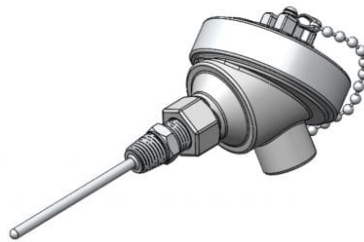


Product Data Sheet

611 – Direct Immersion RTD Assembly



The model 611 series RTD is designed for a wide range of direct immersion nuclear applications requiring a threaded connection for mounting. This sensor is supplied with a threaded hex fitting which is welded to the sensor sheath to provide physical mounting and a pressure tight joint to the process application. This RTD electrical interface can be configured for use with a connection head and terminal block or Quick Disconnect Electrical Connector (QDC). Typical applications include duct mounting, tank, pool or vessel mounting. The RTD is qualified per IEEE 323-1974/1983 and IEEE 344-1975/1987 for use in Class 1E harsh environments, but can also be used for non-safety applications.

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° and 212° (0° and 100°).
Drift/Stability	Sensor drift is less than $\pm 0.2^{\circ}\text{F}$ ($\pm 0.11^{\circ}\text{C}$) 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 M Ω with 100 VDC applied for a minimum of 30 seconds prior to measurement.
Response Time	The response time for the bare sensor 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. Response time will vary depending upon final configuration, fit and actual process conditions.

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	The RTD can be directly mounted to the process via the 1/2" NPT connection threads or incorporate the use of extension pipe fittings and unions. 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.
Terminal Block Material, if applicable	Ceramic
Quick Disconnect Electrical Connector (QDC), if applicable	Quick disconnect bayonet (Gen 1 or Gen 3)
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 611 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 a protection tube or thermowell with the 611 RTD?

Yes, but the tip of the RTD will not contact the bottom of the thermowell or protection tube resulting in slow response time. When using a thermowell or protection tube, it is recommended to use a model 612 or model 615 spring-loaded RTD assembly.

Documents

NAME	VIEW / DOWNLOAD
611 Model Number Configurator	View / Download
611 Head-Extension Code Configurator	View / Download
QDC Model Number Configurator	View / Download
611 Terminal Block Wiring Diagram	View / Download
611 QDC Wiring Diagram	View / Download
611 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
QDC O-Ring	Item No. 0322-001-0070T
