



CHICAGO STAINLESS EQUIPMENT

SANI-FLOW

SANITARY RTD'S INSTRUCTIONS



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SANITARY RTD'S INSTRUCTIONS

All CSE RTDs (Resistance Temperature Detectors) have been specially designed for critical temperature measurement in sanitary fluid processing. We use a PT-100 (platinum 100 Ohm) 3 wire thin film RTD which is epoxy encapsulated in an all stainless steel probe specifically designed to ensure the fastest response characteristics possible. The RTDs are combined with a standard 12mm industrial micro DC male receptacle with gold plated contacts to allow for quick and easy installation and removal. No bulky, complicated, leaking wiring heads or tools required, simply plug in the connector and go. The electrical connection is IP-65/NEMA 4X rated which means that the RTDs can be aggressively washed down or temporarily submerged in water while in use.

An RTD signal should be connected to receiver such as a digital indicator, electronic recorder or PLC. The 3rd wire in a CSE RTD is used to compensate for the resistance added by the length of the wires. This allows for maximum cable lengths up to 200 feet. If longer cable lengths are required then it is best to use a temperature transmitter which converts temperature into a 4 to 20 mA signal.

INSTALLATION

Try to place in a location where the RTD will be the least subjected to physical abuse. Wet locations are acceptable so long as the connector or cap is attached to the RTD during exposure to moisture or during wash down. For installation of a new RTD follow the wiring instructions below. For replacement of an existing CSE RTD, simply install on line then attach the existing cable. No re-wiring or special tools are required.

Always make sure that the connector is clean and dry before connecting.



Never use pliers or other tools to tighten the connector; finger tighten only.

CABLE REQUIREMENTS

The RTD has a standard 12mm Micro DC male receptacle which is widely accepted in all industries. The contacts are gold plated and have either 3 pins (single element RTD) or 6 pins (dual element RTD).

The cable should be of Polyurethane construction, 22 gauge with 3 conductors (for a single element RTD) or 6 conductors (for a dual element RTD), Nema 4X/IP-65 rated and the contacts should be gold plated. The connectors and cables should be shielded to prevent any RFI or EMI interference.

The cable can be purchased from CSE or from most industrial supply warehouses. We also supply cabling accessories such as extra cable, field wireable connectors, and panel mount connectors; please refer to our Electronic Sensors Cable brochure.

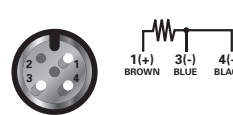
SPECIFICATIONS

Description:	3 Wire PT-100 (Platinum – 100 Ohm resistor)
Coefficient:	Alpha = 0.00385 Ohms/Ohm/Degree C (Per DIN 43760)
Accuracy:	±0.1°C (±0.18°F)
Stability:	Less than 0.05°C drift per year (at 0°C)
Element Range:	-125°C to 200°C (-193°F to 392°F)
Material:	316L SS wetted surfaces
Surface Finish:	R _a max = 8 micro-inches
Ratings:	Nema 4X, IP-65
Ambient Temp. Range:	-50°C to 125°C (-58°F to 257°F)
Connector:	Std. 12mm industrial connector, Gold plated copper contacts and Polyamide insert
CIP/SIP:	Yes
Autoclavable:	Yes

WIRING

Single Element RTD (3 Wires)

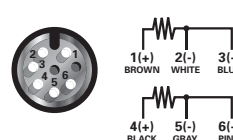
CSE uses a 3 wire platinum thin film RTD (PT-100). CSE cable utilizes the Brown as the signal wire and the Blue and Black as common wires. The shielding should be connected to earth ground at the receiver end.



PIN#	COLOR	WIRE TYPE
1	Brown	Signal
2	No Wire	-
3	Blue	Common
4	Black	Common

Dual Element RTD (6 Wires)

For a dual element RTD, CSE uses two 3 wire platinum thin film RTDs (PT-100). For the primary RTD CSE cable utilizes the White as the signal wire and the Brown and Green as common wires. For the secondary RTD CSE cable utilizes the Yellow as the signal wire and the Gray and Pink as common wires. The shielding should be connected to earth ground at the receiver end.



PIN#	COLOR	WIRE TYPE
1	Brown	Signal - RTD#1
2	White	Common - RTD#1
3	Blue	Common - RTD#1
4	Black	Signal - RTD#2
5	Gray	Common - RTD#2
6	Pink	Common - RTD#2



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TROUBLESHOOTING

- 1. If you suspect that there is a problem with an RTD first check that the wires have been connected properly at the receiving end (see wiring diagram above).
2. Make sure connector is tight and the contacts are clean and dry.
3. Disconnect the cable and perform the tests above under Calibration on the RTD with out the cable.
4. Check that the cable is good by checking the continuity of each wire.
5. Replace any damaged components.

CALIBRATION

RTDs do not need calibration. To check that the RTD is accurate, use the table of temperature versus resistance for a 100 Ohm RTD at the end of this manual. Measure the resistance of the element using a digital multimeter.

Single Element RTD

Measure the resistance between pin #1 and pin #3 (the brown and blue wires on CSE cable). Then subtract the resistance of the wire by measuring between pin #3 and pin #4 (the blue and black wires on CSE cables). Then look up the value in the table and see if the resistance matches the temperature.

Dual Element RTD

For the primary element, measure the resistance between pin #1 and pin #2 (the white and brown wires on CSE cables). Then subtract the resistance between pin #2 and pin #3 (the brown and green wires on CSE cables). Then look up the value in the table and see if the resistance matches the temperature.

For the secondary element, measure the resistance between pin #4 and pin #5 (the yellow and gray wires on CSE cables). Then subtract the resistance between pin #5 and pin #6 (the gray and pink wires on CSE cables). Then look up the value in the table and see if the resistance matches the temperature.

MAINTENANCE

CSE RTDs require little or no maintenance. On a regular basis, simply check that the inside of the connector is clean and dry and that it is finger tight; never use tools to tight the connector. Also check that the probe has not been severely damaged and that the cable is not cracked or cut.

TEMPERATURE VS. RESISTANCE TABLE

DIN 43760*, 100 Ohm
Platinum RTD
Alpha = .00385 ohms/ohm/C

Table with 8 columns: Temperature (C/F), Resistance (Ohms). It contains two identical sets of data for 100 Ohm RTD, one for Celsius and one for Fahrenheit.

* Interchangeability tolerance also matches British Standard BS 1904 Temperature vs. Resistance curve.