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## ENVIRONMENTAL CONTROLS HD9817T.. TRANSMITTERS RELATIVE HUMIDITY AND TEMPERATURE FOR HVAC APPLICATIONS

**HD 9817T1R, HD 9817T2R, HD 9817T3R, HD9817TVS**  
**TEMPERATURE AND HUMIDITY TRANSMITTERS WITH ANALOG**  
**OR DIGITAL OUTPUT RS232, USB OR RS485 MODBUS-RTU**



Dual relative humidity and temperature transmitter for HVAC applications, environmental monitoring, pharmaceutical storage, food transport, green-house automation, etc. Equipped with an IP65 stainless steel AISI 304 housing, it is suitable even for severe environments; besides, its ultra-compact dimensions ( $\varnothing$  14 x 133 mm) and wide range of outputs (analogue 0...1V, digital RS232C OR RS485-MODBUS RTU, USB 1.1-2.0) 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

|                           | HD 9817T1R                                     | HD 9817T1R.1 | HD 9817T2R                           | HD 9817T2R.B                         | HD 9817T3R                 | HD 9817TVS   |
|---------------------------|--|--------------|--------------------------------------|--------------------------------------|----------------------------|--|
| <b>Output</b>             | 0...1V = 0...100% RH<br>0...1V = -40 ... 60 °C |              | RS232C non insulated, 2400 baud rate | RS232C non insulated, 2400 baud rate | USB 1.1-2.0 non insulated  | 0...1V = 0...100%RH<br>0...1V = -40...60 °C DP<br>0...1V = -40 ..60 °C<br>RS485 Modbus RTU non in. |
| <b>Temperature sensor</b> | PT 100   | NTC 10 k     | PT 100                               |                                      | PT 100                     | PT 100   |
| <b>Load resistance</b>    | R > 10k  |              |                                      |                                      |                            | R > 10k  |
| <b>Cable Connection</b>   | L= 1,5m<br>(7 wires + shield)                  |              | L= 2m DB9 female connector           | L= 2, without connector              | L= 2m USB connector type A | M12 8-pole connector. Provided with cable CP9817.3, L=3m   |

### CONNECTIONS MODELS HD9817T1 Y HD9817T1.1 WITH ANALOGUE OUTPUT 0...1Vcc.

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 HD9817T.1CAL interface module (see the paragraph about the RH sensor calibration).

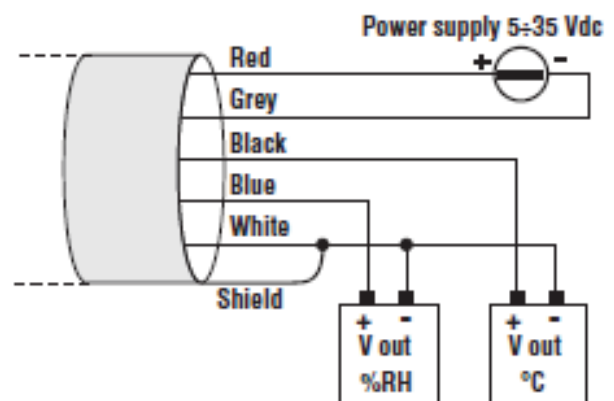
Power is supplied to the Red (+) and Grey (-) wires.

The output signal voltage is taken from:

(+) and White (-) wires for temperature,

(+) and White (-) wires for relative humidity.

The shield must be connected to the White wire.



## CONNECTONS HD9817T2 MODEL WITH RS232C OUTPUT AND HD9817T3 MODEL WITH USB OUTPUT.

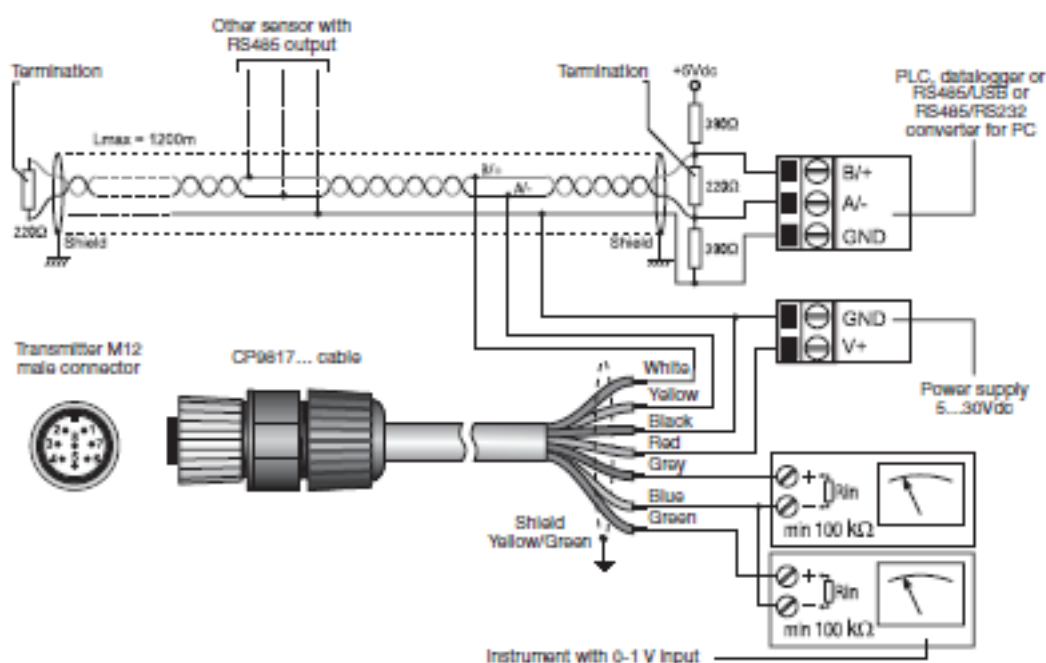
The HD9817T2 cable ends in a RS232C 9-pole subD female connector, while the HD9817T3 cable ends in a USB type A connector.  
The following set of commands is available for both instruments.

| Comando | Respuesta              | Descripción   |
|---------|------------------------|---|
| G0      | HD9817T_Pt100_RH_RS232 | Modelo  |
| G3      | Firm.Ver.=01-00        | Versión firmware  |
| HAnn.n  | &                      | Punto de calibración a 75% donde nn.n representa el valor real de humedad |
| HBnn.n  | &                      | Punto de calibración a 33% donde nn.n representa el valor real de humedad |
| S0      | 0072.7   063.9         | Envía la medida actual (tttt.t   hhh.h)<br>t = temperatura h = HR         |
| U0      | &                      | Unidad de medida Sistema Internacional                                    |
| U1      | &                      | Unidad de medida Sistema Imperial   |

### Note for HD9817T3 model with USB output

This model requires that you install USB drivers first in order to ensure a correct PC connection:  
**don't connect the instrument to your PC before installing the drivers.**  
For further details, see the guide in the CDRom which is supplied with the instrument.

## WIRING DIAGRAM OF THE 0...1VDC 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

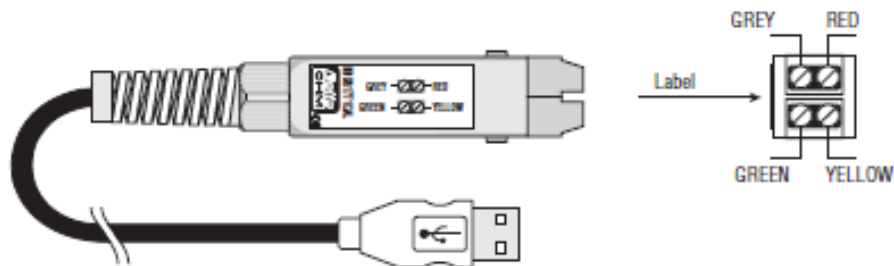
The instruments are supplied factory calibrated and ready to use. The CDRom supplied with the instruments includes a relative humidity calibration procedure. The online help describes this procedure in detail.

No procedure exists for temperature calibration.

To connect HD9817T1 and HD9817T1.1 models to your PC, use the HD9817T.1CAL 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, see the guide in the CDRom which is supplied with the instrument.

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.

## CONNECTIONS HD9817T1 AND HD9817T1.1 MODELS

### Power supply

The power supply voltage must be as per the electrical specifications (5...35Vdc) 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).

## CONNECTIONS HD9817T2 AND HD9817T3 MODELS

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

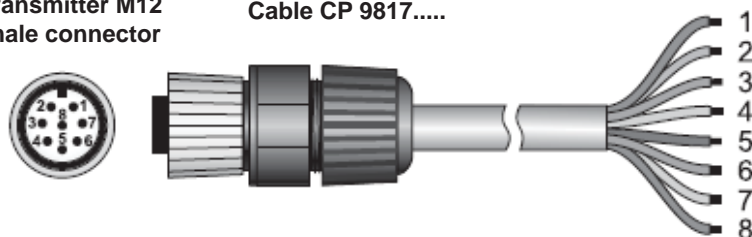
## CONNECTION HD9817TVS MODEL

with analog outputs 0...Vdc and RS485 MODBUS-RTU output..

They are supplied with the cable CP9817.3 equipped with the the M12 connector on the one side for the connection to the instrument and loose wires on the other side.

transmitter M12  
male connector

Cable CP 9817.....

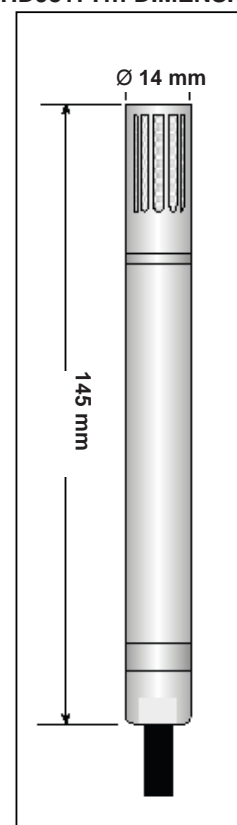


| Connector | Function               | Color        |
|-----------|------------------------|--------------|
| 1         | Power supply (-)       | Black        |
| 2         | Power supply (+)       | Red          |
| 3         | Not connected          |              |
| 4         | RS485 A/-              | Yellow       |
| 5         | RS485 b/+              | White        |
| 6         | Analog output (-)      | Blue         |
| 7         | Temperature output (+) | Grey         |
| 8         | Humidity output (+)    | Green        |
|           | Shield not connected   | Yellow/Green |

## TECHNICAL DATA

| Relative humidity            |  |
|------------------------------|--|
| Sensor                       | Capacitive   |
| Sensor protection            | P8, stainless steel grid and PTFE, 20μ                 |
| Measuring range              | 5...98 % HR  |
| Sensor working range         | -40...+80°C  |
| Accuracy @20°C               | ±1.5% (0...90%RH), ±2,0% in the remaining range        |
| Temperature dependence       | 2% on the whole temperature range                      |
| Hysteresis and repeatability | 1%HR   |
| Long term stability          | 1%/year  |
| Temperature                  |  |
| Sensor type                  | Pt100 1/3 DIN (on request, NTC 10kΩ: code HD9817T1R.1) |
| Measuring range              | -40...+60°C  |
| Accuracy                     | ±0.2°C ±0.15% of the measured value                    |
| Long term stability          | 0.2°C/ year  |
| General                      |  |
| Power voltage                | 5...30VDC  |
| Consumption                  | 2mA  |
| Max. operating temperature   | -40...+80°C (for short periods)                        |
| Operating humidity           | 0...100%HR   |
| Dimensions                   | 14 X 138mm   |
| Degree of protection         | IP65   |

## HD9817T... DIMENSIONS



## ACCESSORIES

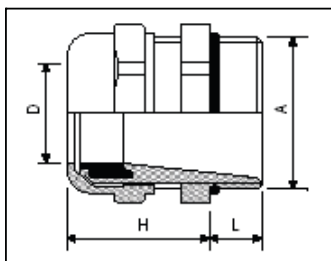
- HD 9008.21.1** Holder for vertical sensor, wall distance 250mm, hole Ø 26  
**HD 9008.21.2** Holder for vertical sensor, wall distance 125mm, hole Ø 26  
**HD 9008.26/14** Holders for Ø 26 and Ø 14mm holes, for HD9008.21.1 and HD9008.21.2  
**HD 9008.31** Flange with sensor block Ø 14mm for duct sensors



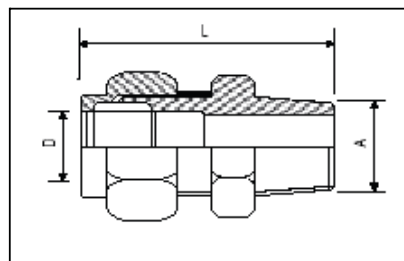
**Holders HD 9008.21.1  
HD 9008.21.2**



**HD9008.31 Flange**

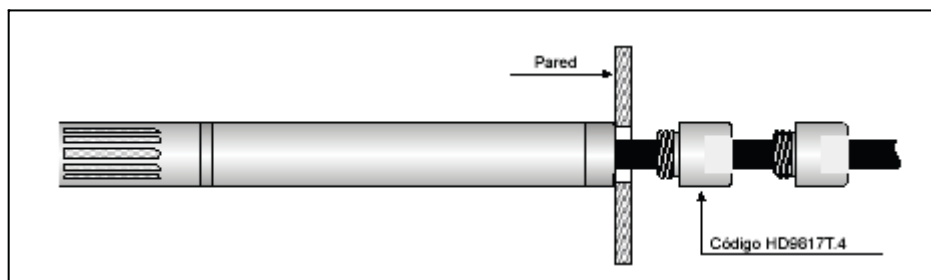


**PG16.12 Metal cable gland**  
D = 10...14mm  
L = 6.5mm, H = 23mm, A = PG16



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

For direct wall mounting on a metal support, the HD9817T.4 part is available as shown in the figure below (for HD9817T1 and HD9817T1.1 versions only).



## HD 9007 MULTIPLATE RADIATION SHIELD

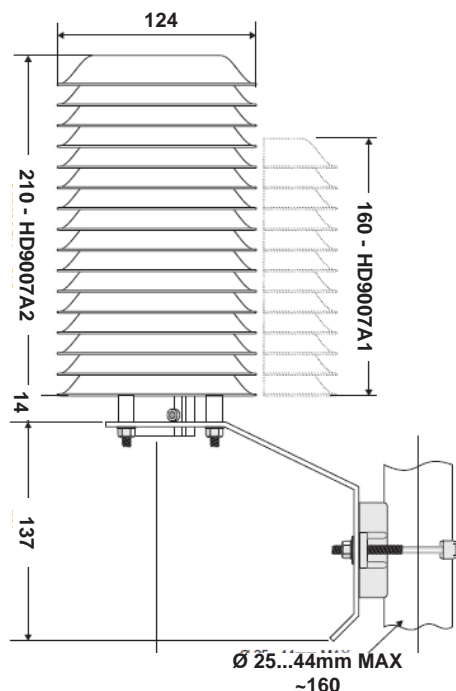
Luran S777K (BASF) antistatic UV-resistant thermoplastic material with low thermal conductivity and high reflection.

White power-painted anticorrosional aluminium support bracket. Stainless steel U-bar mounting bracket for shafts from 25 to 44mm

Dimensions: HD 9007A1 Ø 125 x 190 mm. weight 640 gr. (12 rings)  
HD 9007A2 Ø 125 x 240 mm. weight 760 gr. (16 rings)



These protectors are used  
To preserve the temperature and temperature probes-  
Humidity, of the seasons  
Weather forecast  
Solar radiation  
Rain and wind.



## PROTECTORS FOR PROBES

- P6:** 10µ sintered stainless steel protection for probes Ø 14mm, thread M 12x1.  
**P7:** 20µ PTFE protection for probes Ø 14mm, thread M 12x1.  
**P8:** 20µ stainless steel and Poca grid protection, thread M 12x1.

10µm

20µm

20µm



**P6**



**P7**



**P8**

## MODELOS DISPONIBLES

|                     |   |
|---------------------|---|
| <b>HD 9817T1R</b>   | <p>Dual relative humidity and temperature transmitter, Pt100 sensor. 0...1Vdc analogue outputs.</p> <p>Temperature measuring range -40...+60°C (-20...+80°C on request).</p> <p>Power supply 5...35Vdc. AISI 304 housing.</p> <p>Probe protection class IP65.</p> <p>Dimensions Ø14x145mm. Output with cable L=1,5m (7 wires + shield).</p> <p>Max. working temperature -40°...+80°C.</p> <p>Supplied with HD9817TC software.</p>                       |
| <b>HD 9817T1R.1</b> | <p>Dual relative humidity and temperature transmitter, NTC sensor 10k 0...1Vdc analogue outputs.</p> <p>Temperature measuring range -40...+60°C (-20...+80°C on request).</p> <p>Power supply 5...35Vdc. AISI 304 housing.</p> <p>Probe protection class IP65.</p> <p>Dimensions Ø14x145mm. Output with cable L=1,5m (7 wires + shield).</p> <p>Max. working temperature -40°...+80°C.</p> <p>Supplied with HD9817TC software.</p>                      |
| <b>HD9817T2R</b>    | <p>Dual relative humidity and temperature transmitter, Pt100 sensor. RS232C digital output.</p> <p>Temperature measuring range -40...+60°C (-20...+80°C on request).</p> <p>Powered directly from your PC RS232C port. AISI 304 housing.</p> <p>Probe protection class IP65.</p> <p>Dimensions Ø14x145mm. Output with cable L= 2m with DB9 female connector.</p> <p>Max. working temperature -40°...+80°C.</p> <p>Supplied with HD9817TC software</p>   |
| <b>HD9817T3R</b>    | <p>Dual relative humidity and temperature transmitter, Pt100 sensor. USB1.1-2.0 digital output.</p> <p>Temperature measuring range -40...+60°C (-20... +80°C on request).</p> <p>Powered directly from your PC USB port. AISI 304 housing.</p> <p>Probe protection class IP65.</p> <p>Dimensions Ø14x133mm. Output with cable L=2m with USB type A connector.</p> <p>Max. working temperature -40°...+80°C.</p> <p>Supplied with HD9817TC software.</p> |
| <b>HD9817TVS</b>    | <p>Dual relative humidity and temperature transmitter, Pt100 sensor. 0...1Vdc analogue and RS485 MODBUS-RTU output.</p> <p>Temperature measuring range - 40...+60°C.</p> <p>Power supply 5...35Vdc. AISI 304 housing.</p> <p>Probe protection class IP65.</p> <p>Dimensions Ø14x145mm. Output with cable M12 8-pole connector.</p> <p>Supplied with CP9817.3 cable, length 3m.</p>  |
| <b>HD9817T1CAL</b>  | <p>USB interface module for connecting HD9817T1 and HD9817T1.1 transmitters to your PC USB port as well as calibrating or checking the humidity sensor.</p> <p>USB connector type A, cable L=1.5m. Connection through 4-pole terminal board.</p>  |