

# Precision Freezer PRT



- Fully immersible probe assembly to  $-200^{\circ}\text{C}$
- NVLAP-accredited calibration, lab code 200706-0
- Accuracy to  $\pm 0.05^{\circ}\text{C}$  over the full range

If you need a precision measurement at low temperatures, do not look any further than Hart Scientific.

The 5623B, precision "freezer probe," is specially sealed from the sensing element to the end of the probe cable, preventing ingress of moisture when exposed to temperatures as low as  $-200^{\circ}\text{C}$ . The entire assembly withstands temperatures over its full range ( $-200^{\circ}\text{C}$  to  $156^{\circ}\text{C}$ ), which is ideal for verification of freezers or autoclaves where a thermometer isn't available. The 5623B assembly can be fully immersed in fluids when the application may require use in a liquid bath. The 5623B is available in a 6.35 mm (0.25 in) dia.  $\times$  125 mm (6 in) long Inconel™ sheath. With calibration uncertainty of only  $\pm 0.010^{\circ}\text{C}$  at  $0^{\circ}\text{C}$ , the 5623B is just right as a secondary standard for calibration of other process sensors.

Most Hart Scientific readouts make an excellent companion for the 5623B. We recommend the use of the 1521, 1522, 1502A, 1529, or 1560 thermometer readouts.

With each 5623B, you receive a full NVLAP-accredited calibration report, lab code 200706-0. This report includes test data and ITS-90 calibration coefficients to enter into your Hart Scientific thermometer readout.

## Ordering Information

**5623B-6-X** Freezer Probe, RTD 6.35 mm dia.  $\times$  152 mm (1/4 in  $\times$  6 in),  $-200^{\circ}\text{C}$  to  $156^{\circ}\text{C}$

**2601** Probe Carrying Case

*X = termination. Specify "B" (bare wire), "D" (5-pin DIN for Tweener Thermometers), "G" (gold pins), "I" (INFO-CON for 1521 or 1522 Handheld Thermometers), "J" (banana plugs), "L" (mini spade lugs), "M" (mini banana plugs), or "S" (spade lugs).*

## Specifications

|                                                                                    |                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Resistance</b>                                                                  | Nominal $100\Omega$ ( $\pm 0.1\Omega$ )                                                                                                                                                                                       |
| <b>Temperature Coefficient</b>                                                     | $0.003925 \Omega/\Omega/^{\circ}\text{C}$ nominal                                                                                                                                                                             |
| <b>Temperature Range</b>                                                           | $-200^{\circ}\text{C}$ to $156^{\circ}\text{C}$                                                                                                                                                                               |
| <b>Transition Temperature</b>                                                      | $-200^{\circ}\text{C}$ to $156^{\circ}\text{C}$                                                                                                                                                                               |
| <b>Drift Rate</b>                                                                  | $\pm 0.01^{\circ}\text{C}$ per year maximum at $0^{\circ}\text{C}$ , when used periodically at max temperature                                                                                                                |
| <b>Sheath Material</b>                                                             | Inconel™ 600                                                                                                                                                                                                                  |
| <b>Leads</b>                                                                       | Teflon™-insulated, silver-plated stranded copper, 22 AWG.                                                                                                                                                                     |
| <b>Termination</b>                                                                 | Specify. See ordering information.                                                                                                                                                                                            |
| <b>Calibration</b>                                                                 | Includes manufacturer's NVLAP-accredited, lab code 200706-0, calibration and table with R vs. T values in $1^{\circ}\text{C}$ increments from $-200^{\circ}\text{C}$ to $156^{\circ}\text{C}$ . ITS-90 coefficients included. |
| <b>Probe Accuracy† (includes calibration uncertainty and short-term stability)</b> | $\pm 0.05^{\circ}\text{C}$ over the full range                                                                                                                                                                                |
| <b>Cable Length</b>                                                                | 6.7 meters (20 ft)                                                                                                                                                                                                            |
| <b>Size</b>                                                                        | 6.35 mm (0.25 in) dia. $\times$ 152 mm (6 in)                                                                                                                                                                                 |

†"Accuracy" is a difficult term when used to describe a resistance thermometer. The simplest way to derive "accuracy" is to combine the probe drift specification and calibration uncertainty with readout accuracy at a given temperature.

## NVLAP<sup>†</sup> Calibration Uncertainty

| Temperature            | Expanded Uncertainty (k=2) |
|------------------------|----------------------------|
| $-196^{\circ}\text{C}$ | $0.024^{\circ}\text{C}$    |
| $-38^{\circ}\text{C}$  | $0.011^{\circ}\text{C}$    |
| $0^{\circ}\text{C}$    | $0.010^{\circ}\text{C}$    |
| $100^{\circ}\text{C}$  | $0.018^{\circ}\text{C}$    |
| $200^{\circ}\text{C}$  | $0.018^{\circ}\text{C}$    |

**Note:** Calibration uncertainties depend on the uncertainties of the lab performing the calibration. Subsequent calibrations of this probe performed with different processes, at different facilities, or with changed uncertainty statements may state different uncertainties.

<sup>†</sup>Lab code 200706-0