شرکت توسعه نوآوران پازیریک

TOPAZ

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Temperature and Humidity sensor

Telephone sales advice and orders

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Real time Temperature and Humidity sensor

"Real-Time Temperature and Humidity Sensor for Accurate Environmental Monitoring"

GENERAL SPECIFICATIONS

- Industrial-Grade Precision: ±2% RH, ±0.2°C
- Sensor Probe Operating Range:
  - Temperature: -40°C to +125°C
  - Humidity: 0% to 100% RH
- Processor/Wireless Module Housing:
  - Operating Temperature: -40°C to +60°C
- Housing Specifications:
  - IP65-rated with options for wall-mount or magnetic mounting
- Wireless Range:
  - Up to 50 meters (line-of-sight) with an integrated onboard antenna
  - Up to 2 kilometers in open areas
- Mesh Network Support: Enables simultaneous operation of multiple sensors and repeaters
- High Update Rate: Configurable between 100 and 500 milliseconds

In Short

Topaz temperature and humidity sensors are designed to operate efficiently across a wide temperature range of -40°C to +125°C and a humidity range of 0% to 100% RH. These sensors wirelessly transmit real-time temperature and humidity data from the sampling point to a receiver, which integrates seamlessly with inverters and PLCs via the industry-standard 4–20 mA protocol.

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This product has two parts: sensor and transmitter, which are connected via a wireless network.

(1)- The sensor part includes a temperature and humidity sensor and display, 220 VAC power supply and a wireless network. (Figure 1)

(2)- The transducer part includes a wireless network (for communication with the sensor part), 24 VDC power supply and two 4-20mA outputs for scaled temperature (0-120 ℃) and humidity (0-100%) as well as Modbus RTU for temperature and humidity (Figure 2)

Figure 1: The sensor part

Figure 2: The transducer part

Applications of Temperature and Humidity Sensors

- Industrial Automation: Monitoring and controlling environmental conditions in manufacturing processes.
- HVAC Systems: Ensuring optimal climate control in residential, commercial, and industrial buildings.
- Agriculture: Managing greenhouse climates and crop storage facilities.
- Pharmaceuticals: Maintaining regulated environments for drug manufacturing and storage.
- Food and Beverage Industry: Monitoring storage and production conditions to ensure quality and compliance.
- Data Centers: Protecting sensitive equipment by tracking temperature and humidity levels.
- Cold Chain Logistics: Ensuring consistent temperature and humidity during transportation and storage.
- Energy Management: Monitoring environmental conditions in power plants and renewable energy systems.
- Medical Equipment: Maintaining optimal environmental conditions in hospitals and labs.
- IoT Integration: Enabling real-time monitoring and data analysis in smart systems.

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TECHNICAL SPECIFICATIONS FOR THE WIRELESS TEMPERATURE TRANSDUCER SIDE	
Temperature output	0 °C~ 120 °C scale to 4 ~ 20mA
Humidity output	0 to 100 %RH scale to 4 ~ 20mA
Install Method	Din Rail
Protection	Ip65
DC power supply (default)	10-30 v DC

TECHNICAL SPECIFICATIONS FOR SENSOR SIDE	
Temperature Range	0 °C ~ 120 °C
Measuring Type Magnetic	0 ~ 100 %RH
Temperature Accuracy	Typical ±0.5°C (please see figure 4)
Humidity Accuracy	Typical ±3 %RH (please see figure 3)
repeatability	±0.1%
Transmit Distance	Up to 50 meters line-of-sight with an integrated onboard antenna, and up to 2 kilometers in open areas
Install Method	Din Rail
Protection	Ip10
DC power supply (default)	220AC

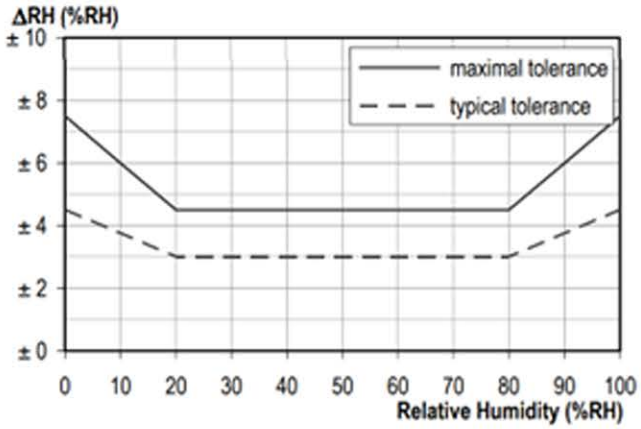


Figure 3 Typical and maximal tolerance at 25°C for relative humidity.

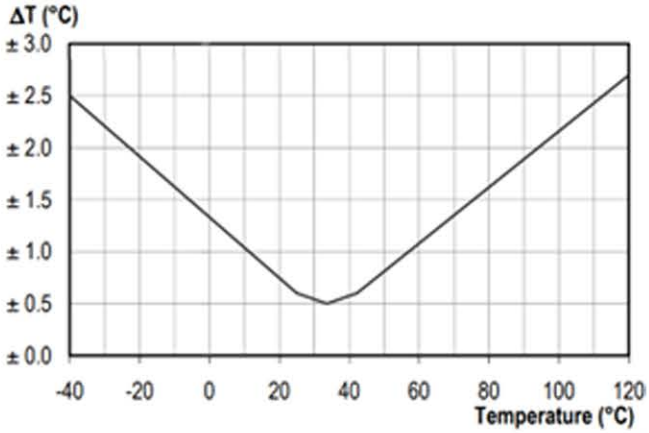
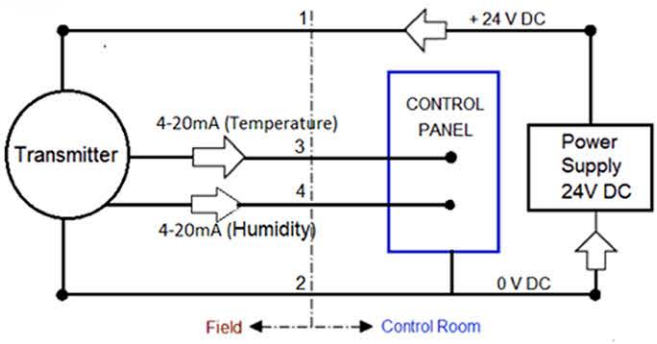


Figure 4 Maximal tolerance for temperature sensor in °C.

Wiring table for wireless temperature and Humidity receiver

signal	Description
1	24 V DC (in put signal)
2	0 V DC (in put signal)
3	0 °C~ 120 °C scale to 4 ~ 20mA
4	0 to 100 %RH scale to 4 ~ 20mA



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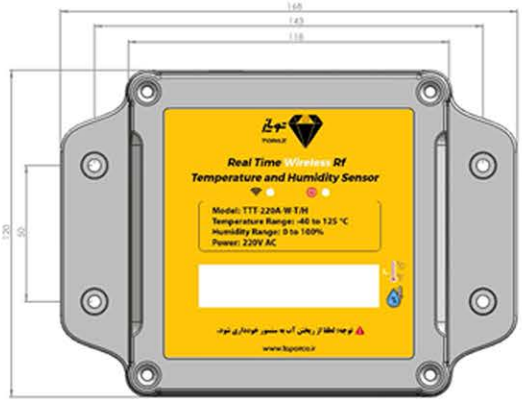
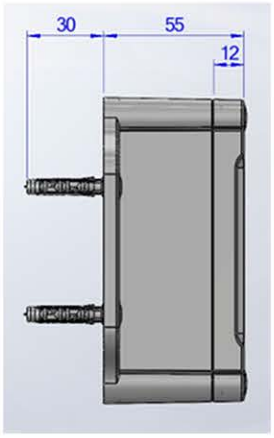
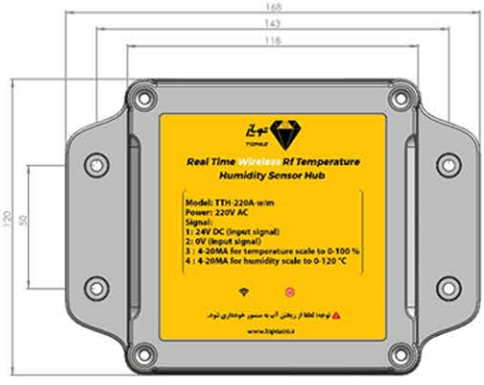
Sensor section dimensions



Transducer section dimensions





INSTALLATION GUIDE

(1) Avoid pouring water directly on the sensor or transducer.

(2) Do not expose the sensor or transducer body to direct heat.

(3) Follow the wiring guide during installation, and ensure all connections are made correctly according to the provided instructions.

(4) The wireless system of this device is designed for line-of-sight communication.

- If objects are placed between the sensor and transducer, the effective wireless range may be reduced.
- To address signal strength issues, consider using a repeater or models with an external antenna.

(5) For the bus mode model, always use twisted pair wires to transmit transducer information.

PRODUCT CODE

T:TOPAZ **T:TRANSMETTER** **T:TRASDUSER** **24D:24VDC** **W:WIRELESS** **1/1/2:RTD/RTD/TC**

Features of transmitter	Feature code
RTD	1
Thermocouple	2
ANALOG (4-20mA)	3
ANALOG (0-20mA)	4
ANALOG (0-10V)	5
ANALOG (0-5V)	6
ANALOG (0-5A)	7
ANALOG (0-1A)	8
3*ANALOG (0-5A)	10
3*ANALOG (0-1A)	11
ANALOG (0-400v)	12
3*ANALOG (0-400v)	13
4*DIGITAL INPUT (24V)	14
4*DIGITAL INPUT (5V)	15
4*DIGITAL OUTPUT (RELAY)	16
4*DIGITAL OUTPUT (Transistor)	17
INCREAMENTAL ENCODER (Line Driver)	18
INCREAMENTAL ENCODER (0-24V)	19
INCREAMENTAL ENCODER (0-5V)	20
ABSOLUTE ENCODER (SSI)	21
ABSOLUTE ENCODER (4-12BIT)	22
ABSOLUTE ENCODER (PWM)	23
Monitor	24

Sample Coding:

TTT-24D-WL-1/1/1

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Table for calculating temperature and humidity based on outlet Current(mA)

Current(mA) for out1(Temperature)	Real Temperature
x	T=(7.5*x)-30
4	0
5	7.5
6	15
7	22.5
8	30
9	37.5
10	45
11	52.5
12	60
13	67.5
14	75
15	82.5
16	90
17	97.5
18	105
19	112.5
20	120

Current(mA) for out2(Humidity)	Real Humidity
y	H=(6.25*y)-25
4	0
5	6.25
6	12.5
7	18.75
8	25
9	31.25
10	37.5
11	43.75
12	50
13	56.25
14	62.5
15	68.75
16	75
17	81.25
18	87.5
19	93.75
20	100