SensorsX

SX-THKD Series

Intelligent Humidity and Temperature Transmitter



IP67	Multiple analog outputs	−40 to +85 °C
Ingress protection	Current, voltage, or RTD	Ambient operation

■ OVERVIEW

The SX-THKD Series is available in humidity-only, temperature-only, and combined humidity and temperature configurations for industrial monitoring and control. Depending on the selected configuration, it also calculates dew point, absolute humidity and mixing ratio. The IP67-rated transmitter is available in wall-mount, duct-mount and remote-probe versions. Output options include 4–20 mA current signals, 0–10 V or 0–5 V voltage signals, and passive Pt100 or Pt1000 temperature outputs. Versions with two current outputs provide galvanic isolation between the channels. An optional backlit LCD displays three parameter values simultaneously. DIP switches support preset temperature-range selection and channel assignment, while a PC configuration tool supports parameter settings and one- or two-point temperature and humidity calibration.



■ FEATURES

- ◆ IP67 compact enclosure with stainless-steel probe
- ◆ Pt100 and Pt1000 passive temperature-output options
- ◆ Optional LCD and intrinsically safe Ex ia configuration
- ◆ Two mutually isolated 4–20 mA current outputs; 0–10 V or 0–5 V output options
- ◆ Wall, duct, and remote-probe installation options
- ◆ DIP-switch range selection; PC configuration and single- or two-point calibration

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.

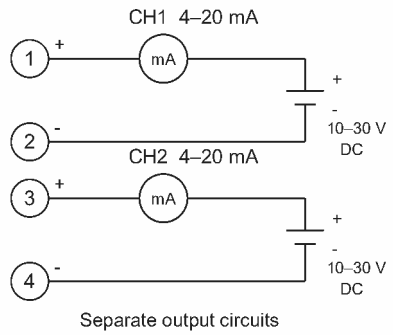
■ TYPICAL APPLICATIONS

Application Fields

- Industrial process monitoring and control
- Industrial drying and humidification
- Electronics production environments
- Meteorological monitoring and environmental chambers
- Food and pharmaceutical facilities
- Cleanrooms, cultivation rooms, and incubators
- Storage and cold rooms
- HVAC and building control
- Utility tunnels
- Agriculture, greenhouses, and indoor pools

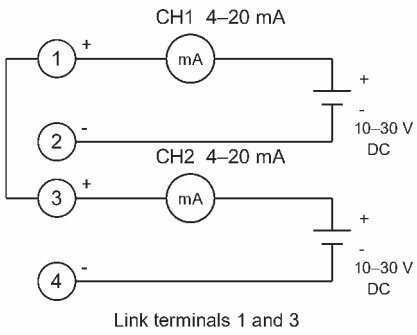
ELECTRICAL CONNECTIONS

Isolated current outputs



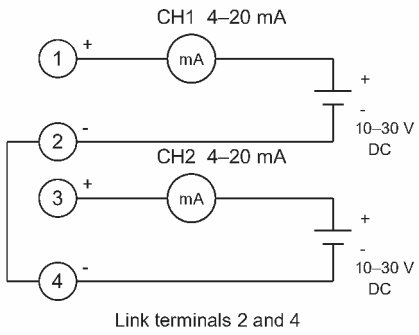
Separate output circuits

Common-positive outputs



Link terminals 1 and 3

Common-negative outputs



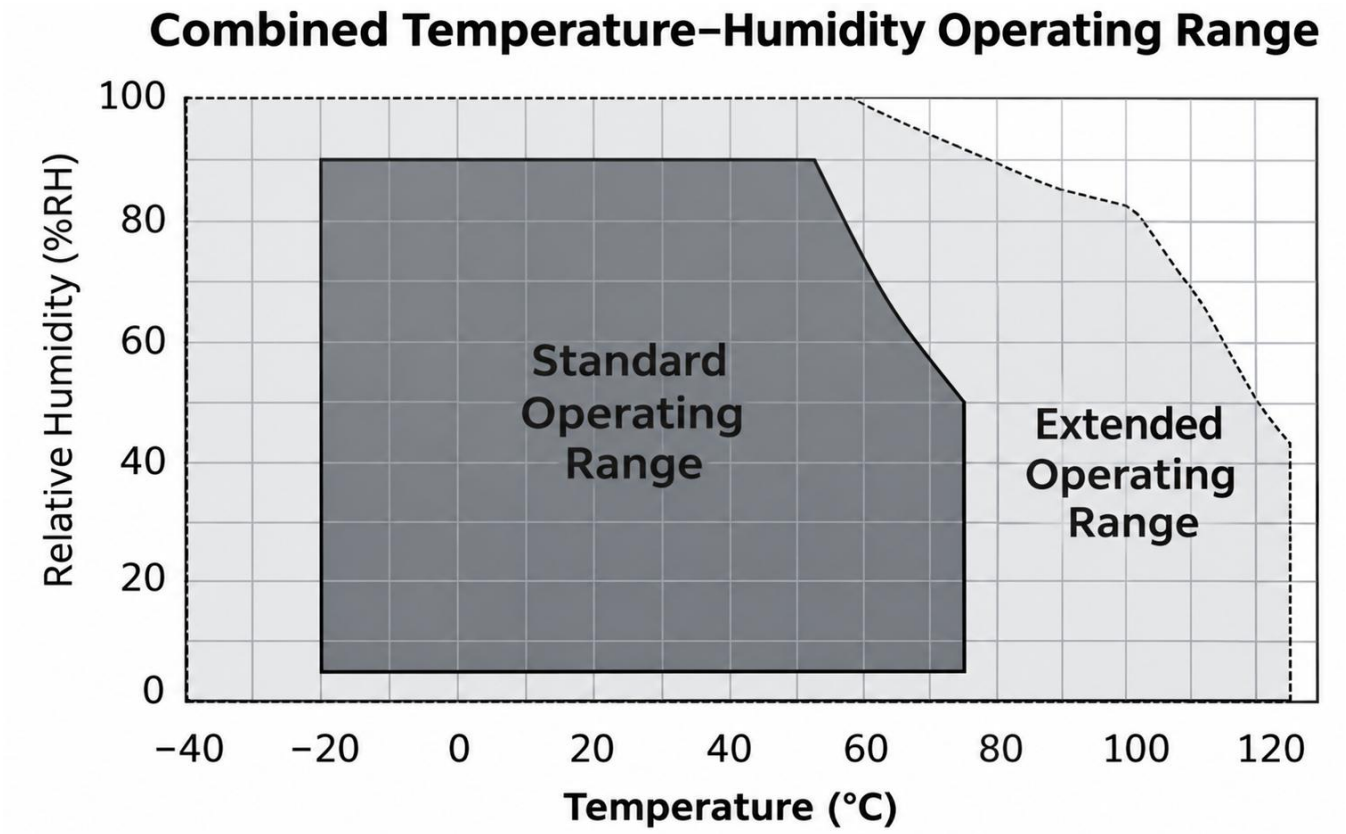
Link terminals 2 and 4

Connection	Wiring information
Isolated current outputs	Channel 1: 1 (+), 2 (−); Channel 2: 3 (+), 4 (−).
Common-positive current outputs	Link 1 and 3 (+). Channel 1 return: 2 (−); Channel 2 return: 4 (−).
Common-negative current outputs	Link 2 and 4 (−). Channel 1 supply: 1 (+); Channel 2 supply: 3 (+).
Voltage outputs	0–10 V or 0–5 V; load resistance ≥ 10 kΩ.
Passive RTD outputs	Pt100 or Pt1000; 2-, 3- or 4-wire connection; RTD lead resistance ≤ 0.5 Ω.

Note: The diagrams apply to two-wire 4–20 mA current outputs with a 10–30 V DC supply. Common-positive or common-negative wiring electrically connects the two output circuits. For voltage and passive RTD output versions, use the wiring diagram for the ordered configuration to identify the terminals.

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.

■ OPERATING ENVELOPE

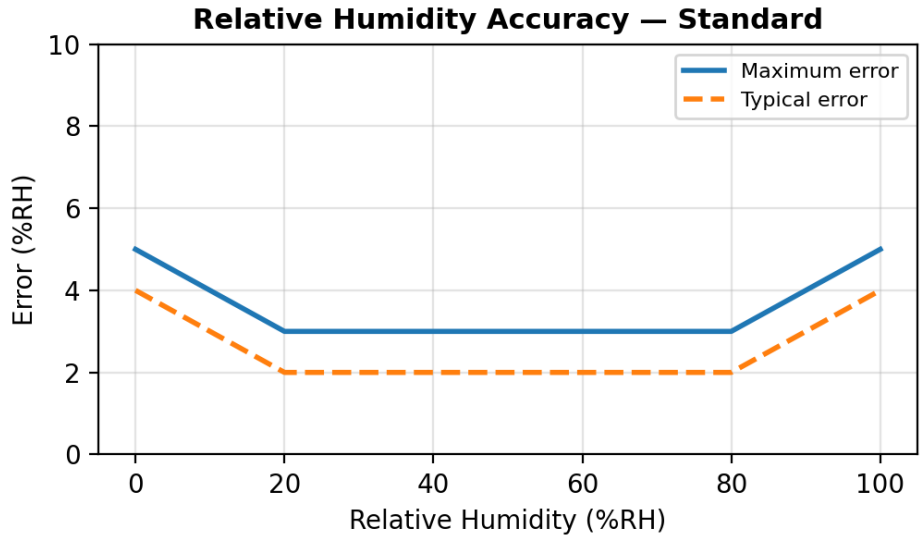


Outside the standard operating range, relative-humidity measurement error may temporarily increase, especially above 80% RH. Accuracy recovers after the sensor returns to the standard range. Recovery may be slower after exposure to high temperature and high humidity.

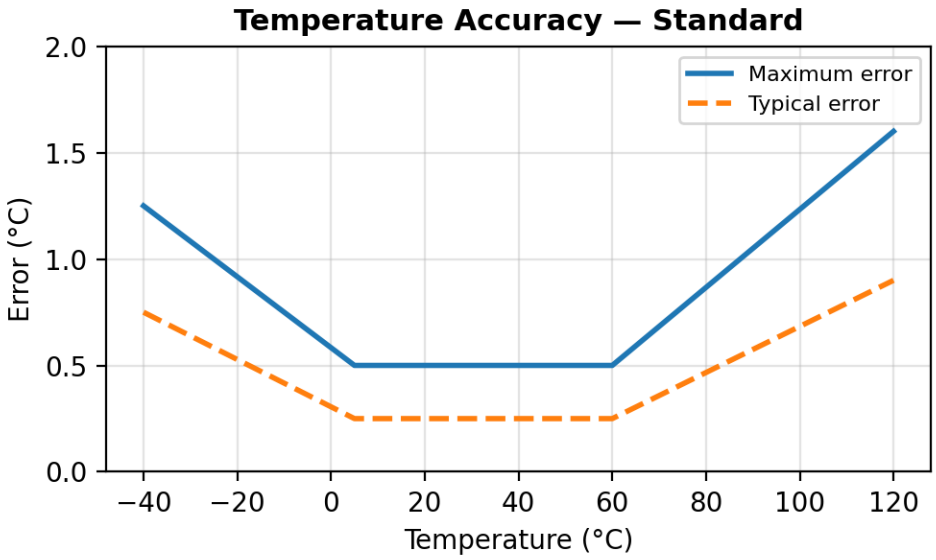
■ MEASUREMENT PERFORMANCE

Measurement	Specification	Reference condition
Relative humidity range	0–100% RH	
Humidity accuracy	±2% RH	20–80% RH at 25 °C
Temperature range	−40 to +120 °C	Integrated T/RH sensing element
Temperature accuracy	±0.3 °C	5–60 °C
Pt100	Class A	DIN EN 60751
Pt1000	Class B	DIN EN 60751

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.



The curves illustrate the typical and maximum relative humidity measurement errors.



The curves illustrate the typical and maximum temperature measurement errors of the integrated sensing element.

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.

■ TECHNICAL DATA

EMC & Immunity	
Applicable EMC standards	EN 61326-1; EN 61326-2-3 — industrial environment
Surge immunity	±4,000 V (up to 5 test applications)
Electrical fast transient/burst	±4,000 V
Isolation voltage	1,500 V AC when both channels are current outputs
RF immunity	>10 V/m, 80 MHz–1000 MHz
Output & Wiring	
Current output	4–20 mA, two-wire; R_l ≤ 750 Ω at 24 V
Voltage output	0–10 V or 0–5 V; R_l ≥ 10 kΩ
Fault indication	Current output ≤ 3.6 mA or ≥ 21.5 mA
Default fault indication	Disabled by default. Specify any required alarm setting when ordering.
Maximum current-output load	(V_s − 10 V) / 0.025 A
Current limit	≤ 25 mA
Terminal capacity	Maximum 1.5 mm²
Cable gland	M16 × 1.5
Power & Response	
Supply voltage	10–30 V DC
Response time	1 s
Display & Configuration	
Display	Optional multi-line backlit LCD, 128 × 64 pixels; displays three parameter values simultaneously.
Configuration	DIP switches and PC configuration
Stability & Drift	
Temperature drift	0.008% FS/°C
Long-term stability	0.05%/year or ≤ 0.1 °C/year
Mechanical & Environmental	
Enclosure material	PC
Ingress protection	IP67
Operating environment	−40 to +85 °C; 0–95% RH, non-condensing
Storage environment	−40 to +85 °C; 20–80% RH

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.

■ DIP SWITCH SETTINGS

Use DIP switches 1 / 2 / 3 / 4 to select a preset temperature range and assign the humidity and temperature output channels. The switch positions below are listed in that order.

Temperature range	Channel 1: Humidity / Channel 2: Temperature	Channel 1: Temperature / Channel 2: Humidity
0 to +50 °C	OFF / OFF / OFF / OFF	ON / OFF / OFF / OFF
0 to +100 °C	OFF / OFF / OFF / ON	ON / OFF / OFF / ON
−40 to +60 °C	OFF / OFF / ON / OFF	ON / OFF / ON / OFF
−10 to +50 °C	OFF / OFF / ON / ON	ON / OFF / ON / ON
−20 to +80 °C	OFF / ON / OFF / OFF	ON / ON / OFF / OFF
−40 to +80 °C	OFF / ON / OFF / ON	ON / ON / OFF / ON
−40 to +125 °C	OFF / ON / ON / OFF	ON / ON / ON / OFF
PC configuration	ON / ON / ON / ON	

Channel assignment: By default, Channel 1 outputs relative humidity and Channel 2 outputs temperature. Setting switch 1 to ON exchanges the channel assignments, as shown above.

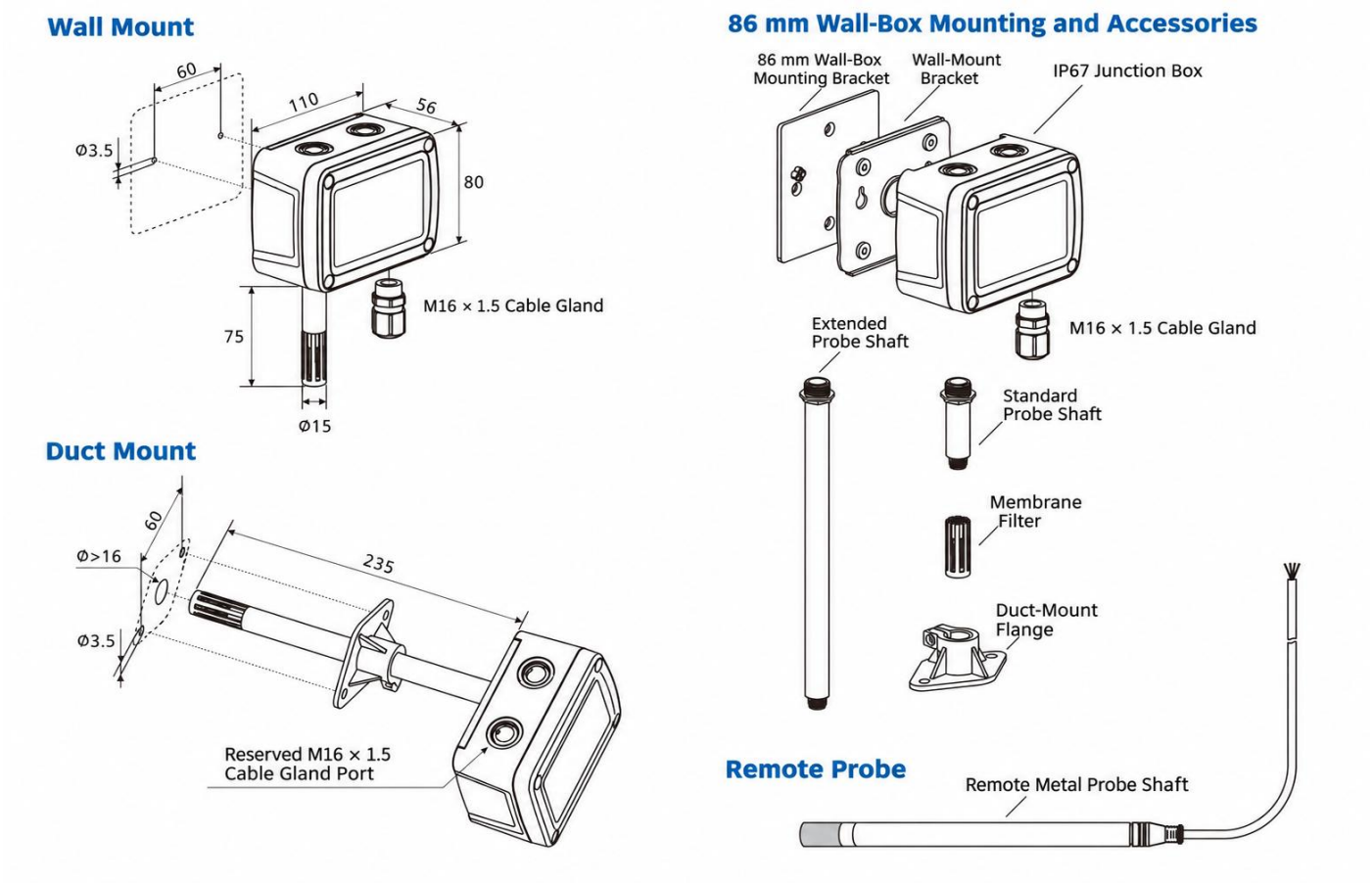
PC configuration: Set all four switches to ON to activate software configuration when a custom temperature range is required. Use the dedicated PC configuration tool to enter the settings.

Configuration without external operating power: Preset ranges can be selected without an external operating power supply. Communication and programming through the dedicated configuration adapter can also be performed without connecting that supply.

Temperature range: The −40 to +125 °C setting requires a compatible sensing element. The integrated temperature/RH sensing element is specified for −40 to +120 °C.

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.

■ PRODUCT DIMENSIONS AND INSTALLATION



All dimensions are in millimeters

Available accessories include a configuration adapter, configuration software, nylon and metal cable glands (M16 × 1.5), a wall-mount bracket, a mounting bracket for 86 mm wall boxes, a duct mounting flange, an extended probe rod, a membrane filter, and a stainless-steel filter.

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.

■ ORDERING INFORMATION

Ordering code example: SX-THKD-A01410100

Example interpretation: SX-THKD series; wall mount (A); 0 to +50 °C range (01); integrated temperature/RH sensing element (4); 0–100% RH (1); standard humidity accuracy (0); 4–20 mA output (1); without display (0); without explosion protection (0).

Model Number	
SX-THKD	
Installation	
A	Wall mount
B	Duct mount
C	Remote mount
Temperature Range	
00	Without
01	0 to +50 °C
02	0 to +100 °C
03	−40 to +60 °C
04	−10 to +50 °C
05	−20 to +80 °C
06	−40 to +80 °C
07	−40 to +125 °C
Type	
4	Integrated temperature/RH sensing element
5	Pt100
6	Pt1000
8	RH sensing element
9	Temperature sensing element
Humidity Range	
1	0–100% RH
Humidity Accuracy	
0	Standard
Output	
1	4–20 mA
2	Pt100
3	Pt1000
4	0–10 V
5	0–5 V
Display	
0	Without display
1	LCD
Explosion Protection	
0	Without

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.

1	Intrinsically safe, Ex ia
Customized Information	
D	Optional configuration - specify requirements when ordering.

Notes:

For remote-mount configurations, specify the required remote probe and cable.
The default humidity measurement range is 0–100% RH.
Select the temperature sensing element, output type, and scaled temperature range as a compatible combination.
The integrated temperature/RH sensing element is specified for −40 to +120 °C; do not apply the −40 to +125 °C scaling option unless the selected sensing element supports it.

The information in this document is subject to change without notice. SensorsX Technology Inc. assumes no responsibility for errors or omissions.