Temperature Sensor

Featuring LoRaWAN®

TS30x

◆ Introduction

TS30x is a compact temperature sensor with a visualized data display. It features extendable connecting lines, a diverse range of detecting probes, and an IP65 waterproof design, making it applicable for accurate temperature and humidity data detection in various harsh environments. Moreover, it provides the option for a magnetic contact switch sensor. TS30x prioritizes security and reliability, ensuring traceable data and effortless data exports for seamless integration.

TS30x is designed for measuring a wide range of temperature in harsh environments and transmitting data using LoRaWAN® technology. With this low power consumption technology, TS30x can maintain a long operational life with its embedded batteries. Combining with Milesight LoRaWAN® gateway and Milesight IoT Cloud solution, users can manage all sensor data remotely and visually.

TS30x is widely used for temperature and humidity monitoring applications like food processing, cold chain storage of food or medicine, etc.



TS301



TS302

◆ Features

- Provides optional high accuracy PT100 temperature probes, DS18B20 temperature probe and TH temperature - humidity probe
- Detachable probe for self-calibration
- IP65 waterproof enclosure with dust plug, suitable for harsh environment
- Support automated temperature monitoring and anti-tamper recording of data in compliance with HACCP, meeting the authenticity requirements of 21 CFR Part 11B electronic record
- Complies with EN12830 regulation, applicable for cold-chain applications
- Provide simplified PDF data export for easy documentation without complex paperwork
- Built-in two large-capacity replaceable batteries, ensuring an extended battery life
- Features low-consumption LCD display, enabling intuitive data reading
- Store historical records locally and supports retransmission to prevent data loss
- Equipped with NFC for quick and easy configuration
- Function effectively with standard LoRaWAN® gateways and network servers
- Compatible with Milesight Development Platform
- Supports Milesight D2D protocol to enable ultra-low latency and direct control without gateways
- Supports Firmware Update Over the Air (FUOTA) feature

◆ Specifications

Wireless Transmission	
Technology	LoRaWAN®, Milesight D2D
Antenna	Internal Antenna
Frequency	CN470/IN865/RU864/EU868/US915/AU915/KR920/AS923-1&2&3&4
Tx Power	16dBm (868MHz)/22dBm (915MHz)/19dBm (470MHz)
Sensitivity	-137dBm @300bps
Mode	OTAA/ABP Class A
Sensor Connector	
Connector Type	5-pin M12 A-Coded Male Connector
Connector Number[1]	TS301: 1 × Connector for Temperature/Humidity Sensor or Magnet Switch Sensor TS302: 2 × Connectors for two Temperature/Humidity Sensors or Temperature/Humidity Probe + Magnet Switch Sensor
Display	

Display	LCD Segment Code Screen
Viewing Direction	12 O'clock
Others	
Button	1 × Power Button (External) + 1 × Reset Button (Internal)
LED Indicator	1 × Status Indicator (Internal)
USB	1 × Type-C Port for Power Supply
Software	
Power On/Off	NFC, Power Button
Configuration	Mobile App via NFC, Downlink
Data Logging	10, 000 measurements and supports to export as CSV or PDF file
Advanced Features	Threshold Alarm, Change Alarm, Data Retrievability, Data Retransmission, Milesight D2D Controller, Milesight D2D Data Transmission
Physical Characteristics	
Power Supply	2 × 4000 mAh ER18505 Li-$SOCl_2$ Batteries or Type-C USB (5V/1A)
Battery Life[2]	**TS301 + One Temperature/Humidity Sensor:** Over 4 Years (SF10, EU868), Over 3.3 Years (SF10, US915) **TS301 + Magnet Sensor (10 triggers per day):** Around 7.3 Years (SF10, EU868), Around 5.3 Years (SF10, US915) **TS302 + Temperature/Humidity Sensor + Magnet Sensor (10 triggers per day):** Over 3.9 Years (SF10, EU868), Over 3.2 Years (SF10, US915) **TS302 + Two Temperature/Humidity Sensor:** Over 2.7 Years (SF10, EU868), Over 2.4 Years (SF10, US915)
Operating Temperature	-30°C to +70°C
Relative Humidity	0% to 95% (non-condensing)
Ingress Protection	IP65
Weight	175 g (TS301), 185 g (TS302)
Dimension	109.35 × 75 × 29 mm (4.31 × 2.95 × 1.14 in)
Installation	Wall Screw Mounting, Magnetic Mounting (Opt.)
Approvals	
Regulatory	CE, FCC, EN12830
Environmental	RoHS

[1]TS302 does not support to connect both magnet switch sensors.

[2]The battery life is based on test results under laboratory conditions using the standard battery provided by Milesight. Actual performance may vary depending on battery brand, environmental factors and the type of probe used.

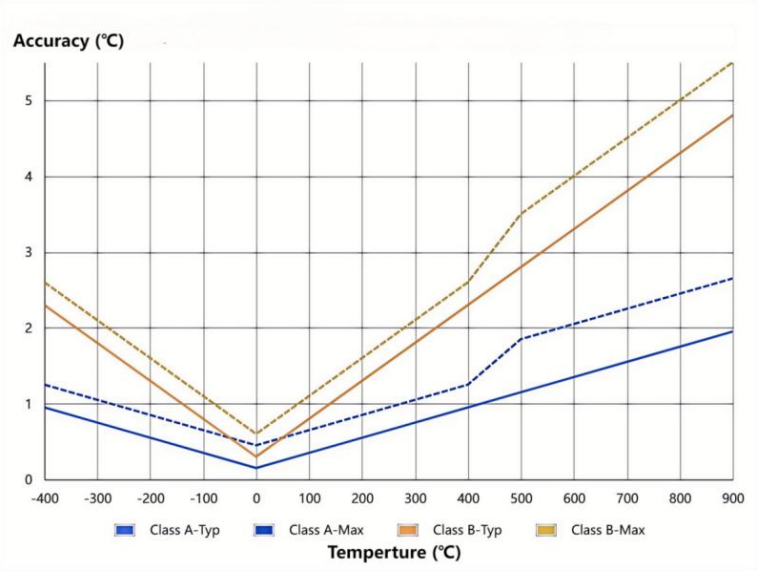
◆ Optional Sensors

Model	Measuring Range	Accuracy Class	Accuracy	Drift	Sensor Probe	Cable	Installation
PT100 Sensor							
Regular Version (SP11-B05-125-200)	-40 °C ~ 125 °C	B	Typ.[2]: ± 0.5°C (-40°C~40°C), ± 1°C (40°C~125°C)	/	Straight tube, 304 Stainless Steel, Φ4*50 mm, IP67	2 m, PVC, -30 °C~105 °C	Contact, Thermal Buffer Bottle Installation(Opt.)
Food Applications (SP11-AF10-125-150)	-40 °C ~ 125 °C	A	Typ.[2]: ± 0.4°C	/	Needle, 316 Stainless Steel (Food Grade), Φ4*100 mm, IP67	1.5 m, Silicone (Food Grade), -60 °C~250 °C	Insert Installation
Low Temperature Applications (SP11-A03-050-150)	-200 °C ~ 50 °C	A	Typ.[2]: ± 0.5°C (-175°C~50°C), ± 0.6°C (-200°C~-175°C)	/	Straight tube, 304 Stainless Steel, Φ4*30 mm, IP67	1.5 m, Teflon, -200 °C~290 °C	Contact
Low Temperature Applications (SP11-A05-500-150)	-50 °C ~ 500 °C	A	Typ.[2]: ± 0.4°C (-50°C~125°C), ± 1.2°C (125°C~500°C)	/	Straight tube, 304 Stainless Steel, Φ4*30 mm, IP30	1.5 m, Fiberglass, -50 °C~500 °C	Contact
Pipe Monitoring (SP11-A09-085-200-B046)	-20°C ~ 85°C	A	Typ.[2]: ± 0.4°C	/	Straight tube (with Baffle), 304 Stainless Steel, Φ4.8*90 mm,	2 m, PVC, -20 °C~85 °C	Baffle Screw Installation (Baffle: 46*14mm)

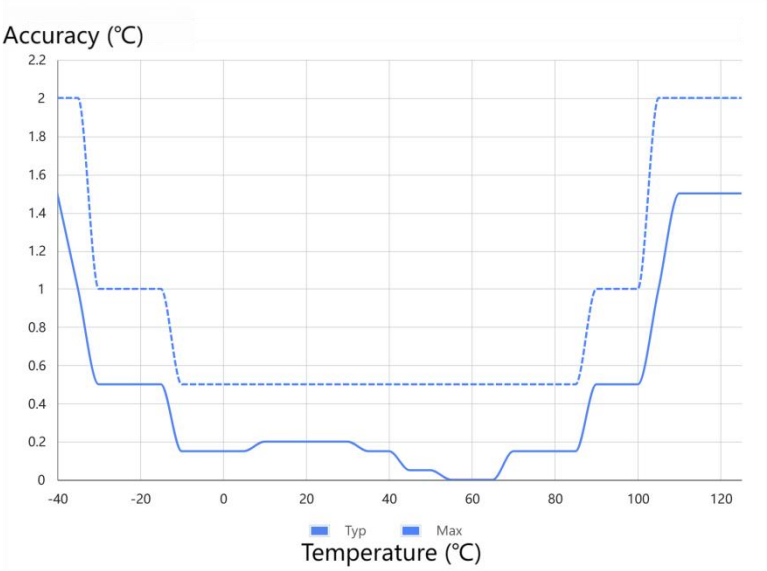
					IP67		
DS18B20 Sensor							
Independent Calibration Applications (SP12-125-150)	-40°C~125°C	/	Typ.[3]: ± 0.5°C(-10°C ~ 85°C), ± 2°C(-40°C ~ -10°C, 85°C ~ 125°C)	Typ.[7]: ±0.2°C	Straight tube, 316 Stainless Steel, Φ6*50 mm, IP67	1.5 m, PVC, -40 °C ~ 125 °C	Contact
TH Sensor							
Temperature and Humidity Measurement (SP13-125-150)	Temperature: -40 °C ~ 125 °C Humidity: 0% RH ~ 100% RH	/	Temperature Typ.[4]: ±0.3°C(-40°C~0°C) ±0.2°C(0°C~60°C) ±0.5°C(60°C~125°C) Humidity Typ.[5][6]: ± 2% RH	Typ.[8]: 0.03°C/year	Straight tube, 304 Stainless Steel, Φ6*50 mm, IP67	1.5 m, PVC, -40 °C ~ 125 °C	Contact
Magnet Switch Sensor							
Magnet Switch Measurement (SS21-PN03-150)	20-30 mm	/	/		Two Magnet Switches, per 31 × 14 × 7.5 mm	1.5 m	Wall Screw Mounting, 3M Tape Mounting

[1]Please contact us for customized probe options according to your specific requirements.

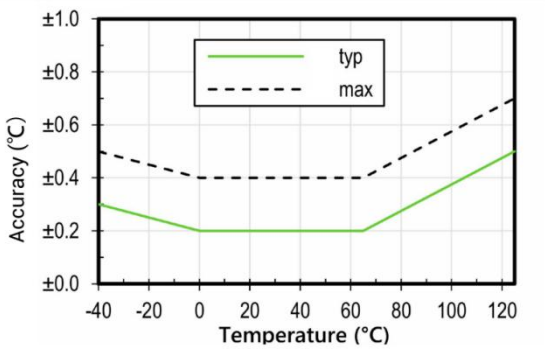
[2]Accuracy corresponding to the temperature of PT100 sensor.



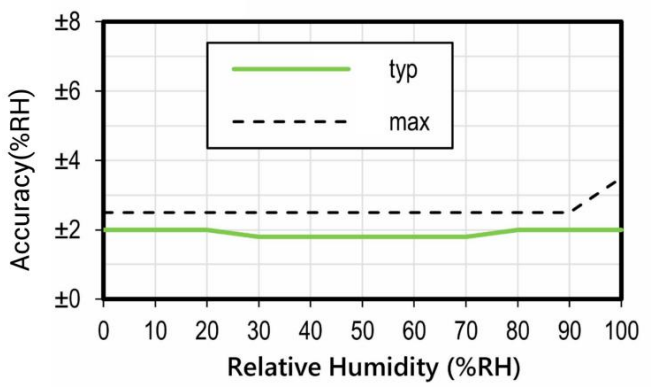
[3]Accuracy corresponding to the temperature of DS18B20 sensor.



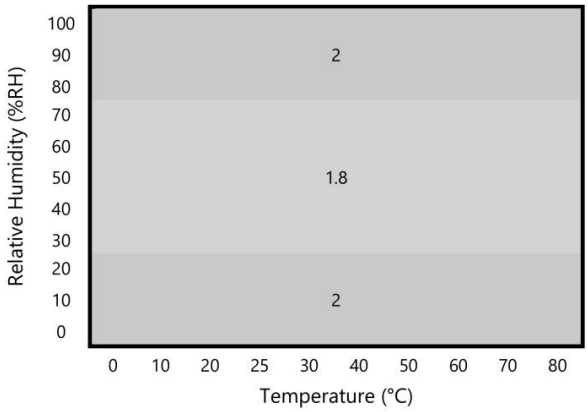
[4]Accuracy corresponding to the temperature of TH sensor.



[5]Accuracy corresponding to the relative humidity of TH sensor (25°C).



[6]Typical RH accuracy corresponding to the temperature of TH sensor.



[7]Based on a 1000-hour stress test at +125°C with V_{DD} = 5.5V. Annual calibration of the device is recommended in accordance with industry standards.

[8]Max. value is < 0.04°C/y. Annual calibration of the device is recommended in accordance with industry standards.

◆ Dimension(mm)

