

# Surface Temperature Sensor

## Block Type



**HAWK**

Since 1971

P-41



### K Type

- ▶ Resistance/Thermocouple Elements
- ▶ Easy and quick installation
- ▶ Reusable and long-lasting
- ▶ Robust and durable compared to adhesive or tape-on sensors
- ▶ High accuracy due to direct metal contact.

The I category temperature sensor is the device to measure surface temperature of an object such as pipe, bar, tube, dusts or vessel walls. The typical sensing element can be in RTD (Resistance Temperature Detector) or thermocouple (T/C).

The HAWK *K model* metal block type temperature sensor is a type of surface-mounted temperature sensor designed for direct measurement of temperature on flat or slightly curved metal surfaces. It is made with a flat or contoured metal block that ensures good thermal contact with the target surface. This metal block can be mounted by the spring-loaded clamps, screws, bolts or welding. The junction is located inside the contact block and offer the better insulation resistance from the influence of ambient temperatures.

### Specifications

#### Sensing Element:

K(Ni-Cr, Ni-Al)...0/+1200°C,  
E(Ni-Cr, Ni-Cu)...-200/+900°C,  
J(Fe, Ni-Cr)...-50/750°C,  
T(Cr, Ni-Cr)...-200/+350°C,  
N(Ni-Cr-Si, Ni-Si)...0/1200°C,  
Platinum 100Ω/500Ω/1000Ω,  
Nickel 120Ω, Copper 10Ω,  
Single, Double or Tripple Resistance,  
Element.

#### Tolerance (°C)-PT100:

JIS/DIN

ClassA	ClassB
$\pm(0.15+0.002 t )$	$\pm(0.3+0.005 t )$

ASTM

ClassA	ClassB
$\pm(0.13+0.0017 t )$	$\pm(0.25+0.0042 t )$

#### Block Style:

Rectangle or Square

#### Block Material:

SS304, SS316, SS316L, Brass

#### Transition Style:

Standard, Spring or Armor.

#### Insulation/Conductor:

Fiberglass, PVC or PTFE.

#### Wire Termination:

Plain Leads-not stripped, Stripped.  
Lead 3mm, Spade lug,  
Standard Male Plug, Mini Male Plug,  
Standard Female Socket,  
Mini Female Socket,  
Terminal Pin or others.

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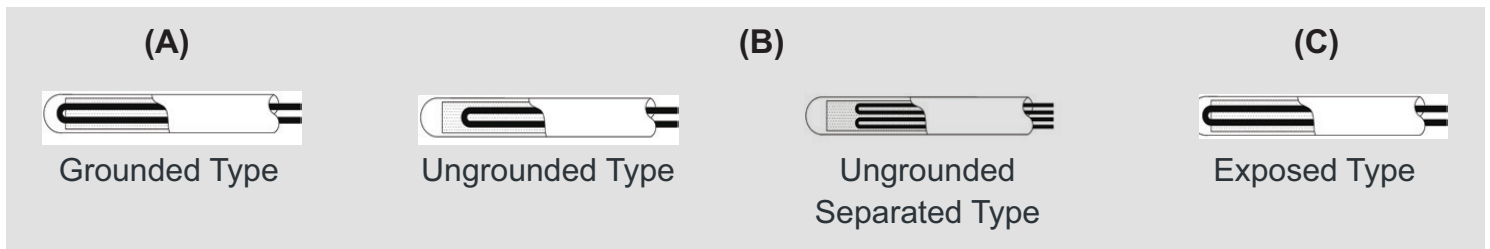


**P-4I**

### Tolerance Thermocouple

Code	JIS C1605/DIN(IEC 584-2)			ASTM E230
	Class 1	Class 2	Class 3	STD / SP
K-TYPE	-40°C~375°C ±1.5°C	-40°C~333°C ±2.5°C	-167°C~40°C ±2.5°C	STD...±0.75% or ±2.2°C(4°F)
	375°C~1000°C ±0.004 · t	333°C~1200°C ±0.0075 · t	-200°C~-167°C ±0.0015 · t	SP...±0.4% or ±1.1°C(2°F)
N-TYPE	-40°C~375°C ±1.5°C	-40°C~333°C ±2.5°C	-167°C~40°C ±2.5°C	STD...±0.75% or ±2.2°C(4°F)
	375°C~1000°C ±0.004 · t	333°C~1200°C ±0.0075 · t	-200°C~-167°C ±0.0015 · t	SP...±0.4% or ±1.1°C(2°F)
E-TYPE	-40°C~375°C ±1.5°C	-40°C~333°C ±2.5°C	-167°C~40°C ±2.5°C	STD...±0.5% or ±1.7°C(3.1°F)
	375°C~800°C ±0.004 · t	333°C~900°C ±0.0075 · t	-200°C~-167°C ±0.0015 · t	SP...±0.4% or ±1°C(1.8°F)
J-TYPE	-40°C~375°C ±1.5°C	-40°C~333°C ±2.5°C	-	STD...±0.75% or ±2.2°C(4°F)
	375°C~750°C ±0.004 · t	333°C~750°C ±0.0075 · t	-	SP...±0.4% or ±1.1°C(2°F)
T-TYPE	-40°C~125°C ±0.5°C	-40°C~133°C ±1°C	-67°C~40°C ±1°C	STD...±0.75% or ±1°C(1.8°F)
	125°C~350°C ±0.004 · t	133°C~350°C ±0.0075 · t	-200°C~-67°C ±0.0015 · t	SP...±0.4% or ±0.5°C(0.9°F)

### Measuring Junction Type



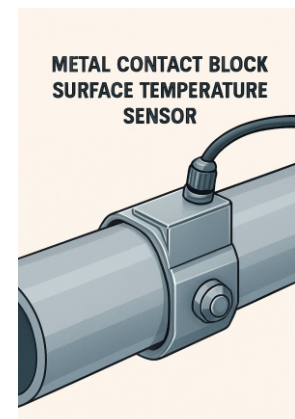
(A) The thermocouple is grounded to the protective tube. It is with fair response than unground type. It is not suitable for the noisy and dangerous location such as electromagnetic induction interfered by radio frequency.

(B) The thermocouple is covered with insulator. It responds slower than grounded type. For most applications, it can ensure a long-life. It is available in two control loop separately.

(C) The thermocouple is exposed. It is with rapid response, but not good in airtightness, insulation and mechanical strength.

### Typical Applications

- ▶ Monitoring pipe or tank wall temperatures.
- ▶ Surface measurement on machinery housings.
- ▶ Motor and transformer casing temperature monitoring.
- ▶ Industrial heating systems (furnaces, boilers, heat exchangers).
- ▶ Preventive maintenance for rotating equipment.



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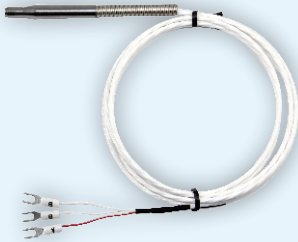


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### Insulation/Conductor

**F**

*PTFE insulation cable*



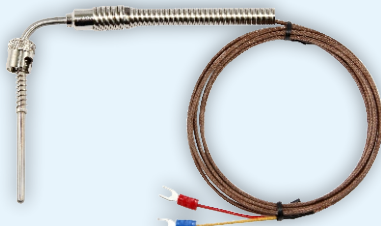
**G**

*Glass coating shield SUS cover insulation cable*



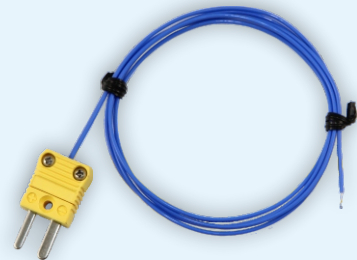
**P**

*Fiberglass insulation cable*



**C**

*PVC insulation cable*



### Transition Type

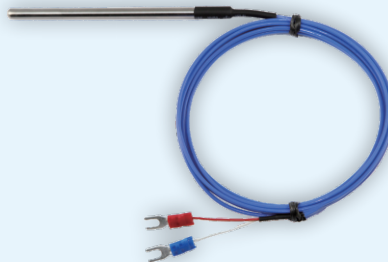
**A**

*SS Armor Transition*



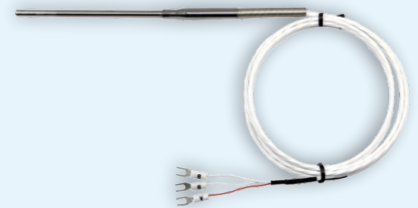
**P**

*Standard Transition*



**S**

*Spring Transition*



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Block Type



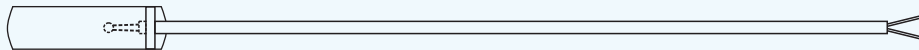
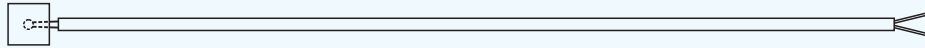
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## Dimensions



## Options



**ZC** Certificate of Accuracy (Factory)

**ZE** Certificate of Accuracy (TAF)

**ZI** Certificate of Accuracy (NIST)



**ZY** Stainless Steel Tag Plate

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**P-4I**

### Order Information

P-4I-K6 R10 K J3 A 006 020 N 000 G S 2 P 100 C P H-XX

**Option**  
 ZC-Certificate of Accuracy (Factory)  
 ZE-Certificate of Accuracy (TAF)  
 ZI-Certificate of Accuracy (NIST)  
 ZY-Stainless Steel Tag Plate  
 Please refer to the options and write down the code which you need.

**Wire Termination**  
 P-Plain Leads-not stripped  
 S-Stripped Lead 3mm  
 L-Spade lug T-Terminal Pin  
 M-Standard Male Plug  
 A-Mini Male Plug  
 F-Standard Female Socket  
 C-Mini Female Socket

**Insulation / Conductor** C-PVC F-PTFE P-Fiberglass  
 N-Nickel G-Glass Coating Shield SUS Cover

<b>Lead/Armor Length</b>	000-Non	06C-6"	15C-16"	050-50mm	1M1-1.1m
	2C5-2 1/2"	09C-9"	18C-18"	100-100mm	1M5-1.5m
	04C-4"	12C-12"	24C-24"	900-900mm	10M-10m and so on...

**Transition Type** P-Standard Transition S-Spring Transition  
 A-Armor Transition

**Wires** 2-2 wires 3-3 wires 4-4 wires 6-6 wires 8-8 wires 0-non

**Number of elements** S-Single Element D-Double Elements T-Triple Elements

**Type of Junction** G-Grounded U-Ungrounded L-Others E-Exposed N-None

**Lagging Extension** 000-Non

**Shank Design** N-None

**Width** C25-1/4" C50-1/2" C60-0.6" C90-0.9" 1C2-1.2" 1C6-1.6" 2C4-2.4"  
 005-5mm 010-10mm 015-15mm 020-20mm 025-25mm and so on...

**Length** C25-1/4" C32-5/16" C38-3/8" 006-6mm 008-8mm 010-10mm 012-12mm and so on...

**Stem Material** A-SS304 S-SS316 W-SS316L B-Brass

<b>Class</b>	J1-JIS/DIN Class 1	EA-JIS/DIN Class A-200/+100°C	LA-JIS/DIN Class A-30/+250°C	MA-JIS/DIN Class A-50/+450°C	HA-JIS/DIN Class A 0/+650°C
	J2-JIS/DIN Class 2	EB-JIS/DIN Class B-200/+100°C	LB-JIS/DIN Class B-30/+250°C	MB-JIS/DIN Class B-50/+450°C	HB-JIS/DIN Class B 0/+650°C
	J3-JIS/DIN Class 3	AA-ASTM Class A-200/+100°C	BA-ASTM Class A-30/+250°C	CA-ASTM Class A-50/+450°C	DA-ASTM Class A 0/+650°C
	AT-ASTM Standard AP-ASTM Special	AB-ASTM Class B-200/+100°C	BB-ASTM Class B-30/+250°C	CB-ASTM Class B-50/+450°C	DB-ASTM Class B 0/+650°C

**Sensor Type** K-K-Type J-J-Type N-N-Type D-D-Type P-Platinum 100Ω D-Platinum 1000Ω  
 E-E-Type T-T-Type C-C-Type A-Platinum 500Ω I-Nickel 120Ω C-Copper 10Ω

**Block Style** **Style** R-Rectangle S-Square  
**Thickness** 05-5mm 06-6mm 08-8mm 10-10mm 12-12mm 16-16mm 20-20mm 25-25mm and so on...

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### Limited Warranty and Liability

HAWK GAUGE CO.,LTD warrants all its mechanical instruments to be free from defects in materials and workmanship. HAWK agrees to repair or replace any thermometers if returned to our factory, transportation charges prepaid, and after which examination reveals is to be defective due to faculty workmanship or material.

This warrant should not apply to subject to the following terms and conditions:

- A. The product has not been subjected to misuse, neglect, abuse , accident, incorrect mounting, improper use or misapplication such as negligence, accident, vandalism, shock or vibration.
- B. The performance of any system of which HAWK's products are a component part.
- C. The product has not been exposed to any other service, range or environment of greater severity than that for which the products were designed.
- D. The product has not been altered or repaired by anyone except HAWK GAUGE or its authorized service agencies.
- E. The serial number or date code has not been removed, defaced or changed.
- F. The actual pressure&temperature occurring exceed the values specified for HAWK Thermometer.

Unless otherwise specified in a manual or warranty card, or agree to in a writing signed by HAWK GAUGE office, HAWK Thermometer products shall be warranted for one years from the date of sale.

This warranty is in lieu of all other warranties expressed or implied, and of all obligations or liabilities on its part for damages including but not limited to consequential damages, following the use of misuse of instruments sold by it. No agent is authorized to assume for it any liability except as set forth above.

### Note

HAWK GAUGE CO.,LTD reserves the right to make product improvements and change its specifications at any time stated throughout this brochure without notification. Please contact the factory on all critical dimensions and specifications for verification.

HAWK GAUGE is not expert in the customer's technical field and therefore doesn't warrant suitability of it's product for the application selected by customer.



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