



TEMPERATURE SENSORS
FOR THE PHARMACEUTICAL AND
CHEMICAL PROCESSING INDUSTRIES



PHARMACEUTICAL TEMPERATURE SENSORS

The high accuracy, long-term stability and consistency of Pyromation's Resistance Temperature Detectors (RTDs) make them the ideal choice for use in the pharmaceutical, biotech and chemical processing industries. Pyromation supplies RTDs suitable for use in temperatures ranging from -300° to 1100° F. Pyromation's standard RTDs are supplied with 100 ohm, wire wound, platinum measuring elements. They are offered with initial accuracies of .1%, .03% and .01% at 0° C. Elements with other values, materials, temperature coefficients and accuracies are also available. Pyromation's standard sheath material is 316 stainless steel. Assemblies that require a connecting terminal head are supplied with an FDA-compliant white polypropylene head to provide excellent resistance to acids, alkalines and moisture penetration. Connecting heads made of other materials, including explosion-proof models, are also available. RTD sensors can be supplied with 4-20mA temperature transmitters integrally mounted in the termination head.

CIP SANITARY CONNECTED TEMPERATURE SENSORS

These sensors are used in pharmaceutical, chemical, biotech, R&D laboratory and other process applications where sensor corrosion and product contamination are critical factors. Sanitary caps are welded to the sheath and heavy support tube, all of 316 stainless steel, and polished to a finish that exceeds the No. 4 minimum finish required by the **3-A Sanitary Council Standard #74-00**. The process contact surfaces are free of pits, crevices, and pockets to prevent corrosion and bacteria growth.

The miniature CIP sanitary connected RTD temperature sensors pictured right come with 16 AMP sanitary caps to fit 1/2" and 3/4" tube size sanitary fittings. Models that do not require a connection head use Teflon® insulated leadwire to provide added moisture and chemical resistance. Industry standard sheath lengths, in conjunction with typical sanitary tees and tube fittings, ensure the sensing element is properly placed in the flowing medium. The small diameter sheath provides fast temperature response times.



These general purpose CIP sanitary connected RTD temperature sensors are used in similar processes as the miniature style assemblies, but they are available with a wider array of cap sizes and style options, sheath diameters, and construction styles. The different styles include general purpose CIP connections, reduced tip assemblies, fast temperature response assemblies to meet "HTST" (High Temperature Short Time) response time requirements and CIP sanitary connected well assemblies.



The assembly shown below is commonly used in sterilizers, chemical and bioreactors, and in fermentation and storage tanks equipped with Ingold* port opening fittings. These assemblies are provided with either a straight or 15 degree chamfer mating plug fitting, in standard fitting lengths, and include attaching nut and silicone O-ring seal.

* a product of Ingold Messtechnik



TANK WALL TEMPERATURE SENSORS

These non-intrusive tank wall RTD temperature sensors are used in single and double wall mixing tanks as found in pharmaceutical and chemical processing applications. They are designed to be mounted through mixing tanks walls of any thickness. The measuring surface of the RTD assembly mounts flush with the inside wall and in direct contact with the contents of the tank, but not intruding into the wiping action of the mixer blades. Complete assemblies are supplied with a tank mounting adapter, an FDA-compliant polypropylene connection head and a silicone/Teflon® O-ring seal.



SENSOR CERTIFICATION AND INSTRUMENT CALIBRATION

Pyromation's modern Certification and Calibration Lab and our NIST trained personnel provide our customers with a wide range of temperature sensor certification and instrument calibration. The combination of our liquid baths, testing furnaces, triple point of water cell and extremely accurate laboratory standards allows us to provide NIST traceable temperature sensor certifications for temperatures ranging from -40 to 2700°F (-40 to 1482°C). Our equipment, testing procedures and lab standards conform to ANSI and ASTM. Each sensor and instrument certified is provided with NIST traceable certificates of calibration results, and the test points are customer specified. Instrument calibrations and certifications for both thermocouple and RTD instrumentation are performed in accordance with ANSI-NCSI 2540-1. Instruments are tested at ten standard or customer specified test points per range.

OTHER PROCESS TEMPERATURE SENSORS

Pyromation also offers a wide variety of thermocouple and RTD temperature sensors for other phases of the pharmaceutical, chemical and related processing industries. A sampling of some of our other temperature sensors and services are described below. Also available are thermocouples with special alloy protection tubes for high temperature corrosive service in incinerator applications and moisture resistant thermocouples and RTDs for steam injected autoclave sterilizers.

MGO INSULATED THERMOCOUPLES

MGO Insulated Thermocouples are good general purpose thermocouples for use in a variety of pharmaceutical and other related industrial processes. Available in all thermocouple types and a variety of sheath materials and diameters.



GENERAL PURPOSE RTD ASSEMBLIES

Pyromation's general purpose RTD temperature sensor assemblies find use in a multitude of process applications. These assemblies are available with measuring elements of several different materials and values, in a variety of sheath diameters, in 2, 3, or 4 wire constructions, and with a choice of connecting head materials or with leadwire terminations.



RTDs - THERMOCOUPLES IN DRILLED THERMOWELLS

Thermocouples and RTDs in standard and special alloy thermowells come in a variety of construction styles and are available with spring loaded elements and integrally head mounted transmitters.



TEMPERATURE SENSOR CONNECTING HEADS

Pyromation's connecting heads are recognized as the standard in the processing industry. Our screw cover heads are offered in five different metal alloy configurations and two thermoplastic materials to provide excellent protection from the most severe corrosive process environments. These heads meet several different NEMA requirements, including two UL listed explosion proof models, and are designed to accept our patented RTD transmitter. All heads are available as either an integral part of our temperature sensor assemblies or as separate components.

STANDARD SCREW COVER CONNECTING HEADS⁽¹⁾



PART NUMBER	301-306 ⁽²⁾	307-309 ⁽²⁾	904-905	480-486	390-396
MATERIAL	Diecast Aluminum	Grey Iron	316L SS	Polypropylene	Delrin [†]
PROCESS CONNECTION	1/8" thru 1" NPT	1/2" thru 1" NPT	1/2", 3/4" NPT	1/2" NPT	1/2" NPT
CONDUIT CONNECTION	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT
NEMA TYPE	NEMA 4, 13	NEMA 4, 13	NEMA 4X, 13	NEMA 4X, 6P, 13	NEMA 4, 6, 13

[†] Trade Name of E. I. DuPont



RTD TRANSMITTERS

Pyromation's patented* RTD transmitters are low cost and highly reliable devices that produce a linearized 4-20mA output current signal that is directly proportional to the RTD temperature measuring element. Units are small in size and designed to fit inside Pyromation's terminal heads, thermostat housings, electrical boxes, or to surface mount on panel subplates.

*Patent No. D360, 596

UL AND cUL LISTED⁽³⁾ SCREW COVER CONNECTING HEADS⁽¹⁾ FOR HAZARDOUS LOCATIONS



PART NUMBER	804-805	807-808 ⁽²⁾
MATERIAL	316L SS	Iron/Aluminum
PROCESS CONNECTION	1/2", 3/4" NPT	1/2", 3/4" NPT
CONDUIT CONNECTION	3/4" NPT	3/4" NPT
NEMA TYPE	NEMA 4X, 7, 9, 13	NEMA 7, 9, 13

NOTES: (1) All above listed heads accept Pyromation Series #340 terminal blocks
 (2) These metal alloy heads can be supplied with an external white epoxy coating
 (3) UL, C-UL listed file E160596 - UL Listing is for ANSI/UL 886 for Class I, Division I, Group C, D; Class II, Division I, Group E, F, G. Other approvals are pending.



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Please contact Pyromation's Factory Sales Department for the availability of special constructions, part number and pricing information, quantity discounts or the name of a local distributor in your area.

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