

**Additional Notes Re Thermo-Wells and Thermocouples:**

The Cast-X 2000 has one thermowell, the CAST-X 2500 has 2 thermo-wells. These are a long skinny tube that is cast into the heater body – and into these little tubes the thermocouples (or RTDs) are installed.

On a CAST-X 2000 with single thermowell a duplex TC can be fitted, 1 probe two sets of wires, in effect giving two separate outputs for process & overtemperature if required.

The thermo-wells on a CAST-X are anywhere from 5-12 inches long.... on the CAST-X 2500 the thermowells are approx. 9 inches long (22 cm)

The TC (or RTD) has a long shaft (sheath) on it, and at the end of that shaft is the sensor, while the lead wires come out the top of it.

The TC, when installed in that thermowell, senses the core operating temp of the heater. You should always use 2 TCs (or RTDs) to control the heater, but both of those sensors do not necessarily need to be on-board the heater.

If you have TC “in the flow path” of the fluid being heated, you can wire that TC to control the heater’s process temp. and then, on board the heater, you just need 1 TC which would be wired for over-temp cutoff.

If you do not have a TC “in the flow path” then you can use a TC on-board the heater to control its Process Temp. You can use a Snap Action High Limit Switch for over-temp. cutoff.

For an onboard Process Temp TC, there might be a small difference between the heater’s operating temp and the actual temp of the gas / liquid media as it exits the heater. The higher your flow rate, the larger that delta T will be.

For example, if you’re flowing your media relatively slow and you have your heater set at 200°C, the fluid will exit the heater at 200 or maybe 199°C. But if you’re flowing relatively fast (higher flow rate), and the heater is set at 200°C the fluid might exit the heater at 190°C.

If you want the fluid to be 200°C, you might have to simply increase the heater’s operating temp to 210°C. What that delta T is can be tricky to calculate...usually it’s a matter of trial and error. But once you figure out what the ratio is, most control panels will allow you to program-in that delta T difference....so the control switching can easily compensate for that difference, and set the heater’s operating temp at the proper temp.

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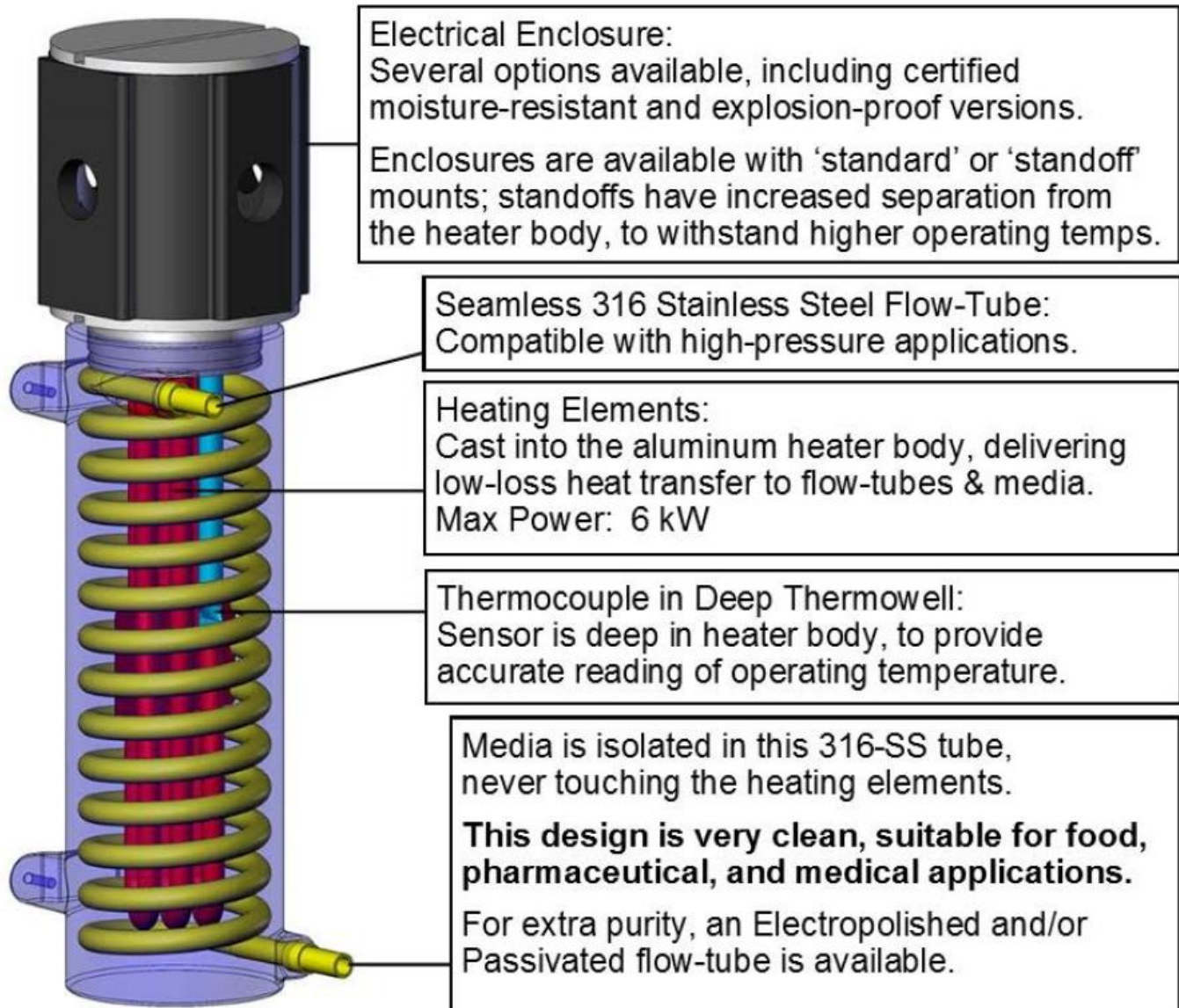


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CAST-X 2000



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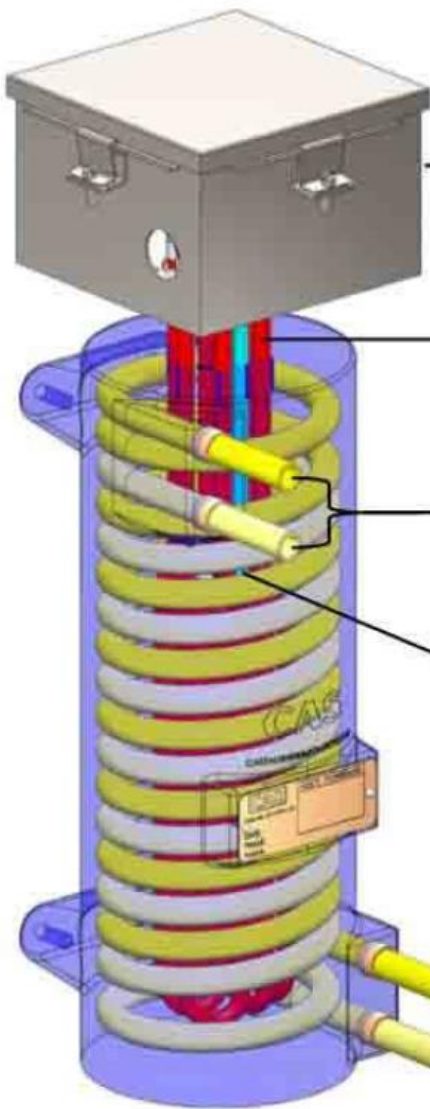


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CAST-X 2500



Electrical Enclosure:
Several options available, including certified moisture-resistant and explosion-proof versions.

Heating Elements:
Cast into the aluminum heater body, delivering low-loss heat transfer to flow-tubes & media.

Seamless 316 Stainless Steel Flow-Tubes:
Compatible with high-pressure applications. Media may be circulated in Single Tube, Dual Tube Parallel, or Dual Tube Series setup.

Thermocouples in Deep Thermowells:
Embedded deep in the heater body, to provide accurate reading of operating temperature.

Safely heat flammable gases & liquids.
(natural gas, aerospace, cryogenic uses)

**Media is isolated in these flow-tubes,
never touching the heating elements.**

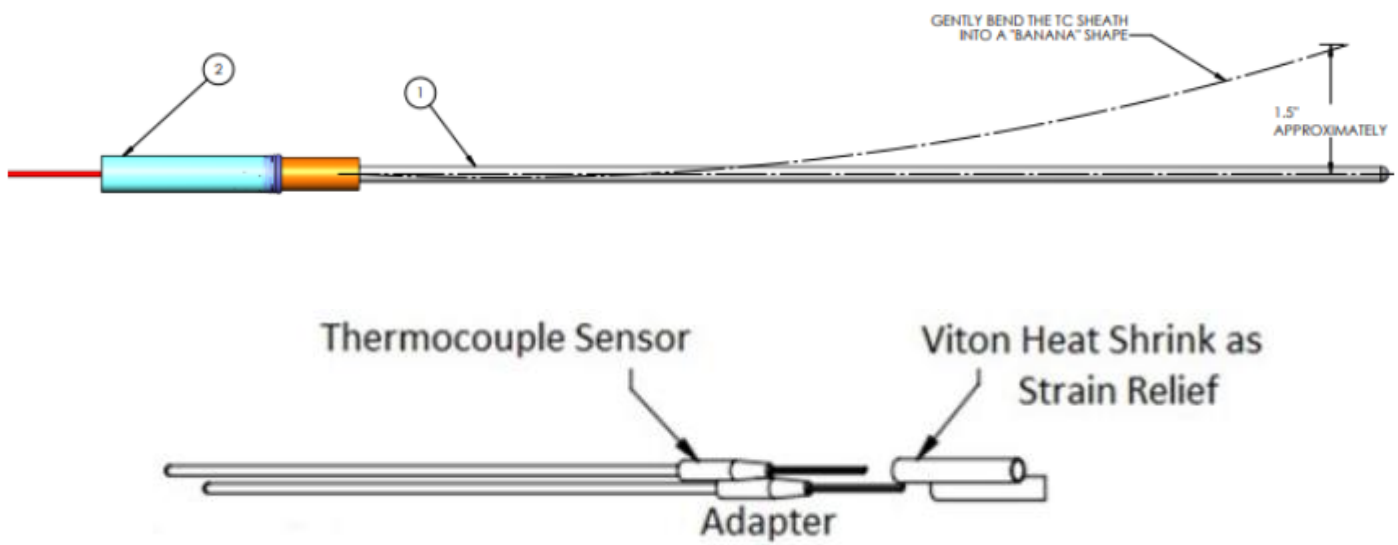
This design also prevents contamination.
(food, medical, semiconductor applications)

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Replacing sensors in Cast-X Circulation heaters:

The thermowells on the CAST-X line are oversized by design to allow the interference fit (aka Banana bend) thermocouple install.

Below are our standard install instructions. In other cases, this oversized thermowell also allows a larger bulb thermostat to be placed in the thermowell as an alternative sensing option.



1. If using a sensor with metal strain relief, remove it.
2. Add heat shrink over bottom edge of adapter, continuing over wires (see image above).
3. Shrink sleeve with suitable heat gun

Interference Fit Sensor Installation advice:

1. Remove lid from electrical enclosure box
2. Pull out existing thermocouple/sensor from thermowell by lifting adapter (covered with heat shrink).
3. Dip the sensor tip in heat transfer paste; Dow corning 340 or equivalent.
4. Align new thermocouple/sensor over either thermowell. Each thermowell goes down to the central core of the aluminium body to sense core casting temperature.
5. Place sensor in cast in thermowell until bottomed out.
6. Retract about 1 to 3 inches.

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CAST ALUMINUM

Solutions

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7. Create interference fit bend by pushing adapter towards center of casting while sensor is located in this position.
8. Push sensor back down to bottom of thermowell.
9. Ensure the sensor is snug, but still removable. If not snug fit repeat steps 5-9.
10. Reinstall lid of electrical enclosure box.

Please liaise with Sensemaster technical mail@sensemaster.co.uk 01291 422022 for further assistance

Further product information can be found on our website link <https://sensemaster.co.uk/cast-x-2/>

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