

Manual

Transmitter for reading the Vapor Pressure Deficit (VPD) + Rh / °C 4-20 mA with cable and sunscreen

CODE 06750003 and 06750010

The Vapor Pressure Deficit (VPD) is the pressure measurement, expressed in kPa, of the difference between the vapor saturation pressure (i.e., the pressure at which the air is saturated when reaching the maximum water retention capacity at a given temperature, also called dew point) and the actual vapor pressure.

The VPD value is calculated from the temperature and relative humidity values.

High values of VPD, means that the air has a greater capacity to retain water, thus stimulating the transfer of water vapor (transpiration), loss of water from the plant, to the point that it can cause stomata to close, reducing performance of the plant. These conditions occur under conditions of low relative humidity.

Low values of VPD, means high levels of water saturation in the air, high levels of relative humidity reduce plant transpiration, but at certain values they are indicators of the risk of plant pathogen diseases.

This indicator can be used for disease prevention, determine if there is a risk of condensation in any part of the system (free water), irrigation needs and/or need to increase humidity in the environment.

For plant metabolism, an adequate VPD value facilitates the absorption of water and nutrients in the roots, along with transport to fruits and leaves.

The Relative Humidity and Ambient Temperature sensor is integrated into a single transmitter housed inside a protector, which protects it from rain and direct sunlight, preventing sensor deterioration or false readings. In this way, good aeration is guaranteed, allowing a correct



reading of the environmental parameters.

It carries out temperature measurements in ranges from -40 to 85 °C with an accuracy of ± 0.4 °C and relative humidity 0 - 100% with an accuracy of $\pm 3\%$. From these values, it gives the calculated vapor pressure deficit (VPD) value in the range of 0 to 8 kPa.

The feeding and reading is done by a 5 m cable.

There is a ventilated version of the sensor, which incorporates a fan to be able to apply a direct current of air. In this way, it is possible to measure humidities close to 100% with greater precision without condensations that distort the readings, adding reliability to the measurements obtained and allowing the sensors to adapt to any environment, no matter how humid.

Technical characteristics

Power supply

Power supply	12 Vdc to 20 Vdc	
Energy consumption	model without fan	less than 0.9 W
	model with fan	less than 2.5 W
Overtoltage fuse:	Input	Thermal (PTC) 0.4 A at 25°C, self-resettable
Reverse Current Protection	Yes	

Outputs

Output sign	4 – 20 mA	3 outputs
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Response time

Minimum transmitter power supply time to receive reading:	500 ms
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Dimensions of the sensor with the solar shield

Height	190 mm
Width	230 mm
Depth	200 mm
Weight (approx.)	1,75 Kg

Transmitter box interior dimensions






Height	99 mm
Width	65 mm
Depth	39 mm
Weight (approx.)	0,4 Kg








This symbol indicates that electronic devices should not be disposed of along with household waste at the end of its useful life. The product must be taken to the corresponding collection point for recycling and properly treating electronic equipment in accordance with the national legislation.



Connecting

The **model without fan** has a 5-wire power supply and current output connection hose:

Wire colour	ID	Function
 Green	+12V	+ (positive) power supply
 Brown	0 V	- (negative) power supply
 White	S1	Output 1 (HR): 4 – 20 mA
 Yellow	S2	Output 2 (°C): 4 – 20 mA
 Pink	S3	Output 3 (VPD): 4 – 20 mA

The **model with fan** also has another hose with two more wires:

<i>Hose n°1</i>		
Wire colour	ID	Function
 Green	+12V	+ (positive) power supply
 Brown	0 V	- (negative) power supply
 White	S1	Output 1 (HR): 4 – 20 mA
 Yellow	S2	Output 2 (°C): 4 – 20 mA
 Pink	S3	Output 3 (VPD): 4 – 20 mA

<i>Hose n°2</i>		
Wire colour	ID	Function
 Blue	+12V	+ (positive) fan power supply
 Brown	0 V	- (negative) fan power supply

Installation

- Preferably mount it on a post, at a minimum height of 1.5 m above the surface.
- Maximum diameter of the post: 32 mm.

Profile view



Back view








The transmitter is located
inside the sun shield



Configuration



The transmitters are generally configured at the factory. However, it is possible to make consultations or configurations through the use of a “Module Reader,” consisting of a screen and four keys that are connected to the transmitter through the only interior visible connector.

Press the  key to enter the main menu. With the  and  keys, you can change the options within the menu. With the  key, you can enter the selected menu option. With the  key, you can return to the menu option of the previous hierarchy.

Within the main menu, you can see the following options:

- Consultation
- Configuration




CONSULTATION MENU

General consultation menu of the module, where you can view:

- Transmitter firmware version number.
- Transmitter type (model used).
- Consultation the value, in %, of the relative humidity (input 1 (A1)).
- Consultation the value, in °C, of the ambient temperature (input 2 (A2)).
- Consultation of the value, in Pa, of the VPD (input 3 (A3)).
- Consultation of the 4-20mA current value that is being delivered (output 1).
- Consultation of the 4-20mA current value that is being delivered (output 2).
- Consultation of the 4-20mA current value that is being delivered (output 3).

CONFIGURATION MENU

Sensor parameters configuration menu:

- Number of inputs: 3 (not configurable in this case).
- Type: Wet Bulb or VPD (default). Use the keys  and  to select and enter with the key  to confirm.

IMPORTANT Depending on the type chosen, output 3 will deliver the Wet Bulb or VPD temperature, and in the input 3 consultation menu it will be displayed in °C of Pa, respectively.

Sensor format

Temperature °C sensor format

Parameter	Default value
N. of integers	2
N. of decimals	1
Sign	Yes
Unit	°C
Calibration Point 1	
True value	4 mA (800 mV)
Logical value	-40 °C
Calibration Point 2	
True value	20 mA (4000 mV)
Logical value	+85 °C

Relative Moisture sensor format %HR

Parameter	Default value
N. of integers	3
N. of decimals	0
Sign	No
Unit	% HR
Calibration Point 1	
True value	4 mA (800 mV)
Logical value	0 % HR
Calibration Point 2	
True value	20 mA (4000 mV)
Logical value	+100 % HR

VPD kPa sensor format

Parameter	Default value
N. of integers	1
N. of decimals	2
Sign	No
Unit	kPa
Calibration Point 1	
True value	4 mA (800 mV)
Logical value	0 kPa
Calibration Point 2	
True value	20 mA (4000 mV)
Logical value	8 kPa

The °C, %HR and kPa values that are obtained are converted, by the transmitter itself, to the standard 4-20 mA current (800-4000 mV in the Agrónic format). So, in the controller in question, you have to select the ideal data format according to the tables before each sensor. It is the responsibility of the user to change the data that characterizes said format.

NOTE

If the temperature sensor is used for a precision application (such as antifreeze), you must calibrate it by applying the appropriate tare. By default, it is always recommended to apply a corrective tare on the controller (to correct the possible 4-20 mA output error plus the possible error that the controller's analogue input may apply).

IMPORTANT

In closed environments (such as greenhouses) or poorly ventilated, it is recommended to use the ventilated sensor version (06750010). Otherwise the accuracy of the sensor may be reduced by approximately $\pm 1^{\circ}\text{C}$.

Sistemes Electrònics Progrés, S.A.

Polígon Industrial, C/ de la Coma, 2 | 25243 El Palau d'Anglesola | Lleida | España

Tel. +34 973 32 04 29 | info@progres.es | www.progres.es

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