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Novus RHT-WM Transmitter Instruction Manual

Contents

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Novus RHT-WM Transmitter

Product Information: RHT-WM and RHT-DM Transmitter by NOVUS AUTOMATION

The RHT-WM and RHT-DM Transmitter by NOVUS AUTOMATION is a device used for measuring and retransmitting the dew point. The device has been designed to ensure accurate measurements and safe operation. The device complies with safety standards and certifications to ensure that it can be safely used in various industrial environments.

Safety Alerts

- It is important to read the manual fully before installing andoperating the device. The manual contains essential information related to device safety and use. The symbols used in the device and throughout the manual draw the user's attention to important safety information.
- There is a risk of electric shock when handling the device. Additionally, the device uses materials that are sensitive to static charge. It is important to check precautions before handling the device.

Installation

- **Mechanical Installation**

  The device should be installed in a dry and clean area. The device should be mounted on a flat surface using screws or adhesive. The device should not be exposed to direct sunlight or heat sources.
- **Electrical Installation**
    - The device should be connected to a power source using a cable.
    - It is recommended to use a shielded cable for better performance.
    - The device should not be connected to a power source while installing or removing sensors.

Installation Recommendations

- Ensure that the power supply voltage matches the device's specifications
- Ensure that the device is grounded properly
- Ensure that the cable connections are secure and tight

- Ensure that the sensors are installed correctly

Sensor Cautions

When handling the sensors, it is important to avoid touching the sensor's active part. The sensors should be installed in a clean and dry area. Do not install the sensors in an area where they may be exposed to direct sunlight or heat sources. Additionally, the sensors should not be exposed to high humidity or corrosive gases.

Sensor Replacement

If the sensors need to be replaced, follow these steps:

1. Disconnect the device from the power source
2. Remove the sensor cover
3. Remove the sensor from the device
4. Install the new sensor in the device
5. Replace the sensor cover
6. Reconnect the device to the power source

Configuration

The RHT-WM and RHT-DM Transmitter can retransmit the dew point reading. To configure the device to retransmit the dew point, follow these steps:

1. Connect the device to a computer using a USB cable
2. Download and install the NOVUS software
3. Open the software and connect to the device
4. Select "Dew Point" as the output variable
5. Configure other settings as required
6. Save the settings to the device

Specifications

Measures Accuracy and Sensor Operating Limits

- **Dew Point Measurement Range**: -60°C to +60°C (-76°F to +140°F)
- **Accuracy:** ±2°C (3.6°F)
- **Response Time:** T63 = 10 seconds (for air velocity > 1m/s)
- **Operating Temperature Range:** -40°C to +60°C (-40°F to +140°F)
- **Operating Humidity Range:** 0 to 100% RH (non-condensing)

Certifications

The device has been certified for use in various industrial environments. The certifications include:

- CE

- FCC
- RoHS

Warranty

The RHT-WM and RHT-DM Transmitter comes with a warranty that covers defects in materials and workmanship for a period of one year from the date of purchase. The warranty does not cover damage caused by misuse or improper installation.

SAFETY ALERTS

- The symbols below are used in the device and throughout this manual to draw the user's attention to essential information related to device safety and use.

CAUTION	CAUTION OR HAZARD	ATTENTION
Read the manual fully before installing and operating the device.	Risk of electric shock.	Material sensitive to static charge. Check precautions before handling.

- All safety recommendations appearing in this manual must be followed to ensure personal safety and prevent damage to the instrument or system.
- If the instrument is used in a manner other than that specified in this manual, the device's safety protections may not be effective.

PRESENTATION

- RHT-WM and RHT-DM transmitters feature highly accurate and stable sensors for measuring relative humidity and temperature. The measured values are converted into 4 to 20 mA output signals linearly related to their readings.
- The microprocessor-based circuit can be configured with the TxConfig communication interface and Windows software. It is possible to configure the measurement and humidity transmission between Relative Humidity and Dew Point.

INSTALLATION

MECHANICAL INSTALLATION

- The RHT-DM (Duct Mount) model must be attached with a flange. The flange is attached to the duct wall. After this, the transmitter probe must be inserted into the flange center hole and then fixed. Figure 1 shows the dimensions and drilling of the polyamide 6.6 flange:
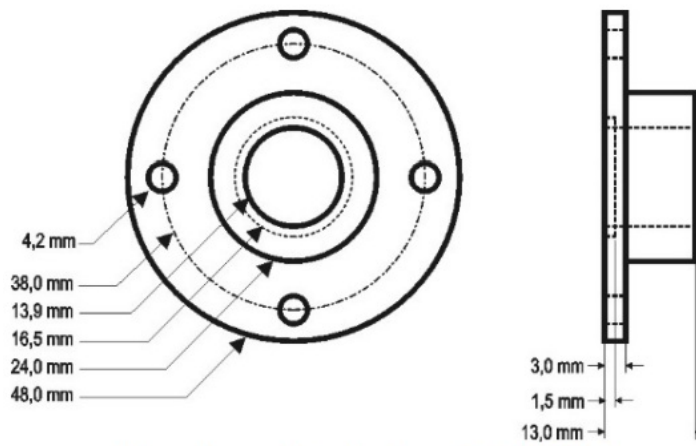
Figure 1 – Mounting flange for **RHT-DM**

4,2 mm
38,0 mm
13,9 mm
16,5 mm
24,0 mm
48,0 mm

3,0 mm
1,5 mm
13,0 mm

- The probe is made of stainless steel, with lengths of 150 mm, 250 mm, or 400 mm:
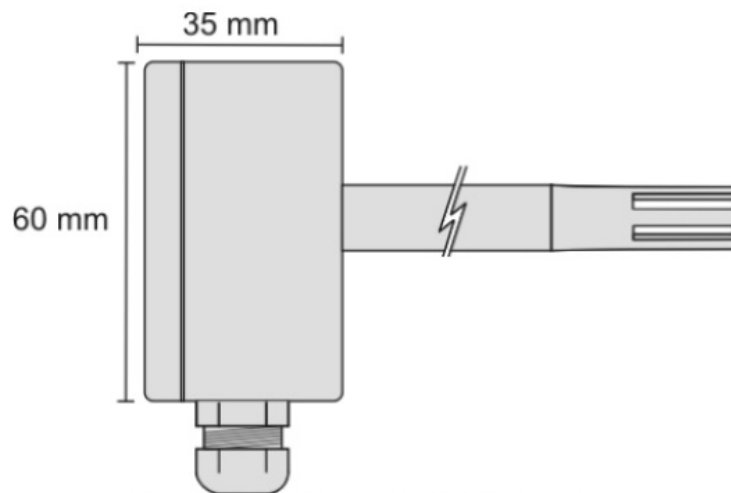

35 mm

60 mm

Figure 2 – Model **RHT-DM** dimensions

- The RHT-WM (Wall Mount) model must be attached to the wall. By removing the transmitter cover, you can access the two fixing holes and the connector, as shown in Figure 3. To ensure the specified accuracy and protection degree, you must mount the transmitter with the sensor capsule facing down.
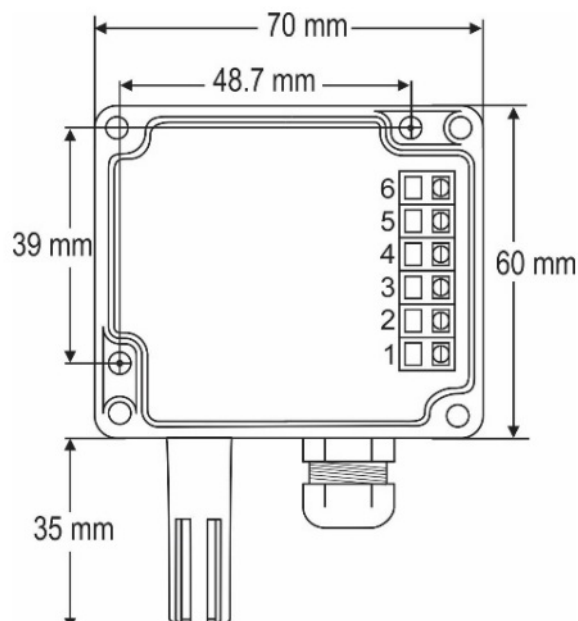

70 mm

48.7 mm

39 mm

60 mm

35 mm

Figure 3 – **RHT-WM** fixing holes and housing dimensions

ELECTRICAL INSTALLATION

- The transmitter has a 4-20 mA current output.
- Variables can be monitored together or separately. Combinations of mobile jumpers J4 and J5 inside the transmitter housing define how variables will be used. The jumpers also define the transmitter terminals with available output signals.

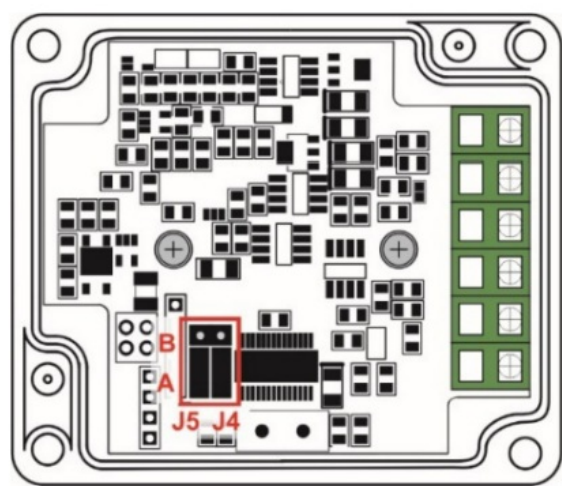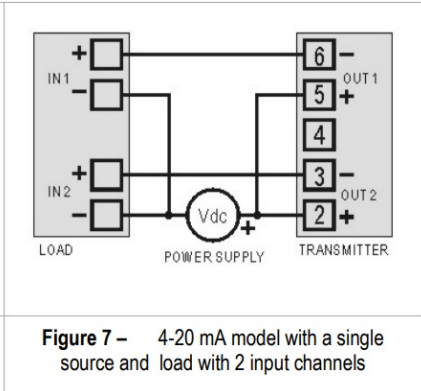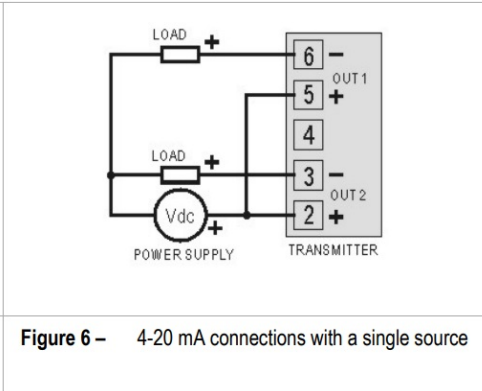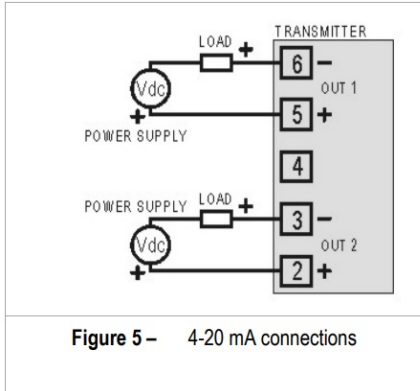| Jumper J5	Jumper J4	OUT1	OUT2
Position **A**	Position **A**	**Temperature**	**Humidity**
Position **A**	Position **B**	**Temperature**	Off
Position **B**	Position **A**	**Humidity**	Off
Position **B**	Position **B**	**Humidity**	**Temperature**

Figure 4 –   Location of jumpers J4 and J5 inside the transmitter

- Figures below shows the required electrical connections.

  Note that loop OUT1 must always be powered!

Figure 5 –   4-20 mA connections

Figure 6 –   4-20 mA connections with a single source

Figure 7 –   4-20 mA model with a single source and load with 2 input channels

- In the figures above, LOAD represents the measuring instrument of the output signal (indicator, controller, register, etc.).
- The connection wires go inside the transmitter trough to the cable gland mounted in the transmitter housing.

1. **INSTALLATION RECOMMENDATIONS**

   - Electronic and analog signal conductors should run through the plant separately from the output and supply conductors. If possible, in grounded conduits.
   - The power supply for electronic instruments must come from a network suitable for instrumentation.
   - In controlling and monitoring applications, you must consider what can happen when any part of the system fails.
   - It is recommended to use RC filters (47 Ω and 100 nF, serial) in inductor charges (contactors, solenoids, etc.).

2. **SENSOR CAUTIONS**

   The humidity sensor calibration may change in case it is exposed to contaminating vapors or to high humidity and temperature conditions for extended periods. To speed up the calibration restoration, proceed as described below:

   - Remove the sensor from the capsule.
   - Wash it with deionized water in case there are solid particles on it.
   - For 24 hours, place it within an 80 °C (± 10 °C) oven.
   - For 48 hours, place it in a place with temperature between 20 and 30 °C (68 and 86 °F) and humidity over 75 % RH.
   - Place the sensor back in the capsule.

3. **SENSOR REPLACEMENT**

   In case of damage, the humidity and temperature sensor may need to be replaced. To perform this procedure, follow the steps below:

   - **Step 1:** Disconnect the transmitter from the power supply. Locate the sensor protective tip.
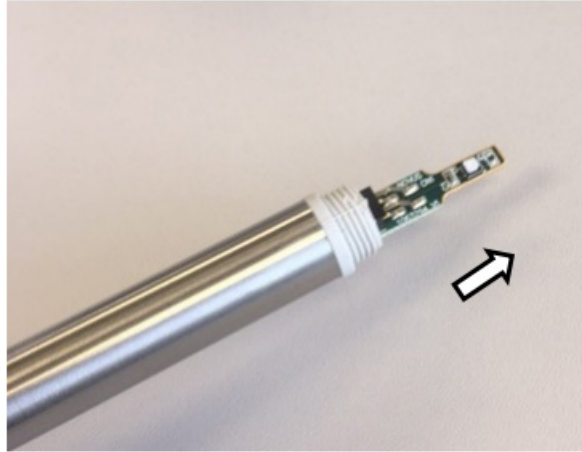   This example shows the sensor replacement of an RHT-DM transmitter. In it, the sensor is located at the end of the probe.
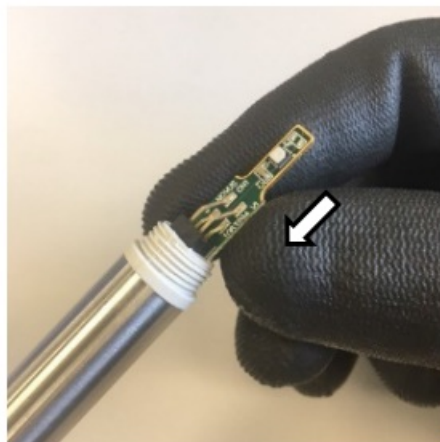

   - **Step 2:** Remove the tip by turning it counterclockwise

   - **Step 3:** Without the tip, the sensor will be exposed. Remove it by pulling it forward to disconnect it.

- **Step 4:** Connect the new sensor to the probe tip connector using clean antistatic gloves or other measures to avoid static discharges. Avoid unnecessary handling.

	Hold the sensor by the connector or its surroundings. Avoid handling the sensor by the thinner end. Do not touch the sensor.
	For this procedure, it is recommended to use clean antistatic gloves.

- **Step 5:** Place the protection tip again and turn it clockwise to secure it to the device.
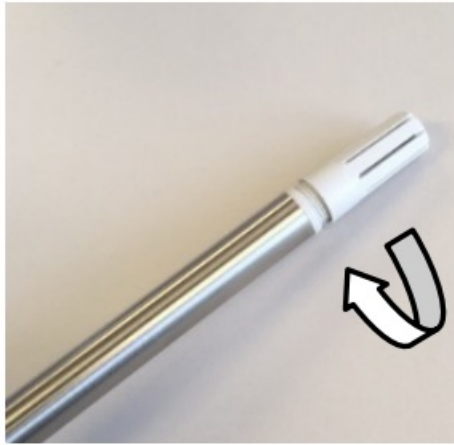
CONFIGURATION

- If the default configuration or the ordered configuration satisfies the application, then no further configuration is necessary, and the transmitter is ready to be used. If a new setting is desired, this can be accomplished by the TxConfig and sent to the transmitter through the TxConfig USB interface.
- The TxConfig interface and software compose the Transmitter Configuration Kit, with can be purchased separately from the manufacturer or one of its distributors. The software can be updated for free on NOVUS website. To install it, run the Tx_setup.exe and follow the instructions.
- The TxConfig interface connects the transmitter to the PC, as shown in figure below:
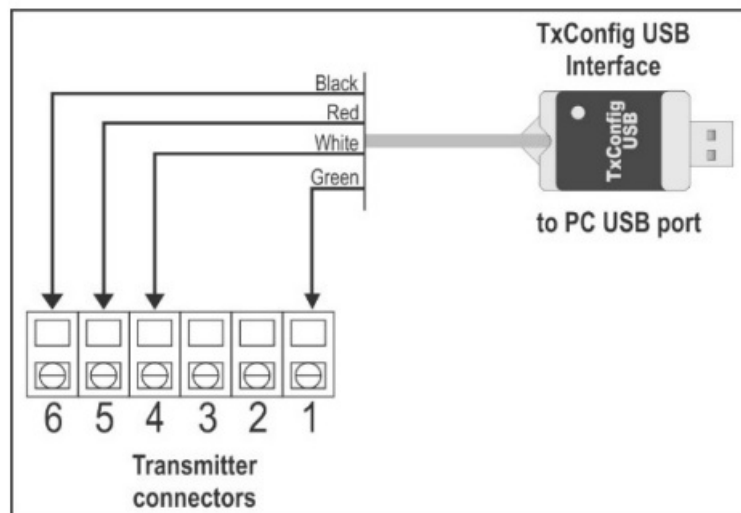

Figure 8 –   TxConfig Interface USB connections

- Once the connection is accomplished, you must run the TxConfig software and, if necessary, use the Help topic to arrange the transmitter configuration. Figure below shows the TxConfig software main screen:
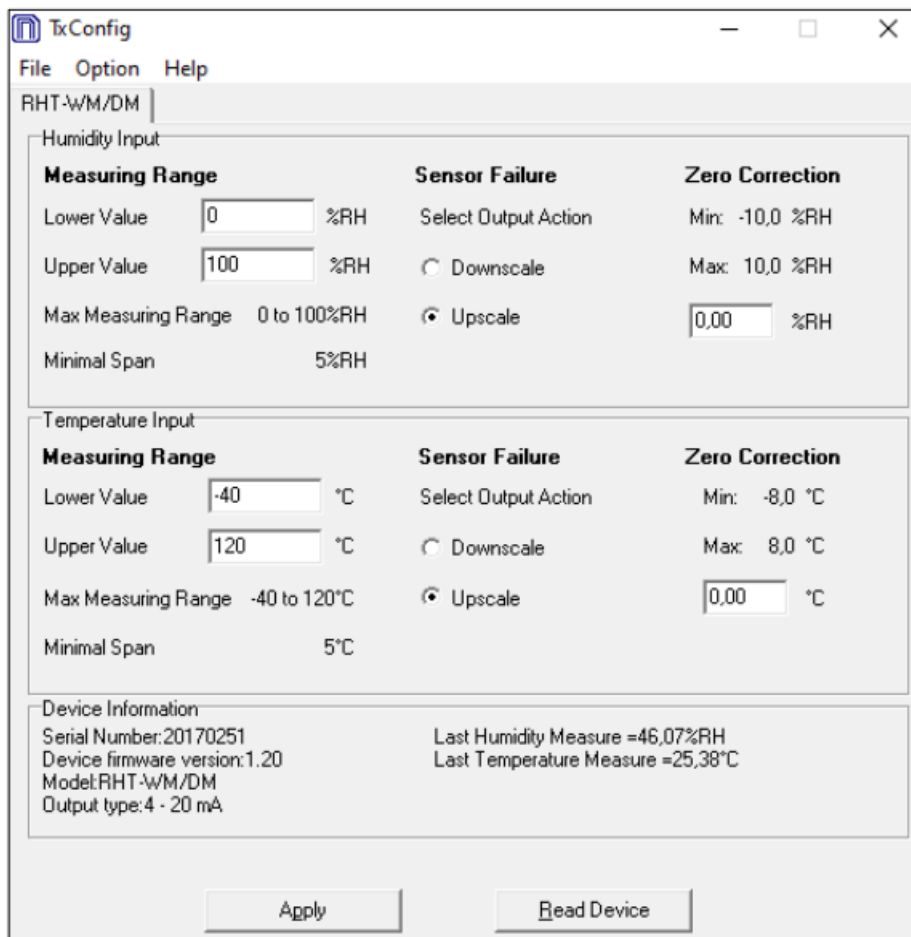
Figure 9 – **TxConfig** software main window

- The fields in the screen mean:
    1. Measuring Range: Define the transmitter humidity and temperature measurement ranges, indicating a Lower Limit value and an Upper Limit value.
        - The defined range cannot exceed the Sensor Measuring shown in this same field, and cannot establish a range with a span less than the Minimum Range indicated below in this same field.
        - When the Lower Limit is set to a value higher than the Upper Limit, the output current has a decreasing behavior (20 ~ 4 mA).
    2. Sensor Failure: Establish the transmitter output behavior in the presence of a sensor fail. When Minimum is selected, the output assumes its minimum value (4 mA) (down-scale). When Maximum is selected, it assumes its maximum value (20 mA) (up-scale).
    3. Zero Correction: Correct, in the output value, small measurement errors presented by the transmitter.
    4. Device Information: This field contains data that identifies the transmitter and is important in any queries to the manufacturer.
    5. Read Device: When selected, allows you to read the configuration present on the connected transmitter.
    6. Apply: When pressed, allows you to send the configuration to the connected transmitter.
        Note: The factory default configuration is (unless otherwise specified or ordered):
        - Measuring ranges: 0 to 100 °C and 0 to 100 % RH.
        - Correction zero: 0 °C.
        - Upscale when sensor fails.
- It is important to notice that the transmitter accuracy is always based on the total span of the used sensor, even if a narrower range is configured.
    Example:

The humidity sensor has a maximum range of 0 to 100 % RH and an accuracy of 3 % at 25 ° C, as shown in Figure 11. We can have an error of up to 3 % RH in any adopted range.

- This error is even in a wide range as the maximum (0 to 100 % RH) or in a narrower range, such as 20 to 80 % RH.
- A serial port configuration error may occur when other software uses the same serial port. Before using it, you must terminate all software that uses the serial port specified for TxConfig.

RETRANSMITTING THE DEW POINT
To use the RHT and transmit the dew point instead of relative humidity, you must follow the following steps:

- Connect the device to the TxConfig interface and run the software.
- The software will recognize the RHT model, read its configuration and make it available to the user.
- In the "Options" menu, enter "Humidity Reading Type" (only available when an RHT model is detected) and select the "Dew Point" option. At this point, the values of the scales will be converted to the dew point unit, ie degrees (Celsius or Fahrenheit, as selected).
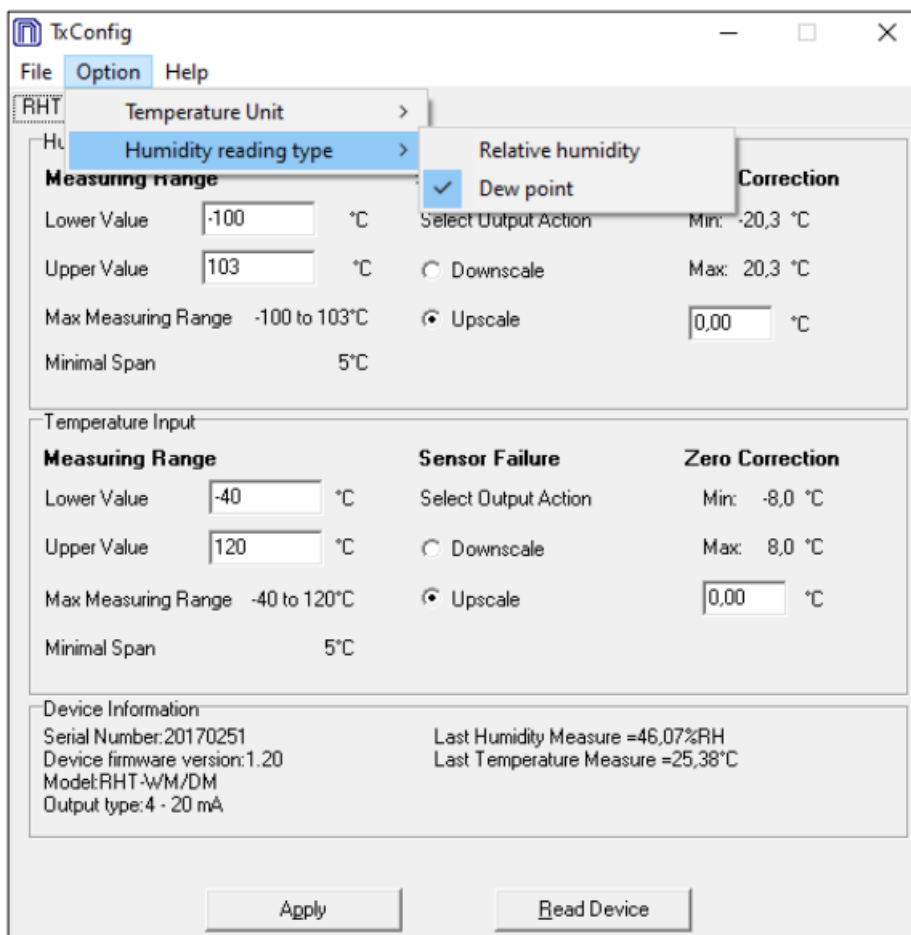- Proceed with the configuration and send it to the device via the "Apply" button.

Figure 10 – Dew point

- If the "Humidity Reading Type" option does not appear even after the RHT transmitter is correctly detected, the TxConfig software version is probably old and does not support this feature. In this case, download and update the latest version.

SPECIFICATIONS

FEATURES	RHT-DM / RHT-WM
Humidity measurement	**Total accuracy**: See **Figure 11**. **Measurement range**: Configurable between 0 and 100 % RH or -100 and 103 °C (-148 to 217.4) for dew point. **Response time (1/e (63 %))**: 8 seconds @ 25 °C (is slow moving air 1 m/s).
Sensor tempe rature measurement	**Total accuracy**: See **Figure 11**. **Total accuracy**: Configurable between -40 and 120 °C (-40 to 248 °F). **Response time (1/e (63 %))**: Up to 30 s (is slow moving air 1 m/s).
Transmitter ope rating temperature	Operating temperature: -10 to 65 °C (14 to 149 °F), 0 to 95 % RH. Storage temperature: -20 to 80 °C (-4 to 176 °F).
Power supply	12 Vdc to 30 Vdc.
Sensor reading range	< 1.5 seconds
Outputs	4-20 mA or 20-4 mA current, 2-wire loop power supply.
Output Load (RL)	RL (Ohms max.) = (Vdc – 12) / 0.02 let: Vdc = Power supply in Volts.
OUT1 output resolution	0.006 mA (4-20 mA)
OUT2 output resolution	0.022 mA (4-20 mA)
Isolation between loops	4-20 mA outputs are isolated from each other.

Provides protection against power supply p olarity inversion	Yes
Protection	**Electronic circuit case:** IP65. **Sensor capsule**: IP40.
Cable entrance	Cord grip PG7.
Operating limits	**Sensor and Probe (RHT-DM)**: See **Figure 11**.

IMPORTANT
The transmitter sensor may be damaged or lose calibration if it is exposed to aggressive atmospheres with high concentrations as Chloride Acid, Nitride Acid, Sulphuric Acid and Ammonia. Acetone, Ethanol and Propylene Glycol may cause reversible measurement errors.

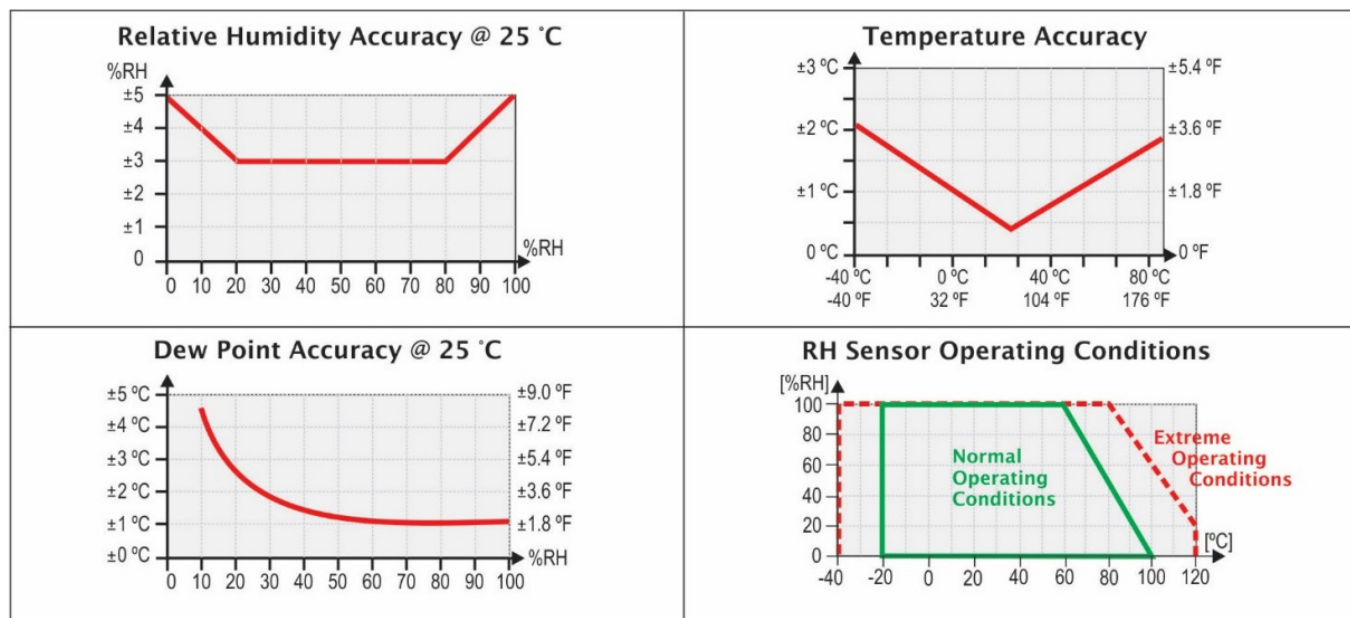**MEASURES ACCURACY AND SENSOR OPERATING LIMITS**

Figure 11 – Humidity and temperature accuracies

CERTIFICATIONS

CE Mark
This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

WARRANTY

Warranty conditions are available on our web site **www.novusautomation.com/warranty**.

Documents / Resources

Novus RHT-WM Transmitter [pdf] Instruction Manual
RHT-WM, RHT-DM, Transmitter, RHT-WM Transmitter

References

- **Warranty - Company - NOVUS Automation Inc.**