



THM50X

Temperature and Humidity Transmitter

www.eyc-tech.com

THM503
Remote type



Features

- Aluminum alloy casing for harsh environments.
- Direct key operation for temperature/humidity adjustment, RS-485 settings, and unit switching.
- High-accuracy temperature and humidity measurement with fast response and quick recovery after condensation.
- RS-485 communication for configuring measurement units, ranges, output type, and station address.
- DATA LOG function capable of recording up to 65,535 entries for analysis.
- Measures extremely low humidity, down to 0.1% RH.
- Multiple physical measurement units switchable: %RH, °C, mbar, g/kg, g/m³, kJ/kg, AH%.

*AH% = the actual amount of water vapor in the air, defined with the saturated value at 25 °C as the reference. That is, the maximum water content at 25 °C is taken as 100%, and AH% represents the percentage calculated based on the corresponding absolute humidity (AH).

Temperature	Actual Absolute Humidity (Measured)	Absolute Humidity Percentage (AH%)
100°C	4.6 g/m³	(4.6 / 23) x 100% = 20%
100°C	1.15 g/m³	(1.15 / 23) x 100% = 5%

*Note: The saturated humidity at 25 °C is 23.03 g/m³.

Applications

Semiconductor / Electronics / Chemical industry / Pharmaceutical / Steel industry / Biotechnology industry / Industrial process monitoring / Air conditioning / Cleanrooms / Laboratories / Weather stations / Hospitals / Buildings / Dryers / Factories / Storage rooms / Environmental ventilation control / Environmental test chambers / Greenhouses

Specification

Input

Signal type	Capacitive humidity sensor & Pt100 Class A
Measuring range	Wall type : -40°C ... +80°C
	Remote type : -40°C ... +150°C
	Humidity : 0 ... 100%RH

Output

Output	4 ... 20 mA / 0 ... 10 V / RS-485 (Optional: NPN / PNP)
Signal connection	3-wire
Warm-up time	< 30 sec
Response time (at 25°C)	t ₉₀ ≤ 20 sec (S.S. Metal grid filter with mesh) t ₉₀ ≤ 30 sec (Sintered filter)
Load resistance	Current output : ≤ 500 Ω Voltage output : ≥ 100 KΩ
Output calibration	Software / Button (Adjustment range)

Accuracy

Temperature	±0.1°C ± 0.002°C t_{actual}
Humidity (0 ... 90%)	Nonlinear error : ±1%RH Hysteresis error : ±0.8%RH Repeatability error : ±0.4%RH
Humidity (90 ... 100%)	±2%RH
Temp. influence	0.05%RH/°C

Communication

Comm. Interface & Protocol	RS-485 Modbus RTU
RS-485 Baud Rate	9600, 19200, 38400, 57600, 115200 bps

Electrical

Power supply	DC 24 V ± 10%
Current consumption	DC 24 V : 60 mA
Electrical connection	M12 8P connector

Measuring Range List

Physical quantity	THM501 Wall type	THM503 Remote type
Temperature(T)	-40°C ... +80°C	-40°C ... +150°C
Humidity(H)	0 ... 100%RH	
Dew point(D)	-40 dp°C ... +60 dp°C	
Frost point(F)	-40 ... 0 fp°C	
Wet-bulb Temp.(W)	0 ... 100°C	
Vapor pressure(E)	0 ... 1100 mbar	
Mixture ratio(R)	0 ... 999 g/kg	
Absolute humidity(A)	0 ... 700 g/m³	
Specific enthalpy(S)	0 ... 2800 kJ/kg	

Environmental

Measuring medium	Air
Temp. operating (Housing)	-20 ... +60°C
Humidity operating (Housing)	0 ... 90% (Non-condensing)
Storage temperature	-20 ... +60°C
Probe pressure resistance	4 bar
Display unit	°C / %RH / dp°C / AH%

Installation

Installation	Wall / Remote
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Display

Display readout	Temperature / Humidity (initial value setting), up to four displays.
Decimal point	Button
Sampling time	1 cycle/sec
Unit selection	Temperature(T) / Humidity(H) / Dew Point(D) / Frost Point(F) / Wet-bulb Temperature(W) / Water Vapor Pressure (E) / Mixing Ratio(R)
	Absolute Humidity(A) / Specific Humidity(S) / Absolute Humidity(A%)
Response time	0 ... 100

Certification

Certification	CE
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Protection

IP rating	IP65 (Body)
Electrical protection	■ Reverse polarity ■ Over-voltage

Material

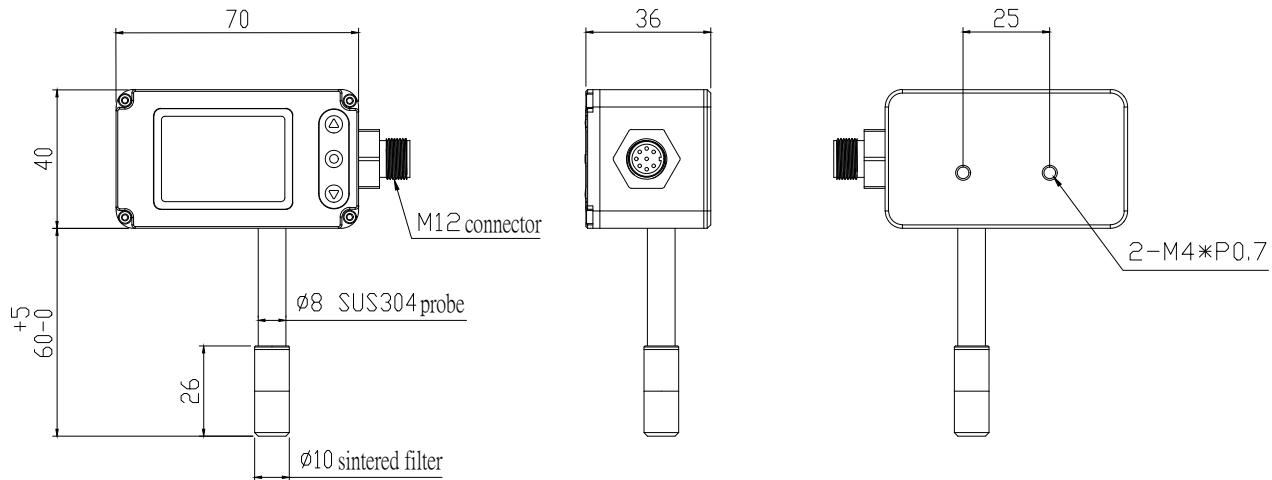
Housing	Aluminum alloy
Probe	Stainless steel
Remote probe cable	TEFLON
Weight	THM501: 170 g, THM503: 370 g

*Measurement ranges are converted based on Temp. and humidity, with values provided for reference only.

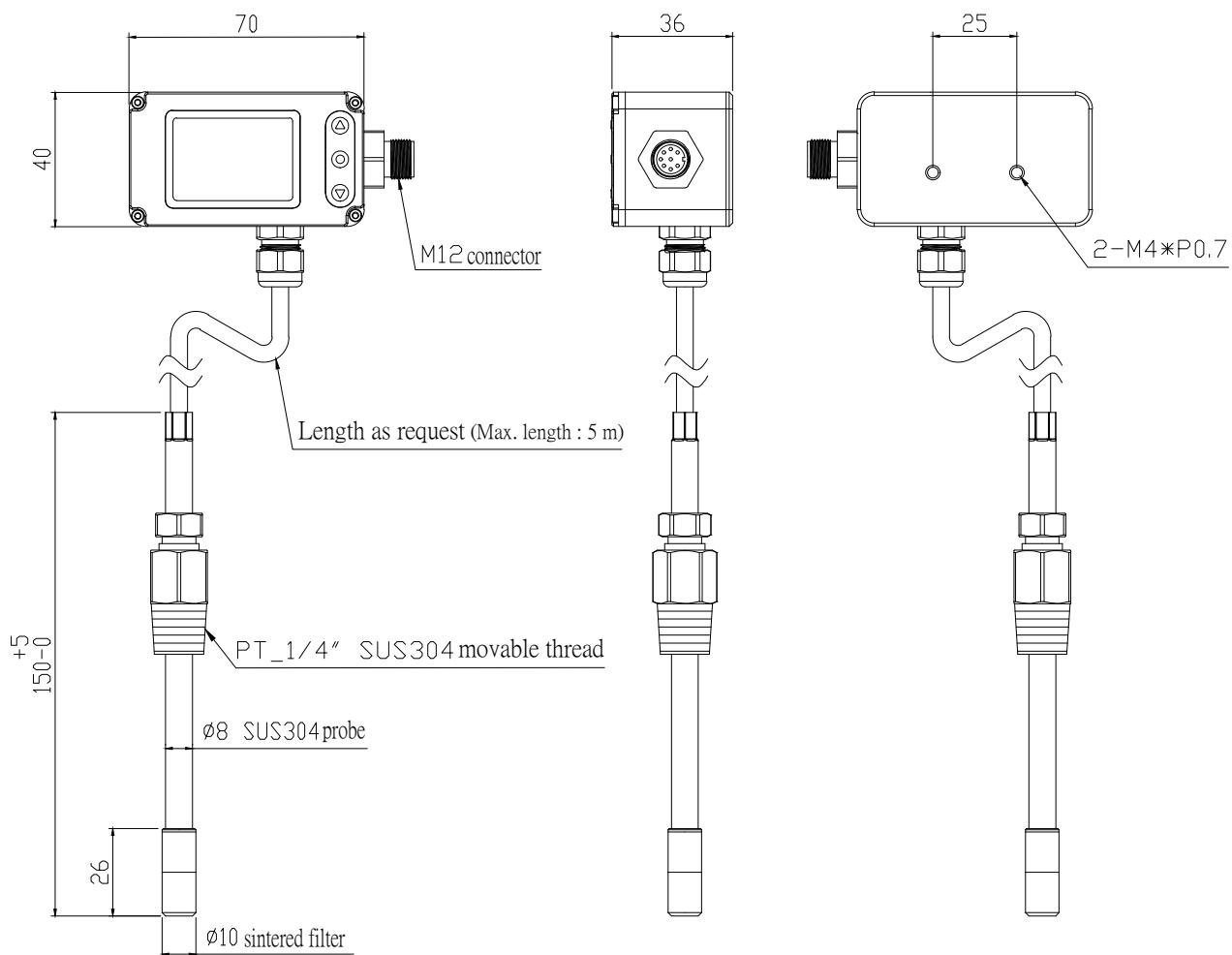
*The measurement range is defined at the standard condition (1013 mbar, 25°C).

| Dimension |

■ THM501 (Wall)



■ THM503 (Remote)



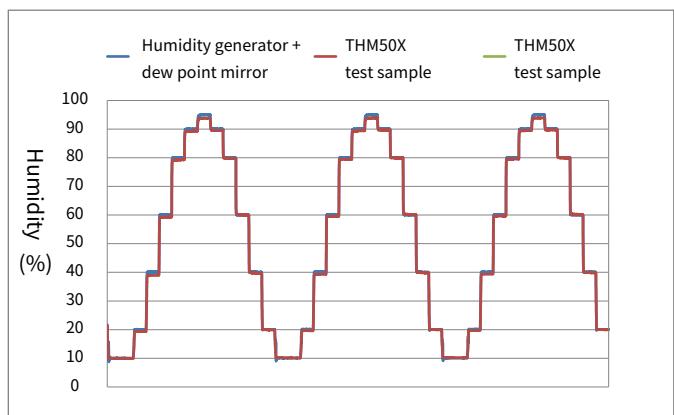
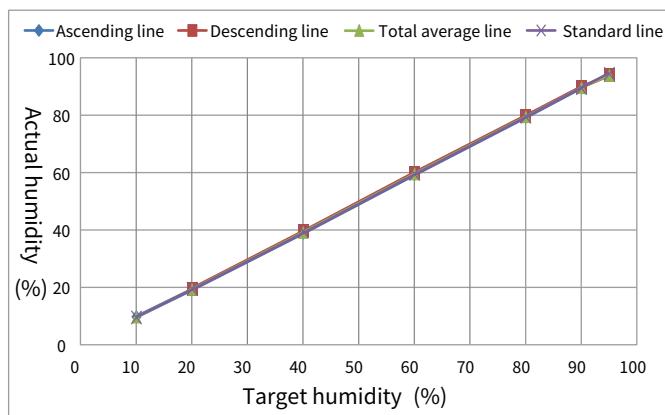
| Calibration System |



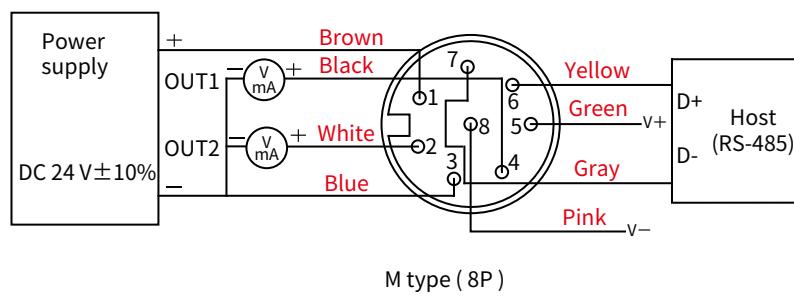
- System Facility
- Humidity generator
- Dew point mirror
- Laboratory level facility to produce products, and automatic QC inspection sheet printing and factory report

| 3-cycle curve |

※ According to IEC 61298 and ISO 17025 standard to measuring 3-cycle curve.
As the charts result, accuracy of test sample match with accuracy chart of humidity generator + dew point mirror



| Analog+RS-485 Diagram |



*Please make sure the product and the device which connect with RS-485 are on common ground, avoid damaged product.

| Ordering Guide |

Product ordering number	Specification
THM501-DS	Wall type / CH1 : T, 0 ... 50°C, 4 ... 20 mA / CH2 : H, 0 ... 100%RH, 4 ... 20 mA+RS-485 / 4 Channel display / M12 8P / Sintered filter(Ø10)
THM503-DS2	Remote type / CH1 : T, 0 ... 100°C, 4 ... 20 mA / CH2 : H, 0 ... 100%RH, 4 ... 20 mA+RS-485 / 4 Channel display / M12 8P / Sintered filter(Ø10) / TEFLON 2 Meters

*Supports NPN and PNP outputs. For additional requirements, please specify option W and note the details.

| Additional Option Test Report |

For more detailed information please contact us.

■ ILAC / TAF

YUDEN-TECH CO.,LTD. Calibration Laboratory - (ILAC / TAF) Test report.

(TAF accreditation : 3032, complying with ISO / IEC 17025) TAF has mutual recognition arrangement with ILAC MRA

Project	Measurand level or range
Hygrometer	Temperature : 0°C ... 69.5°C
	Humidity : 10% ... 95%

Project	Measurand level or range
Dew point transmitter	≥ -80 dp°C ... ≤ 60 dp°C

■ ISO 9001

Project	Measurand level or range
Temperature and Humidity	Temperature : 0°C ... 200°C
	Humidity : 0.1% ... 99.8%

Project	Measurand level or range
Dew point	≥ -95 dp°C ... ≤ 60 dp°C