HD 2101.1
HD 2101.2

HD2101.1 AND HD2101.2
HYGRO-THERMOMETERS

The **HD2101.1** and **HD2101.2** are portable instruments with a large LCD display. They measure relative humidity and temperature using a Pt100 sensor or thermocouple humidity/temperature combined probe. Temperature only is measured by immersion, penetration or contact probes. The sensor can be a Pt100 or Pt1000.
When the humidity/temperature combined probe is connected, the instrument calculates and displays the absolute humidity, the dew point, the partial vapour pressure, and the **comfort indices**.
The probes are fitted with an automatic detection module, with the factory calibration data already stored inside.

The HD2101.2 is a **datalogger**. It stores up to 38,000 samples which can be transferred from the instrument connected to a PC via the multi-standard RS232C serial port and USB 2.0. The storing interval, printing, and baud rate can be configured using the menu.
The HD2101.1 and HD2101.2 models are fitted with an RS232C serial port and can transfer the acquired measurements in real time to a PC or to a portable printer.
The Max, Min and Avg function calculate the maximum, minimum or average values.
Other functions include: the relative measurement REL, the HOLD function, and the automatic turning off that can also be excluded.
The instruments have IP67 protection degree.


HD2101.2


HD2101/USB

INSTRUMENT TECHNICAL CHARACTERISTICS

Instrument

Dimensions (Length x Width x Height)	185x90x40mm
Weight	470g (complete with batteries)
Materials	ABS, rubber
Display	2x4½ digits plus symbols Visible area: 52x42mm

Operating conditions

Operating temperature	-5…50°C
Storage temperature	-25…65°C
Working relative humidity	0…90%RH without condensation
Protection degree	**IP67**

Power

Batteries	4 1.5V type AA batteries
Autonomy	200 hours with 1800mAh alkaline batteries
Power absorbed with instrument off	20µA
Mains	Output mains adapter 12Vdc / 1000mA

Measuring unit	*°C - °F - %RH - g/kg - g/m³ - hPa - J/g - Td Tw - DI - NET*
Security of stored data	Unlimited, independent of battery charge conditions

Time

Date and time	Schedule in real time
Accuracy	1min/month max drift

*Measured values storage - model **HD2101.2***

Type	2000 pages containing 19 samples each
Quantity	Total of 38000 samples
Storage interval	1s…3600s (1hour)

Serial interface RS232C

Type	RS232C electrically isolated
Baud rate	Can be set from 1200 to 38400 baud
Data bit	8
Parity	None
Stop bit	1
Flow Control	Xon/Xoff
Serial cable length	Max 15m
Immediate print interval	1s…3600s (1hour)

*USB interface - model **HD2101.2***

Type	1.1 - 2.0 electrically isolated

Connections

Input module for the probes	8-pole male DIN45326 connector
Serial interface and USB	8-pole MiniDin connector
Mains adapter	2-pole connector (positive at centre)

Measurement of relative humidity by Instrument

Measurement range	0…100%RH
Resolution	0.1%RH
Accuracy	±0.1%RH
Drift after 1 year	0.1%RH/year

Measurement of temperature by Instrument

Pt100 measurement range	-200…+650°C
Pt1000 measurement range	-200…+650°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year

Relative humidity and temperature probes using SICRAM module

Model	Temperature sensor	Working range		Accuracy	
		%RH	Temperature	%RH	Temp
HP472ACR	Pt100	0…100%RH	-20°C…+80°C	±1,5%RH (10…90%RH) ±2,5%RH (in the remaining range)	±0.3°C
HP572ACR	Thermocouple K	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	-40°C…150°C (180°C) ±(1,5+0,02 times the displayed value)	±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 (depending on model)	-20°C…+80°C -40°C…+150°C
Measuring 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 at constant temperature	10sec (10÷80%RH; air speed=2m/s)

Temperature with sensor Pt100

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

Temperature with thermocouple K - HP572AC

Resolution	0.1°C
Temperature drift @ 20°C	0.02%/°C

TECHNICAL DATA OF PROBES AND MODULES EQUIPPED WITH INSTRUMENT
Temperature probes Pt100 sensor with SICRAM module

Model	Type	App. 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	±0.30°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	Globethermometer Ø 150mm	-30°C…+120°C	±0.25°C
TP876	Globethermometer Ø 50mm	-30°C…+120°C	±0.25°C
TP87	Immersion	-50°C…+200°C	±0.25°C
TP878 TP878.1	For solar panel	+5°C…+80°C	±0.25°C
TP879	For compost	-20°C…+120°C	±0.25°C

Common characteristics
Temperature drift @ 20°C 0.003%/°C

4 wire Pt100 and 2 wire Pt1000 Probes

Model	Type	Application range	Accuracy
TP47.100	Pt100 4 wires	-50…+400°C	Class A
TP47.1000	Pt1000 2 wires	-50…+400°C	Class A

Common characteristics
Temperature drift @ 20°C

Pt100	0.003%/°C
Pt1000	0.005%/°C

ORDER CODES

HD2101.1: The kit is composed of the instrument HD2101.1, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **Probes and cable must be ordered separately.**

HD2101.2K: The kit is composed of the HD2101.2 **datalogger,** 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **The probes and cable must be ordered separately.**
HD2110CSNM: 8-pole connection cable MiniDin - Sub D 9-pole female for RS232C.
HD2101/USB: Connection cable USB 2.0 connector type A - 8-pole MiniDin.
DeltaLog9: Software for download and management of the data on PC using Windows 98 to Vista operating systems.
SWD10: Stabilized power supply at 230Vac/12Vdc-1000mA mains voltage.
HD40.1: On request, portable, serial input, 24 column thermal printer, 58mm paper width.

Relative humidity and temperature probes complete with SICRAM module

HP472ACR: %RH and temperature combined probe, dimensions Ø 26x170 mm. 2 m connecting cable.
HP572ACR: %RH and temperature combined probe, **K thermocouple sensor**. Dimensions Ø 26x170 mm. 2 m connecting cable.
HP473ACR: %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x110 mm. 2m connecting cable.
HP474ACR: %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x210 mm. 2m connecting cable.
HP475ACR: %RH and temperature combined probe. 2 m connecting cable. Handle Ø 26x110 mm. Stainless-steel tube Ø 12x560 mm. Terminal tip Ø 13.5x75 mm.
HP475AC1R: %RH and temperature combined probe. 2 m connection cable. Handle Ø 26x110 mm. Stainless steel stem Ø 14x480 mm.
HP477DCR: %RH and temperature combined sword probe. 2 m connecting cable. Handle Ø 26x110 mm. Probe tube 18x4 mm, length 520 mm.
HP478ACR: %RH and temperature combined probe. Dimensions Ø 14x130 mm. 5m connection cable.

Temperature PROBES complete with SICRAM module

TP472I: Immersion probe, Pt100 sensor. Stem Ø 3 mm, length 300 mm. Cable length 2 metres.
TP472I.0: Immersion probe, Pt100 sensor. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.
TP473P: Penetration probe, Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable length 2 metres.
TP473P.0: Penetration probe, Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable length 2 metres.
TP474C: Contact probe, Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.
TP474C.0: Contact probe, Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.
TP475A.0: Air probe, Pt100 sensor. Stem Ø 4mm, length 230mm. Cable length 2 metres.
TP472I.5: Immersion probe, Pt100 sensor. Stem Ø 6mm, length 500 mm. Cable length 2 metres.
TP472I.10: Immersion probe, Pt100 sensor. Stem Ø 6mm, length 1000mm. Cable length 2 metres.
TP875: Globe thermometer Ø 150mm with handle, cable length 2 metres.
TP876: Globe thermometer Ø 50mm with handle. Cable 2 metres.
TP87: Immersion probe, Pt100sensor. Stem Ø 3mm, length 70mm. Cable 2 metres.
TP878: Contact probe for solar panels. Cable 2 metres
TP878.1: Contact probe for solar panels. Cable 5 metres.

Temperature probes without SICRAM module

TP47.100: 4 wire direct Pt100 sensor immersion probe,. Probe's stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 metres.
TP47.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 230mm. Connection cable 2 wires with connector, length 2 metres.
TP47: Only connector for probe connection: direct 4 wires Pt100 and 2 wires Pt1000.

Accessories

HD11: Saturated solution at 11.3%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
HD33: Saturated solution at 33.0%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
HD75: Saturated solution at 75.4%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.

Protection for humidity probes Ø 26 M24x1,5
P1: Stainless steel grid protection for probes Ø 26 mm.
P2: 20µ sintered polyethylene PE protection for probes Ø 26 mm.
P3: 20µ sintered bronze protection for probes Ø 26 mm.
P4: 20µ sintered PE complete cap for probes Ø 26 mm.

Protection for humidity probes Ø 14 M12x1
P5: Stainless steel grid protection for probes Ø 14 mm.
P6: 20µm sintered complete protection made of stainless steel for probes Ø 14 mm.
P7: 10µm sintered complete protection made of PTFE for probes Ø 14 mm.
P8: Stainless steel grid and Pocan protection for probes Ø 14 mm.

HD 2301.0

HD2301.0
HYGRO-THERMOMETER

The **HD2301.0** is a portable instrument with a large LCD display. It measures relative humidity and temperature using a Pt100 sensor or thermocouple humidity/temperature combined probe. Temperature only is measured by immersion, penetration or contact probes. The sensor can be a Pt100 or Pt1000.
When the humidity/temperature combined probe is connected, the instrument calculates and displays the absolute humidity, the dew point, the partial vapour pressure. The probes are fitted with an automatic detection module, with the factory calibration data already stored inside. The Max, Min and Avg function calculate the maximum, minimum or average values. Other functions include: the relative measurement REL, the HOLD function, and the automatic turning off that can also be excluded. **The instruments have IP67 protection degree.**

INSTRUMENT TECHNICAL CHARACTERISTICS

Instrument

Dimensions (Length x Width x Height)	140x88x38mm
Weight	160g (complete with batteries)
Materials	ABS
Display	2x4½ digits plus symbols Visible area: 52x42mm

Operating conditions

Operating temperature	-5…50°C
Storage temperature	-25…65°C
Working relative humidity	0…90%RH without condensation
Protection degree	**IP67**

Power

Batteries	3 1.5V type AA batteries
Autonomy	200 hours with 1800mAh alkaline batteries
Power absorbed with instrument off	< 20µA

Measuring unit — *°C - °F - %RH - g/m³ - Td - hPa*

Connections

Input module for the probes	8-pole male DIN45326 connector

Measurement of relative humidity by Instrument

Measurement range	0…100%RH
Resolution	0.1%RH
Accuracy	±0.1%RH
Drift after 1 year	0.1%RH/year

Measurement of temperature by Instrument

Pt100 measurement range	-200…+650°C
Pt1000 measurement range	-200…+650°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year

Relative humidity and temperature probes using SICRAM module

Model	Temperature sensor	Working range		Accuracy	
		%RH	Temperature	%RH	Temp
HP472ACR	Pt100	0…100%RH	-20°C…+80°C	±1,5%RH (10…90%RH) ±2,5%RH (in the remaining range)	±0.3°C
HP572ACR	Thermocouple K	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	-40°C…150°C (180°C) ±(1,5+0,02 times the displayed value)	±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 (depending on model)	-20°C…+80°C -40°C…+150°C
Measuring 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 at constant temperature	10sec (10÷80%RH; air speed=2m/s)

Temperature with sensor Pt100

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

Temperature with thermocouple K - HP572ACR

Resolution	0.1°C
Temperature drift @ 20°C	0.02%/°C

TECHNICAL DATA OF PROBES AND MODULES EQUIPPED WITH INSTRUMENT
Temperature probes Pt100 sensor with SICRAM module

Model	Type	App. 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	±0.30°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	Globethermometer Ø 150mm	-30°C…+120°C	±0.25°C
TP876	Globethermometer Ø 50mm	-30°C…+120°C	±0.25°C
TP87	Immersion	-50°C…+200°C	±0.25°C
TP878 TP878.1	For solar panel	+5°C…+80°C	±0.25°C
TP879	For compost	-20°C…+120°C	±0.25°C

Common characteristics

Temperature drift @ 20°C	0.003%/°C

4 wire Pt100 and 2 wire Pt1000 Probes

Model	Type	Application range	Accuracy
TP47.100	Pt100 4 wires	-50…+400°C	Class A
TP47.1000	Pt1000 2 wires	-50…+400°C	Class A

Common characteristics
Temperature drift @ 20°C
Pt100 0.003%/°C
Pt1000 0.005%/°C

ORDER CODES
HD2301.0: The kit is composed of the instrument HD2301.0, 3 1.5V alkaline batteries, operating manual, case. **Probes and cable must be ordered separately.**

Relative humidity and temperature probes complete with SICRAM module
HP472ACR: %RH and temperature combined probe, dimensions Ø 26x170 mm. 2 m connecting cable.
HP572ACR: %RH and temperature combined probe, **K thermocouple sensor**. Dimensions Ø 26x170 mm. 2 m connecting cable.
HP473ACR: %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x110 mm. 2m connecting cable.
HP474ACR: %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x210 mm. 2m connecting cable.
HP475ACR: %RH and temperature combined probe. 2 m connecting cable. Handle Ø 26x110 mm. Stainless-steel tube Ø 12x560 mm. Terminal tip Ø 13.5x75 mm.
HP475AC1R: %RH and temperature combined probe. 2 m connection cable. Handle Ø 26x110 mm. Stainless steel stern Ø 14x480 mm.
HP477DCR: %RH and temperature combined sword probe. 2 m connecting cable. Handle Ø 26x110 mm. Probe tube 18x4 mm, length 520 mm.
HP478ACR: %RH and temperature combined probe. Dimensions Ø 14x130 mm. 5m connection cable.

Temperature PROBES complete with SICRAM module
TP472I: Immersion probe, Pt100 sensor. Stem Ø 3 mm, length 300 mm. Cable length 2 metres.
TP472I.0: Immersion probe, Pt100 sensor. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.
TP473P: Penetration probe, Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable length 2 metres.
TP473P.0: Penetration probe, Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable length 2 metres.
TP474C: Contact probe, Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.
TP474C.0: Contact probe, Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.
TP475A.0: Air probe, Pt100 sensor. Stem Ø 4mm, length 230mm. Cable length 2 metres.
TP472I.5: Immersion probe, Pt100 sensor. Stem Ø 6mm, length 500 mm. Cable length 2 metres.
TP472I.10: Immersion probe, Pt100 sensor. Stem Ø 6mm, length 1000mm. Cable length 2 metres.
TP875: Globe thermometer Ø 150mm with handle, cable length 2 metres.
TP876: Globe thermometer Ø 50mm with handle. Cable 2 metres.
TP87: Immersion probe, Pt100sensor. Stem Ø 3mm, length 70mm. Cable 2 metres.
TP878: Contact probe for solar panels. Cable 2 metres
TP878.1: Contact probe for solar panels. Cable 5 metres.

Temperature probes without SICRAM module
TP47.100: 4 wire direct Pt100 sensor immersion probe,. Probe's stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 metres.
TP47.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 230mm. Connection cable 2 wires with connector, length 2 metres.
TP47: Only connector for probe connection: direct 4 wires Pt100 and 2 wires Pt1000.

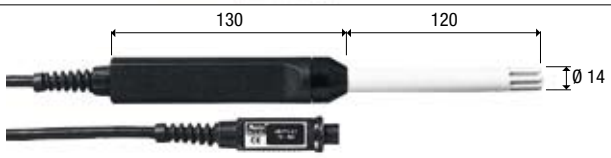
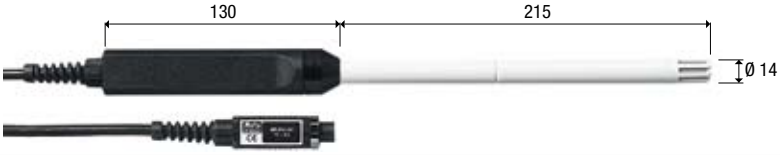
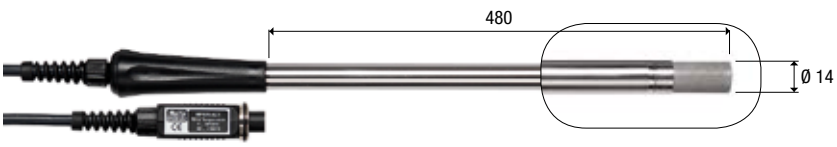
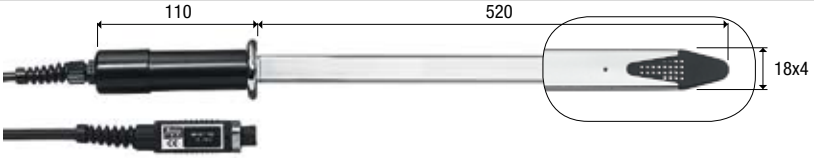
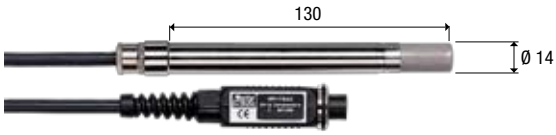
Accessories
HD11: Saturated solution at 11.3%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
HD33: Saturated solution at 33.0%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
HD75: Saturated solution at 75.4%RH@20°C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.

Protection for humidity probes Ø 26 M24x1,5
P1: Stainless steel grid protection for probes Ø 26 mm.
P2: 20µ sintered polyethylene PE protection for probes Ø 26 mm.
P3: 20µ sintered bronze protection for probes Ø 26 mm.
P4: 20µ sintered PE complete cap for probes Ø 26 mm.

Protection for humidity probes Ø 14 M12x1
P5: Stainless steel grid protection for probes Ø 14 mm.
P6: 20µm sintered complete protection made of stainless steel for probes Ø 14 mm.
P7: 10µm sintered complete protection made of PTFE for probes Ø 14 mm.
P8: Stainless steel grid and Pocan protection for probes Ø 14 mm.

HD11 / HD33 / HD75

RELATIVE HUMIDITY AND TEMPERATURE PROBES

Code	Sensors	Range RH - Temp.	
HP472ACR	RH Pt100	5 ÷ 98% RH -20°C…+80°C	
HP572ACR	RH TC.K		
HP473ACR	RH Pt100		
HP474ACR		5 ÷ 98% RH -40°C…+150°C	
HP475ACR			
HP475AC1R			
HP477DCR			
HP478ACR			

SATURATED SOLUTIONS AND PROBE PROTECTIONS

CODE			USE
HD75 HD33 HD11	**Threaded ring nut M24 x 1,5 for probes Ø 26 Threaded ring nut M12 x 1 for probes Ø 14**		
P1 P2 P3 P4	Ø 26	M 24x1,5	 **P1** **P2** **P3** **P4**
P5 P6 P7 P8	Ø 14	M 12x1	 **P5** **P6** **P7** **P8**

HD 75
HD 33
HD 11

HD 75, HD 33, HD 11
HOW TO USE SATURATED SALT SOLUTIONS FOR CHECKING, SETTING UP OR CALIBRATING INSTRUMENTS WITH RELATIVE HUMIDITY SENSORS.

Before starting.

1. Make sure that inside the chamber containing the saturated salt solutions there are at the same time:
   • solid salt
   • liquid solution or wet salt
2. The instrument and the saturated solutions to be used are to be kept in an environment at stable temperature while checking or calibrating them.
3. Wait for at least a couple of hours at stable temperature so that the instrument and the salt solutions reach thermal equilibrium with the environment.
4. Unscrew the cap of the first saturated salt solution to be used for checking or calibrating the instrument. Use:
   • for probes with thread M24X1,5, the bottle threaded hole M24X1,5 directly;
   • for probes with thread M12X1, the supplied adapter M24X1,5 / M12X1.
5. If there is any liquid inside the measurement chamber, dry it with clean absorbent paper. The uncertainty of the solution or measurement is not influenced by any liquid left inside the measurement chamber.
6. Screw the probe to the bottom of the thread; do not touch the sensitive element with your hands or any other object or liquid.
7. The temperature of the salt solution and that of the sensor must be the same or very close. Once the sensor is inserted, wait for at least 30 minutes.
8. Connect the probe to the instrument or transmitter. Power or turn them on as per instructions.
9. After 30 minutes, start the calibration procedure for the first calibration point according to the instruction manual of the specific instrument.
10. Once you have checked, set up or calibrated the first point, take the probe out of the bottle and put the cap back on the bottle. Make sure you do not mix it up with that of other saturated solutions.
11. Repeat points 1, 2, 3 and 4 to perform the second calibration point with the second saturated solution.
12. Repeat points 1, 2, 3 and 4 to perform a possible third point with the third saturated solution (if necessary).

Notes and warnings:

I. Keep salt solutions in the dark at a temperature of about 20°C.
II. Salt solutions are effective and can be used as long as there is salt to be melted as well as liquid inside them. As a rule, in 33% RH and 11%RH solutions make sure that there is some solid salt left, while in 75%RH solution make sure that there is some liquid left or salt is wet.
III. For better results, the temperature of the probe and that of the saturated solution must be as close as possibile. Do not forget that plastic materials are bad conductors of heat. Any difference of tenths of degree between the sensor and the saturated salt solution leads to errors of RH points.
IV. Do not touch the sensitive element with your hands or other objects . Scratches and dirt alter the instrument measurement and may damage the sensor.
V. The measurement chamber must be closed, otherwise the equilibrium cannot be reached.
   Screw the probe to the bottom of the bottle thread.
VI. The check or calibration sequence for Delta Ohm instruments or transmitters is always as follows:
   first solution: 75% RH
   second solution: 33%RH
   third solution: 11% RH (if any)
   No sequence is compulsory for checking the sensor.
VII. To calibrate or set up the instrument, follow the instruction manual of the instrument that you are using.
VIII. If you check, set up or calibrate the instrument at a temperature of other than 20°C, see the following table to find out the equilibrium relative humidity reference value of the salt solution corresponding to the working temperature. In this table, you will find the saturated salt relative humidity variation when temperature changes.

Equilibrium relative humidity of selected saturated salt solutions from 0 to 100°C

Temp. °C	Lithium Chloride	Magnesium Chloride	Sodium Chloride
0	11.23 ± 0.54	33.66 ± 0.33	75.51 ± 0.34
5	11.26 ± 0.47	33.60 ± 0.28	75.65 ± 0.27
10	11.29 ± 0.41	33.47 ±0.24	75.67 ± 0.22
15	11.30 ± 0.35	33.30 ± 0.21	75.61 ± 0.18
20	11.31 ± 0.31	33.07 ± 0.18	75.47 ± 0.14
25	11.30 ± 0.27	32.78 ± 0.16	75.29 ± 0.12
30	11.28 ± 0.24	32.44 ± 0.14	75.09 ± 0.11
35	11.25 ± 0.22	32.05 ± 0.13	74.87 ± 0.12
40	11.21 ± 0.21	31.60 ± 0.13	74.68 ± 0.13
45	11.16 ± 0.21	31.10 ± 0.13	74.52 ± 0.16
50	11.10 ± 0.22	30.54 ± 0.14	74.43 ± 0.19
55	11.03 ± 0.23	29.93 ± 0.16	74.41 ± 0.24
60	10.95 ± 0.26	29.26 ± 0.18	74.50 ± 0.30
65	10.86 ± 0.29	28.54 ± 0.21	74.71 ± 0.37
70	10.75 ± 0.33	27.77 ± 0.25	75.06 ± 0.45
75	10.64 ± 0.38	26.94 ± 0.29	75.58 ± 0.55
80	10.51 ± 0.44	26.05 ± 0.34	76.29 ± 0.65
85	10.38 ± 0.51	25.11 ± 0.39	
90	10.23 ± 0.59	24.12 ± 0.46	
95	10.07 ± 0.67	23.07 ± 0.52	
100	9.90 ± 0.77	21.97 ± 0.60	


1


2


3


4


1


2


3


4


5


6


7


HUMISET HD33
MAGNESIUM CHLORIDE
HUMISET HD11
LITHIUM CHLORIDE
HUMISET HD75
SODIUM CHLORIDE
HUMISET HD33
MAGNESIUM CHLORIDE

HD 37AB17D
HD 37B17D

HD 37AB17D, HD 37B17D
DATALOGGER
RELATIVE HUMIDITY - TEMPERATURE - CO - CO_2

HD37AB17D and **HD37B17D** instrument are **data loggers** able to measure and memorize simultaneously the following parameters:
- Relative Humidity **RH**
- Environment temperature **T**
- Carbon monoxide **CO** (**only HD37AB17D**)
- Carbon dioxide **CO_2**

HD37AB17D and **HD37B17D** instruments have the ability to investigate and monitor the indoor air quality.
Typical applications include checking air quality inside buildings occupied by people (schools, hospitals, auditoria, canteens, etc.); and work places to optimize the comfort and to generally check for small leaks of CO with danger of explosions or fire. This analysis allows the management of conditioning plants (temperature and humidity) and ventilation (recycle air/hour) in order to reach a double purpose: getting a good quality of the air in accordance with ASHRAE and IMC regulations and energy saving.
HD37AB17D and **HD37B17D** are instruments which are very useful to fight the so-called syndrome of sick building.
RH (Relative Humidity) measurement is obtained with a capacitive sensor.
T temperature is measured with a high precision NTC sensor.
The **CO** measurement (Carbon monoxide, only for **HD37AB17D**) is made by an electrochemical cell with two electrodes indicated to detect the presence of Carbon monoxide, lethal for men, in his living or working environment.
The **CO_2** measurement (Carbon dioxide) is obtained with a special infrared sensor (NDIR technology: Non-Dispersive Infrared Technology) that, thanks to the use of double filter and a special measurement techniques, guarantees accurate and stable measurements over time. The infrared sensor is equipped with a protection membrane which provides protection from dust particles and aggressive air agents to assure the sensor's long life.
HD37AB17D and **HD37B17D** are **data loggers** able to memorize the detected measurements at an interval set by the user.
HD37AB17D and **HD37B17D** are connected to the PC by ***USB*** input.
DeltaLog13 communication **software** via the USB port , designed to perform data transfer, data collection and recording and printing of all the instrument parameters and stored measurements. In addition the software allows the calibration adjustments of the RH, CO (only HD37B17D) and CO_2 sensors.

Using appropriate procedure, the Software DeltaLog13 can evaluate the parameter **% OA** (percentage of external air), according to the following formula:.

$$\%OA = \frac{X_r - X_s}{X_r - X_0} \cdot 100$$

whereas:
X_r = CO_2 in return air
X_s = CO_2 in the outlet air
X_0 = CO_2 in the external air

The power supply of the instrument is provided by a 2 Ni-MH **rechargeable** batteries package (code BAT-20), that that allows 8 hours of continuous working in acquisition mode.

Technical Features

Dimensions	275 mm x 45 mm x 40 mm
Weight	230 g (batteries included)
Materials	ABS
Mains power supply **(code SWD06)**	Batteries charger **100-240Vac/6Vdc-1A**
Batteries	Package with 2 rechargeable batteries 1.2V type AA (NiMH)
Autonomy	8 hours of continuous working in measurement mode
Current absorbed with instrument off	200µA
Instrument working temperature	0°C ... 50°C
Working relative humidity	0%RH ... 95%RH no condensation
Temperature / Storage humidity	-25°C ... +70°C / 10%RH ... 90%RH no condensation
Safety of the stored data	Unlimited

Connections

USB interface	USB 2.0 cable B type Baudrate 460800
Charger Batteries power supply (code SWD06)	2 - poles connector (positive at the centre) Output voltage: **6Vdc** Maximum current: 1600mA (9, 60 VA Max).
Measuring rate	1 sample every three seconds
Storage capacity	20000 Records Every record includes the following: - date and time - measurement of the carbon dioxide (CO2) - measurement of the carbon monoxide (CO- only HD37AB17D) - measurement of the relative humidity (RH) - measurement of the temperature (T)

Logging interval	selectable within: 3,6,12,15,30,60 seconds, 2,3,4,5 minutes The stored values represent the average value of the samples that are stored every three seconds.
Printing interval	selectable within: 3,6,12,15,30,60 seconds, 2,3,4,5 minutes The printed values represent the average value of the samples that are stored every three seconds.

Sensor Features

Relative Humidity RH	Capacitive sensor
Sensor protection	Net filter made of stainless steel (on request filter P6 in AISI316 sintered 20µm or filter P7 in PTFE sintered 10µm)
Measurement range	0...100 % RH
Sensor working range	-40...+80°C
Accuracy	±2% (5÷90%RH) ±2,5% in the remaining range
Resolution	0,1%
Thermal effects	±2% on whole 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

Sensor type	NTC 10KΩ
Measurement range	-40...+60°C
Accuracy	±0.2°C ±0.15% of the measure
Resolution	0,1°C
Response time (T_{90})	< 30 sec. (air speed = 2m/sec)
Long term stability	0.1°C/year

Carbon monoxide CO (only HD37AB17D)

Sensor	Electro chemical cell
Measurement range	0…500ppm
Sensor working range	-5…50°C
Accuracy	±3ppm+3% of the measured value
Resolution	1ppm
Response time (T_{90})	< 50 sec.
Long term stability	5% of the measure/year
Expected life	> 5 years in normal environmental conditions

Carbon dioxide CO_2

Sensor	NDIR with a double wave length
Measurement range	0…5000 ppm
Sensor working range	-5…50°C
Accuracy	±50ppm+3% of the measurement
Resolution	1ppm
Thermal effects	0,1%f.s./°C
Response time (T_{90})	< 120 sec. (air speed = 2m/sec)
Long term stability	5% of the measure/ 5 years

Ordering codes

HD37AB17D: The kit consisting of: **HD37AB17D** instrument to measure CO (Carbon monoxide), CO_2 (Carbon dioxide), RH (Relative Humidity), T (Temperature), **DeltaLog13** Software, USB cable code **CP22**, **SWD06** power supply, **BAT-2** batteries pack, instruction manual, carrying case.

HD37B17D: instrument to measure CO_2 (Carbon dioxide), CO (Carbon monoxide), RH (Relative Humidity), T (Temperature), **DeltaLog13** Software, USB cable code **CP22**, **SWD06** power supply, **BAT-2** batteries pack, instruction manual, carrying case.

Accessories:

VTRAP20: Instrument tripod, maximum height 270mm.

SWD06: 100-240Vac/6Vdc-1A mains voltage power supply.

BAT-20: Replacement batteries pack for HD37AB17D and HD37B17D instruments with integrated temperature sensor.

P5: Stainless steel grid protection for probes diameter 14, thread M12×1.

P6: Sintered stainless steel 10µ grid protection, for probes diameter 14, thread M12×1.

P7: 10µ, PTFE protection for probes diameter 14, thread M12×1.

P8: Stainless steel and Pocan protection for probes diameter 14, thread M12×1.

HD75: Saturated solution for testing the Relative Humidity with 75% HR, complete with adapter for probes diameter 14, thread M12×1.

HD33: Saturated solution for testing the Relative Humidity with 33% HR, complete with adapter for probes diameter 14, thread M12×1.

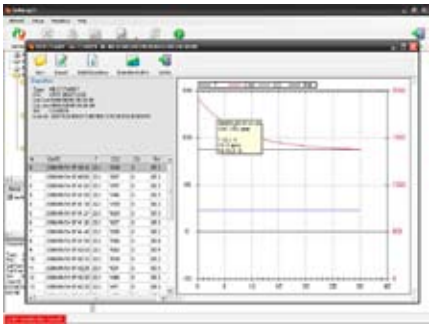
MINICAN.12A: Cylinder of nitrogen for the calibration of CO and CO_2 at 0ppm. Volume 12 litres. **With adjustment valve**.

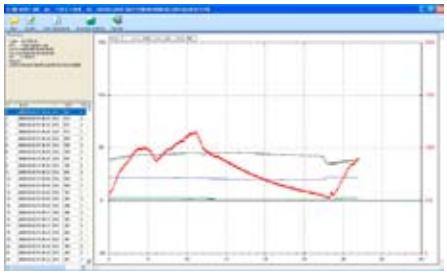
MINICAN.12A1: Cylinder of nitrogen for the calibration of CO and CO_2 at 0ppm. Volume 12 litres. **Without adjustment valve**.

ECO-SURE-2E CO: Spare CO sensor.

HD37.36: Kit connection pipe between instrument and MINICAN.12A for the calibration of CO.

HD37.37: Kit connection pipe between instrument and MINICAN.12A for the calibration of CO_2.





HD 40.1
HD 40.2

HD 40.1, HD 40.2
PORTABLE THERMAL PRINTER

The **HD40.1** and **HD40.2** are lightweight, compact, portable thermal printers.
The HD40.1 is connected to instruments or PC through the RS232 serial input.
The HD40.2 features a dual mode data reception system - RS232 serial and Bluetooth.
The Bluetooth wireless connection makes the HD40.2 printer very useful "in the field", since it does not require any connection to the instrument. A careful design allows you to replace the thermal paper roll in a few seconds. A four NiMH **rechargeable** battery pack provides power supply and ensures long autonomy: you can print up to 3000 lines at full charge.
Standard thermal paper roll width: 57mm.
Print resolution: 203 dpi
Print characters (each line): 24
Protection degree: IP40.

SPECIFICATIONS

Printing method	Thermal
Resolution	203 DPI (8 dot/mm)
Printing width	48mm centered in the paper roll
Paper roll width	57mm ... 58mm
Max. paper roll diameter	32mm
Number of columns	24
Printing speed	Up to 90 mm/sec (depending on battery charge and ambient conditions)
Sensors	Paper detection
Character set	IBM II 858 table
Printing formats	Normal or extended
Character font	1 (16 x 24 dot – 2mm x 3mm)
Thermal head durability	
Mechanism life	100 million pulses (temperature: 20...25°C)
Abrasion resistance	50km of paper (temperature: 20...25°C)
Cover group durability	2000 opening/closing cycles or more
Communication interfaces	RS232
Bluetooth (for HD40.2)	
RS232 Baud rate	9600, 19200 and 38400 baud (**the factory parameter is 38400 baud**)
Bluetooth Baud rate	38400 baud (for HD40.2)
Bluetooth operating distance	Up to 10m without hindrance (for HD40.2)
Mains power supply (cod. SWD10)	100-240Vac/12Vdc-1A mains battery charger
Batteries	Four 1.2V AA rechargeable batteries (NiMH)
Printing autonomy	3000 lines 24 characters each. It prints one line every 10 seconds
Switch-off function	0, 5, 10 or 15 minutes
Dimensions	105mm x 165mm x 53mm
Weight	380g (with batteries and paper roll)
Material	ABS

OPERATING CONDITIONS

Operating temperature	0°C ... 50°C
Operating relative humidity	20%RH ... 85%RH not condensing
Storage Temperature / Relative humidity	-25°C ... +70°C / 10%RH ... 90%RH not condensing
Protection degree	IP40

Connections

Serial interface	9-pole D sub male connector
Battery charger power supply (cod. SWD10)	2-pole connector (positive in the middle)

ORDERING CODES

HD40.1: The kit includes: 24-column portable thermal printer, **serial interface RS232**, 57mm paper width, four NiMH 1.2V rechargeable batteries, SWD10 power supply, instruction manual, 5 thermal paper rolls.

HD40.2: The kit includes: 24-column portable thermal printer, **Bluetooth and serial interface RS232**, 57mm paper width, four NiMH 1.2V rechargeable batteries, SWD10 power supply, instruction manual, 5 thermal paper rolls.

The serial cable for PC/instrument connection must be ordered separately.

HD2110CSNM: RS232C 8-pole MiniDin - 9-pole D Sub female null-modem cable for connecting the printer to instruments with MiniDIN connector (HD21xx.1 and HD21xx.2 series, HD34xx.2, HD2010, HD2110, etc.).

9CPRS232: RS232C 9-pole D Sub female null-modem cable for connecting the printer to instrument with 9-pole D Sub connectors (Delta Ohm instruments: HD22xx.2 series, HD98569, HD25.2, etc.).

SWD10: 100-240Vac/12Vdc-1A Mains battery charger.

BAT.40: Spare battery pack for HD40.1 and HD40.2 printers with in-built temperature sensor.

RCT: The kit includes 4 thermal paper rolls 57mm wide and 32mm diameter.

HD 45...
HD 46...

[**GB**] Transmitters and regulators for humidity, temperature and CO_2 HD45... and HD46... series

The instruments of the series **HD45** and **HD46** are transmitters, indicators and controllers, they measure and control, depending on the model, the following environmental parameters:

- Relative humidity (RH)
- Ambient temperature (T)
- Carbon dioxide (CO2)
- Dew Point Temperature (DP, calculated measurement)

They are suitable for monitoring the air quality in indoor environments. Typical applications include checking air quality in all buildings occupied by people (schools, hospitals, auditoria, work places, canteens, etc.).. This analysis allows the managing of conditioning plants (temperature and humidity) and ventilation (recycle air/ hour) in order to reach a double purpose: getting a good air quality in accordance with ASHRAE and IMC regulations and energy saving.

The measurement of RH (Relative Humidity) is obtained with a capacitive sensor. In models **HD46** ... the relative humidity and temperature sensors with their calibration data are contained within an easily replaceable module. The instrument can also calculate the information on the dew point.

The temperature T is measured with a high precision NTC sensor.

The measurement of CO_2 (carbon dioxide) is obtained with a special infrared sensor (**NDIR** technology: Non-Dispersive Infrared Technology), which, thanks to a double filter and a particular measurement technique, ensures accurate measurements and stable measurements over time. The infrared sensor is equipped with a protection membrane which provides protection from dust particles and aggressive air agents to assure the sensor's long life. The instrument can be wall mounted and sensors are all inside.

The instruments are factory calibrated and require no further adjustment by the installer.

Versions are available with **analog voltage output 0÷10V or analog current output 4÷20mA**, or connectable to a PC via **RS485** with **MODBUS RTU** protocol, which allows connection of multiple transmitters on the same network.

The versions with **relay** allow to monitor the measured environmental parameters when the user-settable thresholds are exceeded. The activation of the control is highlighted by the LED indicators (only on models HD46 ... R). The operation of the relay is very versatile, having modes of activation above and below the threshold, and with single or double threshold modes. The thresholds are configurable by the user throughout the whole measurement range.

The LCD display option allows instant viewing of all the measurements taken by the instrument.

The models **HD45 BVR** and **HD45 BAR** are distinguished by the ability to indicate an immediate level of air quality, through turning on of the LED indicators associated with graphic symbols.

All the functions of the instrument can be quickly and intuitively configured connecting the instrument to the PC.

The instruments are easy to use, with complete configuration possibilities, which makes them versatile and able to meet many needs in various application fields. The instruments come with a standard configuration that makes them immediately operational. Upon request, the devices can be supplied with custom configurations.

HD46... series models can be equipped with keyboard that allows you to easily configure the instrument even without a connection to a PC. The models having a keypad are fitted with backlit display, activated by pushing a button.

Models of the series **HD45** ... provided with relay have a hardware switch that allows quick selection of the threshold between a set of preset values.

All models perform continuous "logging" of the measures, and data can be transferred to the PC.

The instruments work with 24Vac or 15…35Vdc power supply.

Technical data

Characteristics of the sensors

Relative humidity RH *(for models HD45 17…, HD46 17… and HD46 17B…)*	
Sensor	Capacitive
Measuring range	0...100 % RH -40…+85°C Dew point Td
Working range of the sensor	-40...+80°C
Accuracy	±2% (10..90%RH) @ 20°C, ±2.5% in the remaining range. For Dew point, see table.
Resolution	0.1%
Temperature dependance	2% on the whole temperature range
Hysteresis and repeatability	1%RH
Response time (T_{90})	<20 s (air speed = 2m/s and stable temperature)
Long-term stability	1%/year

Temperature T *(for models HD45 17…, HD45 7B…, HD46 17… and HD46 17B…)*	
Sensor type	NTC 10KΩ
Measuring range	-30...+85°C (-22…+185°F)
Accuracy *Except models with current output*	±0.2°C ±0.15% of measured value within 0…70°C ±0.3°C ±0.15% of measured value within -30…0°C and 70…85°C
Accuracy *For models with current output*	±0.5°C ±0.15% of measured value within -30…+85°C
Resolution	0.1°C
Response time (T_{90})	<30 s (air speed = 2m/s)
Long-term stability	0.1°C/year

Carbon dioxide CO_2 *(for models HD45 7B…, HD45 B…and HD46 17B…)*	
Sensor	Dual wavelength NDIR
Measuring range	0…5000 ppm
Working range of the sensor	-5…50°C
Accuracy	±(50ppm+3% of the measured value) @ 20°C and 1013hPa
Resolution	1ppm
Temperature dependance	0.1%f.s./°C
Response time (T_{90})	<120 s (air speed = 2m/s and stable temperature)
Long-term stability	5% of the measured value / 5 years

Accuracy of the dew point Td (°C)

The dew point is a calculated quantity that depends on the accuracy of the calibration of relative humidity and temperature. The values given below refer to accuracy of ± 0.25 ° C, 1013.25mbar, ± 2.5% RH.

Relative humidity(%)							
Temperature (°C)		**10**	**30**	**50**	**70**	**90**	**100**
	-20	2.50	1.00	0.71	0.58	--	--
	0	2.84	1.11	0.78	0.64	0.56	0.50
	20	3.34	1.32	0.92	0.75	0.64	0.62
	50	4.16	1.64	1.12	0.90	0.77	0.74
	100	5.28	2.07	1.42	1.13	0.97	0.91

Characteristics of the instrument

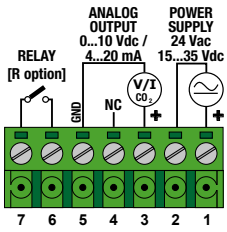
Measuring frequency	1 sample every 3 seconds
Storage capacity	2304 records
Storage interval	Selectable within 30s, 1m, and 5m The stored values represent the average values of samples collected every 3 seconds in selected storage interval.
Serial output	Serial output for USB (mini-USB/USB cable with adapter cod. RS45 or RS45I) RS485 MODBUS-RTU (only HD45…S… and HD46…S…)
Safety of stored data	Unlimited
Analogue output	0…10Vdc (R_L > 10kΩ) *(only HD45…V… and HD46…V)* 11Vdc outside the measuring range 4…20mA ($R_{L\,MAX}$ = 400Ω) *(only HD45…A… and HD46…A)* 22mA outside the measuring range Active sourcing current output
Relay output	Two-state (*only HD45…R and HD46…R)* Contact: max 1A @ 30Vdc resistive load
Power supply	24Vac ± 10% (50…60Hz) or 15…35Vdc
Power consumption	100 mW (*except models with current output*) 400 mW (*for models with current output*)
Stabilising time	15 minutes (to guarantee the declared accuracy)
Working temperature of the instrument	0°C ... 50°C
Working humidity of the instrument	0%RH ... 95%RH no condensate
Dimensions (LxHxW)	80 x 80 x 30 mm *(HD45.17…)* 80 x 80 x 34 mm *(HD45.B… and HD45.7B…)* 120 x 80 x 30 mm *(HD46.17…)* 120 x 80 x 34 mm *(HD46.17B…)*
Weight	50 g
Housing material	ABS

Installation

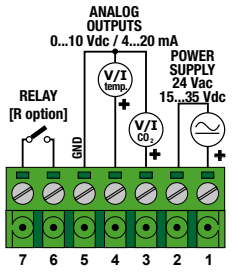
The container is easy and quick to open. Simply press the two tabs of the container to remove the front panel to have immediately access to the terminal block connections and fixing holes.

Electrical connections

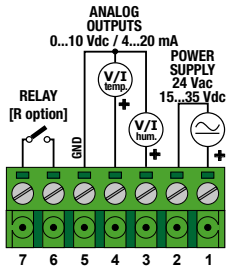
Series HD45...



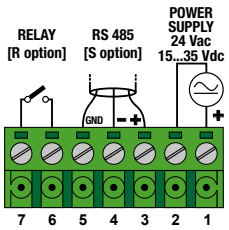
HD45 B...V / HD45 B...A
HD45 B...VR / HD45 B...AR



HD45 7B...V / HD45 7B...A
HD45 7B...VR / HD45 7B...AR



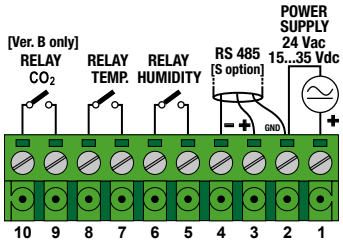
HD45 17...V / HD45 17...A
HD45 17...VR / HD45 17...AR



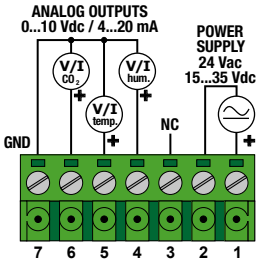
HD45...R
HD45...S

HD45...SR

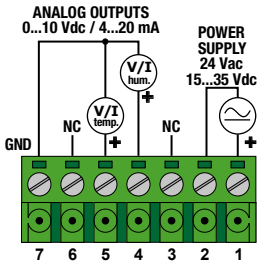
Series HD46...



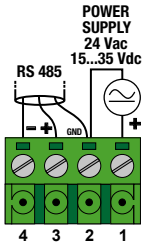
HD46...R
HD46...SR



HD46 17B...V
HD46 17B...A



HD46 17...V
HD46 17...A



HD46...S

Configuration

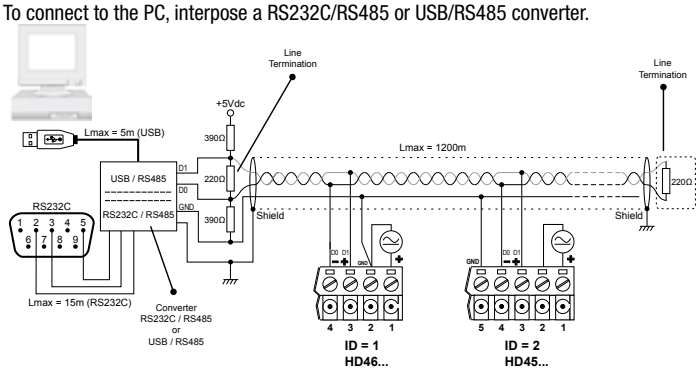
Instruments are provided with serial output, easily accessible on the side of the instrument that allows you to connect to the USB port of your PC using the cable **RS45** or **RS45I** with built-in adapter, to get custom configurations.

With the **RS45** cable, the instrument is powered directly from the USB port of your PC, thus enabling the configuration of the instrument in the field using a laptop before installing fixed.

RS485 Connection

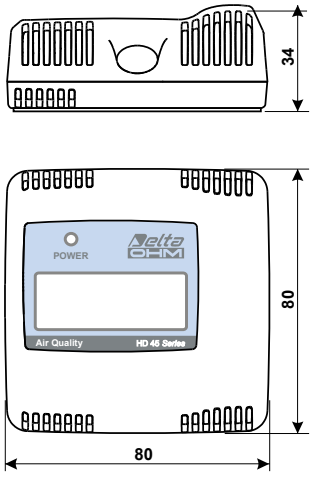
Models with RS485 output use the **MODBUS RTU** protocol.

To connect to the PC, interpose a RS232C/RS485 or USB/RS485 converter.

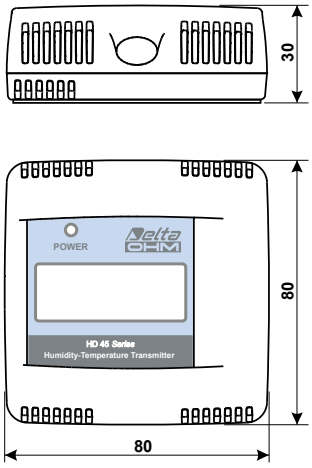


Dimensions of the housing
All dimensions are expressed in mm.

Series HD45...

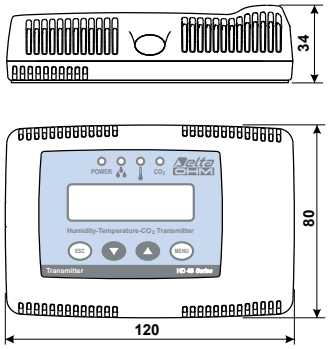


HD45 B...
HD45 7B...

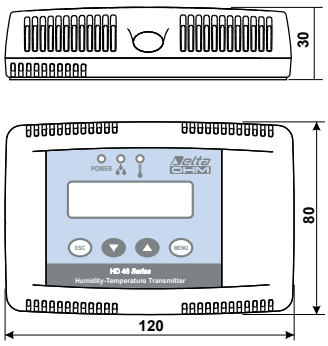


HD45 17...

Series HD46...

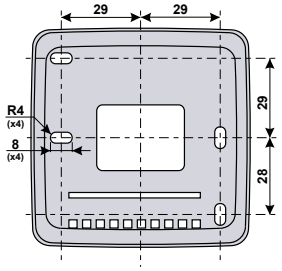


HD46 17B...

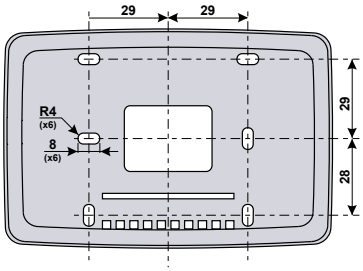


HD46 17...

Fixing holes



HD45...



HD46...

Available models
The instruments are available in the following versions:

HD45 17… Humidity and temperature
HD45 7B… Temperature and CO_2
HD45 B… CO_2
HD46 17B… Humidity, temperature, and CO_2
HD46 17… Humidity and temperature

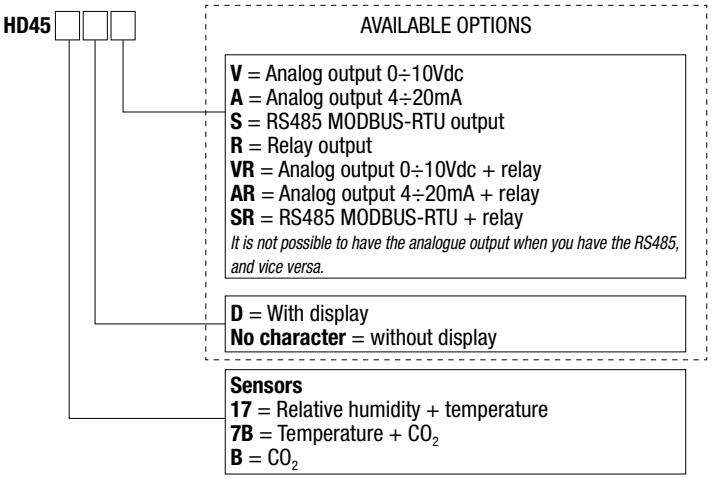
Optionally you can have the analog output 0...10Vdc (option **V**) or 4…20mA (option **A**) for each quantity measured by instrument, or RS485 serial output (option **S**). There are no models with both types of output.
There is the option with only relay (option **R**). In models **HD46 ...** there is one relay for each quantity measured by the instrument. In models **HD45** ... there is one relay that can be associated with one of the quantities measured by the instrument.
It is possible to have the relay output (or the outputs) together with serial output RS485 (option **SR**).
The relay output together with the analog output (option **VR** or **AR**) is only available on models HD45.
All models can be supplied with LCD (option **D**).
In the series **HD46** ..., versions with relay outputs are available with display and keyboard (option **DT**)

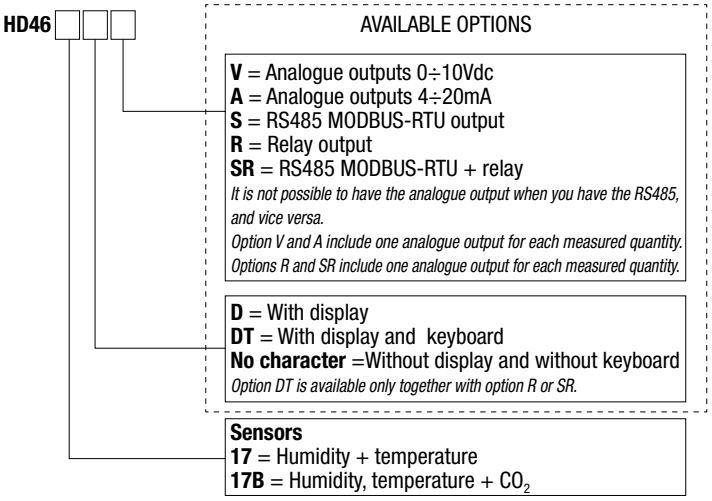
The following table lists the available models:

Model	RH	T	CO_2	Analog output	RS485 output	Relay output	LCD	LED
HD45 17V	✓	✓		✓ (2 outputs)				Power
HD45 17A	✓	✓		✓ (2 outputs)				Power
HD45 17S	✓	✓			✓			Power
HD45 17R	✓	✓				✓ (1 output)		Power
HD45 17SR	✓	✓			✓	✓ (1 output)		Power
HD45 17VR	✓	✓		✓ (2 outputs)		✓ (1 output)		Power
HD45 17AR	✓	✓		✓ (2 outputs)		✓ (1 output)		Power
HD45 17DV	✓	✓		✓ (2 outputs)			✓	Power
HD45 17DA	✓	✓		✓ (2 outputs)			✓	Power
HD45 17DS	✓	✓			✓		✓	Power
HD45 17DR	✓	✓				✓ (1 output)	✓	Power
HD45 17DSR	✓	✓			✓	✓ (1 output)	✓	Power
HD45 17DVR	✓	✓		✓ (2 outputs)		✓ (1 output)	✓	Power
HD45 17DAR	✓	✓		✓ (2 outputs)		✓ (1 output)	✓	Power
HD45 7BV		✓	✓	✓ (2 outputs)				Power
HD45 7BA		✓	✓	✓ (2 outputs)				Power
HD45 7BS		✓	✓		✓			Power
HD45 7BR		✓	✓			✓ (1 output)		Power
HD45 7BSR		✓	✓		✓	✓ (1 output)		Power
HD45 7BVR		✓	✓	✓ (2 outputs)		✓ (1 output)		Power
HD45 7BAR		✓	✓	✓ (2 outputs)		✓ (1 output)		Power
HD45 7BDV		✓	✓	✓ (2 outputs)			✓	Power
HD45 7BDA		✓	✓	✓ (2 outputs)			✓	Power
HD45 7BDS		✓	✓		✓		✓	Power
HD45 7BDR		✓	✓			✓ (1 output)	✓	Power
HD45 7BDSR		✓	✓		✓	✓ (1 output)	✓	Power
HD45 7BDVR		✓	✓	✓ (2 outputs)		✓ (1 output)	✓	Power
HD45 7BDAR		✓	✓	✓ (2 outputs)		✓ (1 output)	✓	Power
HD45 BV			✓	✓ (1 output)				Power
HD45 BA			✓	✓ (1 output)				Power
HD45 BS			✓		✓			Power
HD45 BR			✓			✓ (1 output)		Power
HD45 BSR			✓		✓	✓ (1 output)		Power
HD45 BVR			✓	✓ (1 output)		✓ (1 output)		**4 LED CO_2 level**
HD45 BAR			✓	✓ (1 output)		✓ (1 output)		**4 LED CO_2 level**
HD45 BDV			✓	✓ (1 output)			✓	Power
HD45 BDA			✓	✓ (1 output)			✓	Power
HD45 BDS			✓		✓		✓	Power
HD45 BDR			✓			✓ (1 output)	✓	Power
HD45 BDSR			✓		✓	✓ (1 output)	✓	Power
HD45 BDVR			✓	✓ (1 output)		✓ (1 output)	✓	Power
HD45 BDAR			✓	✓ (1 output)		✓ (1 output)	✓	Power

Model	RH	T	CO_2	Analog output	RS485 output	Relay output	LCD keyboard	LED
HD46 17V	✓	✓		✓ (2 outputs)				Power
HD46 17A	✓	✓		✓ (2 outputs)				Power
HD46 17S	✓	✓			✓			Power
HD46 17R	✓	✓				✓ (2 outputs)		Power RH + T
HD46 17SR	✓	✓			✓	✓ (2 outputs)		Power RH + T
HD46 17DV	✓	✓		✓ (2 outputs)			only LCD	Power
HD46 17DA	✓	✓		✓ (2 outputs)			only LCD	Power
HD46 17DS	✓	✓			✓		only LCD	Power
HD46 17DTR	✓	✓				✓ (2 outputs)	✓	Power RH + T
HD46 17DTSR	✓	✓			✓	✓ (2 outputs)	✓	Power RH+ T
HD46 17BV	✓	✓	✓	✓ (3 outputs)				Power
HD46 17BA	✓	✓	✓	✓ (3 outputs)				Power
HD46 17BS	✓	✓	✓		✓			Power
HD46 17BR	✓	✓	✓			✓ (3 outputs)		Power RH+T+ CO_2
HD46 17BSR	✓	✓	✓		✓	✓ (3 outputs)		Power RH +T+ CO_2
HD46 17BDV	✓	✓	✓	✓ (3 outputs)			solo LCD	Power
HD46 17BDA	✓	✓	✓	✓ (3 outputs)			solo LCD	Power
HD46 17BDS	✓	✓	✓		✓		solo LCD	Power
HD46 17BDTR	✓	✓	✓			✓ (3 outputs)	✓	Power RH +T+ CO_2
HD46 17BDTSR	✓	✓	✓		✓	✓ (3 outputs)	✓	Power RH +T+ CO_2

Ordering codes





Examples of ordering codes

HD45 7BDVR: Transmitter, indicator and regulator for temperature and CO_2. two analogue outputs 0÷10V, one configurable relay to control temperature or CO_2.

HD45 BVR: Transmitter, indicator and regulator for CO_2. Without display, with LED indicators of the CO_2 level, with analogue output 0÷10V, with relay.

HD45 17AR: Transmitter and regulator for humidity and temperature. Without display, with two analogue outputs 4÷20mA, one configurable relay to control the humidity or temperature.

HD45 17DV: Transmitter and indicator for humidity and temperature. With display, two analogue outputs 0÷10V, without relay.

HD45 7BSR: Transmitter and regulator for temperature and CO_2. Without display, with RS485 output, no analogue output, with one configurable relay to control temperature or CO_2.

HD46 17BDV: Transmitter and indicator for humidity, temperature and CO_2. With display, without keyboard, with three analogue outputs 0÷10V, without relays and without RS485.

HD46 17BDTSR: Transmitter, indicator and regulator for humidity, temperature and CO_2. Display and keyboard, three relay outputs, RS485 output.

HD46 17S: Humidity and temperature transmitter. No display and no keyboard, no relays, with RS485 output.

Accessories

DeltaLog14: Software for connecting to the PC via the serial output, for the configuration of the instrument and data download. For Windows® operating systems.

HDM46: Calibrated humidity and temperature replacement module (only for models HD46…)

RS45: Not isolated serial connection cable with built-in adapter. USB connector for PC and mini-USB connector for the serial port of the instrument. The cable powers the instrument.

RS45I: Isolated serial connection cable with built-in adapter. USB connector for PC and mini-USB connector for the serial port of the instrument. The cable does not power the instrument.

HD45TCAL: The Kit includes the **RS45** cable with built-in adapter and the CD-ROM with the **DeltaLog14** software for Windows operating systems. The cable is provided with USB connector on the PC side and mini-USB connector for the serial port of the instrument.

HD45TCALI: The Kit includes the **RS45I** cable with built-in adapter and the CD-ROM with the **DeltaLog14** software for Windows operating systems. The cable is provided with USB connector on the PC side and mini-USB connector for the serial port of the instrument.

Manufacture of portable and bench top scientific instruments
Current loop and voltage output transmitters and regulators
Temperature - Humidity, Dew point - Pressure - CO_2
Air speed - Light - Optical Radiation - Acoustics - Vibration
pH - Conductivity - Dissolved Oxygen - Turbidity
Elements for weather stations - Thermal Microclimate

LAT N° 124 Signatory of EA, IAF and ILAC Mutual Recognition Agreements
Temperature - Humidity - Pressure - Air speed
Photometry/Radiometry - Acoustics

CE CONFORMITY
- **Safety:** EN61000-4-2, EN61010-1 Level 3
- **Electrostatic discharge:** EN61000-4-2 Level 3
- **Electric fast transients:** EN61000-4-4 Level 3, EN61000-4-5 Level 3
- **Voltage variations:** EN61000-4-11
- **Electromagnetic interference susceptibility:** IEC1000-4-3
- **Electromagnetic interference emission:** EN55022 class B

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