

# Temperature Sensor

## Refrigeration & Freezing Applications



# THINKING SENSOR

Refrigeration & Freezing Applications

### Feature

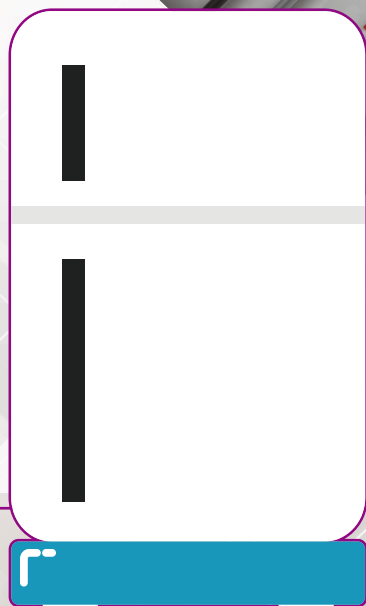
- ◆ THINKING temperature sensor is customizable in accordance with detected environment and operation temperature range.
- ◆ THINKING temperature sensor operates under extremely humid and low-temperature environment and meets customer's requirement of response time.
- ◆ Various electrical characteristics are available for your choice.

### Function

- ◆ Temperature detection of refrigerator and freezer: Sensor is installed in refrigerator compartment, freezer compartment, and multi zone compartment.
- ◆ Temperature detection of ambient environment and heating pipe.
- ◆ Temperature detection of power supply and transformer.

### Application

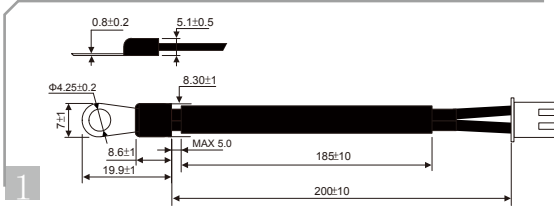
Refrigerator, freezer, commercial ice maker, etc.



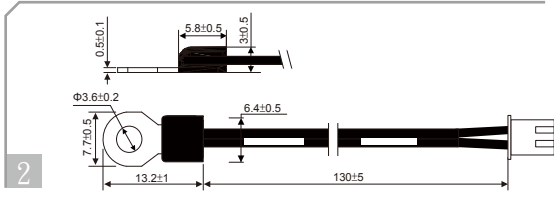
### Screw-On Type

**Feature:** Screw-on design is for easy installation and installed on metallic surface for temperature detection.

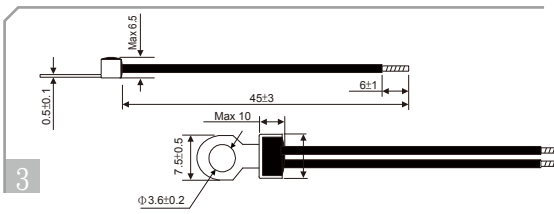
**Application:** The sensor generally detects temperature of transformer, power supply, etc.



**Component** | Sensing top (terminal+plastic cap+NTC chip)+tube  
+lead wire+terminal+housing  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -30~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=100KΩ±3%      **B Value** | B25/50=3900K±2%  
**Thermal Time Constant** | Around 15 seconds (heating board)  
**Hi-Pot Test** | AC 1500V 10mA (Max)



**Component** | Sensing top (terminal+plastic cap+NTC chip)+lead wire  
+terminal+housing  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -20~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R100°C=3.3KΩ±2.5%      **B Value** | B25/50=4050K±5%  
**Thermal Time Constant** | Around 25 seconds (heating board)  
**Hi-Pot Test** | AC 1500V 10mA (Max)

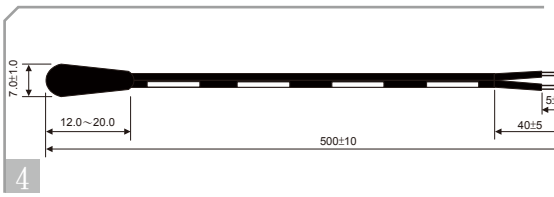


**Component** | Sensing top (terminal+NTC chip+epoxy)+lead wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -20~+125°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=10KΩ±2%      **B Value** | B25/100=3988K±1%  
**Thermal Time Constant** | Around 15 seconds (heating board)  
**Hi-Pot Test** | AC 1500V 10mA (Max)

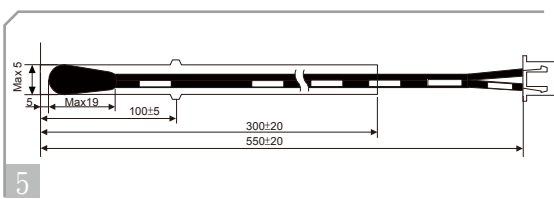
### Epoxy Coating Type

**Feature:** Structure of the sensor is simple, and it is water resistant and responds fast.

**Application:** The sensor generally detects ambient temperature.



**Component** | Sensing top (NTC chip+epoxy)+lead wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -20~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=10KΩ±1%      **B Value** | B25/85=3975K ± 1%  
**Thermal Time Constant** | Around 5 seconds (in water)  
**Hi-Pot Test** | AC 1000V 10mA (Max)

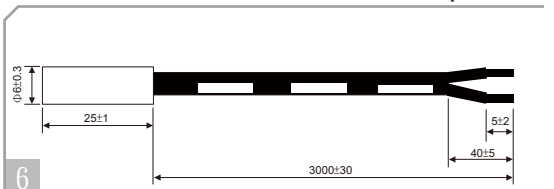


**Component** | Sensing top (NTC chip+epoxy)+lead wire+tube+terminal  
+housing  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -20~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=10KΩ±3%      **B Value** | B25/50=3700K±3%  
**Thermal Time Constant** | Around 5 seconds (in water)  
**Hi-Pot Test** | AC 1000V 10mA (Max)

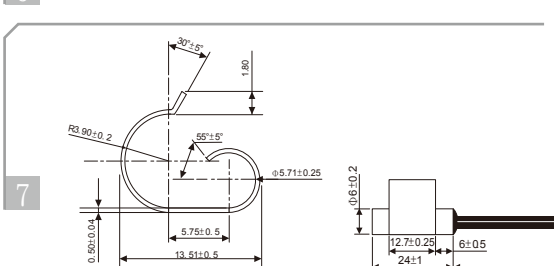
**Feature:** Material of metal case is the same as that of detected object for more accurate temperature detection and faster response. Furthermore, stainless steel material increases product stability and can directly contact water and ice.

**Application:** Temperature detection of freezer compartment of refrigerator, low temperature coil of freezer, heating pipe.

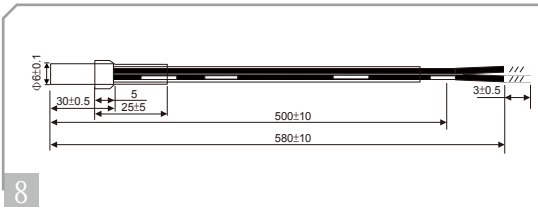
### Metal Case Type



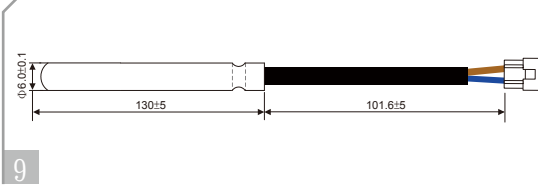
**Component** | Sensing top (NTC chip+copper cap)+lead wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -20~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=10KΩ±1%      **B Value** | B25/85=3975K±1%  
**Thermal Time Constant** | Around 15 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA (Max)



**Component** | Sensing top (NTC chip+brass cap+clip)+lead wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -40~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=2.7 KΩ± 3%      **B Value** | B25/85=3975K±2%  
**Thermal Time Constant** | Around 10 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA (Max)



**Component** | Sensing top (NTC chip+copper cap)+tube+lead wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -30~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=2.707KΩ± 3%      **B Value** | B25/85=3965 K±2%  
**Thermal Time Constant** | Around 15 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA (Max)

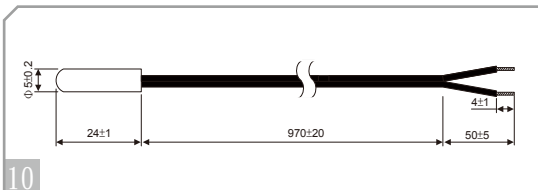


**Component** | Sensing top (NTC chip+stainless steel cap)+cable wire +terminal+housing  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -40~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C= 5KΩ± 1%      **B Value** | B25/85=3975±1%  
**Thermal Time Constant** | Around 20 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA(Max)

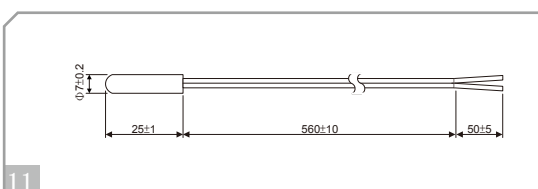
**Plastic Case Type**

**Feature:** Plastic case type sensing top is filled with insulation glue, and which offers better water and corrosion resistances.

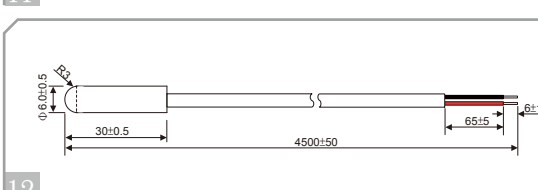
**Application:** Temperature detection of refrigerator and freezer



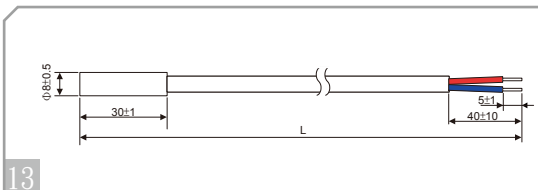
**Component** | Sensing top (NTC chip+plastic cap)+lead wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -40~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R-20°C=19.09KΩ±3%      **B Value** | B0/50=3850K±1%  
**Thermal Time Constant** | Around 15 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA (Max)



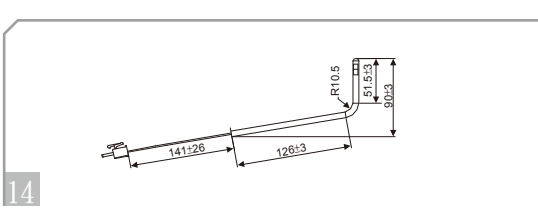
**Component** | Sensing top (NTC chip+plastic cap)+lead wire+terminal +housing  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -40~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=10KΩ±5%      **B Value** | B25/50=3935K±1%  
**Thermal Time Constant** | Around 20 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA (Max)



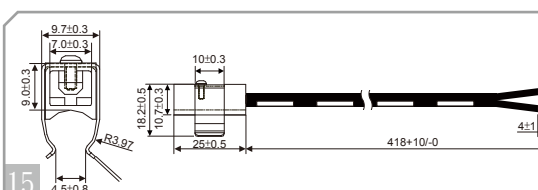
**Component** | Sensing top (NTC chip+plastic cap)+cable wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -10~+80°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=10KΩ±5%      **B Value** | B25/85= 3975K±3%  
**Thermal Time Constant** | Around 20 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA(Max)



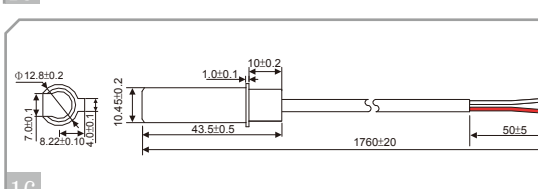
**Component** | Sensing top (NTC chip+plastic cap)+cable wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -40~+80°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R0°C=16.33KΩ±2%      **B Value** | B25/100=3980K±1.5%  
**Thermal Time Constant** | Around 20 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA (Max)



**Component** | Sensing top (NTC chip+plastic cap)+cable wire +terminal+housing  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -40~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=2.7 KΩ±3%      **B Value** | B25/50=3900K±1.5%  
**Thermal Time Constant** | Around 30 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA (Max)



**Component** | Sensing top (NTC chip+plastic cap+stainless steel clip) +lead wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -40~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=2.7 KΩ±1%      **B Value** | B25/50= 3900K±1.5%  
**Thermal Time Constant** | Around 20 seconds (in water)  
**Hi-Pot Test** | AC 1500V 10mA (Max)



**Component** | Sensing top(NTC chip+plastic cap)+lead wire  
**Moisture Resistance** | 40°C 95% RH X 1000 hours  
**Operation Temperature** | -40~+105°C  
**Insulation Test** | DC 500V 100MΩ (Min)  
**R Value** | R25°C=2.342KΩ±1.5%      **B Value** | B25/100=3980K±1.5%  
**Thermal Time Constant** | Around 35 seconds (in water)  
**Hi-Pot Test** | AC 3750V 10mA (Max)

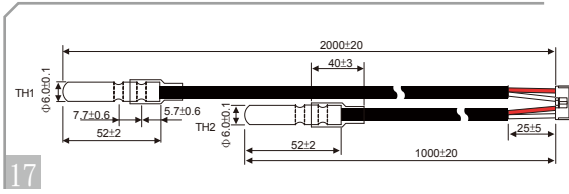


1. Temperature sensor is customizable in accordance with customer's needs, and THINKING provides consulting services for sensor design.
2. All specifications are subject to change with notice.
3. Please contact your sales representative if you have any questions.

**Multiple Sensor Structure**

**Feature:** Sensor is with various sensing tops and electrical characteristics for circuit design and assembly.

**Application:** Refrigerator, freezer, commercial ice maker, etc.



**Component** | Sensing top (NTC chip+stainless steel cap)+lead wire+tube+terminal+housing

**Moisture Resistance** | 40°C 95% RH X 1000 hours

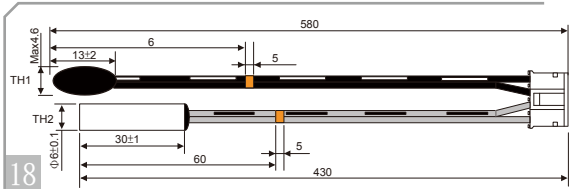
**Operation Temperature** | -40~+105°C

**Insulation Test** | DC 500V 100MΩ (Min)

**R Value** | R25°C=10KΩ±2%

**B Value** | B25/75=3965K±2%

**Thermal Time Constant** | Around 10 seconds (in water)



**Component** | Sensing top (NTC chip+copper cap/NTC chip+epoxy)+lead wire+tube+terminal+housing

**Moisture Resistance** | 40°C 95% RH X 1000 hours

**Operation Temperature** | -30~+80°C

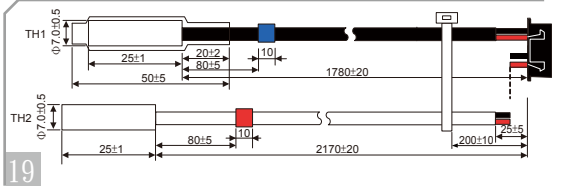
**Insulation Test** | DC 500V 100MΩ (Min)

**R Value** | R25°C=10KΩ±3%

**B Value** | B25/50=3950K±2%

**Thermal Time Constant** | TH1: 5 seconds TH2: 20 seconds (in water)

**Hi-Pot Test** | AC 1500V 10mA(Max)



**Component** | Sensing top (NTC chip+plastic cap+tube/NTC chip+plastic cap)+lead wire+tube+terminal+housing

**Moisture Resistance** | 40°C 95% RH X 1000 hours

**Operation Temperature** | -30~+80°C

**Insulation Test** | DC 500V 100MΩ (Min)

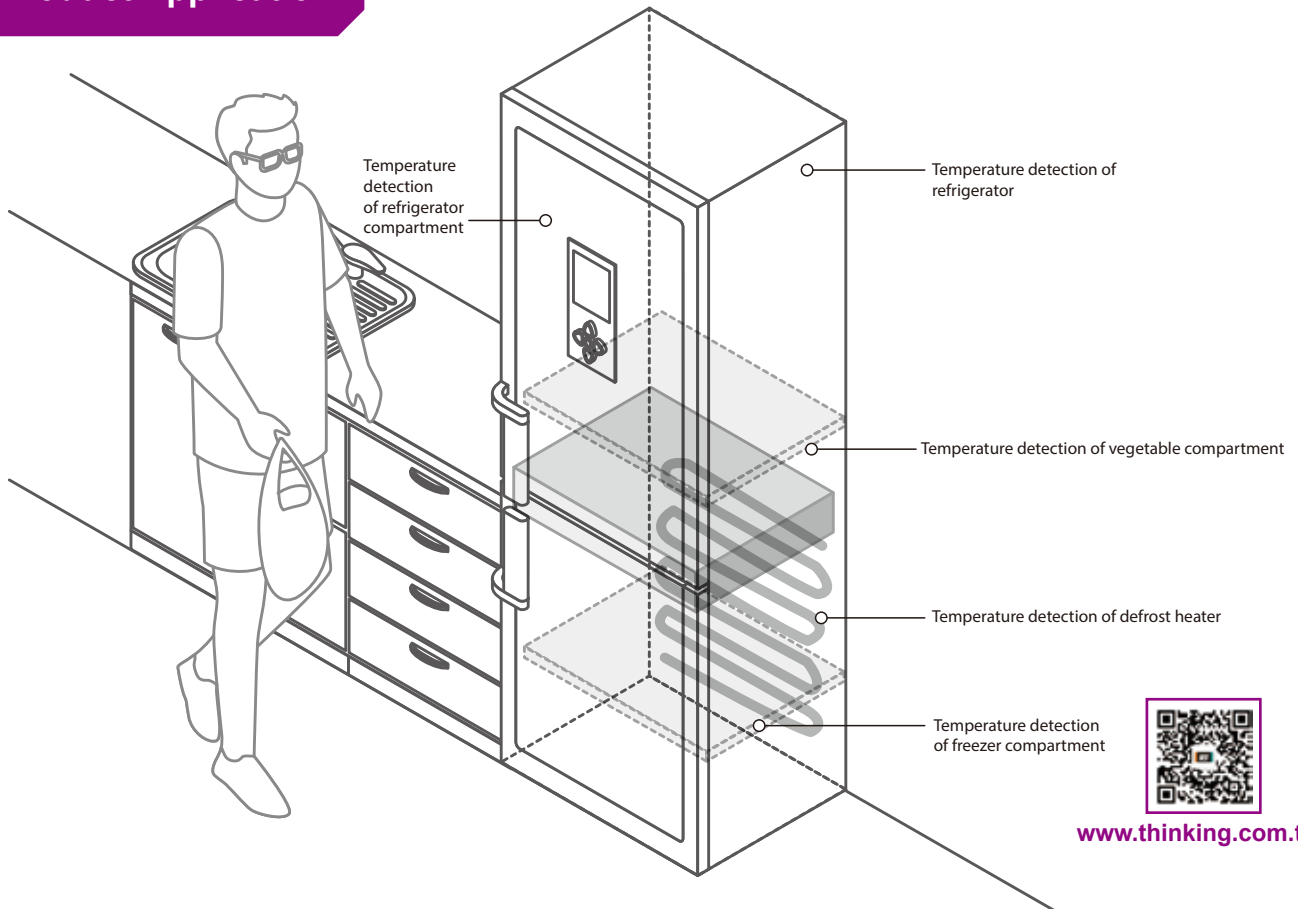
**R Value** | R-18°C=16.9KΩ±2%

**B Value** | B18/25=3771 K±2%

**Thermal Time Constant** | TH1: 25 seconds TH2: 20 seconds (in water)

**Hi-Pot Test** | AC 1500V 10mA(Max)

**Product Application**



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