

Fast Response for Custody Transfer

APPLICATION

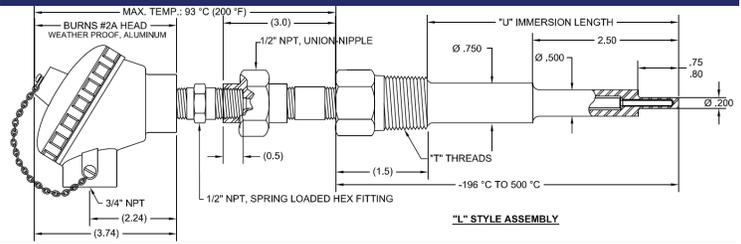
Transferring fluids that change volume significantly with temperature require careful and accurate monitoring of temperature when being transferred from storage facilities to ground level transport. Over or under filling the transport tank and errors in billing can result if corrections to the volume are not made based on an accurate temperature measurement.

As an example, a gallon of gasoline is the amount of fuel that occupies 231 cubic inches at 60 degrees. But at 75 degrees, the same amount of fuel occupies 233.4 cubic inches. At 90 degrees, the gas expands to 235.8 cubic inches.

CHALLENGE

Standard RTD and thermowell assemblies have a time constant of about 25 seconds which is not acceptable for accurately measuring fast moving fluid. Hundreds of gallons can pass before the sensor fully responds to any temperature change. That will affect the volume/temperature calculation and you will end up with an over or under filled tanker and more importantly, poor cost accounting.

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Fast Response RTD and Well

SOLUTION

A fast response thermowell and RTD combination was developed that has a time constant of less than 4 seconds. The replaceable RTD is constructed with a high accuracy sensing element and is spring loaded to insure positive contact with the thermowell.

The thermowell is available in threaded, flanged, or weld-in process connections and immersion lengths to suit your installation. We recommend an immersion of at least 2.5" to avoid measurement error due to conduction. Addition of insulation around the external portions of the sensor housing can help minimize the conduction error. Longer immersion lengths of greater than 4" have been shown by testing to nearly eliminate conduction error. Caution has to be used though to insure that wake frequency and strength factors remain within acceptable limits for your flow velocity.