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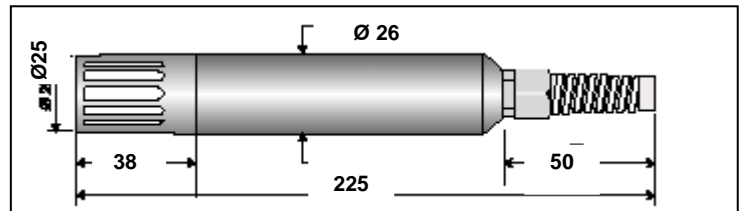
DO-081.70E

## ENVIRONMENTAL CONTROLS

### HD 9008 T, HD 9009 T, HD 9809 T TRANSMITTERS

### RELATIVE HUMIDITY AND TEMPERATURE

HD 9008 T, HD 9009 T



#### TECHNICAL DATA

		HD 9008 T	HD 9009 T
Electronics Working Temperature		-40 a 80 °C	
Sensor Working Temperature		-40 a 80 °C	
Power supply		7...30 Vcc	
Protection class		IP 54	
RELATIVE HUMIDITY			
Sensor		H 6100	
Measuring range		5 a 98 % H.R.	
Accuracy at 20 °C		± 2,5 % H.R.	
Response time at 63% of final variation		60 sec with filter 5 sec without filter	
Output signal		0 % HR 4mA 100% HR 20 mA	0% HR 0,0Vcc 100% HR 1Vcc
TEMPERATURE			
Sensor		Pt 100 class A	
Measuring range		-40 °C a 80 °C	-40 °C a 60 °C
Accuracy		±0,2 °C ±0,15 % of measurement	
Response time at 63% of final variation		60 sec with filter 5 sec without filter	
Output signal		-20 °C 4 mA 80 °C 20 mA	-40 °C 0,00 Vcc 60 °C 1,00 Vcc
Cable conection			
Maximum Length (using screened cables)		200 m	10 m

#### HD 9008T

**Configurable** dual meteorological temperature and relative humidity transmitter.  
Power supply 7...30 Vcc Outputs 4...20 mA  
Probe ø 26 mm L= 185 mm.

#### HD 9009T

**Configurable** dual meteorological temperature and relative humidity transmitter  
Power supply 7...30 Vcc .  
Outputs 0...1V (on request 0.5, 1.5, 1.6, o 0...10 V)  
Probe ø 26 mm L= 185 mm.

#### TRANSMISIÓN DE LA SEÑAL

The electronic circuit is designed so that the signal (current or voltage, depending on model) increases linearly with increasing moisture or temperature

It is advisable that the cables connecting the transmitter to be separated from power cables and other conductors

This condition is imperative, in the case of conductors with high currents, or to devices or machines that cause electromagnetic disturbances

The model with voltage output (HD 9009T) is recommended to use shielded cable for connections.

#### INSTALLATION AND ASSEMBLY

Figures 1 and 2 show the connection diagram of the two models. RRH and R°C represent the current input of any device connected to the 4...20mA loop, that is: an indicator, a controller, a data logger or a recorder. In figure 2, "Vin%RH and Vin°C" symbols have the same meaning..

Accuracy in measuring does not depend on the transmitter position. However, it is suggested to install the transmitter with the sensor faced downwards (where possible) to reduce dust deposit on the sensor protection filter..

The transmitter shall not be mounted next to doors, in draughtiness, in areas with scarce air circulation, or near a heat source, as heating air involves a decrease of relative humidity (the quantity of available water vapour being equal).

Protection degree: IP54.

**Check the compatibility of the sensors with the environment in which they are installed..**

Fig.1

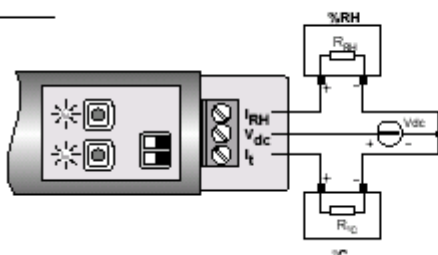
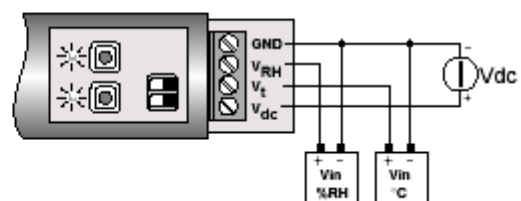
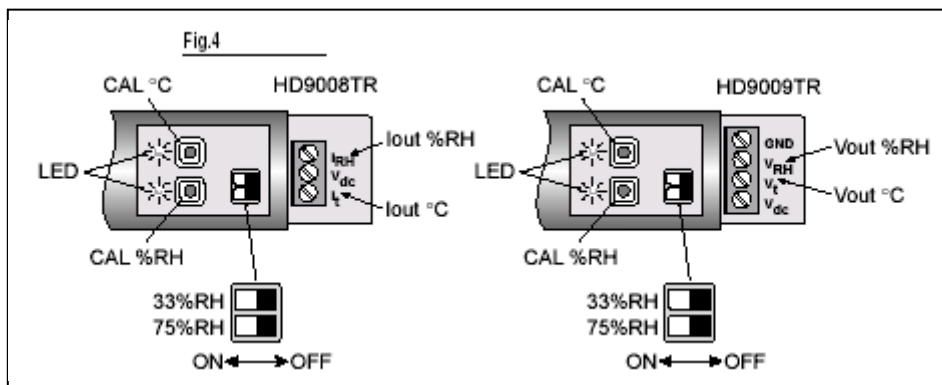
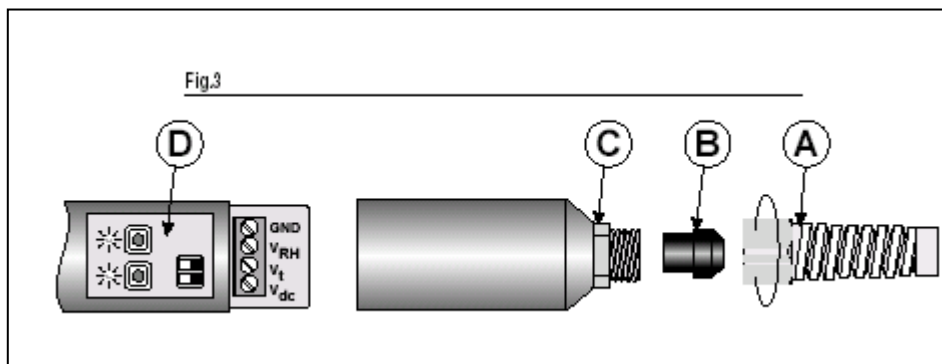


Fig.2





Follow these procedures to access the transmitter terminal board (see fig.3):  
Unscrew grommet "A", take off rubber bulb "B" and unscrew bottom "C". Insert the cable through A, B and C elements and connect it to the terminal board. Hold the cable firmly while screwing grommet "A" to avoid twisting.

#### PROGRAMMING

The Fig.4 shows the elements that allow programming of the transmitters.

The transmitters come factory calibrated:

#### HD 9008TR

Temperature: 4mA = -40 °C  
20mA = 80 °C  
Humidity: 4mA = 0 %RH  
20mA = 100% HR

#### HD 9009TR

Temperature: 0V = -40°C  
1V = 80 °C  
Humidity: 0V = 0 %HR  
1V = 100% HR

#### Humidity Sensor Calibration

The following accessories are needed.

HD9008TR model: a 7...30Vdc continuous voltage power supply, a precision ammeter with a 0...25mA min. range.

HD9009TR: a 7...30Vdc continuous voltage power supply, a precision voltmeter with a 0...1Vdc min. range.

The calibration of the humidity sensor is carried out at two fixed points: at

**75.4%RH – always as first point – and at 33%RH – second point.**

#### Procedure:

1. To access the panel board, unscrew grommet "A" (see fig. 3) and hold the cable firmly to avoid twisting. Take off the rubber bulb and unscrew the bottom of the instrument.
2. Connect the wires to provide the instrument with power supply, as shown in the connection diagrams (Fig. 5: HD9008TR and Fig.6: HD9009TR).
3. Insert the probe in the container with the saturated solution at 75%RH and wait **30 minutes at least**. Probes and solutions have to be at the same temperature.
4. Turn 75%RH dip-switch on ON.
5. Press the CAL%RH little key and **hold it down for 5 seconds**, at least, until the corresponding LED does not flash. Now the little key can be released: the LED will remain on. A built-in sensor compensates the temperature difference of the solution compared with 20°C.
6. Turn the 75%RH dip-switch on OFF.
7. Put the probe in the container with the saturated solution at 33%RH and wait for **30 minutes, at least**. Probes and solutions have to be at the same temperature.
8. Turn the 33%RH dip-switch on ON.

9. Press the CAL%RH small key **and hold it down for 5 seconds**, at least, until the corresponding LED is not off. Now the little key can be released. If the solution is at 20°C, the output will equal 9.28mA (in HD9008TR model) and 0.330V (in HD9009TR model). If the solution is at a different temperature, the output will correspond to the value listed in the following table::

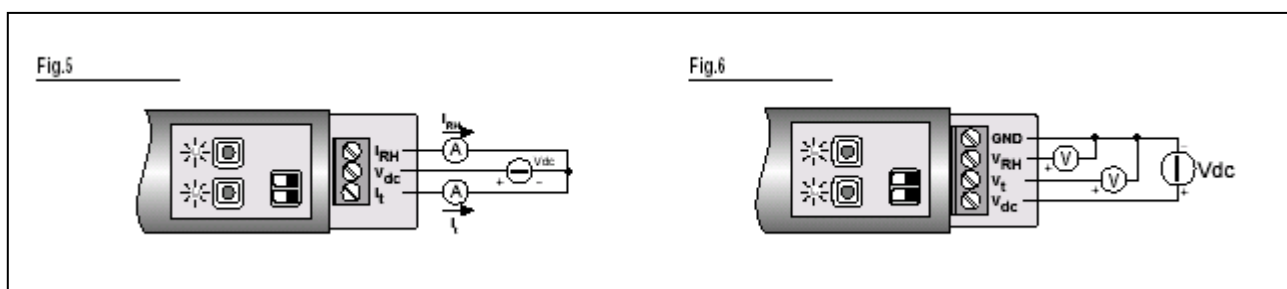
°C	10	15	20	25	30
%HR	33,4	33,3	33	32,7	32,4
mA	9,34	9,33	9,28	9,23	9,18
V	0,334	0,333	0,330	0,327	0,324

°C	35	40	45	50	
%HR	32	31,6	31,1	30,5	
mA	9,12	9,08	8,98	8,88	
V	0,320	0,316	0,311	0,305	

10. Turn the 33%RH dip-switch on OFF again.
11. Re-close the instrument: re-screw the bottom, put the rubber bulb again at its place and screw the grommet: hold the cable firmly to avoid twisting it.
12. The calibration of the RH probe is finished.

#### Important Note:

**the first calibration point has to be always at 75%RH**



## Programming of Temperature Operating Range

The following accessories are needed.

**For HD9008TR:** a 7...30Vdc continuous voltage power supply, a precision ammeter with 0...25mA minimum range.

**For HD9009TR:** a 7...30Vdc continuous voltage power supply, a precision voltmeter with 0...1Vdc minimum range.  
Pt100 simulator or a set of precision resistances..

### Procedure:

1. To access the panel board, unscrew grommet "A" (see figure 3) and hold the cable firmly to avoid twisting. Take the rubber bulb off and unscrew the bottom of the instrument.
2. Unscrew the sensor protection filter.
3. Unsolder the Pt100 sensor (the narrowest one) and in place of it, solder the output wires or those of a Pt100 simulator or of a precision resistance, as shown in figures 7 and 8. Then wait a few seconds for the junction to get cold.
4. Set the Pt100 simulator at the temperature corresponding to the scale upper value. For example, if you want to configure the  $-10^{\circ}\text{C} \dots +80^{\circ}\text{C}$  range, the simulator has to be set at  $-10^{\circ}\text{C}$ ; the equivalent resistance value will be  $96.09\Omega$ . If the calibration is carried out with a fixed resistance, connect a  $96.09\Omega$  fixed resistance to the terminals to which the sensor was soldered.
5. Wait 10 seconds until the measurement becomes steady, press the "CAL °C" key (calibration) and hold it down for min. 5 seconds, until the LED first flashes (once) and then remains on.

6. Set the Pt100 simulator at the temperature value provided for the full scale. According to the above example, the simulator will be set at  $+80^{\circ}\text{C}$ ; the equivalent resistance value will be  $130.89\Omega$ ; if the calibration is carried out with a fixed resistance, a  $130.89\Omega$  fixed resistance will have to be connected to the terminals to which the sensor was soldered.

7. Wait 10 seconds until the measurement becomes steady, press the "CAL °C" key (calibration) and hold it down for min. 5 seconds, until the LED is off. When you release the key, the LED will flash twice to confirm that programming took place. Now the procedure is over.

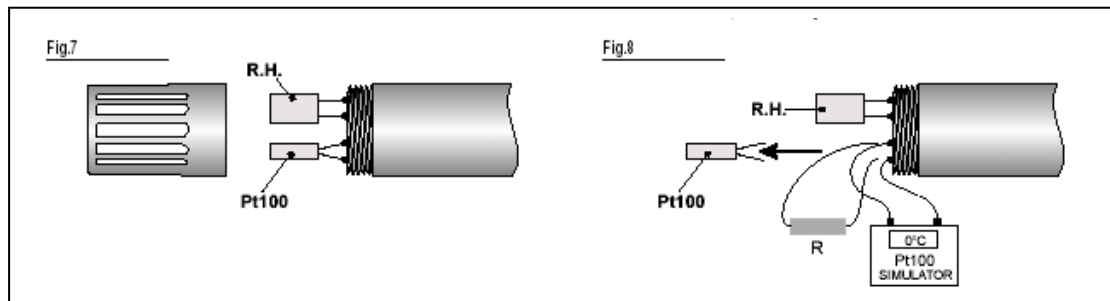
8. Check that the configuration corresponds to the requested specifications, by setting the simulator (or connecting the precision resistances) at the values corresponding to the upper and full scale value and by checking the output with the ammeter (HD9008TR) or with the voltmeter (HD9009TR).

9. Solder again the temperature sensor.

10. Insert again the sensor protection filter, screw the bottom, put the rubber bulb again at its place and screw the grommet holding the cable firmly to avoid twisting.

11. The temperature output programming is over.

**Check the compatibility of the sensors with the environment in which they are installed.**



## CONSTRUCTION PROGRAM

HD 9008TR model can be supplied in four versions:

**HD 9008TR** With two outputs 4 ... 20 mA one for humidity and one for the temperature.

**HD 9008TR.1** With a 4 ... 20 mA output for humidity and output 2-wire Pt 100.

**HD 9008TR.2** With a 4 ... 20 mA output for humidity and an output of 4 wire PT 100

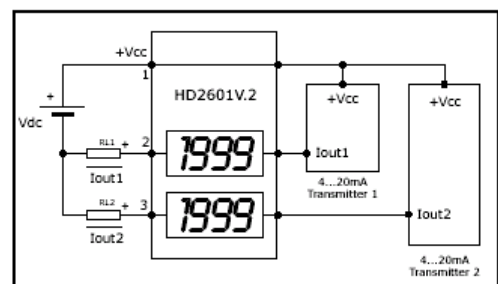
**HD 9808TR.K** With two outputs 4 ... 20 mA one for humidity and one for the temperature and a configurable display HD 2601V.2 incorporated two independent displays.

This display is attached to the probe by a female connector DIN43650.

The output also includes a female connector DIN43650 as seen in the images.

The power indicator is through the loop 4 ... 20 mA,

Using the programming button you can configure and display the maximum, medium and minimum and the time since the instrument was turned



HD 9009TR model can be supplied in three versions:

**HD 9009TR** With two outputs 0 ... 1V one for humidity and one for the temperature.

**9009TR.1** With HD output 0 ... 1V for Humidity and output 2-wire Pt 100.

**9009TR.2** With HD output 0 ... 1V for Humidity and leaving 4-wire Pt 100.

## HD 9809T

Dual meteorological temperature and relative humidity transmitter, Pt 100 sensor. Analogue output 0...1Vcc Power supply 5...35 Vcc, Probe Ø 14mm L=96 mm. 1,5m cable

### APPLICATIONS

The HD 9809T is an economical solution for the combined measure of temperature and relative humidity. The transmitter is factory calibrated regulated, with control parameters set forth in the accompanying table.

### MEASUREMENT OF RELATIVE HUMIDITY

The HD 9809T is equipped with a capacitive sensor that covers an area between 5% and 98% relative humidity. A very low hysteresis and high stability, ensure accurate measurements and calibration intervals

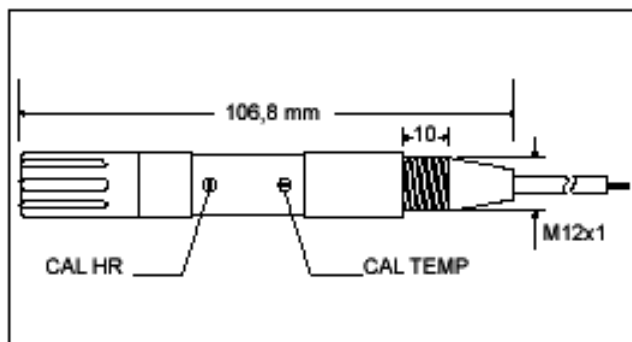
### TEMPERATURE MEASUREMENT

The HD 9809T uses a Pt100 sensor class A The linearity and repeatability are excellent.

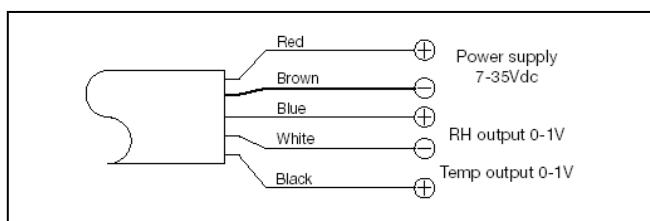
### INSTALLATION

The probe is equipped with an M12x1 thread at the bottom, near the exit of the cable, for easy assembly. Although the accuracy of the measurement depends on the position of the transmitter, it is advisable to install this, whenever possible, so that the sensor is at the bottom. This minimizes the possibility of dust deposited over the protective filter of the sensor element. The transmitter should never be installed near doors, in the presence of air currents, or near sources of heat and a warming of the air, leads to a decrease in the relative humidity is the same amount of water vapor

**Check the compatibility of the sensors with the environment in which they are installed..**



Dimensions

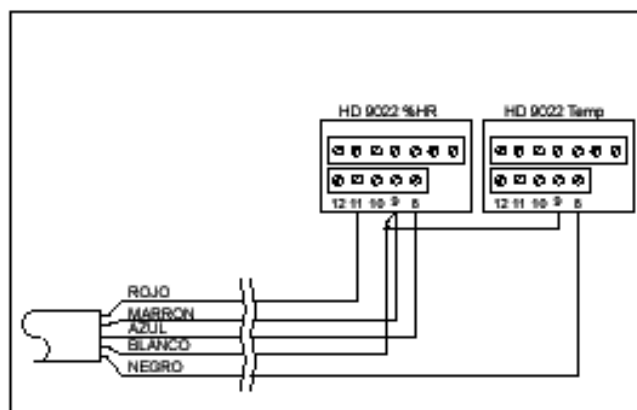


Connections



### TECHNICAL SPECIFICATIONS

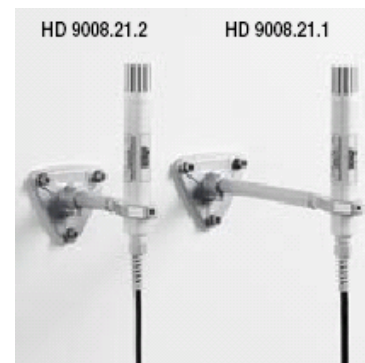
Relative Humidity	
Sensor	Capacitive 500 pF
Sensor protection	20µ Stainless steel grid filter
Measuring range	5 a 99% HR
Sensor working range	-35 a 80 °C
Accuracy	2,5% HR
Temperature influence	0,04% HR/°C
Hysteresis and repeatability	1% HR
Long-term stability	1% year
Output	0,0% HR → 0,00V
	100% HR → 1,00V
Temperature	
Sensor	Pt100 class A
Measuring range	-35 a 60 °C
Accuracy	0,2°C±0,15% of the measurement
Long-term stability	0,2 °C/year
Output	-40 °C → 0,00V
	60 °C → 1,00V
Power supply	
voltage	7 a 35 Vcc
Consumption	2 mA
Working temperature	
Electrical	-35 a 60 °C
Connections	
Cable	Ø 5 mm L = 1,5 m
+ power supply	Red
+ RH output	Blue
+ temperature output	Black
- common output	White
- power supply	Brown
Housing	
Dimensions	Ø 14 x 94 mm
Protection class	IP64
Installation	Thread M12x1



Ejemplo de conexión con HD9022

## HOLDERS FOR TRANSMITTERS HD 9008TR , HD 9009TR , HD 9809T y HD 9817T..

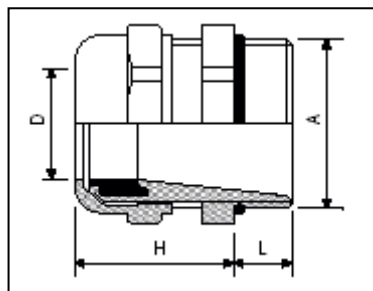
- HD 9008.21.1 HD9008.21.1: Holder for vertical sensor, wall distance 250mm, hole Ø 26. for sensors HD 90008TR, HD 9009TR
- HD9008.21.2: Holder for vertical sensor, wall distance 125mm, hole Ø 26. for sensors HD 90008TR, HD 9009TR
- HD 9008.26/14 Reduction hole Ø 26 to Ø 14 for the holders HD 9008.21.1 y HD 9008.21.2
- HD 9008.31 Holder lock washer tube Ø 14, for duct mounting



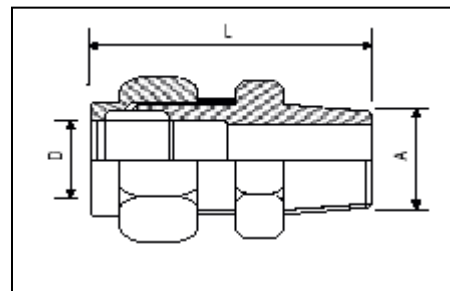
To fix the probes Ø 14en a ventilation duct, canal, etc. HD9008.31.12 support can be used, a metal press-tow PG16 (10 ... 14mm) or a universal fitting biconical 3 / 8 ".



HD9008.31 Flange

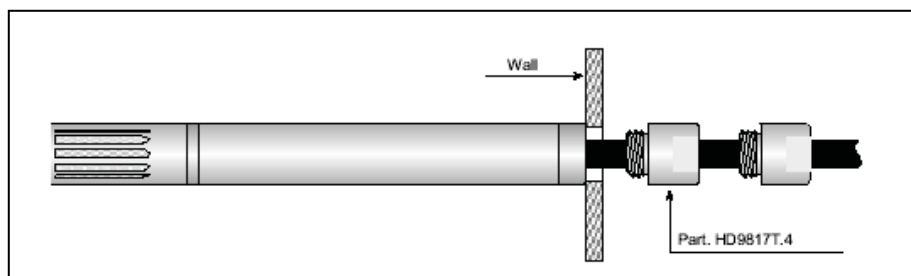


PG16.12 Metal cable gland  
D = 10...14mm  
L = 6.5mm  
H = 23mm  
A = PG16



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 FOR LOS TRANSMITERS HD 9008T AND HD 9009T.

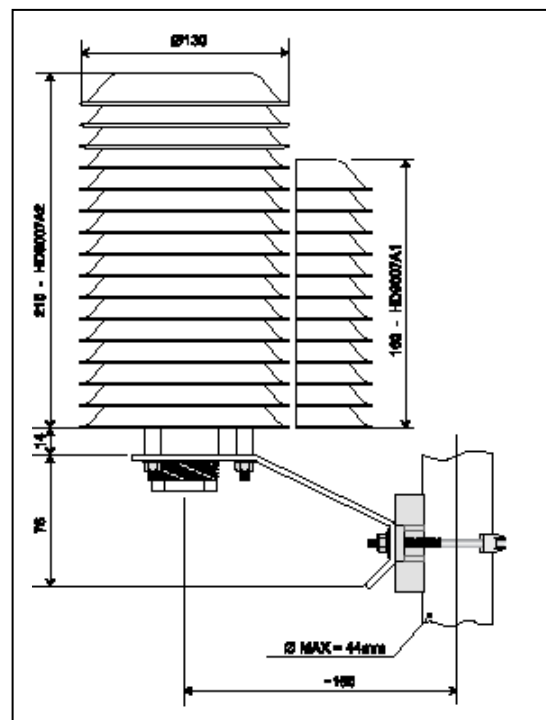
Luran S777K (BASF) antistatic UV-resistant thermoplastic material with low thermal conductivity and high reflection.

White power-painted anticorodal 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)

Sensor fixing ring nuts: Ø 27 mm, Ø 25 mm on demand when ordering. HD9007 ring-shield is suitable to protect temperature and RH/temperature sensors used in weather stations from solar radiations, rain and wind





**ORDER CODES**

<b>HD9008 TR</b>	<b>Configurable</b> dual meteorological temperature and relative humidity transmitter. Measuring range: temperature -40°C...+80°C, relative humidity 5...98% R.H., 4mA correspond to -40°C and 0% R.H., 20mA correspond to +80°C and 100%R.H. Probe . 26 mm, L = 185 mm. <b>Power supply 9...40Vdc.</b>
<b>HD9008 TR.1</b>	Dual meteorological temperature and relative humidity transmitter. <b>It measures the temperature with 2-wire Pt100 sensor.</b> Measuring range: relative humidity 5...98%R.H., 4mA correspond to 0%R.H., 20mA correspond to 100%R.H. Probe . 26 mm L= 185 mm. <b>Power supply 9...40Vdc</b>
<b>HD9008TR.2</b>	Dual meteorological temperature and relative humidity transmitter. <b>It measure the temperature with 4-wire Pt100 sensor.</b> Measuring range: relative humidity 5...98%R.H., 4mA correspond to 0%R.H., 20mA correspond to 100%R.H. Probe . 26 mm L= 185 mm. <b>Power supply 9...40Vdc</b>
<b>HD9008 TRK</b>	<b>Configurable</b> dual meteorological temperature and relative humidity transmitter. Measuring range: temperature -40°C...+80°C, relative humidity 5...98% R.H., 4mA correspond to -40°C and 0% R.H., 20mA correspond to +80°C and 100%R.H. Probe . 26 mm, L = 185 mm. <b>Power supply 7...30Vdc</b> <b>HD2601 features a display with two input V2 4 / 20 mA</b>
<b>HD9009TR:</b>	<b>Configurable</b> dual meteorological temperature and relative humidity transmitter. Measuring range: temperature -40°C...+80°C, relative humidity 5...98% R.H., 0Vdc correspond to -40°C and 0% R.H., 1Vdc correspond to +80°C and 100%R.H. Probe . 26 mm, L = 185 mm. <b>Power supply 5...35Vdc, 2mA.</b>

**ORDER CODES ACCESSORIES**

<b>HD9008.21.1</b>	Flange with support, . 26mm hole for vertical probes, 250mm distance from the wall. hole Ø 26
<b>HD9008.21.2</b>	Flange with support, . 26mm hole for vertical probes, 125mm distance from the wall . hole Ø 26
<b>HD 9008.26/14</b>	Adapter from . 26mm to . 14 for probes of the TC series for temperature and R.H. transmitters.
<b>HD 9008.31</b>	Wall flange with . 14 cable outlet to fix all combined °C and R.H. probes of the TO and T
<b>HD9007 A1</b>	<u>12-ring protection L=190 mm complete with mounting brackets.</u>
<b>HD9007 A2</b>	16-ring protection L=190 mm complete with mounting brackets
<b>HD75</b>	Saturated solutions, 75% RH for calibrating RELATIVE HUMIDITY probes fittong M24x1,5
<b>HD33</b>	Saturated solutions, 33% RH for calibrating RELATIVE HUMIDITY probes fittong M24x1,5