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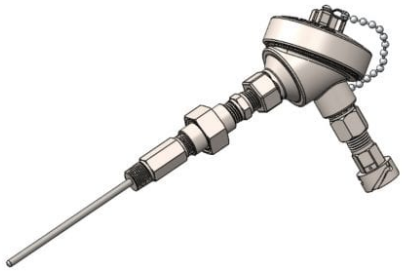
# Product Data Sheet
# 615 – General Purpose Spring-Loaded RTD Assembly



The model 615 spring-loaded RTD is designed for a wide range of nuclear applications. The sensor is intended to be installed in a thermowell or protection tube. The spring-loading action ensures proper contact with the tip of the thermowell or protection tube for optimal heat transfer. This sensor model is optimally configured for use with a quick disconnect electrical connector (QDC), but can also be supplied with a terminal block connection. The RTD is qualified per IEEE 323-1974/1983 and IEEE 344-1975/1987 for use in Class 1E harsh environments.

## Specifications

| NAME | DESCRIPTION |
| --- | --- |
| **Maximum Operating Temperature** | 0°F to 750°F (-18°C to 400°C) |
| **Element Type** | Platinum (Wire-Wound) |
| **Accuracy/Interchangeability** | IEC 60751 Class B is standard. IEC 60751 Class A is available upon request. Other special accuracies are also available. |
| **Calibration Points** | Standard calibration points are 32°, 212° and 554°F (0°, 100° and 290°C). |
| **Drift/Stability** | Sensor drift is less than ±0.2°F (±0.11°C) shift per year up to a maximum of 0.5°F (0.28°C) for the qualified life. These values were determined based on pre and post qualification test data. |
| **Insulation Resistance** | At room temperature and dry external surfaces, the insulation resistance between any wire and the sensor case will be at least 100 MΩ with 100 VDC applied for a minimum of 30 seconds prior to measurement. |
| **Response Time** | The response time for the bare sensor (without thermowell) is approximately 5 seconds or less for the standard version with 1/4" diameter sheath as verified by a plunge test in accordance with ASTM E644 for a 63.2% of a step change from room temperature air to water flowing transverse to the assembly at 3 ft/s (~1m/s) at 180°F. Actual response time will vary depending on final configuration, installation and actual process conditions. Response time when installed in a thermowell or protection tube will vary depending upon final configuration and fit, but is approximately 30 seconds. |

| NAME | DESCRIPTION |
| --- | --- |
| **Operating Current** | Standard operating current is 1 to 4 mA continuous. A continuous current of 20 mA (RMS) or less will not damage the sensor. A short duration or pulsed current of 40 mA maximum will not damage the sensor. |
| **Self-Heating Error** | In 154°F (68°C) water flowing transverse to the sensor sheath at 3 ft/s (~1 m/s), with a sheath diameter of 0.25 inches (6.35 mm), the RTD is capable of dissipating 10 mW/°C without causing the indicated temperature to rise more than 0.36°F (0.2°C). |
| **Qualification** | RTD assemblies are qualified to Class 1E requirements of IEEE 323-1974/1983 and IEEE 344-1975/1987. Original qualification reports are 548-8854-001 and 06-8680-003. |
| **Quality Standards** | RTD assemblies are supplied in accordance with Ultra Electronics Energy QA/QC Quality Assurance & Control Manual 100-1 which meets the requirements of 10 CFR 50 Appendix B, 10 CFR Part 21, ISO 9001, ASME NQA-1 and ANSI N45.2. |
| **Sheath Material** | Stainless Steel |
| **External Leadwire Material** | Stranded Constantan insulated with Polyolefin |
| **Sheath internal insulation** | MgO |
| **Internal Leadwire Material** | Solid Constantan |

| NAME | DESCRIPTION |
| --- | --- |
| **Mounting Connections** | RTDs normally have a 150 lb S.S. union and schedule 80 minimum S.S. extension nipple with 1/2" NPT male threads for interface to the thermowell or protection tube. The terminal head conduit port has 3/4" NPT female threads as standard. The QDC will normally have 1/2" NPT male threads. Custom mounting connections are available upon request. |
| **Quick Disconnect Electrical Connector (QDC)** | Quick disconnect bayonet connector (Gen 1 or Gen 3) |
| **Terminal Block Material, if applicable** | Ceramic |
| **Shipping Weight** | Approximately 5 lbs. without QDC and 6 lbs with QDC. Actual weight will depend upon configuration supplied. |
| **Identification Tags** | S.S. identification tag attached to the terminal head using SS braided cable. Custom configured tagging is available upon request. |
| **Storage Requirements** | RTDs are to be stored in accordance with ANSI N45.2 Level B requirements or better. |

# FAQs

## Can I specify my own required calibration points?

Yes.  Calibration at ice point (32°F/0°C) and boiling point (212°F/100°C) are required to determine the appropriate Alpha temperature coefficient.  Up to 4 additional calibration points at higher temperatures can be specified.  Data from only 3 of the actual calibration points (32°F/0°C, 212°F/100°C and a select third point) will be used to generate a custom temperature versus resistance table using the Callendar-Van Dusen equation.

## Can the 615 RTD be ordered to meet special accuracy needs?

Yes. Please contact Nuclear Sales with the specific requirements so we may determine if we can meet your needs.

## Can I use my own thermowell with the 615 RTD?

Yes. The specific thermowell or protection tube design should be supplied during the request for quote stage in order to ensure optimal fit and interface of the RTD to the thermowell or protection tube.

## Can the 615 RTD be used without a thermowell or protection tube?

No.  The thermowell or protection tube provides an integral part of the environmental seal.  See model 611, N9019 or N9355 for direct immersion applications.

## Documents

| NAME | VIEW / DOWNLOAD |
| --- | --- |
| **615 Model Number Configurator** | View / Download |
| **615 Head-Extension Code Configurator** | View / Download |
| **QDC Model Number Configurator** | View / Download |
| **615 QDC Wiring Diagram** | View / Download |
| **615 Terminal Block Wiring Diagram** | View / Download |
| **615 Qualification Report** | View / Download |

## Accessories

| | |
|---|---|
| **Silicone Sealant** | Item No. 0102-004-0012T |
| **P1 Thread Sealant** | Item No. 0109-001-0113T |
| **PST 580 Thread Sealant** | Item No. 0109-001-0114T |
| **Viton Gasket for Terminal Head** | Item No. 0322-001-0023T |
| **6-Wire Terminal Block** | Item No. 0308-004-0006T |
| **8-Wire Terminal Block** | Item No. 0308-004-0009T |
| **Terminal Head - General Purpose Single Port** | Item No. 0342-002-0016T |
| **Terminal Head - General Purpose Dual Port** | Item No. 0342-002-0017T |
| **Thermowell Cleaning Kit** | Item No. 0125-004-0001 |
| **QDC O-Ring** | Item No. 0322-001-0070T |