HD37AB1347

```
=========================
   Model HD37AB1347 IAQ
=========================
Firm.Ver.=01.00
Firm.Date=2010/01/15
SN=12345678
ID=0000000000000000
-------------------------
Probe ch.1 description
Type: CO2-CO Fw.V0R0
Data cal.:2010/01/15
Serial N.:10010060
-------------------------
Probe ch.2 description
Type: Hot wire
Data cal.:2010/01/15
Serial N.: 10010100
=========================
Date=2010/01/15 15:00:00
CO2           850   ppm
CO              0   ppm
RH           39.1   %
T1           22.0   °C
Patm         1010   hPa
Va           0.00   m/s
=========================
```

Instrument model

Instrument firmware version
Instrument firmware date
Instrument serial number
Identification Code

Description of the probe connected to input 1

Description of the probe connected to input 2

Date and time
Carbon Dioxide
Carbon Monoxide
Relative Humidity
Temperature
Atmospheric Pressure
Air Speed

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_2, **Carbon monoxide** CO, **Temperature**, **Relative humidity** and calculates **Dew Point**, **wet bulb temperature**, **absolute humidity**, **mixing ratio**, **enthalpy** and **atmospheric pressure**. All this with the **P37AB147** SICRAM probe. The probe SICRAM **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, with proper procedure, calculates the percentage of outdoor air intake **(% Outside Air)** as a function of both carbon dioxide CO_2 and temperature and the **Ventilation Rate**.

HD37AB1347 data logger has a storage capacity of 67,600 presets for each of the two inputs divided into 64 blocks. Use the software DeltaLog10 version 0.1.5.0.

The instrument is equipped with a large dot matrix graphic display with a resolution of 160x160 points. 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).

Typical applications of the instrument with the range of sensors mentioned above are:
- Measure IAQ and comfort conditions in schools, offices and indoor.
- 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.

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	**IP66**
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 2200mAh 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

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:	Between 1200 and 38400 baud. With USB baud=460800
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	Xon-Xoff
Cable length:	Max 15 m

Memory	Divided into 64 blocks.
Storage capacity	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_2 – CO – Relative Humidity – Temperature – Atmospheric Pressure.
- **P37B147:** Measurement of CO_2 – Relative Humidity – Temperature – Atmospheric Pressure.

CO_2 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_{90})	< 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_{90})	< 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 (on request 20µm sintered filter P6 in AISI 316 or 10µm sintered filter P7 in PTFE)
Measurement range	0 … 100 % RH
Sensor working range	-20 … +60°C
Accuracy	±2% (10÷90% RH) ±2.5% in the remaining range
Resolution	0.1°C
Temperature dependence	±2% on all temperature range
Hysteresis and repeatability	1% RH
Response time (T_{90})	< 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_{90})	< 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 (10…90% RH) ±2.5%RH remaining range	±0.3°C
HP473ACR	Pt100	0…100%RH	-20°C…+80°C		±0.3°C
HP474ACR	Pt100	0…100%RH	-40°C…+150°C	±2.5% (10…95% RH) ±3.5% remaining range	±0.3°C
HP475ACR	Pt100	0…100%RH	-40°C…+150°C		±0.3°C
HP475AC1R	Pt100	0…100%RH	-40°C…+150°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
Typical capacity @30%RH	300pF±40pF
Sensor operating temperature	-20 … 80°C
Measurement range	0÷100%RH
Uncertainty	±1.5% RH (10…90% RH) ±2.5% RH in the remaining range
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	±0.1 m/s (0…0.99 m/s)	±0.05m/s (0…0.99 m/s)	
	±0.3 m/s (1.00…9.99 m/s)	±0.15m/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		

Vane Air Speed measurement probes with SICRAM module: AP472 S1… - AP472 S2 - AP472 S4…

	AP472 S1	AP472 S2	AP472 S4…			
			L	LT	H	HT
Type of measurements	Air speed, calculated flow rate, air temperature	Air speed, calculated flow rate	Air speed, calculated flow rate	Air speed, calculated flow rate, air temperature	Air speed, calculated flow rate	Air speed, calculated flow rate, air temperature
Diameter	100 mm	60 mm	16 mm			
Type of measurement						
Speed	Vane	Vane	Vane			
Temperature	Tc K	----	----	Tc K	----	Tc K
Measurement range						
Speed (m/s)	0.6 … 25	0.5 … 20	0.8 … 20		10 … 40	
Temperature (°C)	-25…+80 (*)		-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	----	----	0.1°C	----	0.1°C
Accuracy						
Speed	±(0.3 m/s +1.5%f.s.)	±(0.3m/s +1.5%f.s.)	±(0.4 m/s +1.5%f.s.)			
Temperature	±0.8°C	----	----	±0.8°C	----	±0.8°C
Minimum speed	0.6m/s	0.5m/s	0.8m/s		10m/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	Application range	Accuracy
TP472I	Immersion	-196°C…+500°C	±0.25°C (-196°C…+350°C) ±0.4°C (+350°C…+500°C)
TP472I.0	Immersion	-50°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP473P	Penetration	-50°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP473P.0	Penetration	-50°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP474C	Contact	-50°C…+400°C	±0.3°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP474C.0	Contact	-50°C…+400°C	±0.3°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP475A.0	Air	-50°C…+250°C	±0.3°C (-50°C…+250°C)
TP472I.5	Immersion	-50°C…+400°C	±0.3°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP472I.10	Immersion	-50°C…+400°C	±0.3°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49A	Immersion	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49AC	Contact	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49AP	Penetration	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP875	Globe thermometer Ø 150 mm	-30°C…+120°C	±0.25°C
TP876	Globe thermometer Ø 50mm	-30°C…+120°C	±0.25°C
TP87	Immersion	-50°C…+200°C	±0.25°C
TP878 TP878.1	For solar panels	+5°C…+80°C	±0.25°C
TP879	Compost	-20°C…+120°C	±0.25°C

Common characteristics

Temperature drift @20°C	0.003%/°C

PURCHASING 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, 4 x 1.2V type AA Ni-MH rechargeable batteries 2200 mAh, 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_2 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_2 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. Point Ø 26x110 mm.

HP475AC1R: Combined probe %RH and temperature. Connection cable 2 meters long. Handel 80 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.

AP472 S4L: Vane probe, Ø 16 mm. Speed from 0.8 to 20m/s. Cable 2 meters long.

AP472 S4LT: Vane probe, Ø 16 mm. Speed from 0.8 to 20 m/s. Temperature from -25 to 80°C with thermocouple K sensor. Cable 2 meters long.

AP472 S4H: Vane probe, Ø 16 mm. Speed from 10 to 40m/s. Cable 2 meters long.

AP472 S4HT: Vane probe, Ø 16 mm. Speed from 10 to 40m/s. Temperature from -25 to 80°C with thermocouple K sensor. Cable2 meters long.

TEMPERATURE MEASUREMENT PROBES EQUIPPED WITH SICRAM MODULE

TP472I: Pt100 sensor immersion probe. Stem Ø 3 mm, length 300 mm. Cable 2 meters long.

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

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

TP473P.0: Pt100 sensor penetration probe. Stem Ø 4 mm, length 150 mm. Cable 2 meters long.

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

TP474C.0: Pt100 sensor contact probe. Stem Ø 4 mm, length 230 mm, contact surface Ø 5 mm. Cable 2 meters long.

TP475A.0: Pt100 sensor air probe. Stem Ø 4 mm, length 230 mm. Cable 2 meters long.

TP472I.5: Pt100 sensor immersion probe. Stem Ø 6 mm, length 500 mm. Cable 2 meters long.

TP472I.10: Pt100 sensor immersion probe. Stem Ø 6 mm, length 1000 mm. Cable 2 meters long.

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

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

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

TP875: Globe thermometer Ø 150 mm with handle. Cable 2 meters long.

TP876: Globe thermometer Ø 50 mm with handle. Cable 2 meters long.

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

TP878: Contact probe for solar panels. Cable 2 meters long.

TP878.1: Contact probe for solar panels. Cable 5 meters long.

TP879: Penetration probe 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.

HD2110/USB: Connection cable with M12 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_2 sensor calibration at 0ppm. Volume 12 liters. **With adjustment valve.**

MINICAN.12A1: Nitrogen bottle for CO and CO_2 sensor calibration at 0ppm. 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_2 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 ∅ 16 x 300 mm, M10 male thread on one side, female thread on the other side. For AP472S1, AP472S2, AP472S4 vanes.

AP 471S1.23.7: Fixed telescopic element ∅ 16 x 300 mm, M10 female thread on one side only. For AP472S1, AP472S2, AP472S4 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

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

P5: Protection grid in stainless steel for Ø 14mm probes.

P6: Complete protection in 20μ sintered AISI 316 for Ø 14mm probes.

P7: Complete protection in 10μ sintered PTFE for Ø 14mm probes.

P8: Protection grid in stainless steel and Pocan for Ø 14mm probes, thread M12x1.

HD40.1