

# Mini TPW Maintenance Apparatus



- Easy preprogrammed realization
- Inexpensive fixed-point solution
- Training takes just a few hours

If the reason you don't use fixed-point cells is because they're too expensive or too difficult to use, you haven't heard of Hart's mini fixed-point apparatus.

The triple point of water (0.01 °C) is one of the most important temperatures on the ITS-90. Unfortunately, realizing and maintaining triple point of water cells hasn't always been convenient or cost-effective.

Because ITS-90 calibrations require frequent measurements at the triple point of water, and because the triple point of water is often used as a statistical check against the drift of a temperature standard, it is important to be able to realize and maintain well-constructed triple point of water cells easily.

Hart's 9210 TPW Maintenance Apparatus provides built-in programming for the simple supercool-and-shake realization and maintenance of our 5901B Mini TPW Cell. Simply insert the cell, enter the "freeze" mode through the front-panel buttons, have your morning cup of coffee, and when the 9210 audibly alerts you, remove the Mini TPW Cell and give it a shake to initiate freezing a portion of the

water. Re-insert the cell, change the program mode to "maintain," and you've got 0.01 °C for the rest of the day with uncertainty of only  $\pm 0.0005$  °C.

Precision-machined thermal blocks can also be used to take advantage of the excellent stability and uniformity of the 9210 for performing comparison calibrations. Multi-hole and custom blocks are available with 178 mm (7 in) depths.

## Specifications

<b>Temperature Range</b>	-10 °C to 120 °C
<b>Ambient Operating Range</b>	5 °C to 45 °C
<b>Stability</b>	$\pm 0.02$ °C
<b>Vertical Gradient</b>	$\pm 0.05$ °C over 100 mm at 0 °C
<b>Plateau Duration</b>	6-10 hours, typical
<b>Resolution</b>	0.01 ° (0.001 ° in program mode)
<b>Display Scale</b>	°C or °F, switchable
<b>Immersion Depth</b>	171 mm (6.75 in) in optional comparison block
<b>Stabilization Time</b>	15 minutes nominal
<b>Preheat Wells</b>	3 wells (for 3.18, 6.35, or 7.01 mm probes [0.125, 0.25, 0.276 in])
<b>Fault Protection</b>	Adjustable software cutout using control probe; separate circuit thermocouple cutout for maximum instrument temperature
<b>Display Accuracy</b>	$\pm 0.25$ °C
<b>Comparison Block</b>	Three multi-hole blocks, blanks, and custom blocks available
<b>Well-to-Well Gradient (in comparison block)</b>	$\pm 0.02$ °C
<b>Heating Time</b>	Ambient to 100 °C: 45 min.
<b>Cooling Time</b>	Ambient to -5 °C: 25 min.
<b>Comm.</b>	RS-232 included
<b>Power Requirements</b>	115 VAC ( $\pm 10$ %), 60 Hz, 1.5 A, or 230 VAC ( $\pm 10$ %), 50 Hz, 0.75 A, 170 W
<b>Exterior Dimensions (HxWxD)</b>	489 x 222 x 260 mm (19.25 x 8.75 x 10.25 in)
<b>Weight</b>	7 kg (15.5 lb.) with block

## Ordering Information

<b>9210</b>	Mini TPW Maintenance Apparatus	<b>3110-3</b>	Comparison Insert B, 2 holes at 4.76 mm (3/16 in), 2 at 6.35 mm (1/4 in), and 2 at 9.5 mm (3/8 in)
<b>5901B</b>	Mini TPW Cell	<b>3110-4</b>	Comparison Insert C, 6 holes at 6.35 mm (1/4 in) <i>Call for other comparison insert options.</i>
<b>1904-TPW</b>	Accredited Cell Intercomparison		
<b>3110-1</b>	Comparison Insert, Blank		
<b>3110-2</b>	Comparison Insert A, holes at 1.6 mm, 3.2 mm, 4.76 mm, 6.35 mm, 9.5 mm, and 12.7 mm (1/16, 1/8, 3/16, 1/4, 3/8, and 1/2 in)		