Temperature &Humidity Sensor

TS60x

◆ Introduction

TS60x is a compact temperature and humidity sensor with a visualized data display. It features extendable connecting lines, a diverse range of detecting probes, and an IP67 waterproof design, making it applicable for accurate temperature and humidity data detection in various harsh environments. The enclosure, made of food-grade materials, allows safe contact with food or medicines. It not only supports multiple application modes that are compatible with IoT platforms, but is also equipped with base station positioning for tracking and security purposes.

TS60x is widely used for temperature and humidity monitoring applications such as cold chain transportation of food or medicine.

TS601

TS602

◆ Features

Shared Values

- IP67 waterproof with a specialized battery compartment design, making it suitable for harsh environment
- Locally stores historical records and supports retransmission to prevent data loss
- Built-in 3-axis accelerometer for monitoring device status
- Equipped with a light sensor for cargo box opening detection and alarm
- Support flight mode to comply with aviation safety requirements
- Support management and OTA upgrades via the Milesight Development Platform and AWS
- Flexible design supports various mounting options
- Equipped with NFC for quick and easy configuration
- Equipped with base station positioning for tracking
- Support one-click reporting functionality
- Support cumulative reporting to reduce power consumption
- Support multiple network protocols to compatibility with IoT platforms

TS601 Only

- Equipped with an indicator to indicate device status and threshold alarms

TS602 Only

- Provides optional high accuracy PT100 temperature probes, DS18B20 temperature probe and TH temperature - humidity probe
- Features a high resolution 0.96-inch OLED display, enabling intuitive data reading

◆ Specifications

Model Name	TS601	TS602
Connector Type	-	5-pin M12 A-Coded Male Connector
Connector Number	-	1 × Connector for TH/DS18B20/PT100 Sensor
Sensor		
Temperature		
Operating Principle	Digital CMOSens® technology (MEMS)	Refer to Optional Sensors
Range	-35°C to + 70°C	
Accuracy	Typ.[1]: +/- 0.3°C (-35°C to 0°C)	

	+/- 0.2°C (0°C to 65°C) +/- 0.5°C (65°C to 70°C)	
Resolution	+/- 0.1°C	
Humidity		
Operating Principle	Digital CMOSens® technology (MEMS)	Refer to Optional Sensors
Range	0% to 100% RH	
Accuracy	Typ.[2][3]: +/- 2% RH	
Resolution	+/- 0.1% RH	
Light		
Range	0 to 600 Lux	
Status	Light/Dark	
Device Position		
Status	Normal/Tilt	
Measurement Range	-90° to +90° (on all X, Y, Z axes)	
Base Station Positioning		
Parameters	Longitude/Latitude	
Accuracy (On Urban Main Roads)	Typ. Deviation: 1 km Max Deviation: 5 km	
Wireless Transmission		
Technology	LTE Cat.1	
Frequency	LTE - FDD: B1/B3/B5/B7/B8/B20/B28 for EMEA+Australia/New Zealand	
SIM Slot	1 x Micro SIM (3FF) Slot, 1.8V/3V	
Application Mode	TCP/UDP/MQTT/AWS/Milesight Development Platform	
Others		
Screen	-	0.96-inch OLED
LED	1 × Status Indicator	-
Button	1 × Reset/Power Button	
USB	1 × Type-C Port for Power Supply (Internal)	
Software		
Power On/Off	NFC, USB, Power Button	
Configuration	Mobile App via NFC	
Min. Packet Transmission Interval[6]	30min@Operating Temperature≤ 0°C 15min@Operating Temperature>0°C	

Advanced Features	Threshold Alarm, Data Storage (5,000 entries), Data Retransmission	
Physical Characteristics		
Power Supply	2 × 2500 mAh CR18505 Li-MnO_2 Batteries	
Battery Life[7] (6 Times Report per Day, per Report includes 8 Packages with 30-min Collection Interval, Positioning Disabled, -20°C)	MQTT/TCP - Around 4.8 Years AWS - Around 3.9 Years UDP - Around 5.1 Years	MQTT/TCP - Around 4.2 Years AWS - Around 3.5 Years UDP - Around 4.6 Years
Operating Temperature	-35°C to 70°C	
Relative Humidity	0% - 95% (non-condensing)	
Ingress Protection	IP67	
Housing&Color	ABS+PC (Food-grade), White	
Weight (Batteries included)	192g	200g
Dimension	112 × 72 × 29mm	
Installation	Cable-tie Mounting, 3M Tape Mounting, Wall Screw Mounting, Magnetic Mounting (Opt.)	

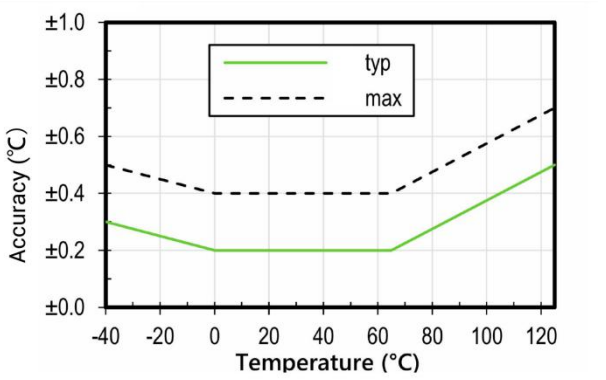
◆ Optional Sensors

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.[4]: ± 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.[4]: ± 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.[4]: ± 0.5°C (-175°C~50°C), ± 0.55°C (-200°C~-175°C)	/	Straight tube, 304 Stainless Steel, Φ4*30 mm, IP67	1.5 m, Teflon, -200 °C~290 °C	Contact
Industrial Applications (SP11-A05-500-150)	-50 °C ~ 500 °C	A	Typ.[4]: ± 0.4°C (-50°C~125°C), ± 1.15°C (125°C~500°C)	/	Straight tube, 304 Stainless Steel, Φ4*30 mm, IP30	1.5 m, Fiberglass, -50 °C~500 °C	Contact

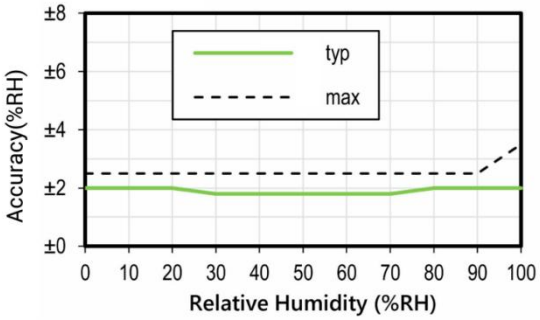
DS18B20 Sensor							
Independent Calibration Applications (SP12-125-150)	-40 °C ~ 125 °C	-	Typ.[5]: ± 0.5°C (-10°C~85°C), ± 2°C (-40°C~-10°C, 85°C~125°C)	Typ.[8]: ±0.2°C	Straight tube, 316 Stainless Steel, Φ6*50 mm, IP67	1.5 m, PVC, -40 °C ~ 125 °C	Contact
TH Sensor							
Temperature and Humidity Measurement (SP13-125-150)	Temperature: -40 °C ~ 125 °C Humidity: 0% RH ~ 100% RH	-	Temperature typ.[1]: ± 0.3°C (-40°C~0°C), ± 0.2°C (0°C~65°C), ± 0.5°C (65°C~125°C) Humidity Typ.[2][3]:: ± 2% RH	Typ.[9]: 0.03°C/year	Straight tube, 304 Stainless Steel, Φ6*50 mm, IP67	1.5 m, PVC, -40 °C ~ 125 °C	Contact

Note:

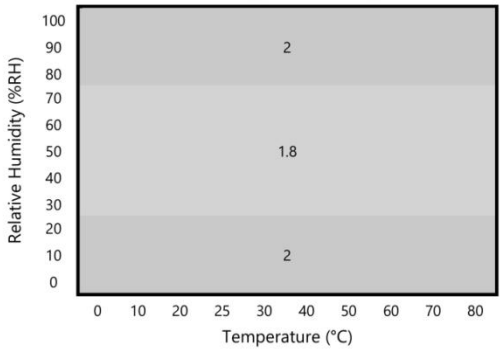
1. Accuracy corresponding to the temperature.



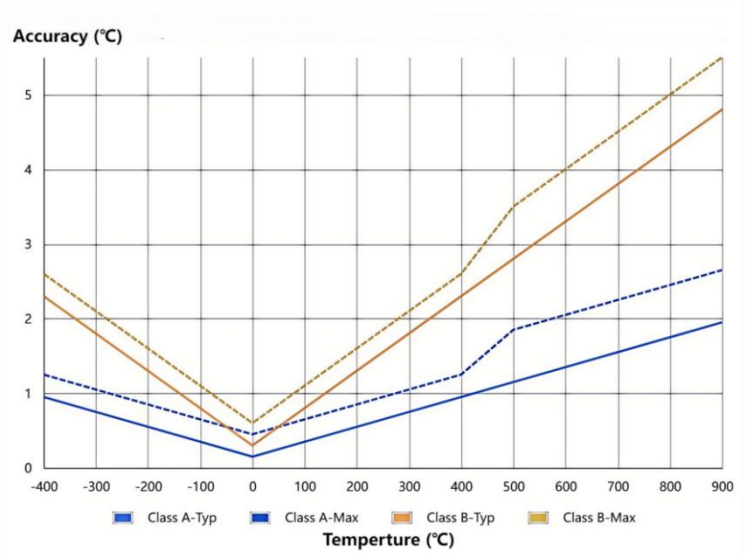
2. Accuracy corresponding to the relative humidity of TH sensor (25°C).



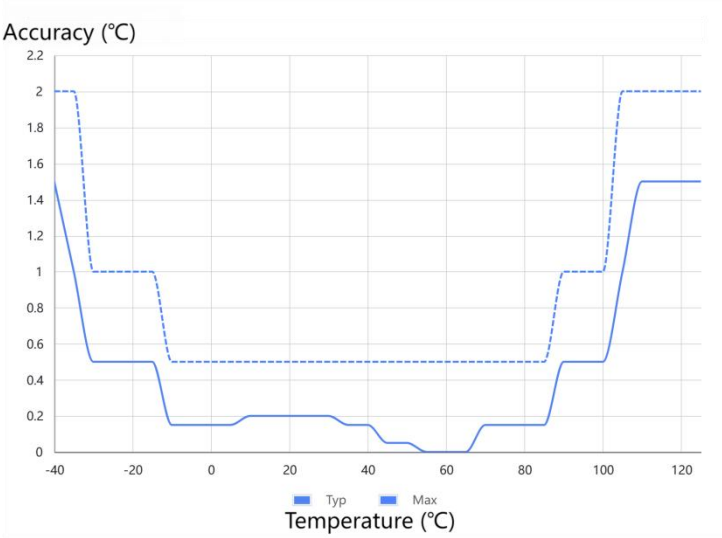
3. Typical RH accuracy corresponding to the temperature of TH sensor.



4. Accuracy corresponding to the temperature.



5. Accuracy corresponding to the temperature.



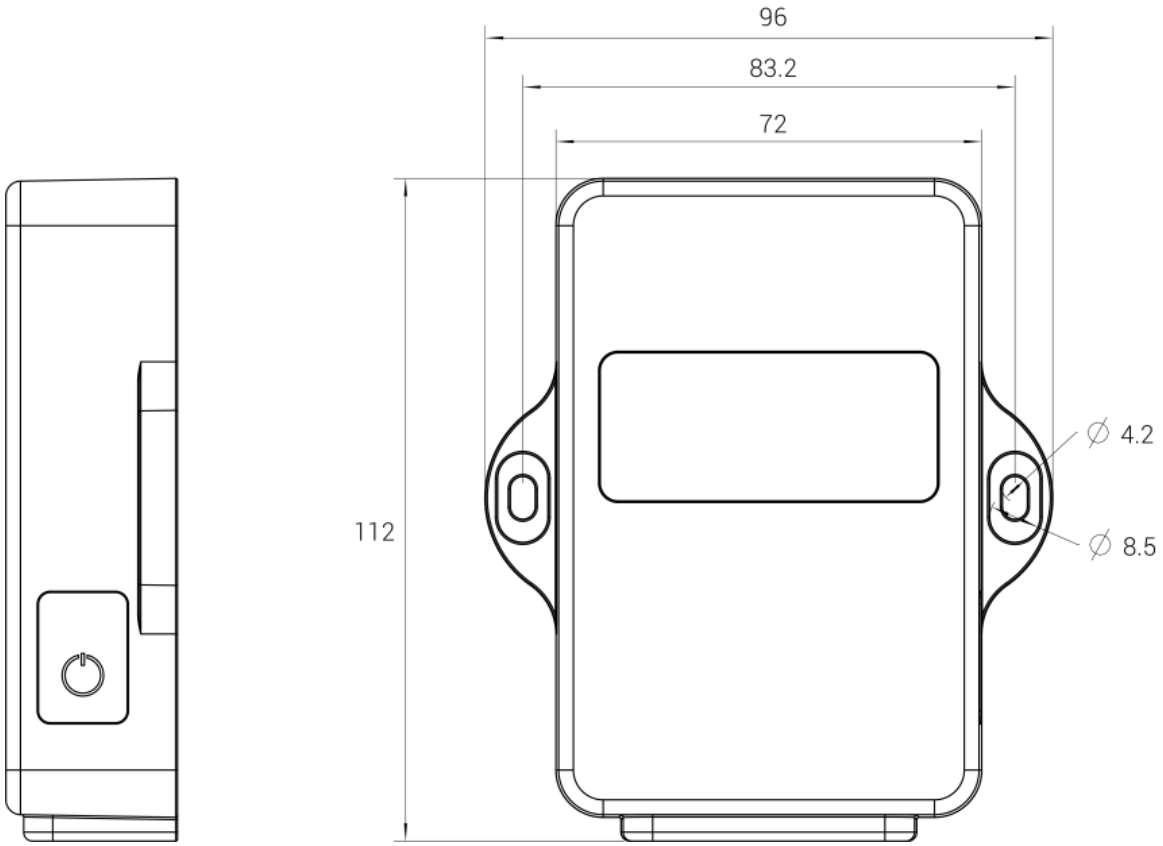
6. Packet transmission interval = Reporting interval × Cumulative numbers.
7. Battery precautions:

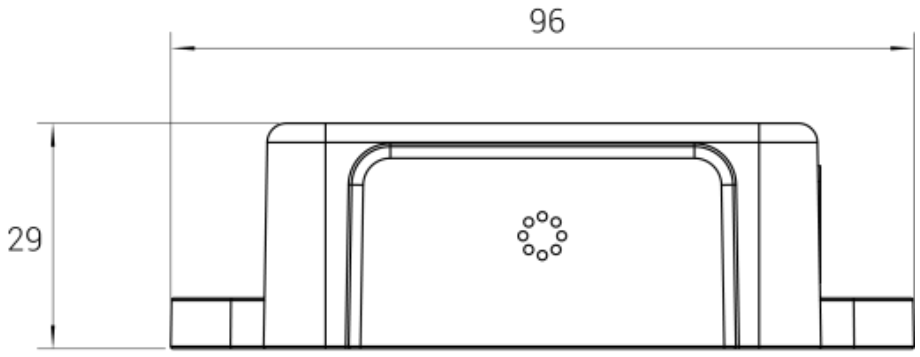
- The battery life is based on test results under laboratory conditions using the standard battery provided by Milesight. Actual performance may vary depending on battery brand and environmental factors.
- Operating the device above 0°C will significantly extend its service life.
- For the TS602 device, the battery life varies depending on the type of probe used.
- Intensified communication behavior (e.8. bad connection or local provider settings) and application below -20°C and above +55°C will shorten battery life.

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

◆ Dimensions

TS601





TS602