD, LED-backlight
Operating temperature:	-20 - 50 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Part B
Noise immunity:	EN50082/1
Safety:	IEC1010-1
Spectrometer:	940, 1200, 1440, 1550nm

Reflection sensor

Housing:	Aluminium, IP65
	L x W x H = 180x180x100mm
Weight:	about 2,5kg
Illumination:	LED's
Operating temperature:	-20 - 50 °C
Storage temperature:	-30 - 95 °C

NIR technology

HK4 - Measurement of up to 4 organic components



Features:

- simultaneous online- measurement of up to 4 organic components e.g. fat, water, protein, connective tissue protein
- NIR (Near Infrared) technology with diode array and therefore the first online NIR- spectrometer.
- modular setup of evaluation unit and sensor
- transmission or reflection sensor
- no drift of the measurement values through aging of the lamps
- independent of colour changes
- no moving parts

The evaluation unit and the NIR sensor are modular developed. Both are connected by an optical fibre glass cable.

Suitable flow cells:

- 3A-flow cell for NIR - reflection
- 3A-flow cell for NIR - transmission
- 3A-tank-sensor for NIR - reflection

Technical data:

Evaluation unit

System:	µController with non volatile data memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 280 x 230 x 110
Weight:	approx. 5kg
Power supply:	100 - 240 VAC; 47 - 63Hz
Power consumption:	50 VA
Current outputs:	0/4 – 20mA, active, isolated, max. resistance 500Ω
RS232 interface:	COM1: 4800 - 38400 Baud, 8 data, 1 stop, no parity
	COM2: 9600 – 115200 Baud, 8 data, 1 stop, no parity
Digital inputs:	TTL
Display:	2 x 24 characters LCD with background lighting
Ambient temperature:	-20 – 40°C
Humidity:	max. 70 % relative air humidity
Storage temperature:	-30 – 80°C
Radiation:	EN 55011 part B
Noise immunity:	EN 50082-1
Safety:	EN 61010-1

Optics

Spectrometer:	900-1350nm
Resolution:	1,75nm
Fiberoptic connector:	SMA 905

Detector

Optical design:	90°
Weight:	300g
Lamp:	Halogen 6,5W, 17500h
Fibre optic connector:	SMA 905
Fibre optic cable length:	free of choice

HK8 - Unique LED- online moisture measurement

HK8 - Versions

Standard with 1 calibration
Option with 8 switchable calibrations

Application area:

The HK8 is a device for continuous NIR reflection measurement with near infrared LED's. The NIR-H_2O-Meter is a modular unit, evaluation unit and sensor system are mounted in different housings. The distance between sensor system and evaluation unit can be up to 50 meters.

Advantages:

In contrast to conventional IR or NIR systems from other suppliers, the HK8 does not work with filters and halogen lamps. Improved stability of the measurement is reached through LED technology. The lifetime of the LED's is up to 10 years. The drift of the measurement value, as is the case with other IR / NIR instruments, has been fully compensated. Colour variations of the product have no influence on the measuring result. Also uneven surfaces of the product, such as coarse bulk materials, can be measured. The HK8 has a very high reliability and very low maintenance costs.

Measurement Design:

The sensor is mounted over the product surface. The product (e.g. paper webs, width of material and any kind of bulk material) is moving on a conveyor belt under the sensor system.

HK8 - Unique LED- online moisture measurement

Technical Data:

Evaluation unit

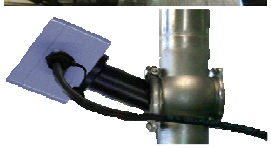
System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 180 x 180 x 100mm
Weight:	about 2,5kg
Voltage:	85 - 260 VAC; 47 - 65Hz
Power consumption:	50 VA
Current output:	0/4 - 20mA isolated, max. load 500 Ohm
RS232 interface:	19200, 38400 Baud, 8 data bit, 1 stop bit, no parity
Display:	2x24 character LCD, LED-backlight
Operating temperature:	-20 - 50 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Part B
Noise immunity:	EN50082/1
Safety:	IEC1010-1
Spectrometer:	940, 1200, 1440, 1550nm

Reflection sensor

Housing:	Aluminium, IP65
	L x W x H = 180 x 180 x 100mm
Weight:	about 2,5kg
Illumination:	LED's
Operating temperature:	-20 - 50 °C
Storage temperature:	-30 - 95 °C

PRODUCT INNOVATION

HK8-Mini - Unique NIR- LED technology



HK8-Mini Versions

HK8-4 with connecting to Tuchenhagen flow cell
HK8-5 with flange DN65 PN6

Application area:

The HK8-mini is a device for continuous NIR reflection measurement with infrared LED's. The NIR-H_2O-Meter is a modular unit, evaluation unit and sensor system are mounted in different housings. The distance between the sensor and the evaluation unit can be up to 50 meters.

The HK8-mini is a further development of our proven HK8. It was specifically designed to be flanged on pipes with different diameter. It also could be flanged via a sight glass on small pipes.
The measured value of the H_2O content is available as digital (RS232, optional RS485) and analogue value (0/4-20mA).

Measurement Design:

The sensor is either completely inserted into the product (flanged to large pipes or a tank) or attaches through a sight glass.
Depending on customer requirements, the HK8-mini sensor process window could be either Borosilicate or Sapphire .

PRODUCT INNOVATION

HK8-Mini - Unique NIR- LED technology

Technical Data:

Evaluation unit

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 180 x 180 x 100mm
Weight:	about 2,5kg
Voltage:	85 - 260 VAC; 47 - 65Hz
Power consumption:	50 VA
Current output:	0/4 - 20mA isolated, max. load 500 Ohm
RS232 interface:	19200, 38400 Baud, 8 data bit, 1 stop bit, no parity
Display:	2x24 character LCD, LED-backlight
Operating temperature:	-20 - 50 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Part B
Noise immunity:	EN50082/1
Safety:	IEC1010-1
Spectrometer:	940, 1200, 1440, 1550nm

Reflection sensor

Housing:	Aluminium, IP65
	L x W x H = 122 x 120 x 80mm
Weight:	about 2,5kg
Illumination:	LED's
Operating temperature:	-20 - 50 °C
Storage temperature:	-30 - 95 °C

HK7 – Continuous online - colour measurement

Application area

Colour measurement based on the standard CIELab or ICUMSA- standard. Continuous online measurement of colours. Colour measurement of products with smooth and planar surfaces, no abrasive or bulk material.

Functionality

Continuous, controlled LED illumination and identification of the product colour in the colour space after CIELab or ICUMSA- standard. The evaluation results in the visible light sector from 390 - 720 nm. The distance between sensor system and product has to be kept constant.
The four measurement results L*, a*, b* and dE are available at four separate 0/4-20 mA current outputs.

HK7 – Continuous online - colour measurement

Technical data:

Evaluation unit

System:	Microprocessor with NV-memory
Housing:	Pressure cast aluminium housing, IP65
	L x W x H = 280 x 230 x 110mm
Weight:	about 5kg
Voltage:	85 - 270 VAC; 47 - 65Hz
Power consumption:	50 VA
Current output:	0/4 - 20mA isolated, max. load 500 Ohm
RS232 interface:	9600, 19200, 38400 Baud, 8 data bit, 1 stop bit, no parity
Display:	2x24 character LCD, LED-back light
Operating temperature:	-20 - 40 °C
Storage temperature:	-30 - 95 °C
Radiation:	EN55011 Part B
Noise immunity:	EN50082/1
Safety:	IEC1010-1
Spectrometer:	390nm – 720nm
Resolution:	ca. 1,3nm
Fibre connection:	SMA905

Reflection sensor

Optical design:	90°/90°
Weight:	about 250g
Lamp:	Power LED's, live time ca. 100.000h
Fibre connection:	SMA905
Fibre length:	standard 3m, stainless sleeve

Suitable Sensor:
LED–Illumination sensor with 9 LED's

particuLAB

The particuLAB is an laboratory device for the simultaneouse determination of up to 10 organic components in solid, pasty and powdery products. Additionally, 5 further components can be calculated out of the measured components.

It is not suitable for liquid products!
For liquid products is our HK12 (page 32)!

Fields of applications:

- Meat processing
- Sausage processing
- Milk powder
- Curd
- Cheese
- Bulk material
- Koffee
- Tee

Calibration

The calibration of the particuLAB can be made either
in-house (at the Harrer & Kassen GmbH)
or you make your own
calibration with the SPECTER
software!

Technical data:

Housing:	ABS - plastic
Size:	L x W x H = 340 x 375 x 255mm
Weight:	9,5 Kg
Colour:	RAL 9002
Power supply:	100 - 240 VAC
PC interface:	USB
Operating:	4 soft keys integrated in keypad
Display:	2 x 24 characters illuminated in display
Environmental temperature:	-20°C to +40°C
Product temperature:	>0°C to +70°C

Laboratory Instrument

HK11

The Low-Cost laboratory device HK11 was developed for the pure fat analysis in the meat- and sausage industry

Fields of applications:

- Meat processing

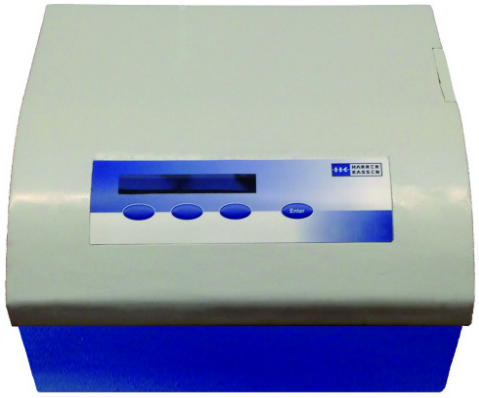
Calibration

The calibration of the HK11 can be made either in-house (at the Harrer & Kassen GmbH) or you make your own calibration with our easy to use SPECTER8 software!

Technical data:

Housing:	ABS - plastic
Size:	L x W x H = 340 x 375 x 255mm
Weight:	9,5 Kg
Colour:	RAL 9002
Power supply:	100 - 240 VAC
PC interface:	USB
Operating:	4 soft keys integrated in keypad
Display:	2 x 24 characters illuminated in display
Environmental temperature:	-20°C to +40°C
Product temperature:	>0°C to +70°C

HK12



Our newly developed HK12 is suitable for the simultaneouse determination of up to 10 organic components in liquid products with different consistencies. Additionally, 5 further components can be calculated out of the measured components. It complements our laboratory device particuLAB in a perfect way, which is suitable for the measurement of solid, pasty and powdery products.

Calibration

The calibration of the HK12 can be made either in-house (at the Harrer & Kassen GmbH) or you make your own calibration with the SPECTER software!

Fields of applications:

- Liduid products with different consistencies (milk, curd, yoghurt, beer, juice, etc.)

Technical data:

Housing:	ABS - plastic
Size L x W x H:	340 x 375 x 255mm
Weight:	6 Kg
Colour:	RAL 9002
Power supply:	100 - 240 VAC
PC interface:	USB
Operating:	4 soft keys integrated in keypad
Display:	2 x 24 characters illuminated in display
Environmental temperature:	-20°C to +40°C
Product temperature:	>0°C to +70°C

Microwave antennas

Cleaning Flange

Range of application:

Microwave measurement in pipes or tanks.

For use with:	Dimensions:
HK1-M	Immersion depth 195mm
HK2-M	Flange DN65 PN16
HK1-MP	

Pin antenna with flange

Range of application:

Microwave measurement in pipes or tanks.

For use with:	Dimensions:
HK1-M	Immersion depth 195mm
HK2-M	Flange DN65 PN6 others on request

Elongated pin antenna with flange

Range of application:

Microwave measurement in pipes or tanks.

For use with:	Dimensions:
HK1-M HK2-M	Immersion depth to max. 370mm.
HK1-MP	Flange DN65 PN6/ DN80 PN6 others on request

3-A Spiral antenna

Range of application:

Microwave measurement in pipes. Using Tuchenhagen process connections.

For use with:	
HK1-M	Pipe diameter max. 200mm
HK1-MP	

Microwave antennas

Short 3-A pin antenna

Range of application:

Microwave measurement in pipes or tanks.

For use with:

HK1-M

Mini-spiral antenna

Range of application:

Microwave measurement in pipes.

Pipe diameter max. 150mm

For use with:

HK1-M

HK1-MP

HK2-M

Spiral antenna

Range of application:

Microwave measurement on conveyor belt.

For use with:

HK1-Mc

HK1-M

Microwave antennas

Horn antenna

Range of application:

Microwave measurement on a conveyor belt.

For use with:

HK1-M

24 GHz-Sensor

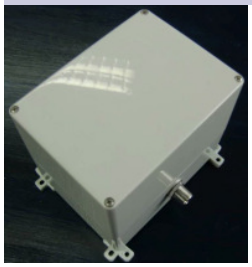
Range of application:

Microwave measurement of thin layers (paper, cardboard, chip boards). Layers from 0,1 cm to 1,0 cm depending on water content.

For use with:

HK5

Vivaldi–antenna



Range of application:

Microwave measurement of moisture and density at bulk cargo and bale on a conveyor belt. Used from a layer thickness from 10 cm to 100 cm, depending on material.

For use with:

HK9

Optical sensors

NIR- Sensor / Halogen bulbs

Range of application:

Simultaneous online- measurement of up to 4 organic components (e.g. fat, water, protein, connective tissue protein).

For use with:

HK4

4 Halogen bulbs / stainless steel housing

Transmission measurement

4 Halogen bulbs / stainless steel housing

Reflection measurement

LED–illumination–sensor

Range of application:

Continuous online– colour measurement

Basic equipment

For use with:

HK7-1

Pressure cast aluminium housing

L x W x H = 120 x 120 x 90mm

LED–illumination–sensor

Range of application:

Continuous online– colour measurement

Basic equipment + automatic white balance

For use with:

HK7-2

Pressure cast aluminium housing

L x W x H = 220 x 120 x 110mm

Optical sensors

LED–illuminations–sensor

Range of application:

Continuous online– colour measurement

Basic equipment

+ 3-way sensor

For use with:

HK7-3

Pressure cast aluminium housing

L x W x H = 280 x 230 x 110

LED–illumination–sensor

Range of application:

Continuous online– colour measurement

Basic equipment

+ automatic white balance

+ 3-way sensor

For use with:

HK7-4

Pressure cast aluminium housing

L x W x H = 280 x 230 x 110mm

Optical sensors

NIR-LED-Sensor

Range of application:

Near infrared–reflection–measurement with NIR–LED's . Measurement of products on a conveyor belt.

Spectrum / wavelength range: Standard
Medium
High

For use with:

HK3 / HK8

Pressure cast aluminium housing

L x B x H = 180 x 180 x 110mm

Temperature sensor

PT100 (immersion probe)

Range of application:

Temperature acquisition of the product to compensate the measuring result. Temperature measurement via direct contact to the product.

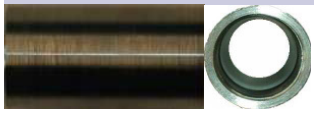
PT100 (surface sensor)

Range of application:

Temperature acquisition of the product to compensate the measuring result. Temperature measurement via

pipe surface.

Flow cells

Flow cell (for 3-A-spiral antenna and Photo NIR) 	Range of application: Microwave and NIR measurements in Pipes For use with: 3A–spiral antennas / NIR-HK4 / NIR–HK8 mini Pipe diameter DN40 to DN125 1 1/2 inch to 5 inch
2 welding fittings (for 3A–spiral antenna) 	Range of application: 3A–spiral antennas
3A– flow cell (for short 3A–pin antenna) 	Range of application Microwave measurement in pipes For use with: Short 3A–pin antennas Pipe diameter starting at DN40 1 1/2 inch
2 welding sockets stainless steel (for short 3A–pin antenna) 	For use with: Short 3A– pin antennas Welded on pipes starting at DN40 or 1 1/2 inch

Flow cells

Flow cell (for Mini–spiral antennas)	Range of application: Microwave measurement total solid (water) in pipes.
	For use with: Mini–spiral antennas Pipe diameter from DN40 to DN150
2 welding sockets stainless steel (for Mini-spiral antennas)	For use with: Mini-spiral antennas
	In pipes from DN40 to DN150/ 1 1/2 inch to 5 inch
3A–tank–cell (for NIR–reflection)	Range of application: NIR– reflection measurement in tanks
	For use with: HK4- NIR– sensor reflection
3A–pipe–cell (for NIR–reflection)	Range of applikation: NIR– reflection measurement
	For use with: HK4- NIR– sensor reflection Customer specific

Accessories / Spare parts

Operation device

Range of application:

Remote operation of HK- evaluation units via 8m connection cable (up to 50m).

Use for:

All Harrer & Kassen measuring instruments

Plastic housing with keypad and Display.

HF- cable

Range for applications:

Connection of modular microwave evaluation units with sensors.

For use with:

HK1-m	HK1-MC
HK1-MP	HK2-M

Standard cable

Range for application:

Connection of microwave sensors with HK5

For use with:

HK5

NYM– cable. Length 1m to max. 100m

Accessories / Spare parts

Fibreglass cable

Range of application:

Connection of HK4-spectrometers with NIR-sensors.

For use with :

HK4

Fiberglass cable for indoor and outdoor. with Stainless steel coating. Length 1m to max. 100m

Swiffle– Flange

Range of application:

Adjustable counter flange for pin antennas.

For use with:

Pin antennas

DN65 PN6

DN80 PN6

Stainless steel housing

Range for application:

Housing for the protected installation of evaluation and power supply.

Use for :

All Harrer & Kassen measurement instruments

Structure technology:

L x W x H = 500 x 300 x 167mm

L x W x H = 600 x 300 x 167mm

Accessories / Spare parts

Laser-height-sensor

Range of application:

Measurement of product height, empty belt detection.

To use with:

HK1-MC

HK3

HK8

Dimensions:

L x W x H: 50 x 20 x 65mm

Ultrasonic– distance- sensor

Range of application:

Measurement of the minimum load

To use with:

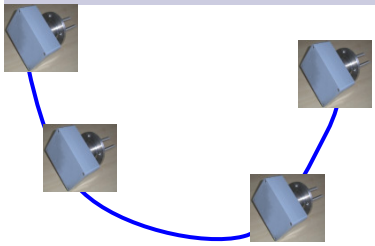
HK3

HK8

M30x1,5

Accessories / Spare parts

RS485-Bus-Module



Range of application :

Bus network with RS485-bus-module (incl. bus administration software) for up to 16 instruments.

For use with:

HK6 with HK6-Display PC– Software

Remote service

Range of application :

Data– acquisition and calibration via modem.

Application of a modem for remote data transmission

For use with:

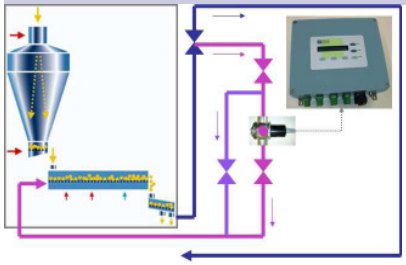
HK1 HK4

HK3 HK8

Structure technology:

Separate modem inserted in a stainless steel housing

Powder- sampling– System



Range of application :

Measuring of types of milk powder in a compressed–air bypass– system.

For use with:

HK4

System with the application of 4 valves incl. flow cell

Accessories / Spare parts

Product selection switch

Range of application:

Switching of max. 16 products

Use with:

HK1-M
HK1-MC
HK3
HK4
HK8

L x W x H = 85 x 80 x 58mm

Add-on HK4-2

1x upgrade set from

HK4-21 to HK4-22

HK4-22 to HK4-23

HK4-23 to HK4-24

2x updrade set from

HK4-21 to HK4-23

HK4-22 to HK4-24

3x upgrade set from

HK4-21 to HK4-24

Range of application:

Upgrade of the measurement for an additional organic constituent incl. analogue output 0/4—20 mA.

Use with:

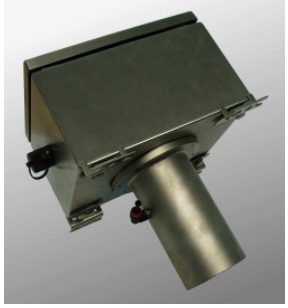
HK4-2

Extension 1-3 constituents

Structure technology:

Upgrade– HW and SW

Stainless steel enclosure



For use with:

HK3

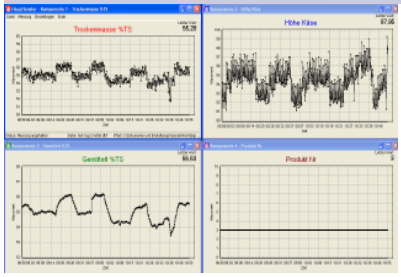
HK8

L x W x H = 250 x 250 x 200mm

Stainless steel

Software

Visual- Specter



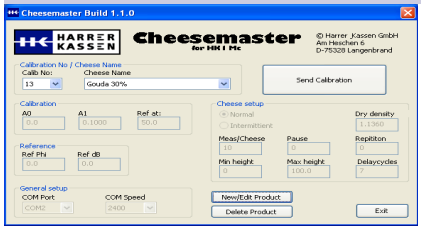
Range of application:

Display– and archiving software

For use with: All Harrer & Kassen measurement instruments

Software is installed on a Windows-based PC or laptop.

CheeseMaster



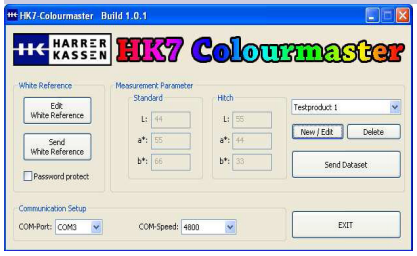
Range of application:

Cheese– management software

For use with: HK1-Mc

Software is installed on a Windows-based PC or laptop.

ColorMaster



Range of application:

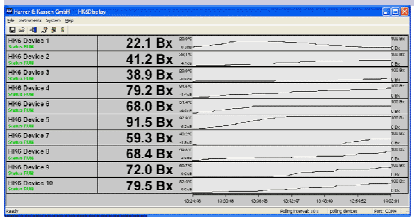
Colour standard management software / management for up to 100.000 standards.

For use with: HK7

Software is installed on a Windows-based PC or laptop.

Data collection software

HK6 Display



Range of application:

The measured values of up to 16 devices can be displayed via the HK6– Display software. The devices will be connected via a RS-485 bus.

For use with: HK6

Software is installed on a Windows-based PC or laptop.

Software

Specter

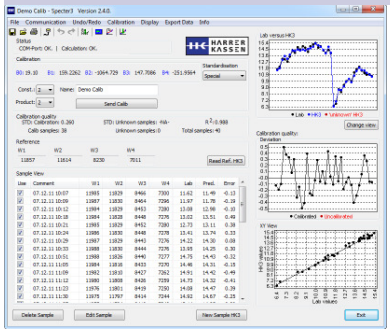
Range of application:

Chemo metric calibration software

For use with: HK4

Software is installed on a Windows-based PC or laptop.

Specter3



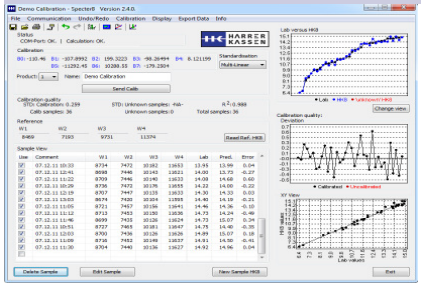
Range of application:

Calibration software

For use with: HK3

Software is installed on a Windows-based PC or laptop.

Specter8



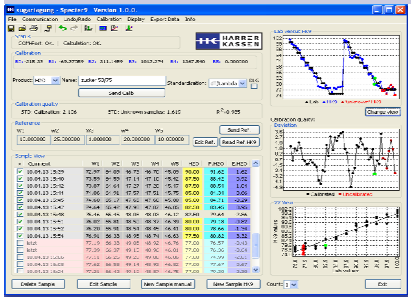
Range of application:

Calibration software

For use with: HK8

Software is installed on a Windows-based PC or laptop.

Specter9



Range of application:

Calibration software

For use with: HK9

Software is installed on a Windows-based PC or laptop.

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