



Temperature Sensors





Daniel Hügli
President

Dear Customer

Many thanks for your interest in our products. HUEGLI TECH has enjoyed the trust of our customers since 1929. I am proud that our family business has grown into a leading company in the diesel gas and engine control business with more than 60 employees. Our own research and development department for software and hardware allows us to respond flexibly to market needs. The HUEGLI TECH governing systems and our specialist support allow customers to get nearly 100% performance from their diesel and gas engines. Let yourself be inspired by our products catalog. For further questions or local advice we are happy to help you. For a successful future, we are your partner and stand by your side.



Certificates

ISO 9001:2015 Certifications



Re-certified
20 March 2017
(ISO 9001: 2015)

Re-certified
14 March 2014
(ISO 9001: 2008)

Re-certified
09 April 2009
(ISO 9001: 2008)

Re-certified
21 February 2005
(ISO 9001: 2000)

Certificate
01 April 1999
(ISO 9001: 1994)



Our Product Overview

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Temperature Control



Temperature Control

Temperature Sensor

Thermocouple

Thermocouple is a sensor used to measure temperature using voltage.

There are many types of Thermocouple, each with its own unique characteristics in terms of temperature range; durability, vibration resistance, chemical resistance and application compatibility.

Type K; J; T; N & E are “Base Metal” thermocouples, the most common and inexpensive types of thermocouple where ranges can be from -200 to 1350°C.

Type R; S; B & C are “Noble Metal” thermocouples; which are used in high temperature application where range can be from 0 - 1700°C

RTD (Resistance Temperature Detector)

RTD (Resistance Temperature Detector) is another model of Temperature Sensor where the measurement using Resistance ($\Omega = ^\circ\text{C}$). RTD element and material designed to give superior temperature measurement and exceptional stability. RTD material that we supply is Platinum Thin Film Element and Wire Wound Element.

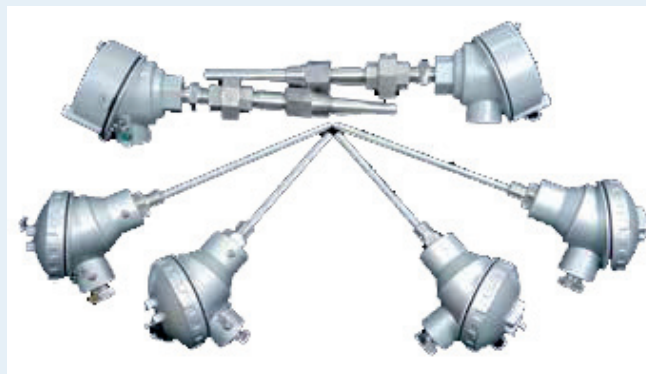
TD temperature probe are available in 2, 3 & 4 wire configurations with different accuracy:

- Class A = $\pm 0.15^\circ\text{C}$ at 0°C
- Class B ($\pm 0.30^\circ\text{C}$) at 0°C
- 1/3Din ($\pm 0.10^\circ\text{C}$) at 0°C
- 1/10Din ($\pm 0.03^\circ\text{C}$) at 0°C

Types Of RTD: 50ohm, 100ohm, 500ohm & 1000ohm.

Thermistor (Thermally Sensitive Resistors)

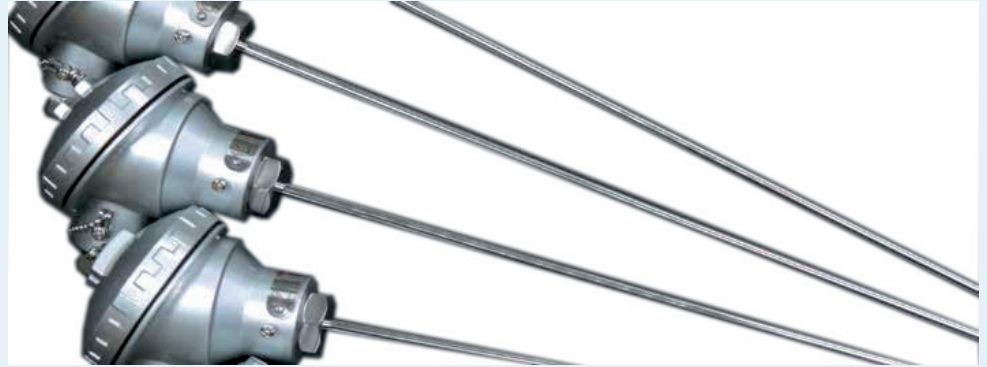
Thermistor (Thermally Sensitive Resistors) is electronic devices which detect thermal environmental changes for use in temperature measurement, control and compensation circuitry. Basics of thermistor sensors: NTC (Negative Temperature Coefficient) thermistors and PTC (Positive Temperature Coefficient) thermistors.



Temperature Control

Temperature Sensor

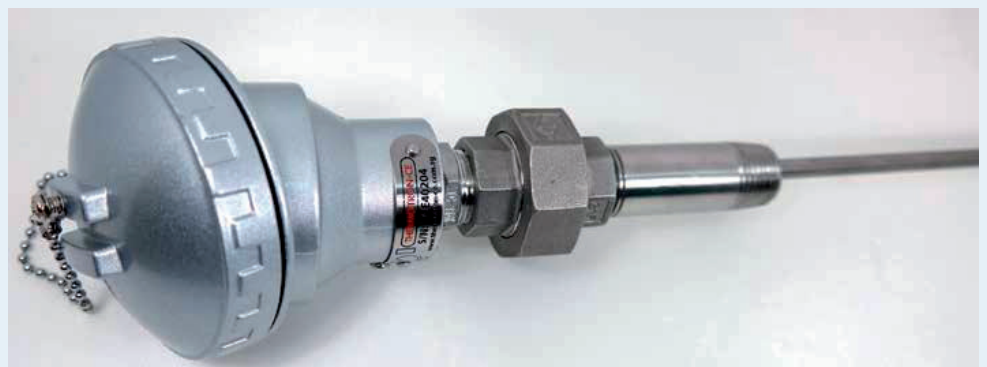
SENSOR WITH
DIE-CAST
ALUMINIUM HEAD



SENSOR WITH
FITTING



SPRING LOADED
SENSOR



SENSOR WITH
PROTECTION
TUBE

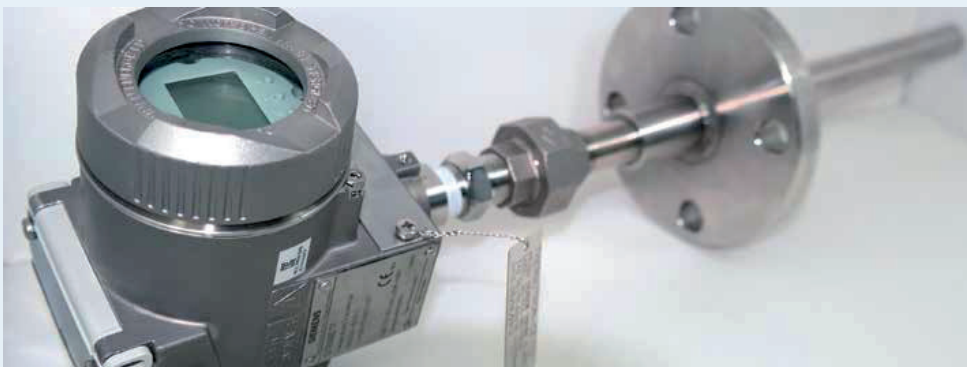


Temperature Control

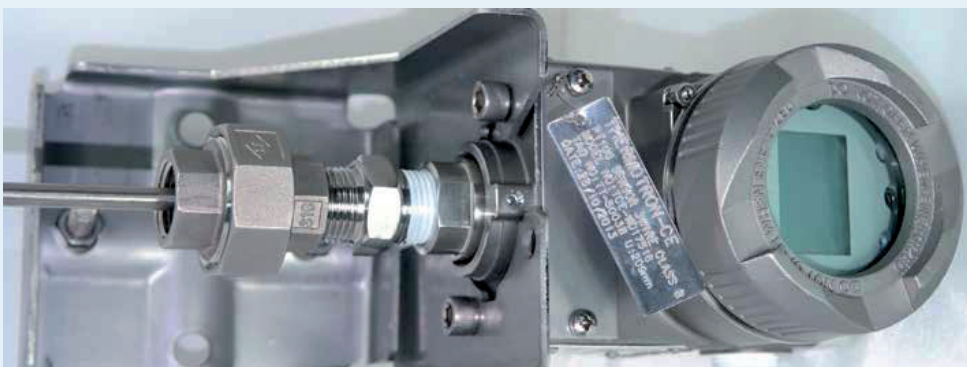
Temperature Sensor



**CERAMIC
POLE
SENSOR**



**FLANGE
SENSOR**



**REMOTE
SENSOR**



**DESIGNED SENSOR
WITH ELEMENT &
PROBE
COVERED WITH
THERMOWELL**

Temperature Control

Temperature Sensor

**SANITARY
SENSOR**



**CERAMIC
SENSOR**



**LED TRANSMITTER
WITH EXPROOF
JUNCTION BOX**

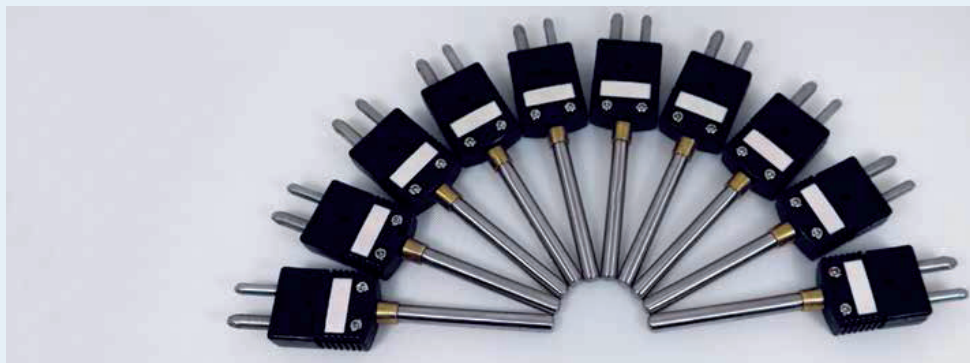


**EXPOSED SENSOR
WITH THERMOWELL
PROTECTION &
TESTING PLUG FOR
PREVENTING
LEAKAGE**



Temperature Control

Temperature Sensor



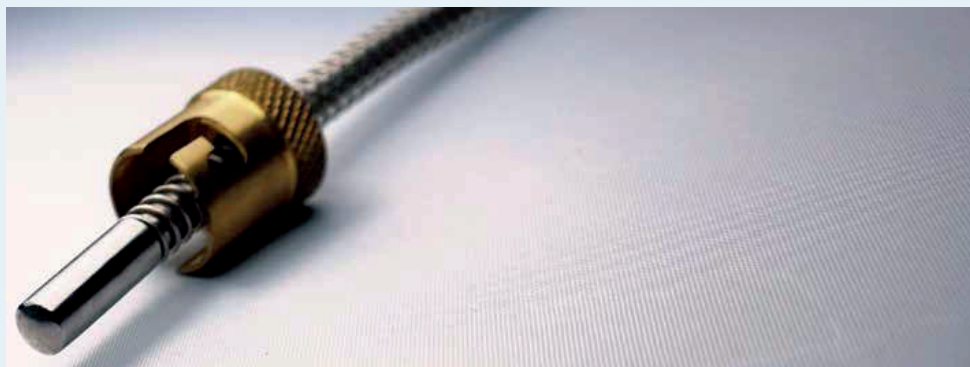
**SENSOR PROBE
WITH CONNECTOR**



**SIMPLE SENSOR
PROBE WITH
LEAD WIRE**



**SENSOR EXPOSED
TOP WITH TEFLON
PROTECTION THAT
DESIGN SPECIFICALLY
FOR CHEMICAL/
ACIDIC PRODUCT**

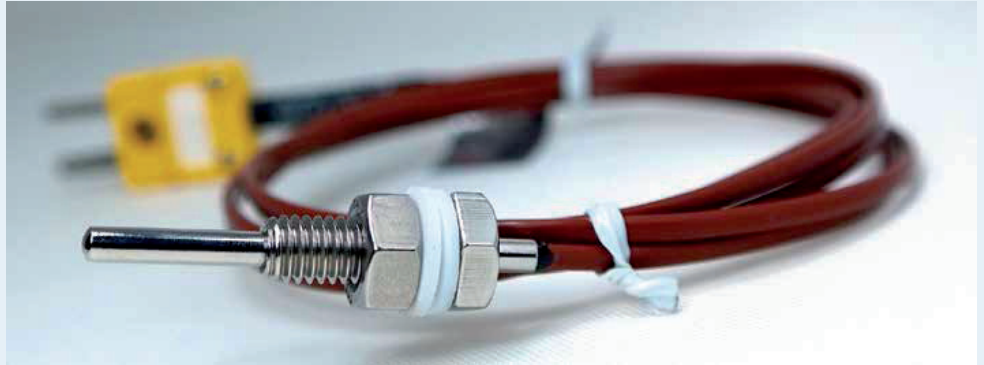


BAYONET CAP

Temperature Control

Temperature Sensor

**SENSOR SCREW
PROBE WITH
LEAD WIRE &
CONNECTOR**



**SPOT WELDED
WITH
CONNECTOR**



**SURFACE & SCREW
SENSORS**



**ANGLE
FITTING
SENSOR**



Temperature Control

Temperature Sensor



**HIGH TEMPERATURE
SENSOR WITH
VIBRATION
APPLICATION**



**SENSOR WITH
DIN RAIL
CONNECTOR**



**TUBE SKIN
THERMOCOUPLE
SENSOR**



**MULTI POINT
SENSOR**

Temperature Control

Temperature Sensor

Thermocouple junction:

- Grounded Junction = where elements and the sheath are all welded together to form one junction at the probe tip. Very good respond time because of the direct contact with the sheath, allowing heat to transfer easily. The only negative point about this junction is that this thermocouple is more susceptible to electrical interference as the sheath often comes into contact with the surrounding area, providing a path for interference.
- Ungrounded Junction = where elements being welded together but they are insulated from the sheath and normally being separated by MGO powder.
- Exposed Junction = where elements being welded together and directly exposed out from sheath and directly inserted into the process / products. Very good respond time due to the direct measured however these thermocouples are more prone to corrosion and degradation.
- Dual Junction = double elements for dual ungrounded junction thermocouple but each of the elements are insulated from one another.
- Multi-Points junction = one probe thermocouple that contains of more than single elements and able put in the different level for each elements.

RTD Lead Wire Configuration:

Because an RTD is a resistance type sensor, resistance introduced by connecting extension wire between the RTD and control Instrument will add to readings. Furthermore, this additional resistance is not constant but increases with ambient temperature.

- 2 Wire = It is suitable where the resistance of the run of the lead wire may be considered as an additive constant in the circuit and particularly where the changes in lead resistance due to ambient temperature changes may be ignored
- 3 Wire = Three wire compensation is achieved for lead resistance and temperature change in lead resistance. This is the most commonly used configuration.
- 4 Wire = This construction is used for measurement of the highest precision



MI (Mineral Insulation) Cable is flexible tube that made from SS contain of MGO powder. It has a wide range of SS material that suits many applications that consider of their temperature range, chemical / corrosion resistance; pressure durability, etc. Aside from the wide ranges of SS material, we also provide numerous of sizes.

Benefits of MI:

- Fire & heat resistant
- Waterproof
- Mechanical Strength: it can withstand extremely high mechanical stress such as crushing and curving with a banding radius equal to 6 times of the cable size.
- Temperature stable & High Operating Temperature (up to 1100°C)

Temperature Control

Protection Tube

Materials:

- **Stainless Steel:** Thermo-Pocket., Thermo-Well
- **Ceramic / Composite material:** Ceramic Alumina, Ceramic Rubalit, Silicon Carbide, Silicon Nitride

Model of Thermo-Well:

- Threaded Thermo-Well : Straight & Tapered
- Threaded Thermo-Well with Lagging : Straight & Tapered
- Flange Thermo-Well : Straight & Tapered
- Flange Thermo-Well with Lagging : Straight & Tapered
- Weld-In Thermo-Well
- Step-Down Flange Thermo-Well
- Van-Stone Thermo-Well

A wide variety of steel and nickel-based alloys are used to make thermowells. This is because there is no one material which will stand up to all of the many service conditions which can be found across the industry. It is important that the proper metal be used in the fabrication of a thermowell.

- | | | |
|----------------|---------------|---------------|
| • Carbon Steel | • SS310 | • Titanium |
| • Brass | • SS446 | • Monel |
| • SS304 | • Inconel 600 | • Hastelloy |
| • SS316 | • Inconel 800 | • Teflon, etc |

If you do require other material, please do consult our sales team.



Temperature Control

Protection Tube

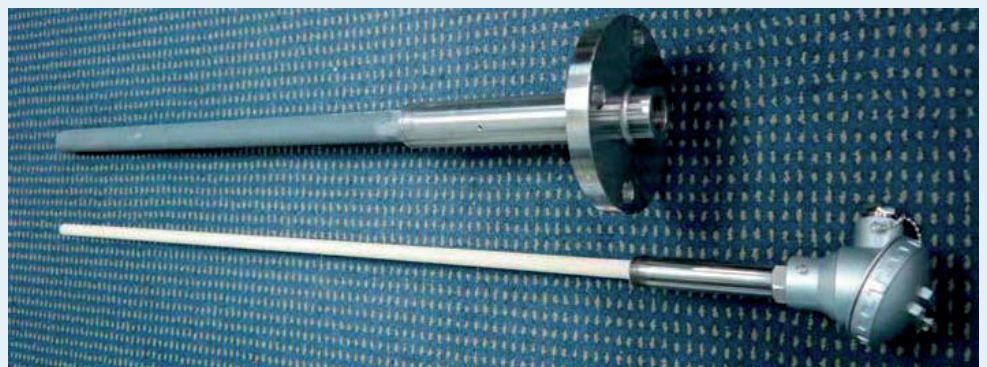
**THERMOWELL SOLID
STAINLESS STEEL
BLOCK WITH
SENSOR**



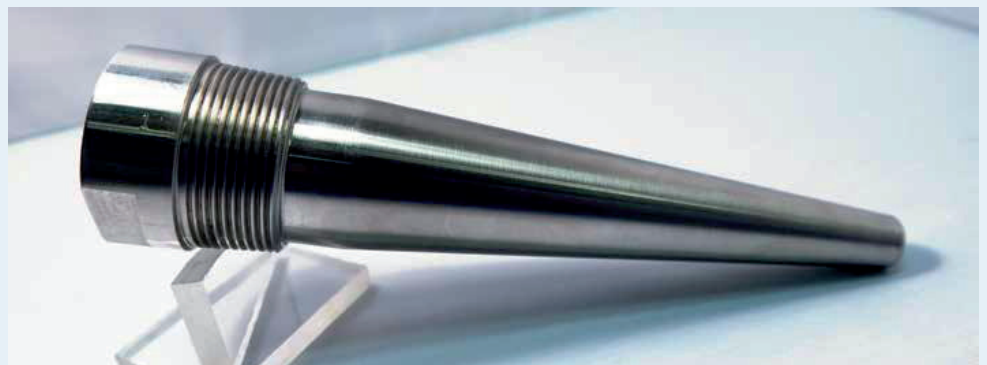
**FLANGE
THERMOWELL**



**PROTECTION TUBE -
SILICON CARBIDE,
SILICON NITRIDE,
CERAMIC TUBE,
ETC.**



**TAPERED
THREADED
THERMOWELL**



Temperature Control

Float Level Switch

Huegli Tech will get you the float level sensor to suit your application, be it custom liquid level sensor or an off shelf float switch.

Float switch is a device used to detect the level of liquid within a tank. The switch is worked through contact of a float magnet with a switch inside the probe.

Sizes of floats:

- 1" • 2" • 3"

Material of floats:

- SS304
- SS316
- Teflon
- Foam
- PP, etc

General Specification:

Description	
Switching Capacity Max	50W
Switching Voltage	240VAC/200VDC
Switching Current Max (A)	0.5A
Carry Current Max (A)	1.0A
Lead Wire	Teflon / PVC
Reversible Switch Action	Yes
Operating Temperature	-10-120°C – SS316 -20 - 80°C – PP



Temperature Control

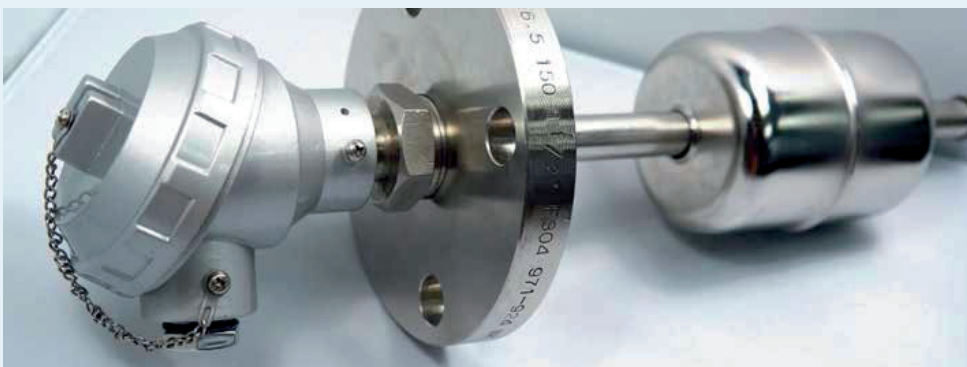
Float Level Switch



**STANDARD
FLOAT LEVEL
SWITCH**



**STANDARD
STAINLESS STEEL
FLOAT LEVEL
SWITCH**



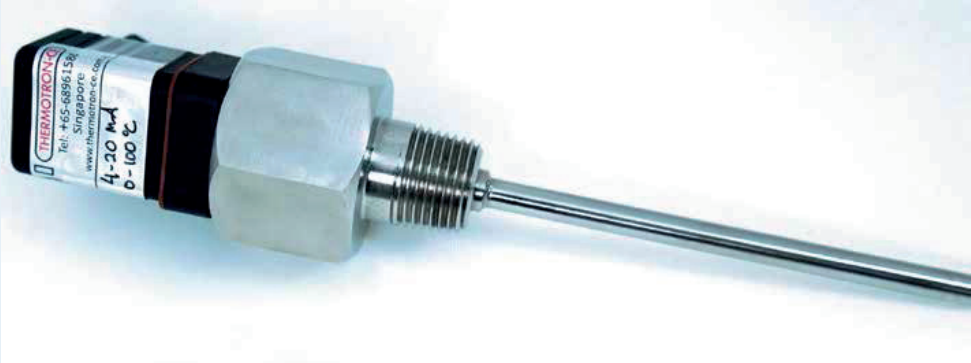
**FLANGE
FLOAT LEVEL
SWITCH**



**TEFLON /
PP MATERIAL
FLOAT LEVEL
SWITCH**

Temperature Control

Transmitter



**BUILT IN
TRANSMITTER**



**PRESSURE
TRANSMITTER**



TRANSMITTER

Digital Thermometer

- From Single Channel /Dual Channel
- Multi input (Type K / J / T / E / R)
- Small build for easy carry
- Temp Range -50 to +1300°C
- Selectable C or F scales
- Decimal point : 0.1
- Accuracy : 0.3%
- MAX function – displays maximum temperature reading
- HOLD function – hold the current reading and display
- Battery operated

Data Logger Thermometer

- Multi Channel (up to 8 channels)
- Multi-input (Type K / J / T / E / N / R / S ; etc)
- RS232 data output
- Memory function to record the maximum and minimum reading

Humidity & Temperature recorder – big display

- Indoor / outdoor humidity & temperature display
- Indoor temperature measuring range -10 to +50°C
- Outdoor temperature measuring range -10 to +70°C
- Humidity measuring range 20 to 99% with 1% resolution
- Daily reset of maximum and minimum records function
- With internal clock

Infrared thermometer –OPTEX

Chart Paper Recorder

- DELTA-Trak “In-Transit” chart recorder
- Chart Paper Recorder : 6channel – point form, 1 channel – continue form, 2 channel – continue form



Temperature Control

Thermometer



DELTA TRAK IN-TRANSIT CHART RECORDER

A highly reliable time and temperature strip chart recorder for recording environmental conditions during storage and transportation of perishable or any other temperature sensitive commodities. This chart recorder provides maximum accuracy & generate permanent record of transit conditions on a 36 inch strip chart.



DIGITAL THERMOMETER (MULTI-INPUT & CHANNEL)



INFRARED THERMOMETER



HUMIDITY / TEMPERATURE RECORDER

Temperature Control

Gauges

Huegli Tech provide gauges with the highest standards for quality and performance. Reliability and durability are just part of benefits of our wide range of temperature & pressure gauge.

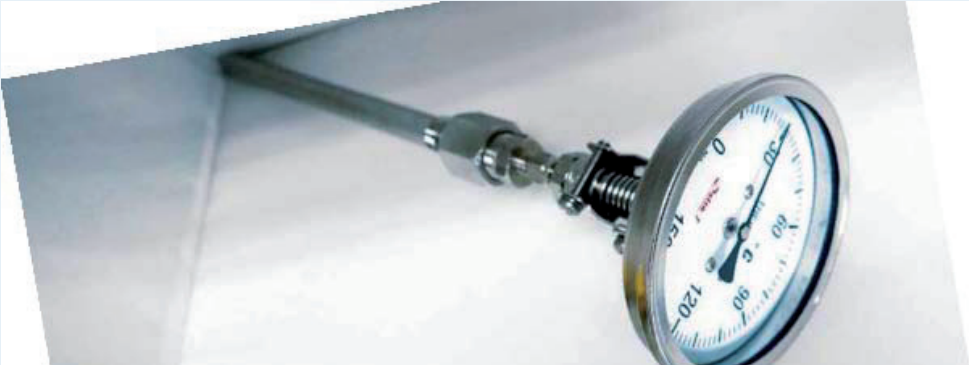
Sanitary gauges: digital/mechanical style as well as sanitary instrument fittings and comes with standard electropolished stainless steel case weatherproof case.

Huegli Tech precision pressure gauge yields consistent, reliable accuracy through the use of state-of-the-art precision machining and the world's most refined tube technology.



Temperature Control

Gauges



**TEMPERATURE
GAUGE**



**TEMPERATURE
GAUGE WITH
TEMPERATURE
SWITCH**



**SANITARY
TEMPERATURE
GAUGE**



**SANITARY
PRESSURE
GAUGE**

Temperature Control

Heater



TUBULAR HEATER /
IMMERSION HEATER

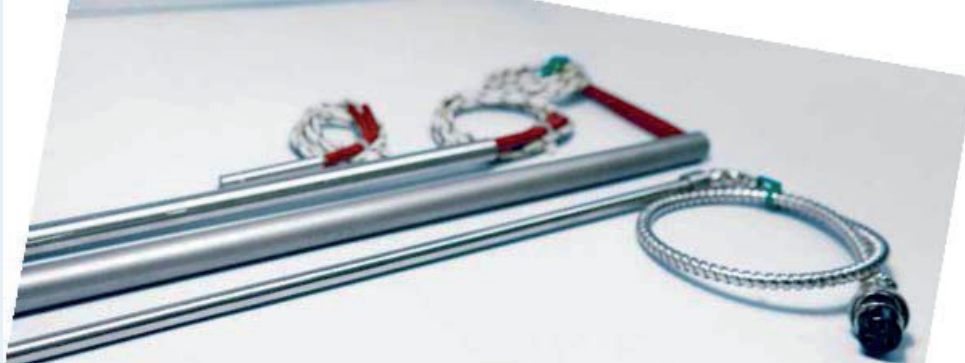


INFRARED HEATER



Temperature Control

Heater



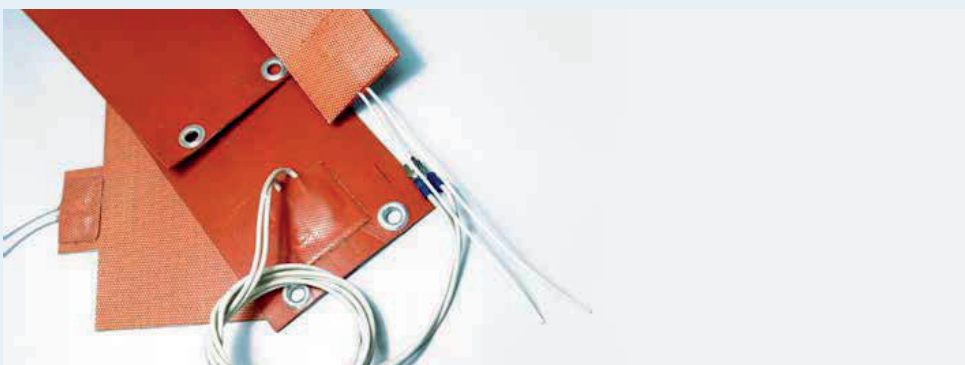
**CARTRIDGE
HEATER**



**BAND
HEATER**



**FIN HEATER
FOR AIR
APPLICATION**



**SILICON RUBBER
HEATER &
ENERGY SAVING
HEATER JACKET**

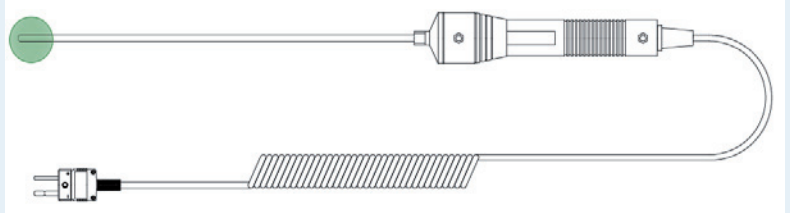
Temperature Control

Hand Held Probe

HAND HELD GENERAL PURPOSE PROBE

A general purpose probe for air and liquid temperature measurement. Fitted with handle, curly cable and mini plug.

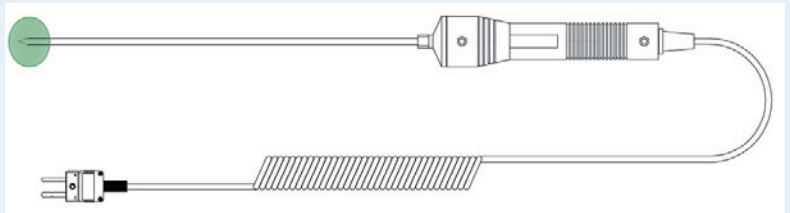
Maximum Operating Temperature: 800°C
Overall Length 180mm / Probe Diameter 3.0mm



GENERAL PURPOSE SPEAR POINT PROBE

A general purpose probe for air, liquid and soft solids (e.g fruit) measurement. Fitted with handle, curly cable and mini plug.

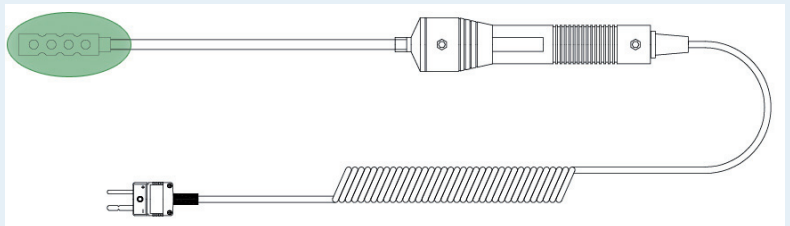
Maximum Operating Temperature: 800°C
Overall Length 180mm / Probe Diameter 3.0mm



AIR TEMPERATURE PROBE

A general purpose for air and gas temperature measurement. Fitted with handle, curly cable & mini-plug.

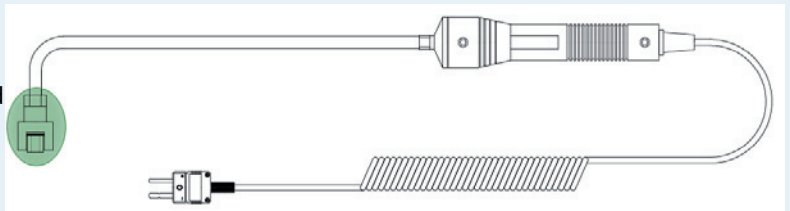
Maximum Operating Temperature: 500°C
Overall Length 230mm



RT. ANGLE SURFACE TEMPERATURE PROBE

Similar to the standard surface temperature probe, but with a 90° bend for hard to reach locations. Fitted with handle, curly cable and mini-plug.

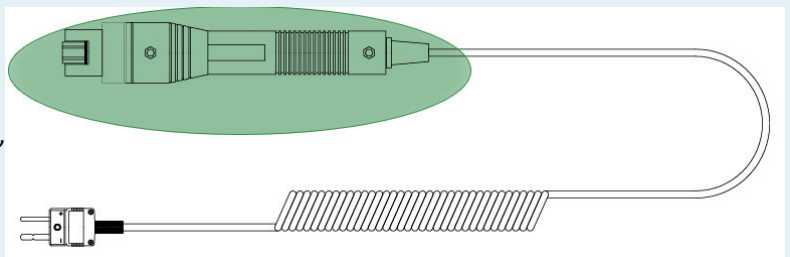
Maximum Operating Temperature: 500°C
Overall Length 155mm + 55mm Probe Diameter (at tip) 15.0mm



STUBBY SURFACE TEMPERATURE PROBE

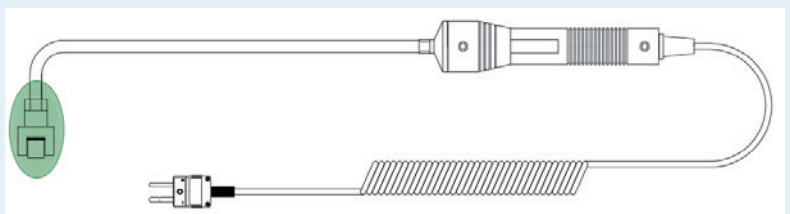
A quick response probe for surface temperature measurement, including bearing housings, motorings, etc. Fitted with handle, curly cable and mini-plug.

Maximum Operating Temperature: 500°C
Overall Length 110mm / Probe Diameter 15.0mm



RT. ANGLE HIGH TEMPERATURE SURFACE PROBE

A surface temperature probe with a higher temperature rating than our standard probes. Applications include refractory measurements (please note that response time will be slower than the standard probes). Maximum Operating Temperature: 800°C
Overall Length 180mm / Probe Diameter (at tip) 3.0mm



Temperature Control

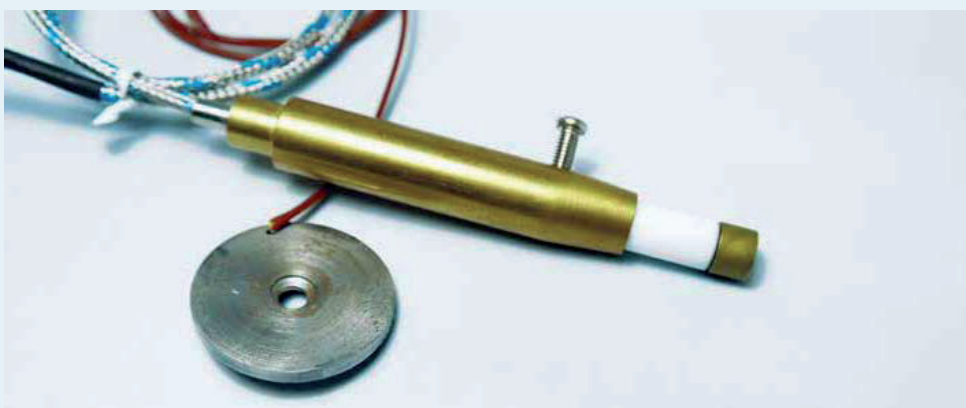
Surface Probe



**MAGNETIC
SURFACE
THERMOCOUPLE**



**SURFACE
THERMOCOUPLE**



**SURFACE
THERMOCOUPLE
WITH
SPRING FUNCTION**

Temperature Control

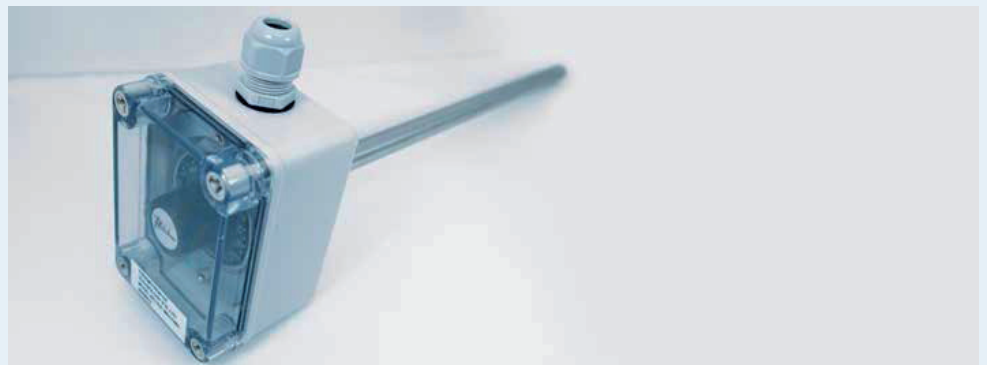
Thermostat



**SENSBEY
THERMOSTAT
WITH
FIXED TEMPERATURE
SETTING**

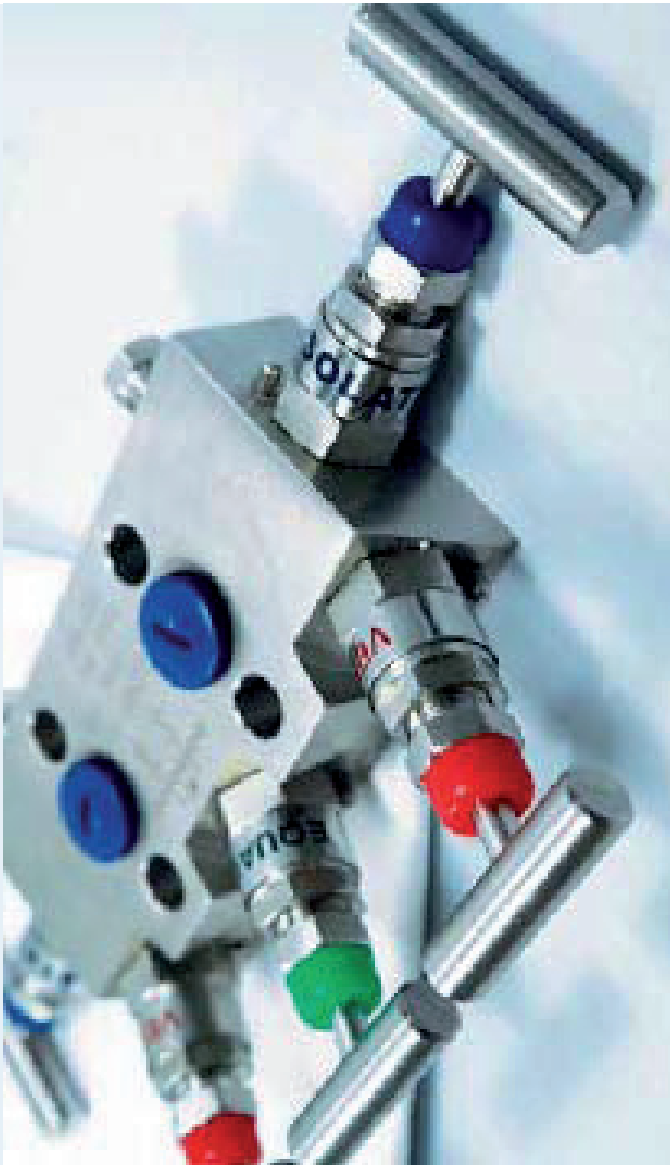


**THERMOSTAT
WITH PROTECTION
TRANSPARENT BOX
& STRAIGHT
PROTECTION TUBE**



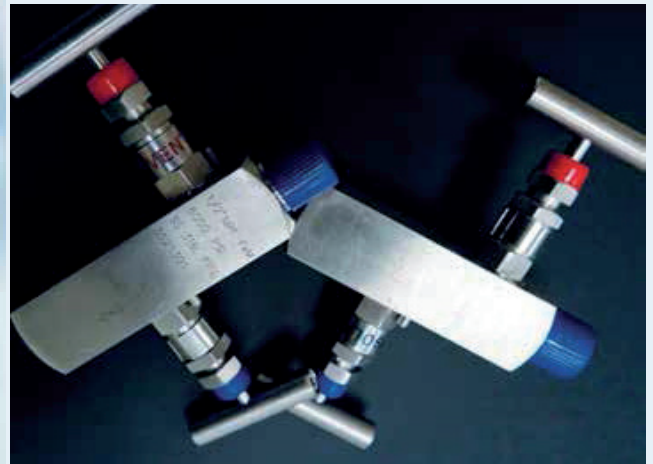
Temperature Control

Valves & Flushing Rings



2 MANIFOLD VALVE & 5 MANIFOLD VALVE

Valve manifold is a standard accessory for pressure transmitter and differential pressure transmitter. By providing a valve manifold in the instrument, it will allow a calibration or change in the instrument without the necessity of plant shutdown. In particular application there are three type of valve manifold, 2-way valve manifold, 3-way valve manifold and 5-way valve manifold. 5-way valve manifold, line 3-way valve manifold, is used for differential pressure transmitter. The typical 5-way valve manifold consist of 2 block valve, 1 equalizer valve, and 2 vent or test valve. If we want to check the zero of transmitter, we just need to close the block valve and open the equalizing valve. Either that, we could calibrate the transmitter for 3 or 5 point calibration and then we just need to connect the test valve to a pressure generator after the pressure is equalized. Such 5-way valve manifold is the most common valve manifold for differential pressure transmitter.



FLUSHING RINGS

Flushing rings are used with flanged chemical seal systems for flushing or venting the space immediately in front of the diaphragm. They are simply mounted between the flanged process connection and the diaphragm seal. The two flushing ports allow washing out of particles accumulated in front of the membrane and the pressure space can be vented or drained according to requirement.

Temperature Control

Wire

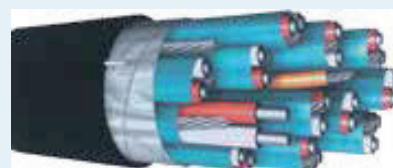
OVERALL SHIELDED 300 VOLT POLYVINYL CHLORIDE 221°F (105°C)

Flame retardant PVC insulation over conductors twisted into pairs. Pairs are cabled together with an overall shield and PVC overall jacket. Construction is UL listed PLTC or ITC rated 300 Volt. Available with thermocouple extension or copper conductors. FER, TPE or CPE insulations and jackets are also available.



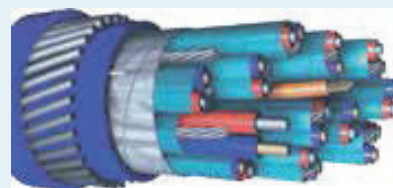
INDIVIDUAL & OVERALL SHIELDED 300 VOLT POLYVINYL CHLORIDE 221°F (105°C)

Flame retardant PVC insulation over conductors twisted into shielded pairs. Pairs are cabled together with an overall shield and PVC jacket. Construction is UL listed PLTC or ITC rated 300 volt. Available with thermocouple extension or copper conductors. FEP, TPE or CPE insulations and jackets are also available.



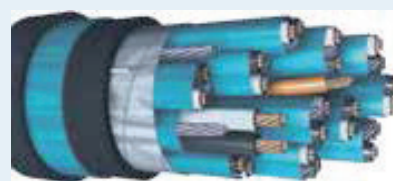
SERVED WIRE ARMOR 300 VOLT - POLYVINYL CHLORIDE 221°F (105°C)

Flame retardant PVC insulation over conductors twisted into shielded pairs. Pairs are cabled together with an overall shield and PVC jacket. Galvanized steel served wire armor is helically applied and an overall PVC jacket completes the construction. UL listed PLTC or ITC rated 300 volt. This construction features excellent mechanical protection and tensile strength as well as exceptional resistance to rodent and mechanical abuse. Available with thermocouple extension or copper conductors. Overall shield only construction is available as well. FEP, TPE & CPE insulations and jackets are available.



METAL BOND TAPE 300 VOLT POLYVINYL CHLORIDE 221°F (105°C)

Flame retardant PVC insulation over conductors twisted into shielded pairs. Pairs are cabled together with overall shield and inner PVC jacket. A continuously bonded aluminium composite tape is applied longitudinally with an overall CPE jacket, bonded to the tape. This construction offers excellent moisture and chemical resistance as well as exceptional mechanical strength and is UL listed PLTC or ITC rated 300 volt. Available with thermocouple extension or copper conductors. Overall shield only construction is also available.



INSTRUMENTATION CABLE 600 VOLT POLYVINYL CHLORIDE/NYLON 194°F (90°C)

Flame retardant PVC and Nylon insulation over conductors twisted into shielded pairs. Pairs are cabled together with an overall shield and PVC jacket. UL listed TC rated 600 Volt. Available with thermocouple or copper conductors. Overall shield only construction is also available. TPE & CPE insulations and jackets are available.



CONTROL CABLE 600 VOLT POLYVINYL CHLORIDE/NYLON 194°F (90°C)

Flame retardant PVC and Nylon insulation over conductors all cabled together under PVC jacket. UL listed TC rated 600 Volt. Cable available shielded and non-shielded. TPE and CPE insulations and jackets are available.





POLYVINYL CHLORIDE 221°F (105°C) • NYLON 250°F (121°C)

Flame retardant PVC insulation provides excellent chemical and abrasion resistance. UL listed constructions are also widely available. Nylon constructions are available for applications requiring a small diameter and/or a 121°C temperature rating.



ETFE 300°F (150°C) • FEP 400°F (200°C) • PFA 500°F (260°C)

These fluoropolymers are rated for use from -200°C up to high temperatures shown for each construction. They are flame retardant and non-propagating in fire conditions. All are moisture and chemical resistance & accepted for use around food & pharmaceuticals. ETFE I addition provides excellent cut through, crush & abrasion resistance.



PTFE 500°F (260°C) • POLYIMIDE 500°F (260°C)

A variety of colour coded polyimide film constructions are available with an operating range -200°C up to 260°C continuous. They are highly resistant to abrasion & solvents and are unaffected by extreme or rapid variations in temperature. PTFE tape rated to 260°C is also available.



B-FIBER 500°F (260°C)

A special blend containing synthetic polyimide fibers that offer superior physical characteristics. Its excellent thermal properties make it ideally suited for continuous use at temperatures up to 500°F (260°C) and intermittent use at higher temperatures. When used as a jacket material it imparts superior abrasion resistance compared to fiberglass.



BRAIDED FIBERGLASS • G 950°F (510°C) • Q 1300°F (704°C)

Individual conductors are insulated with fiberglass braid & may be ordered twisted (without jacket) or with an overall fiberglass jacket. Designed for continuous use in high temperature applications. Reduced itch "TUF BOND" construction available.



BRAIDED VITREOUS SILICA • 1800°F (982°C)

Vitreous silica fibres are braided on individual conductors and the construction is completed with an overall braid of vitreous silica fibre. The construction is specially designed for extreme temperature applications to 982°C. Supplied saturant free with or without tracers in the negative leg.



CEFIR 2200°F (1204°C)

Designed for extreme temperature applications. Ceramic fiber is braided on the individual conductors and the jacket giving a continuous temperature rating of 1204°C. The ceramic fiber is flexible throughout the extended temperature range. The high temperature limit of CEFIR allows it to be used in areas where the beaded and ceramic thermocouples or sheathed thermocouples were previously specified. CEFIR is available with or without saturant or tracers.



METAL COVERINGS

A variety of specialty metal coverings are available for use with insulated wire. These coverings include stainless steel tinned copper and Inconel braids offering excellent cut through and abrasion protection from low to high temperatures.

Temperature Control

Application Reference

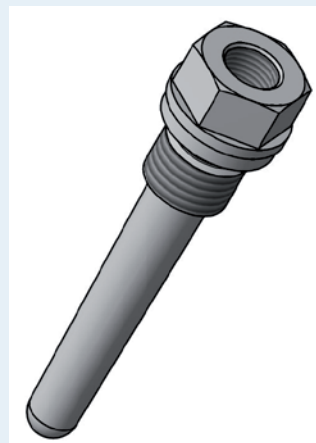
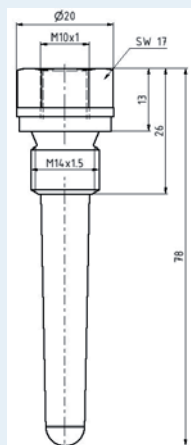
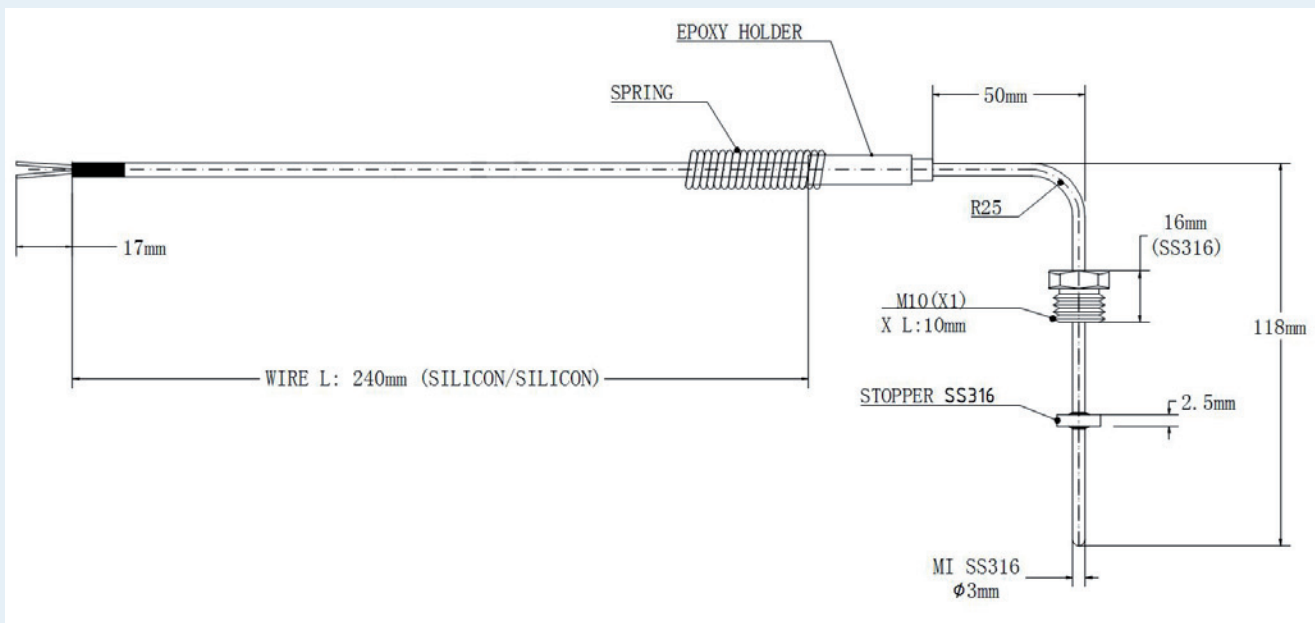
Exhaust Temperature Sensor

Specifications:

- Art. Number: HT-TC-60
- Suitable for MAN gas Engines
- Sensor type: K-Typ NiCr-Ni K
- Max. Temperature: 1000 °C
- Material (jacket): Inconel 600
- Cable insulation: Glass fiber/steel netting
- Cable length: 25 cm
- Adapter fitting: Stainless steel 316L
- Output Voltage in mV for NiCr-Ni, Type K



Dimensions:

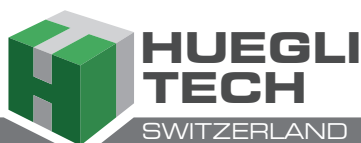


The products described in this publication are subject to be revised or improved at any moment. Catalogue descriptions and details, such as technical and operational data, drawings, diagrams and instructions, etc., do not have any contractual value. In addition, products should be installed and used by qualified personnel and in compliance with the applicable regulations in force in order to avoid damages and safety hazards.

*due to pre-existing agreements not all products are available in every country



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