Protecting Tube/Head Assembly Thermocouple

HAWK®
Since 1971

P-4H

SX Series

- Noble/Base Metal Sensing Elements
- Case 316 Stainless Steel
- Wide Temperature Ranges from -200°C to 2300°C
- Various Robust Tube Sizes and Materials for your applications
- IP68 Weather Proof for applications in hazardous areas

A protecting tube/head assembly temperature sensor is most commonly used in high temperature process heating application. This assembly includes a thermocouple (T/C) sensor, robust tube and head housing which protect the sensing element and insure that the temperature of the process is passed to the sensor.

The protecting tube is available in non-metal, metal alloys, or composite materials such as Fused Quartz, Cermet, Alumina, Mullite, SS316, P4, 253MA, Inconel 600, UMCO50, Titanium, Tantalum and so on in order to offer protection from a variety of high temperature process environment.

HAWK SX model is with 316 stainless steel explosion proof head assembly temperature sensor which provides the better dust and moisture resistance.
It is a intrinsically safety designs which are most widely used for applications in hazardous areas.

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,
D(3%W.Re, 25%W.Re)...-200/+2300°C,
C(5%W.Re, 26%W.Re)...-200/+2300°C,
B(30%Pt.Ph, 6%Pt.Ph)...-200/+1700°C,
R(13%Pt.Ph, Pt)...0/+1600°C,
S(10%Pt.Ph, Pt)...0/+1550°C.

Tube Size:
3/8", 1/2", 11/16", 5/8", 3/4", 7/8", 1", 1 1/4", 1 1/2", 1 3/4", 10mm, 15mm, 16mm, 17mm, 18mm, 19mm, 20mm, 21mm, 22mm, 24mm, 25mm, 26mm and other dia available.

Tube Material:
SS304, SS316, SS316L, SS310, Inconel.

Tube Length:
9", 12", 15", 18", 24", 30", 36", 500mm, 1000mm, 1400mm standard lengths, available in other lengths.

Head&Conduit:
Casting 316 Stainless Steel,
1/2"NPT, 3/4"NPT, M20*1.5, M25*1.5.

Thread Connection Style:
Fixed Rigid Male/Female, Plain, 1/2", 3/8", 1/4" NPT standard, JIS, DIN, M14*1.0 and M20*1.5 available.

Flange Connection:
ANSI Flange 1/2".....2"
(150LB...2500LB rating),
JIS Flange 15A.....50A
(10K.....63K rating),
DIN Flange DN15.....DN50
(PN2.5.....PN400Bar rating).

Top Sensing Tube Material:
SS304, SS316, SS316L, SS310S, SS321, Sandvik P4 (446), Sandvik 253M, Inconel 600, Inconel 800, Hastelloy B, Hastelloy C276, UMCO 50, Titanium, Molybdenum, Tantalum, PFA, Fused Quartz, Cermet, Silicon Carbide, Boron Nitride, Alumina, Mullite, Zirconium, Magnesium Oxide.

Terminal Block (Insulation):
Ceramic (Al_2O_3).

Weatherproof:
IP68.

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Tolerance

	JIS C1605/DIN(IEC 584-2)			ASTM E230
Code	Class 1	Class 2	Class 3	STD / SP
B-TYPE	-	-	600°C~800°C ±4°C	STD...±0.5%
	-	600°C~1700°C ±0.0025 · t	600°C~1700°C ±0.005 · t	SP...±0.25%
R-TYPE	0°C~1100°C ±1°C	0°C~600°C ±1.5°C	-	STD...±0.25% or ±1.5°C(2.7°F)
	-	600°C~1600°C ±0.0025 · t	-	SP...±0.1% or ±0.6°C(1.1°F)
S-TYPE	0°C~1100°C ±1°C	0°C~600°C ±1.5°C	-	STD...±0.25% or ±1.5°C(2.7°F)
	-	600°C~1600°C ±0.0025 · t	-	SP...±0.1% or ±0.6°C(1.1°F)
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 as 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 response, but not good in airtightness, insulation and mechanical strenght.

Typical Applications

- Medical and Pharmaceutical industry
- Dairy processing
- Food and Beverage processing
- Power generating stations
- Offshore Oil platforms
- Pulp and Paper mills
- Waste water treatment
- Petrochemical, Oil and Gas processing

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Metal Tube

The main responsibility of the tube is to protect the temperature sensor form corrosion or oxidation conditions found in the process, as well as mechanical stresses. There is no one material which can withstand all service conditions across the industry. It is very important to choose the proper material for your applications. A wide variety of steels and nickel-based alloys are used to make the protecting tube. The primary metals used in the fabrication of tube are Carbon Steel, Chrome Molybdenum Steels, Stainless Steels, Nickel Based Alloys. As a general guide, a high chromium content is desirable for high temperature resistance to oxidation and sulfur attach. The followings are the application notes for popular materials.

Material	Temperature		Property
	Normal	Max	
SS304	800°C	900°C	The general purpose austenitic Stainless Steel. Corrosion resistant in the annealed condition. Not affected by sterilizing solutions, foodstuffs, most dyestuffs, organic chemicals and many inorganic chemicals.
SS304L	800°C	900°C	Lower carbon content than SS304. Better corrosion resistance than SS304.
SS316	800°C	900°C	It is modified by 2-3% molybdenum which improve its resistance to chlorides. Higher corrosion resistance than SS304. High creep strength. Withstands sulphurous acid compounds, resists tendency to pit in phosphoric and acetic acids. The max continuous service temperature in air is up to 900°C. SS316 is most popular austenitic stainless steel to resist the corrosion, especially in chlorides.
SUS316L	800°C	900°C	Lower carbon content than SS316. It reduces the effects of carbide precipitation. Better corrosion resistance than SS316.
SUS310S	900°C	1050°C	Very high elevated temperature strength and scale resistance. Superior to 304 in many high temperature applications. Good resistance to carburizing and reducing environments. Subject to carbide precipitation in the 500°C to 870°C range.
SUS321	900°C	1000°C	Carbide stabilized grade intended to prevent harmful precipitation of chromium carbides and the resulting susceptibility to intergranular corrosive. For corrosion conditions and intermittent heating and cooling applications between 430°C and 815°C.
Sandvik-P4(446)	1000°C	1100°C	Good in resisting the corrosion and sulfur attack in high temperature environments up to 1050°C.
Sandvik 253MA	900°C	1100°C	High hot strength and resistance to progressive oxidation. It is with strong mechanical strength to resist the abrasion in high temperature condition.
Inconel 600	1000°C	1200°C	Good in severely corrosive environments and at elevated temperatures. High hot strength and resistance to progressive oxidation.
Inconel 800	800°C	1200°C	Good elevated temperature resistance to oxidation and carburization. Good sulfur and corrosion resistance.
Hastelloy B	900°C	1050°C	Excellent corrosion resistance to hydrochloric, sulfuric, phosphoric, and acetic acids. Excellent corrosion resistance to hydrogen chloride gas.
Hastelloy C-276	900°C	1050°C	Excellent corrosion resistance to many chemical environments, including ferric and cupric chlorides, contaminated mineral acids, wet chloride gas. Oxidation resistance to 1800°F.
UMCO 50	1000°C	1200°C	It contents CO to ensure the thermal shock for the high temperature application. Excellent wear and abrasion resistance in high temperature condition. Good to resist the sulfur attack and corrosion in many environments.
Titanium	400°C	1000°C	Excellent corrosion resistance in low temperature condition and oxidize rapidly in high temperature condition.
Molybdenum	1500°C	2000°C	Excellent operation in vacuum condition and oxidize rapidly above (500°C).
Tantalum	1800°C	2300°C	Excellent corrosion resistance in low temperature condition and oxidize rapidly above (250°C).

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Non-Metal Tube

Most stainless steel and nickel-based alloy may become weak and soft at/before approximately 1200°C. There are two metals Tantalum and Molybdenum which can resist the temperature up to 2600°C. However, there are with the limits to use in such high temperature applications. Both of them oxidize rapidly, Tantalum above (250°C), and Molybdenum above (500°C). Therefore, these metals can't be used except in strictly non-oxidizing atmospheres. For such solutions, we will recommend a non-metallic or ceramic type protection tube material. These non-metals include fused quartz, cermet, silicon carbide, alumina, mullite and so on.

Material	Temperature		Property
	Normal	Max	
PFA	200°C	260°C	It is with a excellent corrosive resistance for strong acid and alkaline media. Excellent electrical characteristic and no oxidizing condition.
Fused Quartz (QT)	1000°C	1200°C	It has a very low coefficient of thermal expansion and with a excellent resistance to thermal shock cracking. It can resist attack by many corrosive chemicals and liquid materials, but the mechanical strength is not so good.
Aluminum 610 (58%)	1500°C	1600°C	It is with strong heat resistance ability and can resist the sulfur gas under oxidizing conditions up to 1000°C. It may be broken quite easily by mechanical shock.
Aluminum 610 (55%)	1400°C	1500°C	It is with strong heat resistance ability and can resist the sulfur gas under oxidizing conditions up to 1000°C. It may be broken quite easily by mechanical shock.
Aluminum 710 (99.7%)	1600°C	1800°C	The better heat resistance ability than Alumina 610 and can resist the sulfur gas under oxidizing conditions up to 1000°C. It may be broken quite easily by mechanical shock.
Silicon Carbide (SIC)	1400°C	1600°C	It can resist the rapid cold and heat condition. Excellent wear and abrasion resistance in high temperature condition, but the air tightness is not so good.
Beryllia Ceramics (Be)	1800°C	2000°C	It can resist the rapid cold and heat condition. It has a very stable chemical property.
Magnesium Oxide (Mg)	1800°C	2200°C	Excellent corrosion resistance to many chemical environments. It can be use for extreme high temperature applications.
Zirconium (Zr)	1800°C	2200°C	It has the excellent thermal shock resistance. It can be use for extreme high temperature palliations.

Process Connections

Fixed/Rigid Type:

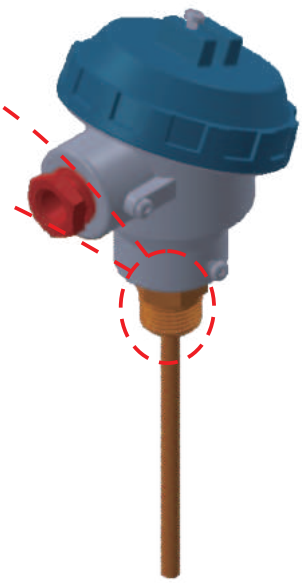
The fixed/rigid type is the most common connection. This threaded type connection is directly attached to the process by means of a male or female NPT, BSP, BSPT or other threads.

Plain Type:

The plain bulbs are suitable for open tank applications without any pressure or combine with thermowell for the applications where fixed installation is not required.

Flange Type:

The flange connection is directly attached to the process by means of a ANSI, DIN or JIS flange. This connection is most popular for a piping system and have been designed to meet the needs of standard industrial applications and installations.



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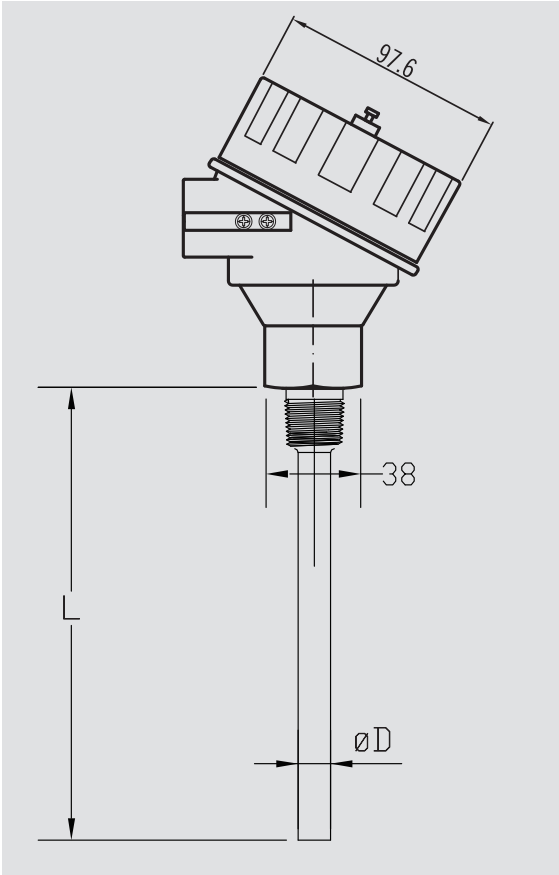
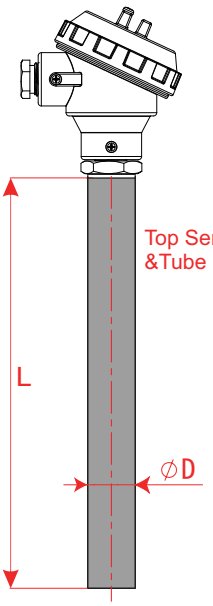
Head Style/Dimensions

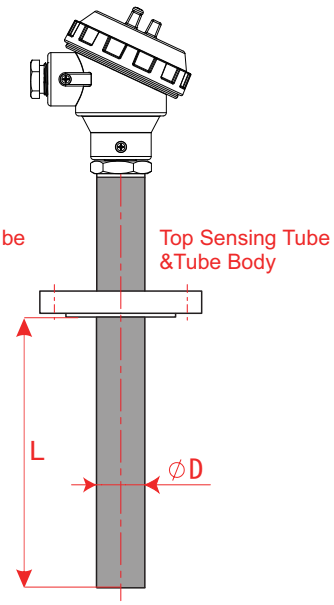
SX-Y Series



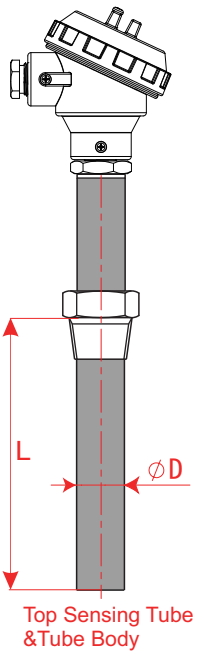
Plain

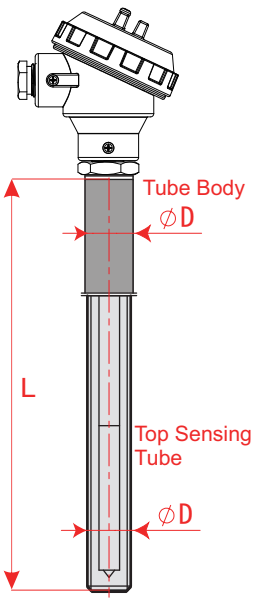


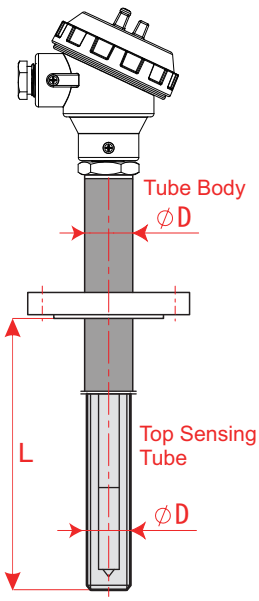
Flange

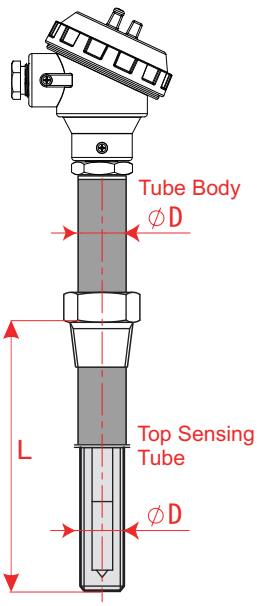


Thread









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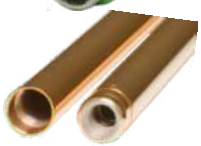
Accessories/Options

- ZC Certificate of Accuracy (Factory)
- ZE Certificate of Accuracy (TAF)
- ZI Certificate of Accuracy (NIST)
- ZY Stainless Steel Tag Plate

- ZN NACE-MR0175 Heat Treatment
- ZX Oxygen Cleaning
- TC PFA Lining Stem

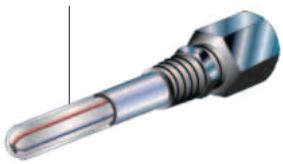
- TD PTFE Coating Stem

- TE Titanium Coating Stem



- E# Pipe Nipple Extension

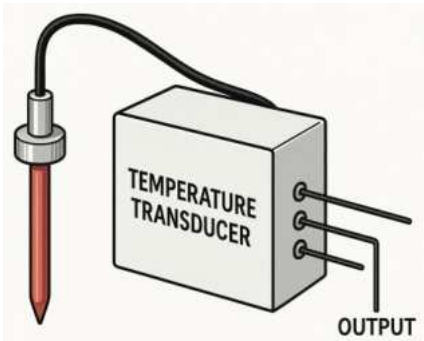
- KG Laser Length Scale on Tube



- KH Sheath Type

Pipe Nipple Extension

- EA-1"
- EB-2"
- EC-3"
- ED-4"
- EE-5"
- EF-6"
- EG-7"
- EH-8"
- EI-9"
- EJ-10"
- EK-11"
- EL-Others
- E1-25mm
- E2-50mm
- E3-75mm
- E4-100mm
- E5-125mm
- E6-150mm
- E7-175mm
- B8-200mm



- VA 0...10V Transducer (Analog 3 Wires)
- VB 0...5V Transducer (Analog 3 Wires)
- VC 1...5V Transducer (Analog 3 Wires)
- VD 0.5...4.5V Transducer (Analog 3 Wires)
- VE 1...6V Transducer (Analog 3 Wires)
- VF 4...20mA Transducer (Analog 2 Wires)

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Order Information

** For Thread&Plain Style*

Example:

P-4H-SXAM2P0M3HBA006075SAC382C5R000NS3H-XX

A	M2	P	0M3	HB	A	006	075	S	A	C38	2C5	R	000	N	S	3	H-	XX

Option
ZC-Certificate of Accuracy (Factory)
ZE-Certificate of Accuracy (TAF)
ZI-Certificate of Accuracy (NIST)
ZN-NACE-MR0175-2002 Heat Treatment
ZX-Oxygen Cleaning
ZY-Stainless Steel Tag Plate
KA-SS Armor Cable **KS**-Load Spring
TC-PFA Lining Stem
Please refer to the options and write down the code which you need.

Wires **2**-2 wires **3**-3 wires **4**-4 wires **6**-6 wires **8**-8 wires **9**-9 wires

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

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

Cable Length **000**-No Wire **050**-50mm **200**-200mm **01M**-1m **10M**-10m **10C**-10" **50C**-50" **10F**-10Feet **50F**-50Feet and so on...

Electrical Connection **Q**-Head-1/2"NPT-F **X**-Head-3/4"NPT-F **Z**-Head-M25*1.5-F **L**-Others **S**-Head-M20*1.5-F

Tube Body Length **2C5**-2 1/2" **04C**-4" **06C**-6" **09C**-9" **12C**-12" **16C**-16" **24C**-24" **075**-75mm **100**-100mm **150**-150mm **200**-200mm **250**-250mm and so on...

Tube Body Diameter **C38**-3/8" **015**-15mm **C50**-1/2" **017**-17mm **C69**-11/16" **020**-20mm **C75**-3/4" **025**-25mm **1C0**-1" and so on...

Tube Body Material **A**-SS304 **S**-SS316 **W**-SS316L **K**-SS310 **O**-Inconel

Shank Design **S**-Straight **R**-Stepped **T**-Tapered

Top Sensing Tube Length **2C5**-2 1/2" **04C**-4" **06C**-6" **09C**-9" **12C**-12" **16C**-16" **24C**-24" **075**-75mm **100**-100mm **150**-150mm **200**-200mm **250**-250mm and so on...

Top Sensing Tube Diameter **C38**-3/8" **015**-15mm **C50**-1/2" **017**-17mm **C69**-11/16" **020**-20mm **C75**-3/4" **025**-25mm **1C0**-1" and so on...

Top Sensing Tube Material
A-SS304 **S**-SS316 **W**-SS316L **K**-SS310 **1**-SS321 **O**-Inconel 600 **E**-Hastelloy B **H**-Hastelloy C276 **F**-PFA **Q**-Fused Quartz **3**-Sandvik 253MA **4**-Sandvik P4 (446) **5**-UMCO50 **6**-Silicon Carbide (SIC) **9**-Molybdeum **T**-Titanium **U**-Tantalum **X**-Alumina 610 (58%) **Y**-Alumina 610 (55%) **Z**-Alumina 710 (99.7%) **R**-Zirconium (Zr) **V**-Beryllia Ceramics (Be) **G**-Magnesium Oxide (Mg)

Class **J1**-JIS/DIN Class 1 **J2**-JIS/DIN Class 2 **J3**-JIS/DIN Class 3 **AT**-ASTM Standard **AP**-ASTM Special

Wire Gauge **0M3**-0.3mm **0M4**-0.4mm **0M5**-0.5mm **0M6**-0.65mm **1M0**-1mm **1M6**-1.6mm **2M3**-2.3mm **3M2**-3.2mm **W08**-AWG8 **W14**-AWG14 **W20**-AWG20 **W24**-AWG24 **W26**-AWG26

Sensor Type **K**-K-Type **C**-C-Type **E**-E-Type **D**-D-Type **J**-J-Type **B**-B-Type **T**-T-Type **R**-R-Type **N**-N-Type **S**-S-Type

Process Connection
Style **M**-Fixed Rigid Male **F**-Fixed Rigid Female
Size **1**-1"NPT **5**-3/4"NPT **2**-1/2"NPT **6**-1 1/2"NPT **X**-2"NPT **U**-1"PT(R) **T**-3/4"PT(R) **A**-1/2"PT(R) **O**-1 1/2"PT(R) **G**-3/8"PT(R) **I**-1"PF(G) **Q**-3/4"PF(G) **D**-1/2"PF(G) **N**-1 1/2"PF(G) **R**-2"PF(G) **J**-M20*1.5 **Z**-M35*1.5 and so on... **0P**-Plain

Head Style **Y**-Casting 316 Stainless Steel, 1278g-ATEX Certified and FMCUS Certified

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Order Information

** For Flange Style*

Example:

P-4H-SXAV1RP0M3HBA006075SAC382C5R000NS3H-XX

Process Connection

A	V	1	R	P	0M3	HB	A	006	075	S	A	C38	2C5	R	000	N	S	3	H-	XX

Option
ZC-Certificate of Accuracy (Factory)
ZE-Certificate of Accuracy (TAF)
ZI-Certificate of Accuracy (NIST)
ZN-NACE-MR0175-2002 Heat Treatment
ZX-Oxygen Cleaning
ZY-Stainless Steel Tag Plate
KA-SS Armor Cable **KS**-Load Spring
TC-PFA Lining Stem
Please refer to the options and write down the code which you need.

Wires **2**-2 wires **3**-3 wires **4**-4 wires **6**-6 wires **8**-8 wires **9**-9 wires

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

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

Cable Length **000**-No Wire **050**-50mm **200**-200mm **01M**-1m **10M**-10m **10C**-10" **50C**-50" **10F**-10Feet **50F**-50Feet and so on...

Electrical Connection **Q**-Head-1/2"NPT-F **X**-Head-3/4"NPT-F **Z**-Head-M25*1.5-F **L**-Others **S**-Head-M20*1.5-F

Tube Body Length **2C5**-2 1/2" **04C**-4" **06C**-6" **09C**-9" **12C**-12" **16C**-16" **24C**-24" **075**-75mm **100**-100mm **150**-150mm **200**-200mm **250**-250mm and so on...

Tube Body Diameter **C38**-3/8" **015**-15mm **C50**-1/2" **017**-17mm **C69**-11/16" **020**-20mm **C75**-3/4" **025**-25mm **1C0**-1" and so on...

Tube Body Material **A**-SS304 **S**-SS316 **W**-SS316L **K**-SS310 **O**-Inconel

Shank Design **S**-Straight **R**-Stepped **T**-Tapered

Top Sensing Tube Length **2C5**-2 1/2" **04C**-4" **06C**-6" **09C**-9" **12C**-12" **16C**-16" **24C**-24" **075**-75mm **100**-100mm **150**-150mm **200**-200mm **250**-250mm and so on...

Top Sensing Tube Diameter **C38**-3/8" **015**-15mm **C50**-1/2" **017**-17mm **C69**-11/16" **020**-20mm **C75**-3/4" **025**-25mm **1C0**-1" and so on...

Top Sensing Tube Material
A-SS304 **S**-SS316 **W**-SS316L **K**-SS310 **1**-SS321
O-Inconel 600 **E**-Hastelloy B **H**-Hastelloy C276 **F**-PFA **Q**-Fused Quartz
3-Sandvik 253MA **4**-Sandvik P4 (446) **5**-UMCO50 **6**-Silicon Carbide (SIC) **9**-Molybdeum
T-Titanium **U**-Tantalum **X**-Alumina 610 (58%) **Y**-Alumina 610 (55%) **Z**-Alumina 710 (99.7%)
R-Zirconium (Zr) **V**-Beryllia Ceramics (Be) **G**-Magnesium Oxide (Mg)

Class **J1**-JIS/DIN Class 1 **J2**-JIS/DIN Class 2 **J3**-JIS/DIN Class 3 **AT**-ASTM Standard **AP**-ASTM Special

Wire Gauge **0M3**-0.3mm **0M4**-0.4mm **0M5**-0.5mm **0M6**-0.65mm **1M0**-1mm **1M6**-1.6mm **2M3**-2.3mm **3M2**-3.2mm **W08**-AWG8 **W14**-AWG14 **W20**-AWG20 **W24**-AWG24 **W26**-AWG26

Sensor Type **K**-K-Type **C**-C-Type **E**-E-Type **D**-D-Type **J**-J-Type **B**-B-Type **T**-T-Type **R**-R-Type **N**-N-Type **S**-S-Type

Face
R-RF(Raise Face) **P**-SFF(Small Female Face) **B**-SGF(Small Groove Face)
M-LMF(Large Male Face) **L**-LTF(Large Tongue Face) **F**-FF(Flat Face)
N-LFF(Large Female Face) **G**-LGF(Large Groove Face) **J**-RJ(Ring Joint Face)
O-SMF(Small Male Face) **A**-STF(Small Tongue Face) **K**-RFSF(Raise/Smooth Face)

Size

ANSI, DIN, HG20615,JIS	**1**-1/2"(DN15) **2**-3/4"(DN20)	**3**-1"(DN25) **4**-1 1/4"(DN32)	**5**-1 1/2"(DN40) **6**-2"(DN50)	**7**-2 1/2"(DN65) **8**-3"(DN80)	**9**-4"(DN100) **A**-5"(DN125)
HG20592 PN0.25, 0.6, 1.0, 2.5, 6.3, 10, 16	**B**-DN20	**C**-DN25	**D**-DN32	**E**-DN40	**F**-DN50	**G**-DN65	**H**-DN80	**I**-DN100	**J**-DN125
HG20592 PN0.4, 1.6, 4.0	**L**-DN20	**M**-DN25	**N**-DN32	**O**-DN40	**P**-DN50	**Q**-DN65	**R**-DN80	**S**-DN100	**T**-DN125

Rating (Standard)

ANSI	**A**-150LB	**B**-300LB	**C**-400LB	**D**-600LB	**E**-900LB	**F**-1500LB	**G**-2500LB
DIN	**H**-PN2.5Bar **I**-PN4.0Bar	**J**-PN6.0Bar **K**-PN10Bar	**L**-PN16Bar **M**-PN25Bar	**N**-PN40Bar **O**-PN64Bar	**P**-PN100Bar **Q**-PN160Bar	**R**-PN250Bar **S**-PN320Bar	**T**-PN400Bar
JIS	**U**-PN 5K	**V**-PN 10K	**W**-PN 16K	**X**-PN 20K	**Y**-PN 30K	**Z**-PN 40K	**0**-PN 63K
HG20615 (MPA)	**1**-150LB(PN2.0)	**2**-300LB(PN5.0)	**3**-600LB(PN11)	**4**-900LB(PN15)	**5**-1500LB(PN26)	**6**-2500LB(PN42)	
HG20592 (MPA)	**1**-PN0.25,PN0.4	**2**-PN0.6	**3**-PN1.0, PN1.6	**4**-PN2.5, PN4.0	**5**-PN6.4	**6**-PN10	**7**-PN16

Head Style **Y**-Casting 316 Stainless Steel, 1278g-ATEX Certified and FMCUS Certified

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

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 Process gauge 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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