

HD37AB1347



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 CO₂**, **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. 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 CO₂ 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.

Example of an immediate printout obtained using the **HD40.1** printer

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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**
- **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
Flow control:	Xon-Xoff

Cable length: Max 15 m

USB interface
 Type 1.2 or 2.0 non insulated
 Connection 8-pole M12

Memory
 Storage capacity Divided into 64 blocks.
 Logging interval 67600 recordings per each of the 2 inputs.
 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: Measurement of CO₂ - CO - Relative Humidity - Temperature - Atmospheric Pressure.

CO₂ 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 (T₉₀) < 120 sec (air speed = 2m/sec)
 Long-term stability 5% of measurement/5 years

CO Carbon Monoxide

Sensor Electrochemical cell
 Measurement range 0 ... 500ppm
 Sensor working range -5 ... 50°C
 Accuracy ±3ppm±3% of measurement
 Resolution 1ppm
 Response time (T₉₀) < 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 (T₉₀) < 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 (T₉₀) < 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)	±0.3°C
HP473ACR	Pt100	0...100%RH	-20°C...+80°C	±2%RH (elsewhere)	±0.3°C
HP474ACR	Pt100	0...100%RH	-40°C...+150°C	For T=15...35°C	±0.3°C
HP475ACR	Pt100	0...100%RH	-40°C...+150°C	---	±0.3°C
HP475AC1R	Pt100	0...100%RH	-40°C...+180°C	±(1.5+1.5% of the measure)%RH in the remaining temperature range	±0.3°C
HP477DCR	Pt100	0...100%RH	-40°C...+100°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		



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	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP472I.0 1/3DIN - Thin film	Immersion	-50°C...+300°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP473P.I	Penetration	-50°C...+400°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP473P.O 1/3DIN - Thin film	Penetration	-50°C...+300°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP474C.0 1/3DIN - Thin film	Contact	-50°C...+300°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP475A.0 1/3DIN - Thin film	Air	-50°C...+250°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C)
TP472I.5	Penetration	-50°C...+400°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP472I.10	Penetration	-50°C...+400°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP49A.I Class A - Thin film	Immersion	-70°C...+250°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP49AC.I Class A - Thin film	Contact	-70°C...+250°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C) ±0.3 °C (t < -50 °C; t > 250 °C)
TP49AP.I Class A - Thin film	Penetration	-70°C...+250°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C)
TP875.I	Globethermometer Ø150mm	-30°C...+120°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C)
TP876.I	Globethermometer Ø 50mm	-30°C...+120°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C)
TP87.0 1/3DIN - Thin film	Immersion	-50°C...+200°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C)
TP878.0 1/3DIN - Thin film TP878.1.0 1/3DIN - Thin film	For solar panel	+4°C...+85°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C)
TP879.0 1/3DIN - Thin film	For compost	-20°C...+120°C	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250°C)

Common characteristics

Temperature drift @20°C

0.003%/°C

ORDERING CODES

HD37AB1347: IAQ Monitor datalogger instrument complete with: **DeltaLog10** software downloadable from Delta OHM website (**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 probe with SICRAM module

P37AB147: CO₂ 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.

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

AP471S1: Hot-wire telescopic probe, measuring range: 0.1 ... 40m/s. Cable 2 meters long.

AP471S2: Omni directional hot-wire telescopic probe, measuring range: 0.1 ... 5m/s. Cable 2 meters long.

AP471S3: Hot-wire telescopic probe with terminal tip for easy position, measuring range: 0.1 ... 40m/s. Cable 2 meters long.

AP471S4: 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

TP472I: 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.0: Thin film Pt100 sensor penetration probe. Stem Ø 4 mm, length 150 mm. Cable 2 meters long.

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

TP475A.0: 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.I: Thin film Pt100 sensor immersion probe. Stem Ø 2.7 mm, length 150 mm. Cable 2 meters long. Aluminium handle.

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

TP49AP.I: 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.

TP87.0: Thin film Pt100 sensor immersion probe. Stem Ø 3 mm with handle, length 70mm. Cable 2 meters long.

TP878.0: Thin film Contact probe for solar panels. Cable 2 meters long.

TP878.1.0: Thin film Contact probe for solar panels. Cable 5 meters long.

TP879.0: 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.

HD 2110 USB: Connecting cable with M12 connector on instrument side and USB 2.0 connector on PC 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 probe:

MINICAN.12A: Nitrogen bottle for CO and CO₂ sensor calibration at Oppm. Volume 12 liters. **With adjustment valve.**

MINICAN.12A1: Nitrogen bottle for CO and CO₂ sensor calibration at Oppm. Volume 12 liters. **Without adjustment valve.**

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 CO₂ 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:

HD11: Saturated solution at 11.0%RH@20°C for calibration of relative humidity probes, ring M24x1.5, M12x1.

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. For temperatures up to 180 °C.

P7: Complete protection in 20µm sintered PTFE for Ø 14mm probes. For temperatures up to 150 °C.

P8: 20µm protection grid in stainless steel and PBT Technopolymer for Ø 14mm probes, thread M12x1. For temperatures up to 100 °C.