



===== Model HD37AB1347 IAQ =====	Instrument model
Firm.Ver.=01.00	Instrument firmware version
Firm.Date=2010/01/15	Instrument firmware date
SN=12345678	Instrument serial number
ID=0000000000000000	Identification Code
-----	
Probe ch.1 description	Description of the probe connected to input 1
Type: CO2-CO Fw.V0R0	
Data cal.:2010/01/15	
Serial N.:10010060	
-----	
Probe ch.2 description	Description of the probe connected to input 2
Type: Hot wire	
Data cal.:2010/01/15	
Serial N.: 10010100	
-----	
Date=2010/01/15 15:00:00	Date and time
CO2 850 ppm	Carbon Dioxide
CO 0 ppm	Carbon Monoxide
RH 39.1 %	Relative Humidity
T1 22.0 °C	Temperature
Patm 1010 hPa	Atmospheric Pressure
Va 0.00 m/s	Air Speed
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### HD37AB1347 Technical specifications

#### Instrument

Dimensions (Length x Width x Height)	185x90x40 mm
Weight	470 g (batteries included)
Materials	ABS, rubber
Display	Backlit, Dot Matrix 160x160 dots, visible area 52x42 mm

#### Operating conditions

Operating temperature	-5...50°C
Storage temperature	-25...65°C
Working relative humidity	0 ... 85% RH without condensation

#### Protection degree

**IP65**

#### Instrument uncertainty

± 1 digit @ 20°C

#### Power supply

Mains adapter (code SWD10)	12Vdc/1A
Rechargeable batteries	4 1.2V type AA batteries Ni-MH
Autonomy	20 hours with 1800mAh Ni-MH batteries (with P37AB147 probe connected)
Power absorbed with instrument off	< 45µA

#### Security of stored data

Unlimited

#### Connections

Input for probes with SICRAM module	Two 8-pole male DIN45326 connectors
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You can connect the following probes to the **Indoor Air Quality** input:

- **P37AB147**
- **P37B147**
- **Temperature** probes equipped with SICRAM module
- **Temperature and Humidity** combined probes with SICRAM module

You can connect the following probes to the **Temp - Air Velocity** input:

- **Hot-Wire Sensor Air Speed** probes with SICRAM module
- **Vane Air Speed** probes with SICRAM module
- **Temperature** probes equipped with SICRAM module

#### Serial interface:

Socket:	8-pole M12
Type:	RS232C (EIA/TIA574) or USB 1.1 or 2.0 not insulated
Baud rate:	From 1200 to 38400 baud.
Data bits:	8
Parity:	None
Stop bits:	1

## HD37AB1347 INDOOR AIR QUALITY MONITOR

HD37AB1347 IAQ Monitor is a tool manufactured by Delta Ohm for the analysis of air quality (Indoor Air Quality, IAQ).

The instrument simultaneously measures several parameters: **Carbon Dioxide CO<sub>2</sub>**, **Carbon monoxide CO**, **Temperature**, **Relative humidity**, **atmospheric pressure** and calculates **Dew Point**, **wet bulb temperature**, **absolute humidity**, **mixing ratio**, **enthalpy**. All this is done with the **P37AB147** SICRAM probe. The SICRAM probe **P37B147** does not measure the Carbon Monoxide CO. Also combined **temperature and humidity** SICRAM probes, **Hot wire Air speed** SICRAM probes, **Vane air speed** SICRAM probes and **temperature** SICRAM probes can be connected to the instrument.

The instrument, according to a proper procedure, calculates the percentage of injection of outdoor air (% **Outside Air**) for both carbon dioxide CO<sub>2</sub> and temperature and **Ventilation Rate**.

HD37AB1347 **data logger** has a storage capacity of 67,600 presets for each of the two inputs divided into 64 blocks; it uses the software DeltaLog10 from version 0.1.5.0 for Windows® operating systems.

The instrument is equipped with a large dot matrix graphic display with a resolution of 160x160 points. The Reference Standards: **ASHRAE 62.1-2004**, **Decree Law 81/2008**. The rules apply to all enclosed spaces that may be occupied by people. Should be considered, depending on air quality, chemical contaminants, physical and biological or outdoor air flow inside inadequately purified (Ventilation Rate).

The typical applications of the instrument with the range of sensors above mentioned are:

- IAQ measure and comfort conditions in schools, offices and indoor environments.
- Analysis and study of sick building syndrome (Sick Building Syndrome) and consequences.
- Verification of HVAC system.
- Investigation of IAQ conditions in factories to optimize the microclimate and improve productivity.
- Audits in Building Automation.

Flow control: Xon-Xoff  
Cable length: Max 15 m

#### USB interface

Type: 1.2 or 2.0 non insulated  
Connection: MiniUSB B-Type

#### Memory

Storage capacity: Divided into 64 blocks.  
67600 recordings per each of the 2 inputs.  
Logging interval: Selectable among: 15, 30 seconds, 1, 2, 5, 10, 15, 20, 30 minutes and 1 hour.

Logging interval	Storage capacity	Logging interval	Storage capacity
15 seconds	About 11 days and 17 hours	10 minutes	About 1 year and 104 days
30 seconds	About 23 days and 11 hours	15 minutes	About 1 year and 339 days
1 minute	About 46 days and 22 hours	20 minutes	About 2 years and 208 days
2 minutes	About 93 days and 21 hours	30 minutes	About 3 years and 313 days
5 minutes	About 234 days and 17 hours	1 hour	About 7 years and 261 days

#### Technical specifications of the probes that can be connected to the HD37AB1347 instrument

##### P37AB147 and P37B147 SICRAM probes

- **P37AB147:** Measurement of CO<sub>2</sub> - CO - Relative Humidity - Temperature - Atmospheric Pressure.
- **P37B147:** Measurement of CO<sub>2</sub> - Relative Humidity - Temperature - Atmospheric Pressure.

##### CO<sub>2</sub> Carbon Dioxide

Sensor: NDIR Dual Wavelength  
Measurement range: 0 ... 5000ppm  
Sensor working range: -5 ... 50°C  
Accuracy: ±50ppm±3% of measurement  
Resolution: 1ppm  
Temperature dependence: 0.1%f.s./°C  
Response time (T<sub>90</sub>): < 120 sec (air speed = 2m/sec)  
Long-term stability: 5% of measurement/5 years

##### CO Carbon Monoxide (only P37AB147)

Sensor: Electrochemical cell  
Measurement range: 0 ... 500ppm  
Sensor working range: -5 ... 50°C  
Accuracy: ±3ppm±3% of measurement  
Resolution: 1ppm  
Response time (T<sub>90</sub>): < 50 sec  
Long-term stability: 5% of measurement/year  
Service life: > 5 years in normal environment conditions

##### Relative Humidity RH

Type of sensor: Capacitive  
Sensor protection: Stainless steel grid filter (upon request 10µm sintered filter P6 in AISI 316 or 20µm sintered filter P7 in PTFE)  
Measurement range: 0 ... 100 % RH  
Sensor working range: -20 ... +60°C  
Accuracy: ±1.5%RH (0÷90% RH)  
±2%RH (elsewhere) for T=15...35°C  
±(1.5+1.5% of the measure)%RH for T= -20...+60°C  
Resolution: 0.1°C  
Temperature dependence: ±2% on all temperature range  
Hysteresis and repeatability: 1% RH  
Response time (T<sub>90</sub>): < 20 sec (air speed = 2m/sec) without filter  
Long-term stability: 1%/year

##### Temperature T

Type of sensor: NTC 10kΩ  
Measurement range: -20 ... +60°C  
Accuracy: ±0.2°C ±0.15% of measurement  
Resolution: 0.1°C  
Response time (T<sub>90</sub>): < 30 sec (air speed = 2m/sec)  
Long-term stability: 0.1°C/year

##### Atmospheric Pressure Patm

Type of sensor: Piezo-resistive  
Measurement range: 750 ... 1100 hPa  
Accuracy: ±1.5 hPa @ 25°C  
Resolution: 1 hPa  
Long-term stability: 2hPa/year  
Temperature drift: ±3hPa with temperature -20 ... +60°C

##### Relative humidity and temperature probes using SICRAM module

Model	Temp. sensor	Application range		Accuracy	
		%RH	Temperature	%RH	Temp.
HP472ACR	Pt100	0...100%RH	-20°C...+80°C	±1.5%RH (0...90% RH) ±2%RH (elsewhere) For T=15...35°C	±0.3°C
HP572ACR	K TC	0...100%RH	-20°C...+80°C		±0.5°C
HP473ACR	Pt100	0...100%RH	-20°C...+80°C	---	±0.3°C
HP474ACR	Pt100	0...100%RH	-40°C...+150°C		±0.3°C
HP475ACR	Pt100	0...100%RH	-40°C...+150°C	±(1.5+1.5% of the measure)%RH in the remaining temperature range	±0.3°C
HP475AC1R	Pt100	0...100%RH	-40°C...+180°C		±0.3°C
HP477DCR	Pt100	0...100%RH	-40°C...+150°C	---	±0.3°C
HP478ACR	Pt100	0...100%RH	-40°C...+150°C		±0.3°C



### Common characteristics

#### Relative Humidity

Sensor	Capacitive
Sensor operating temperature	-20 ... 80°C
Measurement range	0÷100%RH
Resolution	0.1%RH
Temperature drift @20°C	0.02%RH/°C
Response time %RH	10sec (10÷80% RH; air speed=2m/s) at constant temperature

#### Temperature with sensor Pt100

Resolution	0.1°C
Temperature drift @20°C	0.003%/°C

### Hot-Wire Air Speed measurement probes with SICRAM module: AP471 S1 - AP471 S2 - AP471 S3 - AP471 S4

	AP471 S1 - AP471 S3	AP471 S2	AP471 S4
Type of measurements	Air speed, calculated flow rate, air temperature		
Type of sensor			
Speed	NTC thermistor	Omni directional NTC thermistor	
Temperature	NTC thermistor	NTC thermistor	
Measurement range			
Speed	0.1 ... 40m/s	0.1 ... 5m/s	
Temperature	-25 ... +80°C	-25 ... +80°C	0 ... 80°C
Measurement resolution			
Speed	0.01 m/s 0.1 km/h 1 ft/min 0.1 mph 0.1 knot		
Temperature	0.1°C		
Measurement accuracy			
Speed	±0.2 m/s (0...0.99 m/s)	±0.2m/s (0...0.99 m/s)	
	±0.4 m/s (1.00...9.99 m/s)	±0.3m/s (1.00...5.00 m/s)	
	±0.8 m/s (10.00...40.0 m/s)		
Temperature	±0.8°C (-10...+80°C)	±0.8°C (-10...+80°C)	
Minimum speed	0.1 m/s		
Air temperature compensation	0...80°C		
Sensor working conditions	Clean air, RH<80 %		
Battery life	Approx. 20 hours @ 20 m/s with alkaline batteries	Approx. 30 hours @ 5 m/s with alkaline batteries	
Unit of measurement			
Speed	m/s – km/h – ft/min – mph – knot		
Flow rate	l/s - m³/s - m³/min - m³/h - ft³/s - ft³/min		
Pipeline section for flow rate calculation	0.0001...1.9999 m²		
Cable length	~2m		



HD40.1

### Vane Air Speed measurement probes with SICRAM module: AP472 S1 - AP472 S2

	AP472 S1	AP472 S2
Type of measurements	Air speed, calculated flow rate, air temperature	Air speed, calculated flow rate
Diameter	100 mm	60 mm
Type of measurement		
Speed	Vane	Vane
Temperature	Tc K	----
Measurement range		
Speed (m/s)	0.6 ... 25	0.5 ... 20
Temperature (°C)	-25...+80 (*)	
Resolution		
Speed	0.01 m/s 0.1 km/h 1 ft/min 0.1 mph 0.1 knot	
Temperature	0.1°C	----
Accuracy		
Speed	±(0.4 m/s +1.5%f.s.)	±(0.4m/s +1.5%f.s.)
Temperature	±0.8°C	----
Minimum speed	0.6m/s	0.5m/s
Unit of measurement		
Speed	m/s – km/h – ft/min – mph – knot	
Flow rate	l/s - m³/s - m³/min - m³/h - ft³/s - ft³/min	
Pipeline section for flow rate calculation	0.0001...1.9999 m²	
Cable length	~2m	

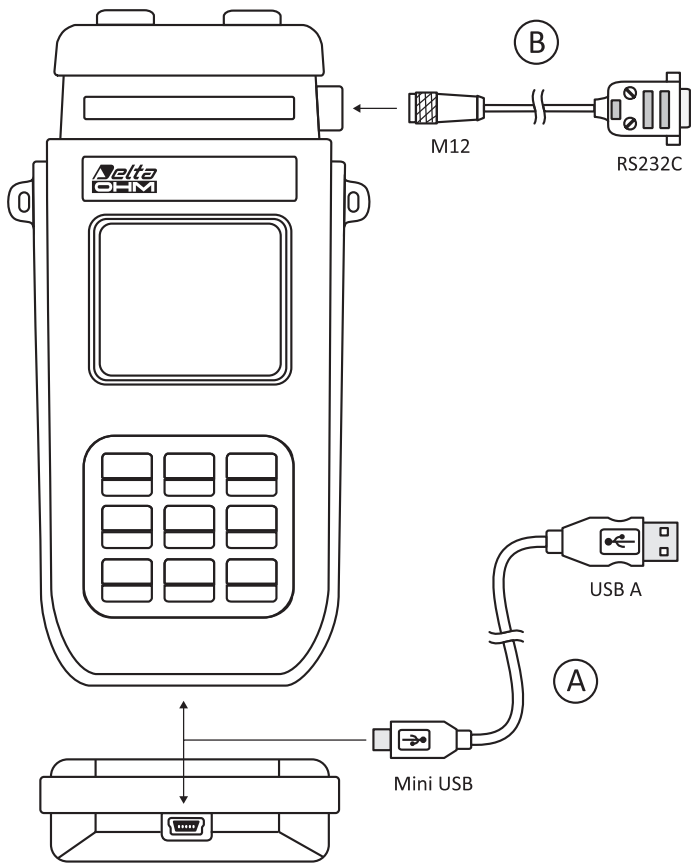
(\*) The indicated value refers to the vane's working range.

### Temperature probes Pt100 using SICRAM module

Model	Type	App. range	Accuracy
TP472I	Immersion	-196°C...+500°C	±0.25°C (-196°C...+300°C) ±0.5°C (+300°C...+500°C)
TP472I.0 1/3DIN - Thin film	Immersion	-50°C...+300°C	±0.25°C
TP473P.I	Penetration	-50°C...+400°C	±0.25°C (-50°C...+300°C) ±0.5°C (+300°C...+400°C)
TP473P.0 1/3DIN - Thin film	Penetration	-50°C...+300°C	±0.25°C
TP474C.I	Contact	-50°C...+400°C	±0.3°C (-50°C...+300°C) ±0.5°C (+300°C...+400°C)
TP474C.0 1/3DIN - Thin film	Contact	-50°C...+300°C	±0.3°C
TP475A.0 1/3DIN - Thin film	Air	-50°C...+250°C	±0.3°C
TP472I.5	Penetration	-50°C...+400°C	±0.3°C (-50°C...+300°C) ±0.6°C (+300°C...+400°C)
TP472I.10	Penetration	-50°C...+400°C	±0.30°C (-50°C...+300°C) ±0.6°C (+300°C...+400°C)
TP49A.0 Class A - Thin film	Immersion	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AC.0 Class A - Thin film	Contact	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AP.0 Class A - Thin film	Penetration	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP875.I	Globethermometer Ø150mm	-30°C...+120°C	±0.25°C
TP876.I	Globethermometer Ø 50mm	-30°C...+120°C	±0.25°C
TP87.0 1/3DIN - Thin film	Immersion	-50°C...+200°C	±0.25°C
TP878.0 1/3DIN - Thin film TP878.1.0 1/3DIN - Thin film	For solar panel	+4°C...+85°C	±0.25°C
TP879.0 1/3DIN - Thin film	For compost	-20°C...+120°C	±0.25°C

Common characteristics  
Temperature drift @20°C

0.003%/°C



- A** The HD37AB1347 uses a new serial miniUSB port HD type (Human Interface Device). **It is not necessary to install any driver** for making the connection to the PC with the USB cable type A – MiniUSB type B coded CP23.
- B** The port equipped with the M12 connector is an RS232C type that can be used for the connection to the PC or to the HD40.1 printer by using the cable HD2110RS.

#### ORDERING CODES

**HD37AB1347:** IAQ Monitor datalogger instrument complete with: **DeltaLog10** software (**from version 0.1.5.0**) for data download, monitor, and data processing on Personal Computer, BAT-40 4x1.2V type AA Ni-MH rechargeable batteries, operating manual, case. **Probes and cables have to be ordered separately.**

#### *Carbon dioxide, carbon monoxide, relative humidity, temperature and atmospheric pressure probes with SICRAM module*

**P37AB147:** CO<sub>2</sub> Carbon Dioxide, CO Carbon Monoxide, Relative Humidity RH, Temperature T and Atmospheric Pressure Patm combined probe. Dimensions 275 mm x 45 mm x 40 mm. Connection cable 2 meters long.

**P37B147:** CO<sub>2</sub> Carbon Dioxide, Relative Humidity RH, Temperature T and Atmospheric Pressure Patm combined probe. Dimensions 275 mm x 45 mm x 40 mm. Connection cable 2 meters long.

#### *Relative humidity and temperature probes equipped with SICRAM module*

**HP472ACR:** Combined probe %RH and temperature, dimensions Ø 26x170 mm. Connection cable 2 meters long.

**HP473ACR:** Combined probe %RH and temperature. Handle size Ø 26x130 mm, probe Ø 14x120 mm. Connection cable 2 meters long.

**HP474ACR:** Combined probe %RH and temperature. Handle size Ø 26x130 mm, probe Ø 14x215 mm. Connection cable 2 meters long.

**HP475ACR:** Combined probe %RH and temperature. Connection cable 2 meters long. Handle Ø 26x110mm. Stainless steel stem Ø 12x560mm. Tip Ø 14x75 mm.

**HP475AC1R:** Combined probe %RH and temperature. Connection cable 2 meters long. Handle Ø 26x80 mm. Stainless steel stem Ø 14x480 mm.

**HP477DCR:** Combined sword probe %RH and temperature. Connection cable 2 meters long. Handle Ø 26x110mm. Probe's stem 18x4mm, length 520 mm.

**HP478ACR:** Combined probe %RH and temperature. Dimensions Ø 14x130 mm. Connection cable 5 meters long.



#### **Hot-wire wind speed measurement probes equipped with SICRAM module**

**AP471 S1:** Hot-wire telescopic probe, measuring range: 0.1 ... 40m/s. Cable 2 meters long.

**AP471 S2:** Omni directional hot-wire telescopic probe, measuring range: 0.1 ... 5m/s. Cable 2 meters long.

**AP471 S3:** Hot-wire telescopic probe with terminal tip for easy position, measuring range: 0.1 ... 40m/s. Cable 2 meters long.

**AP471 S4:** Omni directional hot-wire telescopic probe with base, measuring range: 0.1 ... 5m/s. Cable 2 meters long.

#### **Vane wind speed measurement probes with SICRAM module**

**AP472 S1:** Vane probe with thermocouple K, Ø 100 mm. Speed from 0.6 to 20 m/s; temperature from -25 to 80°C. Cable 2 meters long.

**AP472 S2:** Vane probe, Ø 60mm. Measurement range: 0.5...20m/s. Cable 2 meters long.

#### **Temperature measurement probes equipped with SICRAM module**

**TP471:** Wire wound Pt100 sensor immersion probe. Stem Ø 3 mm, length 300 mm. Cable 2 meters long.

**TP472I.0:** Thin film Pt100 sensor immersion probe. Stem Ø 3 mm, length 230 mm. Cable 2 meters long.

**TP473P.I:** Wire wound Pt100 sensor penetration probe. Stem Ø 4 mm, length 150 mm. Cable 2 meters long.

**TP473P.O:** Thin film Pt100 sensor penetration probe. Stem Ø 4 mm, length 150 mm. Cable 2 meters long.

**TP474C.I:** Wire wound Pt100 sensor contact probe. Stem Ø 4 mm, length 230 mm, contact surface Ø 5 mm. Cable 2 meters long.

**TP474C.O:** Thin film Pt100 sensor contact probe. Stem Ø 4 mm, length 230 mm, contact surface Ø 5 mm. Cable 2 meters long.

**TP475A.O:** Thin film Pt100 sensor air probe. Stem Ø 4 mm, length 230 mm. Cable 2 meters long.

**TP472I.5:** Thin film Pt100 sensor penetration probe. Stem Ø 6 mm, length 500 mm. Cable 2 meters long.

**TP472I.10:** Thin film Pt100 sensor penetration probe. Stem Ø 6 mm, length 1000 mm. Cable 2 meters long.

**TP49A.O:** Thin film Pt100 sensor immersion probe. Stem Ø 2.7 mm, length 150 mm. Cable 2 meters long. Aluminium handle.

**TP49AC.O:** Thin film Pt100 sensor contact probe. Stem Ø 4 mm, length 150 mm. Cable 2 meters long. Aluminium handle.

**TP49AP.O:** Thin film Pt100 sensor penetration probe. Stem Ø 2.7 mm, length 150 mm. Cable 2 meters long. Aluminium handle.

**TP875.I:** Wire wound Globe thermometer Ø 150 mm with handle. Cable 2 meters long.

**TP876.I:** Wire wound Globe thermometer Ø 50 mm with handle. Cable 2 meters long.

**TP87.O:** Thin film Pt100 sensor immersion probe. Stem Ø 3 mm with handle, length 70mm. Cable 2 meters long.

**TP878.O:** Thin film Contact probe for solar panels. Cable 2 meters long.

**TP878.1.O:** Thin film Contact probe for solar panels. Cable 5 meters long.

**TP879.O:** Thin film penetration probe for compost. Stem Ø 8 mm, length 1 meter. Cable 2 meters long.

#### **Accessories:**

**SWD10:** Stabilized power supply at 100-240Vac/12Vdc-1A mains voltage.

**VTRAP20:** Tripod to be fixed to the instrument, maximum height 270 mm.

**HD2110/RS:** Connection cable with M12 connector on instrument's side and sub D 9-pole female connector for RS232C on PC's side.

**CP23:** Connection cable with type B MiniUSB connector on instrument's side and USB 2.0 connector on PC's side.

**HD40.1:** Printer (it uses the **HD2110/RS** cable).

#### **Accessories for HD40.1 printer:**

**BAT-40:** Spare batteries for the HD40.1 printer with built-in temperature sensor.

**RCT:** Kit of four thermo-paper rolls, width 57 mm, diameter 32 mm.

#### **Accessories for P37AB147 and P37B147 SICRAM probes:**

**MINICAN.12A:** Nitrogen bottle for CO and CO<sub>2</sub> sensor calibration at Oppm. Volume 12 liters. **With adjustment valve.**

**MINICAN.12A1:** Nitrogen bottle for CO and CO<sub>2</sub> sensor calibration at Oppm. Volume 12 liters. **Without adjustment valve.**

**ECO-SURE-2E CO:** CO spare sensor (only P37AB147)

**HD37.36:** Kit connection tube between instrument and MINICAN.12A for CO calibration (only P37AB147).

**HD37.37:** Kit connection tube between instrument and MINICAN.12A for CO<sub>2</sub> calibration.

#### **Accessories for Wind Speed SICRAM probes:**

**AST.1:** Telescopic rod (fully closed 210 mm, fully open 870 mm) for AP472S1 and AP472S2 vanes.

**AP 471S1.23.6:** Fixed telescopic element Ø 16 x 300 mm, M10 male thread on one side, female thread on the other side. For AP472S1, AP472S2 vanes.

**AP 471S1.23.7:** Fixed telescopic element Ø 16 x 300 mm, M10 female thread on one side only. For AP472S1, AP472S2 vanes.

#### **Accessories for Temperature-Humidity SICRAM probes:**

**HD33:** Saturated solution at 33.0%RH@20°C for calibration of relative humidity probes, ring M24x1.5, M12x1.

**HD75:** Saturated solution at 75.4%RH@20°C for calibration of relative humidity probes, ring M24x1.5, M12x1.

**P6:** Complete protection in 10µm sintered AISI 316 for Ø 14mm probes.

**P7:** Complete protection in 20µm sintered PTFE for Ø 14mm probes.

**P8:** 20µm protection grid in stainless steel and Pocan for Ø 14mm probes, thread M12x1.