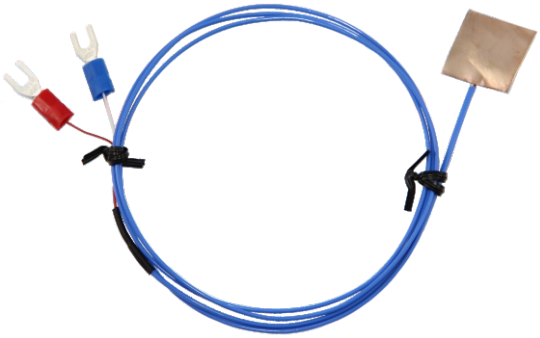
Surface Temperature Sensor

Sheet Type

ISO 9001 CERTIFIED

HAWK Since 1971

P-4I



A Type

- **Resistance/Thermocouple Elements**
- **Easy and quick installation (minimal mass and close contact)**
- **Flexible (can conform to curved or uneven surface)**
- **Usually attached with adhesive backing, thermal tape, or clamping**

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 ***A model*** sheet type temperature sensor is welded into a pad, allowing tight contact with surface. This type surface temperature sensor is a flat, flexible sensor designed to measure temperature on the surface of objects. It is commonly used where traditional probe-type sensors cannot fit, especially in applications requiring close contact with irregular or flat surfaces.

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
±(0.15+0.002|t|)	±(0.3+0.005|t|)

ASTM

ClassA	ClassB
±(0.13+0.0017|t|)	±(0.25+0.0042|t|)

Sheet Style:
Rectangle, Square or Round

Sheet 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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Tolerance Thermocouple

	JIS C1605/DIN(IEC 584-2)			ASTM E230
Code	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)

Grounded Type

Ungrounded Type

(B)

Ungrounded Separated Type

(C)

Exposed Type

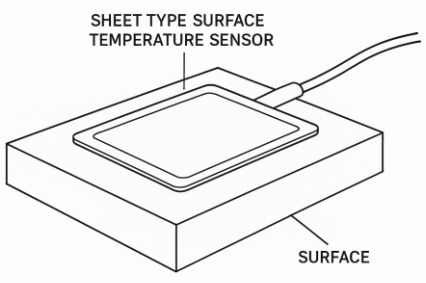
(A) The thermocouple is grounded to the protective tube. It is with fair response than unground type. It is not suitable for the noisy an dangerous location such us electromagnetic induction interfered by radio frequency.

(B) The thermocouple is covered with insulator. It responses 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 reponse, but not good in airtightness, insulation and machanical strength.

Typical Applications

- ▶ Measuring motor or transformer winding temperature.
- ▶ Monitoring battery pack surface temperature in EVs.
- ▶ HVAC system duct surface measurement.
- ▶ Industrial equipment surface monitoring (pipes, tanks, machinery).
- ▶ Electronics temperature control (e.g., PCBs, power modules).

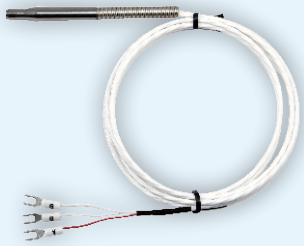


Surface Temperature Sensor

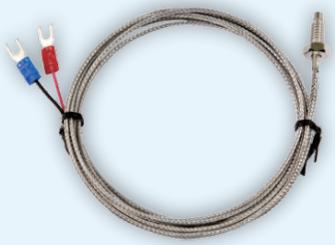
Sheet Type

Insulation/Conductor

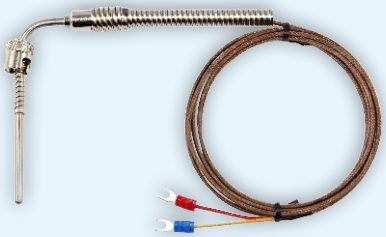
F *PTFE insulation cable*



G *Glass coating shield SUS cover insulation cable*



P *Fiberglass insulation cable*

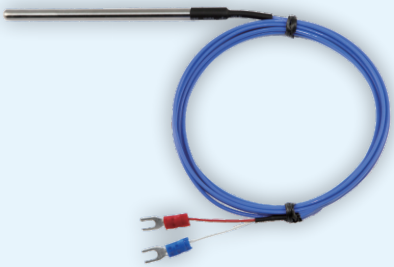


C *PVC insulation cable*

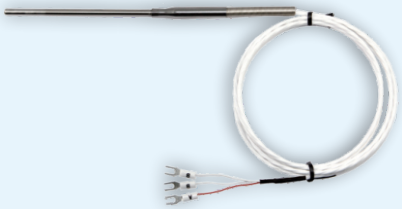
Transition Type

A *SS Armor Transition*

P *Standard Transition*



S *Spring Transition*



Surface Temperature Sensor

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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

Surface Temperature Sensor

Sheet Type

P-4I

Order Information

P-4I-A6 R00 K J3 A 006 020 N 000 G S 2 P 100 C P H- XX

Option XX
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
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
C-PVC F-PTFE P-Fiberglass
N-Nickel G-Glass Coating Shield SUS Cover

Lead/ Armor Lenght 100
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
P-Standard Transition S-Spring Transition
A-Armor Transition

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

Number of elements S
S-Single Element D-Double Elements T-Tripple Elements

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

Lagging Extension 000
000-Non

Shank Design N
N-None

Width 006
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 020
C25-1/4" C32-5/16" C38-3/8" 006-6mm 008-8mm 010-10mm 012-12mm and so on...

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

Class J3
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 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
AP-ASTM Special

Sensor Type K
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

Sheet Style R00
R00-Rectangle S00-Square U00-Round

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.

55 YEARS ANNIVERSARY

1971 – 2025

Data Sheet No: MKDP4IAA0-E