

WSA

Outdoor sensor for relative humidity and temperature

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
Issue date: 03/27/2024 • A140



» APPLICATION

Duct humidity and temperature sensor in new hinged lid enclosure USE for all HVAC duct applications. Designed for control and monitoring applications.

» TYPES AVAILABLE

Weather protection - outdoor humidity sensor temperature + humidity – active

- WSA VV
- WSA AA

» SECURITY ADVICE – CAUTION



The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

» PRODUCT TESTING AND CERTIFICATION



Declaration of conformity

The declaration of conformity of the products are available on our website
<https://www.thermokon.de/direct/en-gb/categories/wsa>

» NOTES ON DISPOSAL



The crossed-out wheeled bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: www.thermokon.com

» BUILD-UP OF SELF-HEATING BY ELECTRICAL DISSIPATIVE POWER

Sensors with electronic components always have a dissipative power, which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. This dissipative power has to be considered when measuring temperature. In case of a fixed operating voltage ($\pm 0,2$ V) this is normally done by adding or reducing a constant offset value.

Thermokon transducers can be operated with variable operating voltages. The transducers are set at the factory with a reference operating voltage of 24 V =.

At this voltage, the expected measuring error of the output signal will be the least. Other operating voltages, can cause a measurement deviation changing power loss of the sensor electronics.

A recalibration can be carried out directly on the unit or via a software variable (app or bus).

Remark: Occurring draught leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.

» APPLICATION NOTICE FOR HUMIDITY SENSORS

At regular environmental condition, it is recommended to calibrate the sensor annually to check the compliance with the accuracy required in the application. The following conditions can damage the sensor element or lead in long term to loss of the specified accuracy:

- Mechanical stress
- Contamination (e.g. dust / fingerprints)
- Aggressive chemicals
- Ambient conditions (e.g. condensation on measuring element)



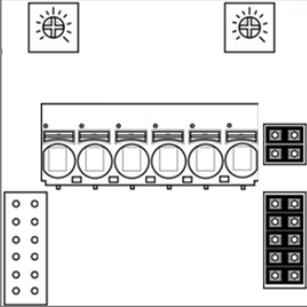
Do not touch the sensor elements!

Re-calibration or exchange of the sensor element are not subject of the general warranty.

» TECHNICAL DATA

Measuring values	temperature, humidity (humidity output configurable)	
Output voltage	VV : 2x 0..10 V or 0.5 V, configurable via Jumper, min. load 10 k Ω	
Output ampere	AA : 2x 4..20 mA, max. load 500 Ω	
Output passive (*optional)	VVS AAS : optional, PT100/PT1000/NI1000/NI1000TK5000/NTC10K... and other sensors on request	
Power supply	VV : 15..24 V = ($\pm 10\%$) or 24 V ~ ($\pm 10\%$) SELV	AA : 15..24 V = ($\pm 10\%$) SELV
Power consumption	VV : typ. 0,4 W (24 V =) 0,8 VA (24 V ~)	AA : typ. 1 W (24 V =)
Measuring range temp.	VV AA adjustable at the transducer: 0..+200 +40..+140 -40..+160 0..+100 °F, default setting: 0..+200 °F	passive depending on used sensor
Measuring range humidity	0..100% rH non-condensing	
Measuring range abs. hum.	adjustable at the transducer: 0..50 0..80 g/m ³ , default setting: 0..50 g/m ³	
Measuring range enthalpy	0..85 KJ/kg	
Measuring range dew point	adjustable at the transducer: +40..+140 0..+200 °F, default setting: +40..+140 °F	
Accuracy temperature	VV AA $\pm 0,3$ K (typ. at 70 °F within default measuring range)	passive typ. $\pm 0,3$ K (typ. at 70 °F), depending on used sensor
Air speed	max. 40 ft./s	
Accuracy humidity	$\pm 2\%$ between 10..90% rH (typ. at 70 °F)	
Enclosure	enclosure USE-S, PC, pure white	
Protection	enclosure IP65 according to EN 60529	sensor head IP30 according to EN 60529
Cable entry	Flextherm M20, for wire max. $\varnothing=0.18..0.35$ in., removable	
Connection electrical	removable plug-in terminal, max. 14AWG	
Pipe	PA6, black, $\varnothing=0.77$ in., length=5.5 10.6 15.75 in.	
Ambient condition	-4..+158 °F, short term condensation	
Delivery contents	wall mounting or mounting to a mast tube	
Notes	additional passive sensor available (type VVS AAS)	

» CONNECTION PLAN AND CONFIGURATION

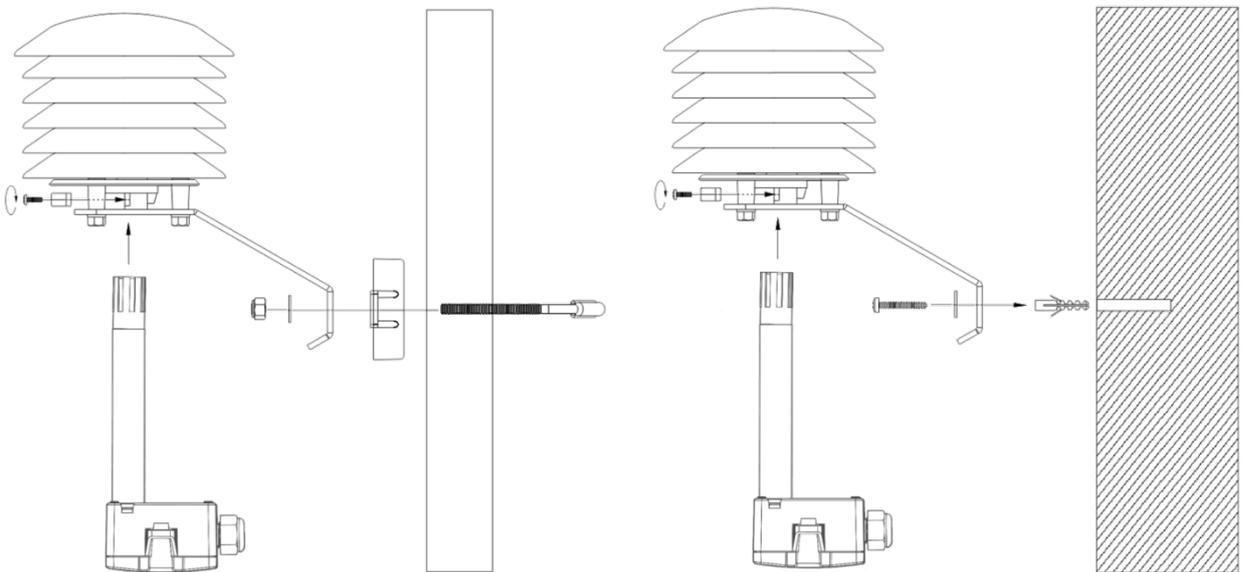
<p>Offset</p> <p>Temperature</p> <p>0 K -6°F +6°F</p>	<p>Terminal assignment</p>  <p>VV, VVS 0..10V 0..5V</p> <p>AA, AAS 4..20mA</p> <p>UB+ GND AO1 AO2 ST+ ST-</p> <p>AOU1: Humidity AOU2: Temperature</p> <p>Clamp ST+ ST- : passive sensor (VVS AAS)</p>	<p>Device configuration</p> <p>Jumper 1-2 (humidity)</p> <p>relative humidity enthalpy absolute humidity dew point</p> <p>Jumper1-5</p> <table border="1"> <tr> <td>1</td> <td>°F</td> <td>°C (additional information below)</td> </tr> <tr> <td>2</td> <td>0..10V</td> <td>0..0.5 V VV, VVS only</td> </tr> <tr> <td>3</td> <td colspan="2"> relative humidity: 0..100% absolute humidity: 0..80 g/m³ enthalpy: 0..85 kJ/kg dew point: 0..+200 °F </td> </tr> <tr> <td>3</td> <td colspan="2"> relative humidity: 0..100% absolute humidity: 0..50 g/m³ enthalpy: 0..85 kJ/kg dew point: +40..+140 °F </td> </tr> <tr> <td>4</td> <td>-40°F..+160°F</td> <td>+40°F..+140°F</td> </tr> <tr> <td>4</td> <td>0°F..+200°F</td> <td>0°F..+100°F</td> </tr> </table> <p>EN datasheet with additional information about °C</p> 	1	°F	°C (additional information below)	2	0..10V	0..0.5 V VV, VVS only	3	relative humidity: 0..100% absolute humidity: 0..80 g/m³ enthalpy: 0..85 kJ/kg dew point: 0..+200 °F		3	relative humidity: 0..100% absolute humidity: 0..50 g/m³ enthalpy: 0..85 kJ/kg dew point: +40..+140 °F		4	-40°F..+160°F	+40°F..+140°F	4	0°F..+200°F	0°F..+100°F
1	°F	°C (additional information below)																		
2	0..10V	0..0.5 V VV, VVS only																		
3	relative humidity: 0..100% absolute humidity: 0..80 g/m³ enthalpy: 0..85 kJ/kg dew point: 0..+200 °F																			
3	relative humidity: 0..100% absolute humidity: 0..50 g/m³ enthalpy: 0..85 kJ/kg dew point: +40..+140 °F																			
4	-40°F..+160°F	+40°F..+140°F																		
4	0°F..+200°F	0°F..+100°F																		

The adjustment of the measuring ranges is made by changing the jumpers in a de-energized state. The output value of the new measuring range is available after 2 seconds. *fig. (Measuring range and offset adjustment, default settings: 0 °F..+200 °F | 0 °F)*

Note (type WSA AA)

When only using the temperature output, the humidity output must always be connected to mass/GND of the analog input module.

» MOUNTING ADVICES



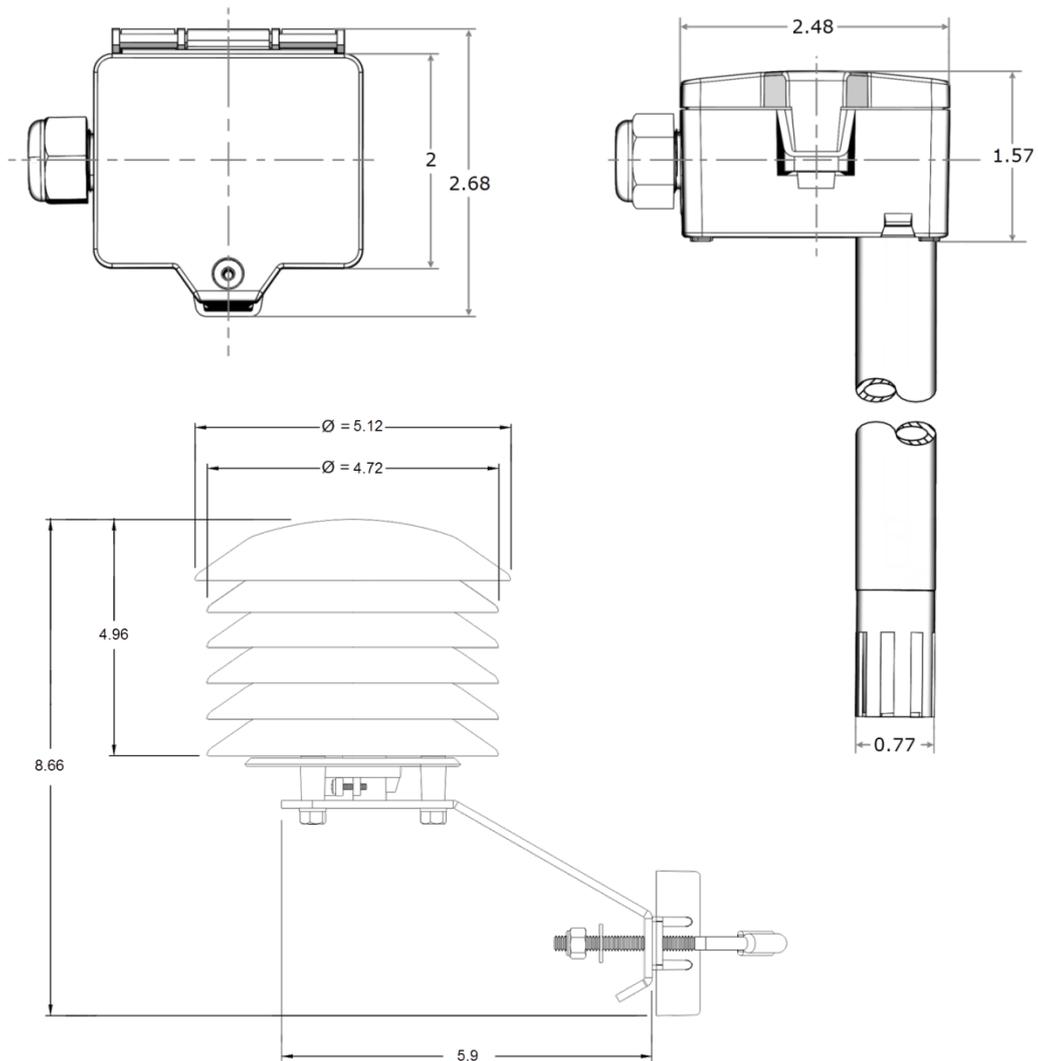
» USE ENCLOSURE WITH UV AND WEATHER RESISTANCE

After some time, outdoor mounted plastics can lose their color and quality. Therefore, all USE housings are made of special white polycarbonate (PC). The light-stable colorants and additives are used to achieve optimum protection of the polymer while maintaining color stability. The titanium dioxide used is specially developed for polycarbonate and offers excellent UV protection through the reflection of the entire light spectrum including the UV component by 340 nm. This effectively counteracts the otherwise occurring photochemical polymer degradation. The colors stay full for a long time without fading. The material is also resistant to cold and frost.

» APPLICATION NOTICE

After a certain time, dirt in the air can collect on the filter and then adversely affect the operation of the sensor. Under normal ambient condition an annual maintenance is recommended. Rinse the filter after cleaning with distilled water and dry it using clean oil-free air or nitrogen. Extremely contaminated filters should be replaced. At extreme ambient conditions, e.g. corrosive gases, the humidity sensor may have to be changed.

» DIMENSIONS (IN.)



» ACCESSORIES (OPTIONAL)

Filter stainless steel, wire mesh (spare part)
 Weather protection for FTK, FTK+, WSA (replacement)
 Sealing insert M20 USE white, 2x $\varnothing=0.28$ in. (for 2 wire; PU 10 pieces)

Item No. 231169
 Item No. 625241
 Item No. 641333