



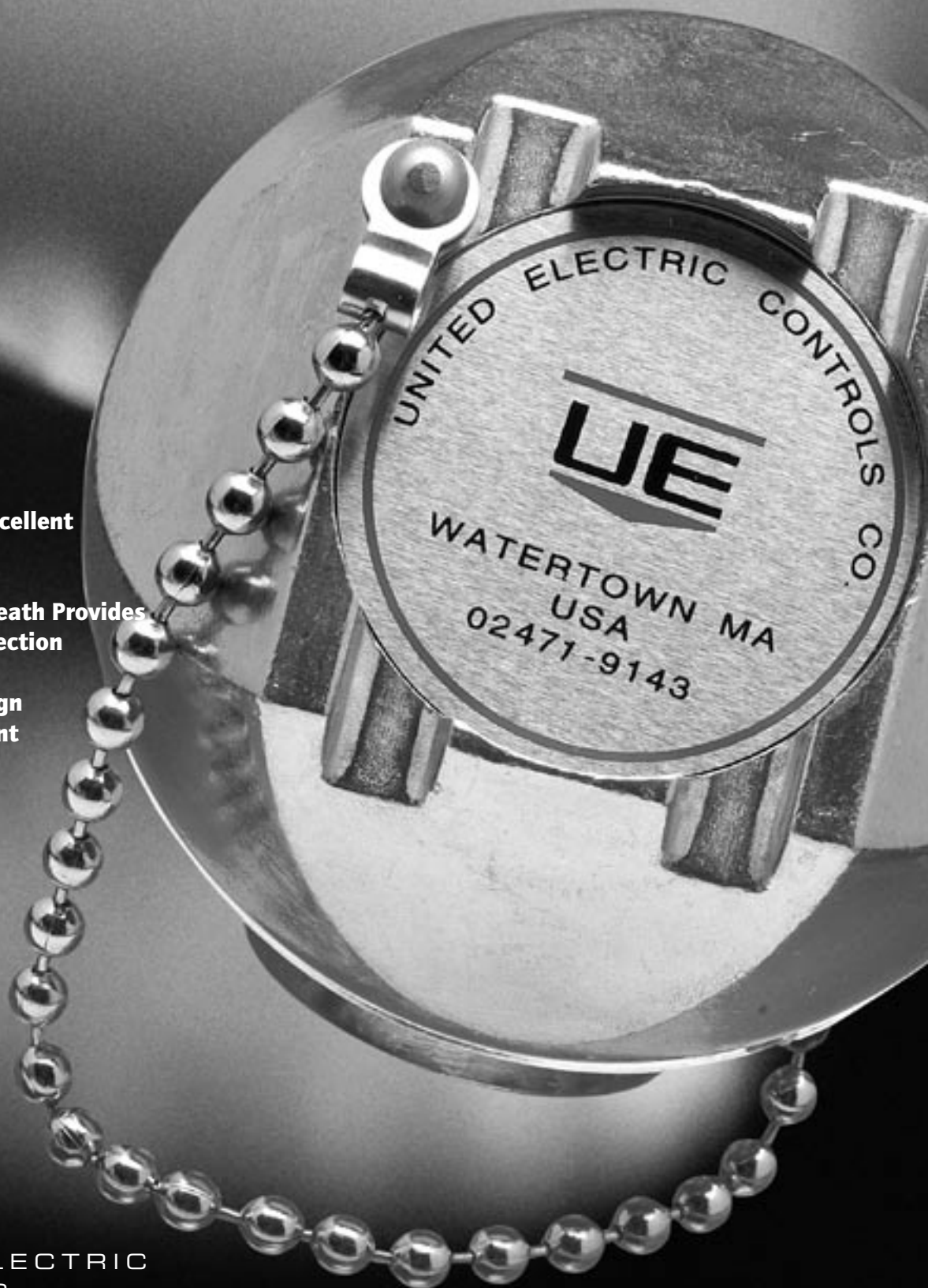
RTDs

RTDs

HEAT TRACE RTDs

FEATURES

- **Heat Transfer Pad with Excellent Temperature Response**
- **Rugged Stainless Steel Sheath Provides Excellent Mechanical Protection**
- **Replaceable Element Design Simplifies RTD Replacement**



**UNITED ELECTRIC
CONTROLS**



OVERVIEW

United Electric Controls offers a broad range of temperature sensors. We design, engineer and manufacture the following types of sensor assemblies:

- Thermocouples
- RTDs (both wire wound and thin film)
- Thermistors
- Integrated Circuit (IC)

All of our products are known for their consistent high reliability and durability. We are continually examining and improving our engineering, production and service operations to meet constantly evolving customer requirements. Our ISO 9001 certification is objective proof of our company-wide commitment to quality.

UE Temperature Sensor Group

UE has recognized the importance of Temperature Sensors to the future of United Electric Controls. We have assembled a talented group of Temperature Sensor experts to form our Sensor Group at our Headquarters in Watertown, MA. This organization is specifically formed to serve our wide spectrum of customers. We have experienced professionals dedicated to producing the best temperature sensors for your products. This group consists of experts with extensive Temperature Sensor experience in:

- Sales
- Design
- Engineering
- Supplier Development
- Manufacturing
- Customer Service
- Marketing
- Quality Assurance

FEATURES

Simplify installation and address maintenance issues with United Electric Controls Heat Trace RTDs capable for use in any pipe or surface temperature measuring application, these sensors have been specifically designed for use with electronic heat control products.

United Electric Controls heat trace products have:

- Heat transfer pad for maximum temperature response
- Rugged stainless steel sheath for excellent mechanical protection
- Replaceable RTD e-clamps

Replaceable element design simplifies and reduces the cost of sensor replacement. United Electric Controls Heat Trace RTDs make the job of replacing a faulty element easy. With old style Heat Trace RTDs, several time-consuming and expensive steps need to be executed to replace a faulty element.



TECHNOLOGY

The process routinely involves 3 trades to make a change – insulation handlers, welders and technicians. This results in significant cost and downtime.

With United Electric Controls Heat Trace RTDs with replaceable elements, the process is not only simpler, but much quicker and more cost-effective. To replace a faulty element, you simply remove the head cover, disconnect the leads and remove the element. You then insert the new element and reconnect the leads. Your process is up and running in minutes.

When choosing which temperature sensor to use there are many things to consider. One very important decision is selecting the type of sensor that best fits your requirement. For use in heat trace applications, RTDs provide the best accuracy. Below is a description of the characteristics of RTDs.

RTDs or Resistance Temperature Detectors

RTDs are stable and have a fairly wide temperature range, but are not as rugged as thermocouples.

An RTD capitalizes on the fact that the electrical resistance of a material changes as its temperature changes. RTDs rely on the resistance change in a metal. The resistance will rise more or less linearly with temperature.

RTDs are used to measure temperatures from -196°C to 500°C (-320°F to 932°F).

Here is a summary of some of the advantages and disadvantages of RTDs:

| Advantages | Disadvantages |
|--------------------------------|--------------------------------|
| Most Stable | Slower Response Time |
| Most Accurate | Current Source Required |
| More Linear than Thermocouples | Self-heating |
| Better Repeatability | Less Robust than Thermocouples |



SPECIFICATIONS

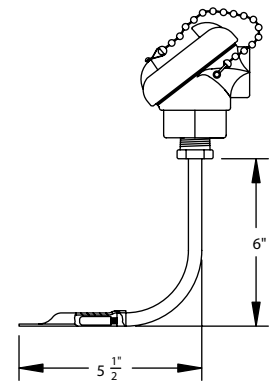
NEMA 4 CAST ALUMINUM HEAD WITH REPLACEABLE ELEMENT

T1804

Element type: 3 wire construction, DIN 0.00385
 Resistance: 100 ohms @ 0° C
 Tolerance: Class B, +/- 0.12%
 Enclosure: Cast aluminum head; conforms to NEMA 4 requirements
 Sheath: 0.375" O.D. stainless steel
 Operating Range: 0° to 482° C (32° to 900° F)

Uses replacement element T1805

| Product Number | Nominal Pipe Size | O.D. |
|----------------|-------------------|------|
| T1804-F | Flat | 0 |
| T1804-5 | 0.50 | 0.84 |
| T1804-7 | 0.75 | 1.05 |
| T1804-10 | 1.00 | 1.32 |
| T1804-15 | 1.50 | 1.90 |
| T1804-20 | 2.00 | 2.38 |
| T1804-30 | 3.00 | 3.50 |
| T1804-40 | 4.00 | 4.50 |
| T1804-60 | 6.00 | 6.63 |
| T1804-80 | 8.00 | 8.63 |

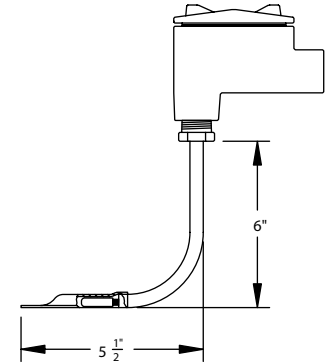


EXPLOSION PROOF CAST ALUMINUM HEAD WITH REPLACEABLE ELEMENT

T1804X

Element type: 3 wire construction, DIN 0.00385
 Resistance: 100 ohms @ 0°C
 Tolerance: Class B, +/- 0.12%
 Enclosure: Cast aluminum head; approved for Class I, Division I, Groups C, D; Class II, Groups E,F,G
 Sheath: 0.375" O.D. stainless steel
 Operating Range: 0° to 482°C (32° to 900°F)

Uses replacement element T1805



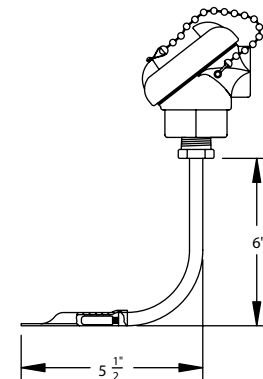
| Product Number | Nominal Pipe Size | O.D. |
|----------------|-------------------|------|
| T1804X-F | Flat | 0 |
| T1804X-5 | 0.50 | 0.84 |
| T1804X-7 | 0.75 | 1.05 |
| T1804X-10 | 1.00 | 1.32 |
| T1804X-15 | 1.50 | 1.90 |
| T1804X-20 | 2.00 | 2.38 |
| T1804X-30 | 3.00 | 3.50 |
| T1804X-40 | 4.00 | 4.50 |
| T1804X-60 | 6.00 | 6.63 |
| T1804X-80 | 8.00 | 8.63 |

NEMA 4X CAST IRON, EPOXY COATED HEAD WITH REPLACEABLE ELEMENT

T1855

Element type: **Dual element**, 3 wire construction, DIN 0.00385
 Resistance: 100 ohms @ 0°C
 Tolerance: Class B, +/- 0.12%
 Enclosure: Cast iron head with epoxy coating; conforms to NEMA 4X requirements
 Sheath: 0.375" O.D. stainless steel
 Operating Range: 0° to 482°C (32° to 900°F)

Uses replacement element T1805D



| Product Number | Nominal Pipe Size | O.D. |
|----------------|-------------------|------|
| T1855-F | Flat | 0 |
| T1855-5 | 0.50 | 0.84 |
| T1855-7 | 0.75 | 1.05 |
| T1855-10 | 1.00 | 1.32 |
| T1855-15 | 1.50 | 1.90 |
| T1855-20 | 2.00 | 2.38 |
| T1855-30 | 3.00 | 3.50 |
| T1855-40 | 4.00 | 4.50 |
| T1855-60 | 6.00 | 6.63 |
| T1855-80 | 8.00 | 8.63 |

NEMA 4X POLYCARBONATE BOX WITH REPLACEABLE ELEMENT

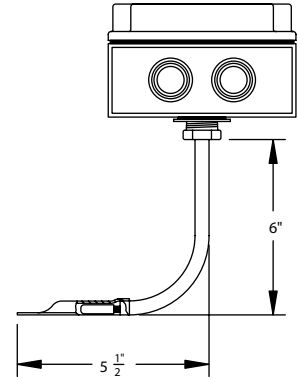
T1844

Element type: 3 wire construction, DIN 0.00385
 Resistance: 100 ohms @ 0°C
 Tolerance: Class B, +/- 0.12%
 Enclosure: Polycarbonate head; conforms to NEMA 4X requirements, 6 knock-outs

Sheath: 0.375 O.D. stainless steel
 Operating Range: 0° to 482°C (32° to 900°F)

Uses replacement element T1805

| Product Number | Nominal Pipe Size | O.D. |
|----------------|-------------------|------|
| T1844-F | Flat | 0 |
| T1844-5 | 0.50 | 0.84 |
| T1844-7 | 0.75 | 1.05 |
| T1844-10 | 1.00 | 1.32 |
| T1844-15 | 1.50 | 1.90 |
| T1844-20 | 2.00 | 2.38 |
| T1844-30 | 3.00 | 3.50 |
| T1844-40 | 4.00 | 4.50 |
| T1844-60 | 6.00 | 6.63 |
| T1844-80 | 8.00 | 8.63 |

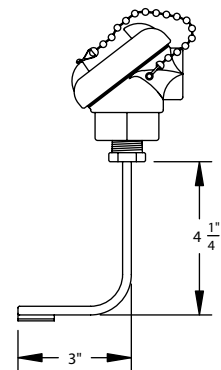


NEMA 4 CAST ALUMINUM HEAD/FIXED ELEMENT

T1441

Element type: 3 wire construction, DIN 0.00385
 Resistance: 100 ohms @ 0°C
 Tolerance: Class B, +/- 0.12%
 Enclosure: Cast aluminum head; conforms to NEMA 4 requirements
 Sheath: 0.250" O.D. stainless steel
 Operating Range: -18°C to 371°C (0° to 700°F)

Product Number
 T1441

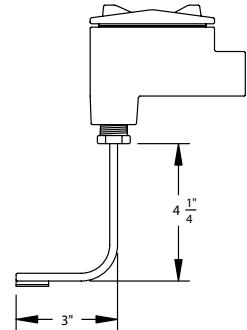


CAST ALUMINUM HEAD WITH REPLACEABLE ELEMENT

Element type: 3 wire construction, DIN 0.00385
 Resistance: 100 ohms @ 0°C
 Tolerance: Class B, +/- 0.12%
 Enclosure: Cast aluminum head; See T1804X
 Sheath: 0.250" O.D. stainless steel
 Operating Range: -18°C to 371°C (0°F to 700°F)

Product Number
 T1441X

T1441X

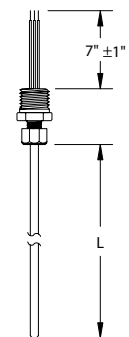


100 OHM RTD ASSEMBLY WITH FLEXIBLE MI CABLE CONSTRUCTION

Element type: 3 wire construction, DIN 0.00385
 Resistance: 100 ohms @ 0°C
 Tolerance: Class B, +/- 0.12%
 Sheath: 0.250" O.D. stainless steel
 Operating Range: -18° to 780°C (0° to 1400°F) maximum

| Product Number | Length (in inches) L | Instrument |
|----------------|----------------------|------------|
| T1792 | 120 | 1/2" NPT |
| T1792-8 | 8 | 1/2" NPT |
| T1792-10 | 10 | 1/2" NPT |
| T1792-12 | 12 | 1/2" NPT |

T1792



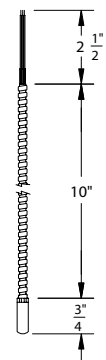
SINGLE AND DUAL "BULLET" RTD REPLACEMENT ELEMENT

(For T1804, T1804X, T1855, T1844)

Element type: 3 wire construction, DIN 0.00385
 Resistance: 100 ohms @ 0°C
 Tolerance: Class B, +/- 0.12%
 Sheath: 0.250" O.D. stainless steel
 Lead: 22 AWG, fiberglass insulation, st/st armor
 Operating Range: 0° to 482°C (32° to 900°F)

Product Number

T1805 Single element
 T1805D Dual element



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. Orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- For all applications, a factory set unit should be tested before use.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Use only factory authorized replacement parts and procedures.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY OF REPAIR AND REPLACEMENT

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (F.O.B. UE Watertown); provided, however, that this warranty applies only to equipment found to be so defective within a period of 18 months from the date of manufacture by the Seller (36 months for the Spectra 12 and One Series products). Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives.

EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIABILITY LIMITATION

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE IMPUTED TO SELLER, IS LIMITED TO THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED HEREIN. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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