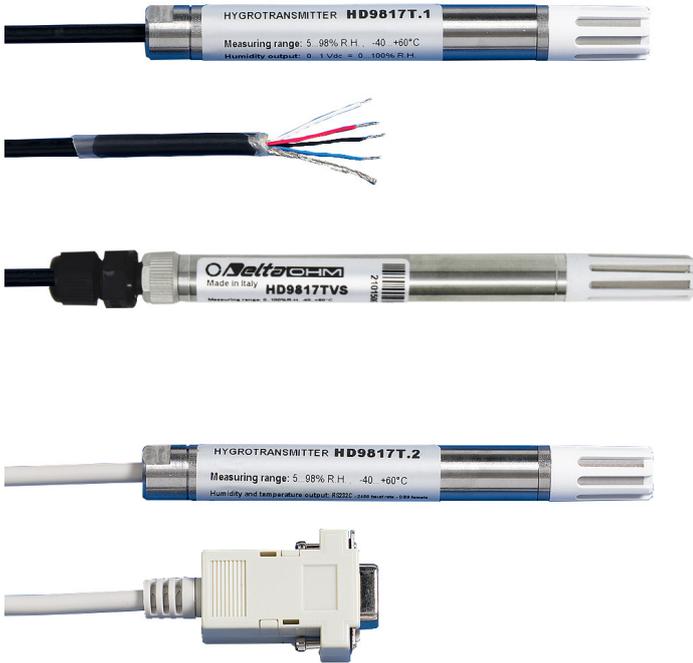**Delta OHM**
Member of GHM GROUP

HD9817T1R, HD9817T2R, HD9817TVS

HD9817T1R, HD9817T2R, HD9817TVS
TEMPERATURE AND HUMIDITY TRANSMITTERS

Dual relative humidity and temperature transmitter for HVAC applications, environmental monitoring, pharmaceutical storage, food transport, greenhouse automation, etc. Equipped with an IP65 stainless steel AISI 304 housing, it is suitable even for severe environments; besides that, its ultra-compact dimensions (Ø14x138 mm or Ø14x155 mm depending on the models) and wide range of outputs (analogue 0…1V, digital RS232C or RS485-MODBUS RTU) make it ideal for integrating into a variety of OEM applications. It is supplied with the HD9817TC software for reading measurements and calibrating the relative humidity sensor.

VERSIONS, OUTPUTS AND CONNECTIONS

	HD9817T1R	HD9817T2R
Output	0…1 V = 0…100%RH 0…1 V = −40…+60 °C	RS232C non insulated, 2400 baud rate
Temperature sensor	Pt100	Pt100
Load resistance	$R_L > 10k\Omega$	
Cable Connection	L=1.5 m (7 wires + shield)	L= 2m DB9 female connector

	HD9817TVS
Output	0…1 V = 0…100% RH or 0…1 V = −40…+60 °C DP 0…1 V = −40…+60 °C RS485 Modbus RTU non insulated
Temperature sensor	Pt100
Load resistance	$R_L > 10k\Omega$
Cable Connection	M12 8-pole connector. Provided with cable CP9817.3, L=3m

Technical specifications

HD9817T1R - HD9817T2R - HD9817TVS		
Relative humidity	Sensor	Capacitive
	Sensor protection	P8, stainless steel grid and PTFE, 10 µm
	Measuring range	0…100%RH
	Sensor working range	-40…+80 °C
	Accuracy	±1.5% (0…90% RH), ±2% (90…100%) @ T= 15…35 °C ±(1.5 + 1.5% measure)% @ T= remaining range
	Response time at 63% of final variation	< 15 s @ 23 °C (air speed = 1 m/s without filter)
	Temperature dependence	2% on the whole temperature range
	Hysteresis and repeatability	0.4%RH
	Long term stability	1%/year
Temperature	Sensor type	Pt100 1/3 DIN
	Measuring range	-40…+60 °C
	Accuracy	±0.2°C ±0.15% of the measured value
	Response time at 63% of final variation	< 15 s (without filter)
	Long term stability	0.2°C/year
General	Power voltage	5…35 Vdc 5…30 Vdc (HD9817TVS)
	Consumption	Typically 2 mA 4 mA typical @ 12 Vdc (HD9817TVS)
	Max. operating temperature	-40…+80 °C (for short periods)
	Operating humidity	0…100% RH
Housing	Dimensions	Ø14x138 mm Ø14x155 mm (HD9817TVS)
	Degree of protection	IP65

Connections

HD9817T1 models with 0…1 Vdc analogue output.
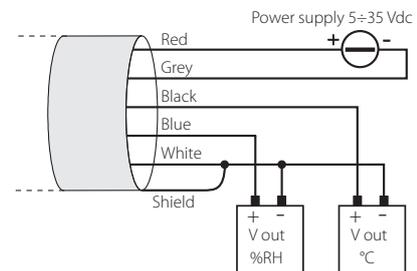
The instrument is equipped with a 7 wire + shield cable.
The yellow and green wires are used during calibration only for PC connection through the HD9817T1CAL interface module (see the paragraph about the RH sensor calibration).
Power is supplied to the red (+) and grey (-) wires.

The output signal voltage is taken from:
- Black (+) and white (-) wires for temperature,
- Blue (+) and white (-) wires for relative humidity.

The shield must be connected to the white wire.

HD9817T2R model with RS232C output

The HD9817T2R cable ends in a RS232C 9-pole subD female connector. Communication parameters: 2400 baud, 8N1.
The following set of commands is available:

Command	Response	Description
G0	HD9817T_Pt100_RH_RS232	Model
G3	Firm.Ver.=01-00	Firmware version
HAnn.n	&	75% calibration point where nn.n stands for the actual humidity value
HBnn.n	&	33% calibration point where nn.n stands for the actual humidity value
S0	0072.7 | 063.9	It sends the current measurement (tttt.t | hhh.h) t = temperature h = RH
U0	&	International System of units
U1	&	Imperial units

Wiring diagram of the 0…1 Vdc analog outputs and of the RS485 digital output.
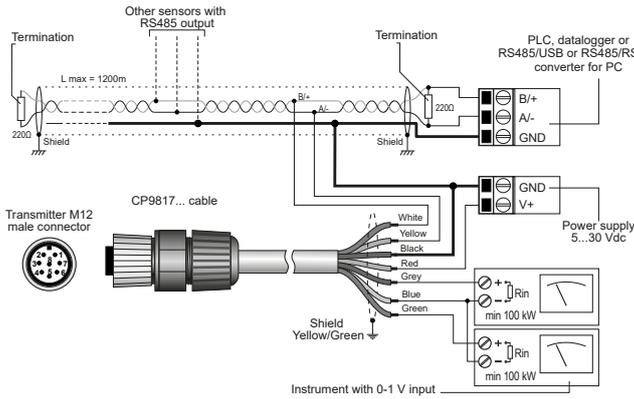
Setting parameters for RS485 communication

Before connecting the transmitter to the RS485 network you must assign an address and set the communication parameters if different those preset at the factory.
The setting of the parameters is made by connecting the transmitter to the PC by using the cable CP24 (optional) with integrated RS485/USB converter or the cable CP9817.3 supplied with the instrument and a generic RS485/USB or RS485/RS232 converter.

Relative humidity calibration

The instruments are supplied **factory calibrated and ready to use.**

If necessary, the user can calibrate Relative Humidity. Before preforming the calibration, please note that to connect HD9817T1R models to your PC, you have to use the HD9817T1CAL interface module: **the module is equipped with a USB type A connector for your PC USB port connection as well as a 4-pole terminal board to connect the transmitter. Before connecting the module to your PC, you need to install the USB drivers: don't connect the module to your PC before installing the drivers.**
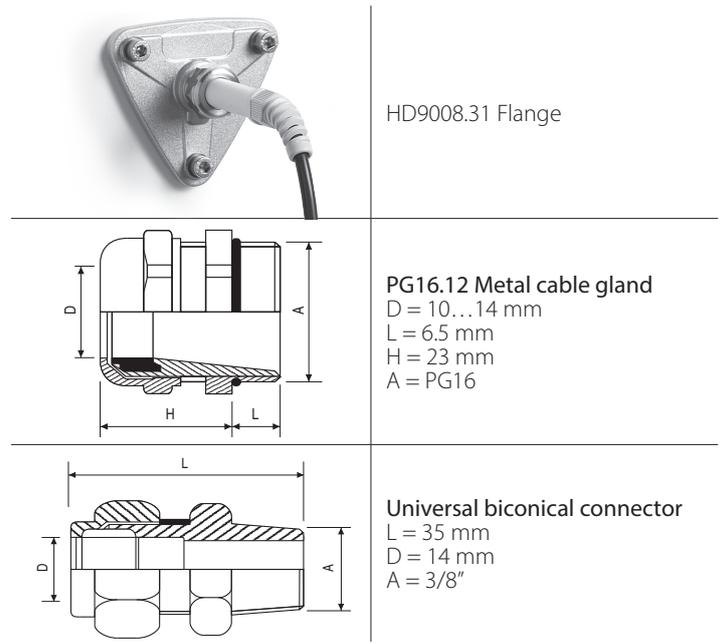
For further details, please follow the guide you can find when you download the software. Please connect the **red** (power supply positive), **grey** (power supply negative), **yellow** (Tx) and **green** (Rx) wires as shown in the figure below.
The terminal board is seen from above: in order to direct the clamps correctly, make sure that the label on the side of the module is placed as shown in the figure below.
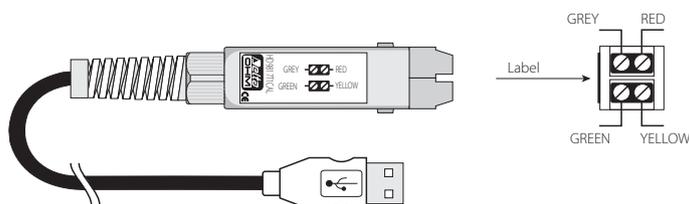

INSTALLATION NOTES

To fix the probe in a ventilation duct, pipe ,etc. you can use, for example, the HD9008.31.12 flange (a PG16 metal cable gland Ø10…14 mm) or a 3/8" universal biconical connection.

HD9008.31 Flange

PG16.12 Metal cable gland
D = 10…14 mm
L = 6.5 mm
H = 23 mm
A = PG16

Universal biconical connector
L = 35 mm
D = 14 mm
A = 3/8"

For wall-mounted installation, the HD9008.21.1 (distance from wall 250 mm) and HD9008.21.2 (distance from wall 125 mm) supports are available. Both require the HD9007T26.2 adapter.

For direct wall mounting on a metal support, the HD9817T.4 part is available as shown in the figure below (for HD9817T1 versions only).
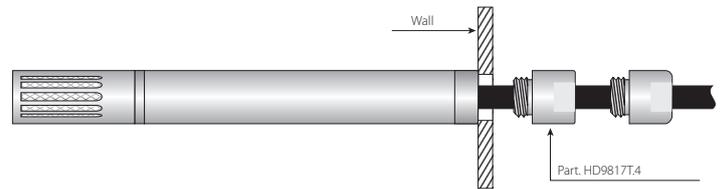
The wall can be 2 mm thick at most while the hole in the wall can be 10.5 mm.

Electrical connection HD9817T1R models

Power supply

The power supply voltage must be as per the electrical specifications (5…35 Vdc) between the wires:

Red = (+) power supply positive
Grey = (-) power supply negative.

Analogue output

The voltage output signals are taken from the following wires:

Blue = (+) %RH output positive
Black = (+) Temperature output positive
White = (-) ground. Common reference between %RH and Temperature outputs.
Shield = the braid is connected to the common ground (white wire).

HD9817T2R models

These models are powered directly from your PC port and no external power supply is required.

Models HD9817TVS with analog outputs 0…1Vdc and RS485 MODBUS-RTU output.

They are supplied with the cable CP9817.3 equipped with the M12 connector on the one side for the connection to the instrument and loose wires on the other side.
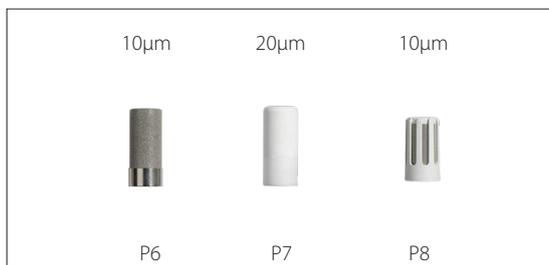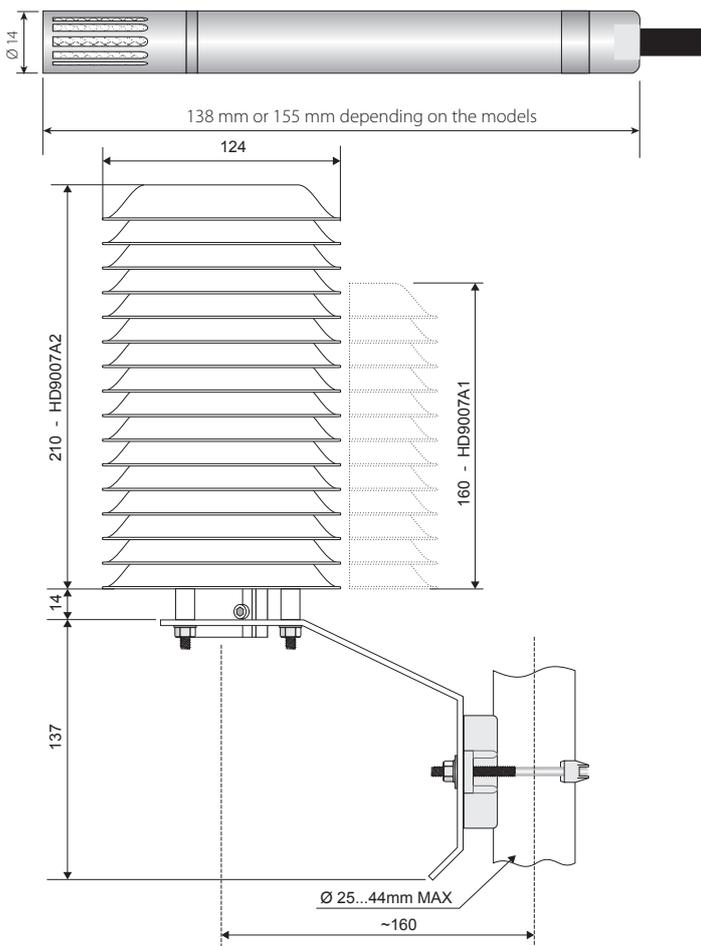
transmitter M12
male connector   CP9817… cable
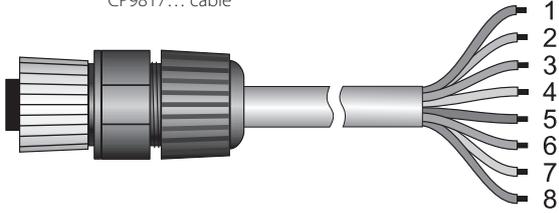
Connector	Function	Color
1	Power supply negative	Black
2	Power supply positive	Red
3	Not connected	
4	RS485 A/-	Yellow
5	RS485 B/+	White
6	Analog output negative	Blue
7	Temperature analog output positive	Grey
8	Humidity analog output positive	Green
	Cable shield	Yellow/Green

HD9817T… DIMENSIONS

138 mm or 155 mm depending on the models

124

210 - HD9007A2

160 - HD9007A1

14

137

Ø 25...44mm MAX

~160

| 10μm | 20μm | 10μm |
| P6 | P7 | P8 |

ORDERING CODES

HD9817T1R: Dual temperature and relative humidity transmitter. 1/3 DIN Pt100 temperature sensor. Measuring range for relative humidity: 0…100% RH, for temperature: -40…+60 °C. **Double output signal 0…1 Vdc**. Power supply 5…35 Vdc. Housing made of AISI 304, dimensions Ø 14 mm, L= 138 mm. Standard configuration 0…100% RH = 0…1 Vdc, -40…+60 °C = 0…1 Vdc. 7-wire cable with shield L = 1.5 m. Supplied with HD9817TC software with basic and calibration management functions downloadable from Delta OHM website.

HD9817T2R: Dual temperature and relative humidity transmitter. Pt100 1/3 DIN temperature sensor. Measuring range for relative humidity: 0…100%RH, for temperature: -40…+60 °C. **RS232C output.** Non-isolated power supply: power supply comes from RS232C PC output. Housing made of AISI 304, dimensions Ø 14 mm, L= 138 mm. Standard configuration 0…100% RH for relative humidity and -40…+60°C for temperature. Output cable with DB9 female connector, L=2 m. Supplied with HD9817TC software with basic and calibration management functions downloadable from Delta OHM website.

HD9817TVS: Dual humidity and temperature transmitter, Pt100 sensor. **0…1 Vdc analog outputs and RS485 MODBUS-RTU output**. Temperature measuring range -40…+60 °C. Power supply 5…30 Vdc. AISI 304 housing. IP 65 probe protection degree. Dimensions Ø14 x 155 mm. Output with 8-pole M12 male connector. Supplied with CP9817.3 cable, length 3 m.

ACCESSORIES

CP24: PC connecting cable for the MODBUS parameters configuration. With built-in RS485/USB converter. 8-pole M12 connector on instrument side and A-type USB connector on PC side.

CP9817.3: Spare cable for HD9817TVS transmitter, with 8-pole M12 female connector on one side, open wires on the other side.Length 3 m.

HD9817T1CAL: Calibration device for HD9817T1R. USB cable to connect a PC and software to perform the calibration.

HD75: saturated salt solution 75% R.H. thread M 12x1.

HD33: saturated salt solution 33% R.H. thread M 12x1.

HD9008.21.1: holder for vertical sensor, wall distance 250 mm, hole Ø26 mm. HD9007T26.2 adapter is required.

HD9008.21.2: holder for vertical sensor, wall distance 125 mm, hole Ø26 mm. HD9007T26.2 adapter is required.

HD9007T26.2: adapter from Ø 26 to Ø 14 mm to fit transmitters into the solar radiation protections HD9007A-1 and HD9007A-2.

HD9008.31: flange with sensor block Ø 14 mm.

HD9007A-1: 12-ring protection from solar radiations for Ø26 mm probes. Complete with mounting brackets. It requires HD9007T26.2 adapter.

HD9007A-2: 16-ring protection from solar radiations for Ø26 mm probes. Complete with mounting brackets. It requires HD9007T26.2 adapter.
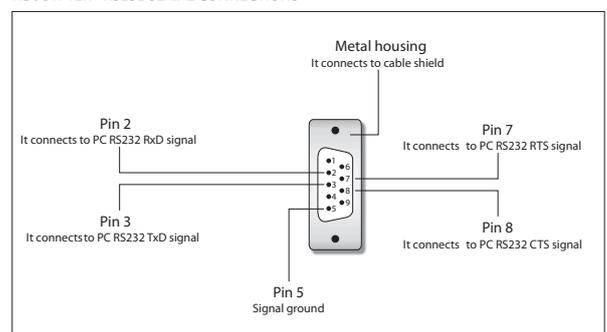
Protection for humidity probes Ø 14, thread M12x1

P6: 10 μm sintered stainless steel protection. Operating temperature: -40…180 °C.

P7: 20 μm PTFE protection. Operating temperature: -40…150 °C.

P8: PBT and 10 μm stainless steel grid protection. Operating temperature: -40…120 °C.

HD9817T2R - RS232 SERIAL CONNECTIONS

Metal housing
It connects to cable shield

Pin 2
It connects to PC RS232 RxD signal

Pin 7
It connects to PC RS232 RTS signal

Pin 3
It connects to PC RS232 TxD signal

Pin 8
It connects to PC RS232 CTS signal

Pin 5
Signal ground

DICHIARAZIONE DI CONFORMITÀ UE
EU DECLARATION OF CONFORMITY

Delta Ohm S.r.L. a socio unico – Via Marconi 5 – 35030 Caselle di Selvazzano – Padova – ITALY

Documento Nr. / Mese.Anno:
Document-No. / Month.Year :   **5173 / 07.2019**

Si dichiara con la presente, in qualità di produttore e sotto la propria responsabilità esclusiva, che i seguenti prodotti sono conformi ai requisiti di protezione definiti nelle direttive del Consiglio Europeo:
We declare as manufacturer herewith under our sole responsibility that the following products are in compliance with the protection requirements defined in the European Council directives:

Codice prodotto:
Product identifier :   **HD9817T…**

Descrizione prodotto:
Product description :   **Trasmettitori di temperatura e umidità relativa**
Temperature and relative humidity transmitters

I prodotti sono conformi alle seguenti Direttive Europee:
The products conform to following European Directives:

Direttive / *Directives*	
2014/30/EU	Direttiva EMC / *EMC Directive*
2014/35/EU	Direttiva bassa tensione / *Low Voltage Directive*
2011/65/EU - 2015/863/EU	RoHS / *RoHS*

Norme armonizzate applicate o riferimento a specifiche tecniche:
Applied harmonized standards or mentioned technical specifications:

Norme armonizzate / *Harmonized standards*	
EN 61010-1:2010	Requisiti di sicurezza elettrica / *Electrical safety requirements*
EN 61326-1:2013	Requisiti EMC / *EMC requirements*
EN 50581:2012	RoHS / *RoHS*

Il produttore è responsabile per la dichiarazione rilasciata da:
The manufacturer is responsible for the declaration released by:

Johannes Overhues

Amministratore delegato
Chief Executive Officer

Caselle di Selvazzano, 19/07/2019

Questa dichiarazione certifica l'accordo con la legislazione armonizzata menzionata, non costituisce tuttavia garanzia delle caratteristiche.
This declaration certifies the agreement with the harmonization legislation mentioned, contained however no warranty of characteristics.

WARRANTY

Delta OHM is required to respond to the "factory warranty" only in those cases provided by Legislative Decree 6 September 2005 - n. 206. Each instrument is sold after rigorous inspections; if any manufacturing defect is found, it is necessary to contact the distributor where the instrument was purchased from. During the warranty period (24 months from the date of invoice) any manufacturing defects found will be repaired free of charge. Misuse, wear, neglect, lack or inefficient maintenance as well as theft and damage during transport are excluded. Warranty does not apply if changes, tampering or unauthorized repairs are made on the product. Solutions, probes, electrodes and microphones are not guaranteed as the improper use, even for a few minutes, may cause irreparable damages.
Delta OHM repairs the products that show defects of construction in accordance with the terms and conditions of warranty included in the manual of the product. For any dispute, the competent court is the Court of Padua. The Italian law and the "Convention on Contracts for the International Sales of Goods" apply.

TECHNICAL INFORMATION

The quality level of our instruments is the result of the continuous product development. This may lead to differences between the information reported in the manual and the instrument you have purchased. In case of discrepancies and/or inconsistencies, please write to sales@deltaohm.com. Delta OHM reserves the right to change technical specifications and dimensions to fit the product requirements without prior notice.

DISPOSAL INFORMATION

Electrical and electronic equipment marked with specific symbol in compliance with 2012/19/EU Directive must be disposed of separately from household waste. European users can hand them over to the dealer or to the manufacturer when purchasing a new electrical and electronic equipment, or to a WEEE collection point designated by local authorities. Illegal disposal is punished by law.

Disposing of electrical and electronic equipment separately from normal waste helps to preserve natural resources and allows materials to be recycled in an environmentally friendly way without risks to human health.