

HIGH-ACCURACY DRY-WELLS



High-Accuracy Dry-Well

Models 9105, 9122 and 9123

World's highest-precision dry-wells, accurate to 0.1°C

Automatic thermal switch test with display hold

RS-232 and Windows software included

Programmable ramp and soak settings

Hart's dry-wells are the best in this industry, not only because of their performance specs, but because they're the easiest to use and have a variety of software packages available to fully automate the calibration of sensors.

These units are specifically built for the demanding requirements of temperature work in calibration labs. Each instrument has excellent stability, uniformity and accuracy and features Hart's own proprietary controller for precision work; you can set the temperature with 0.01°C resolution.

All three dry-wells come with an RS-232 port and have an optional IEEE

interface available. However, unlike the competition, Hart dry-wells include our 9930 Interface-*it* software for controlling the unit with your PC. And if you want more, buy our 9932 Calibrate-*it* software, which totally automates the calibration process for RTDs, thermocouples and thermistors.

No other company offers software packages that are even close to these two from Hart. Our Calibrate-*it* software is not entry level data acquisition stuff. It is a total automation solution for the calibration process. These packages do everything but take the probe out of your dry-well when the calibration pro-

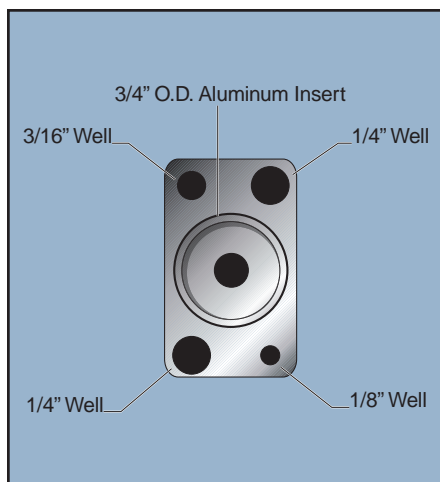
cess is done, and we're working on a program that will do that too! (See page 66.)

If you don't want to use a PC with these dry-wells, program them through the front panel to automatically set and hold up to eight temperatures in the sequence and duration of your choice. Each unit also has a "switch test" protocol that locks in the triggering temperature for thermal switches. The dry-well's ramp rate can be set to a speed of your choosing.

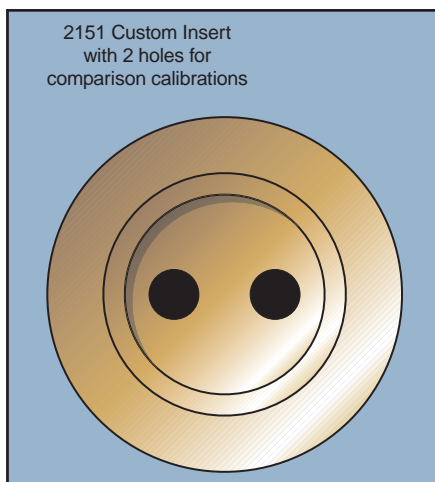
Each dry-well is completely tested and calibrated before shipment, and we don't charge extra for the traceability certificate. When accuracy and stability are important to your work, Hart is your best choice, especially when you compare prices.

Model 9105

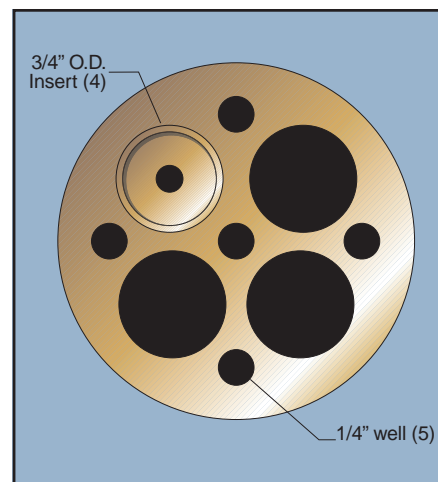
The Model 9105 Dry-Well has a temperature range of -25°C to 140°C with a



The 9105 block is drilled with five calibration wells, one of which accepts interchangeable inserts.



The 9123 block has one well that accepts interchangeable inserts.



The 9122 has the most wells of any dry-well: nine total with four that accept interchangeable inserts.

stability of $\pm 0.02^{\circ}\text{C}$. It has four outside wells of various sizes and a custom-size center well as shown in the illustration. Well-to-well uniformity in the drilled inserts is $\pm 0.05^{\circ}\text{C}$.

Used with a standards probe, the Model 9105 has the test well uniformity and the stability to give you $\pm 0.05^{\circ}\text{C}$ calibration accuracy. The high-precision, microprocessor-based controller has 0.01 degrees of resolution.

You recalibrate your 9105 through its front panel, which reduces the cost and problems of recertifying your instrument. It comes with a NIST-traceable certificate at no additional cost, making the 9105 dry-well an even better value.

Model 9122

Too many probes to calibrate and not enough time? The Model 9122 High Capacity Dry-Well lets you calibrate up to nine probes simultaneously, manually or under PC control. Load your probes in the 9122 and start your calibration. You won't have to touch them again until the calibration is complete.

The temperature in any of the nine test wells is accurate to $\pm 0.2^{\circ}\text{C}$ up to 300°C and $\pm 0.7^{\circ}\text{C}$ at 600°C . This includes all errors such as uniformity between wells, repeatability and the

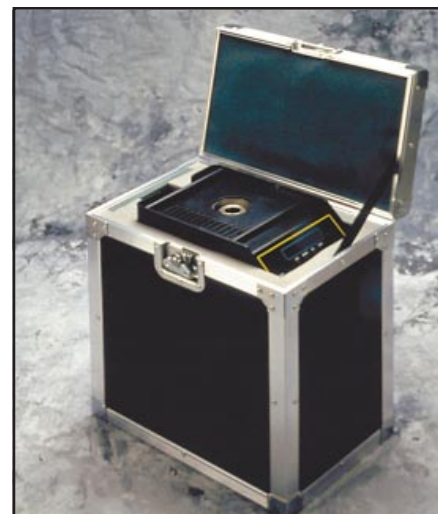
uncertainty of the NIST-traceable calibration performed in our factory. Put your probe in any well and compare its output to the 9122's display, or use it with a reference probe for comparison calibrations and even greater accuracy.

For testing only one probe, use the center well for an accuracy of $\pm 0.1^{\circ}\text{C}$ up to 300°C and $\pm 0.3^{\circ}\text{C}$ at 600°C . The Model 9122 is a great buy, especially if you have high-volume calibration needs.

Model 9123

For work between 35°C and 600°C , the Model 9123 is one of our most popular instruments. It has a "smart" controller that automatically increases fan speed for cooling the block and then reduces the fan speed at a specific set-point temperature for maximum stability during calibrations.

It has an accuracy of $\pm 0.1^{\circ}\text{C}$ up to 300°C and $\pm 0.5^{\circ}\text{C}$ to 600°C . Resolution is 0.01°C and stability is $\pm 0.02^{\circ}\text{C}$. Inserts are available with two sensor holes for doing comparison calibrations. Uniformity between holes is typically $\pm 0.01^{\circ}\text{C}$.



9304 carrying case for 9105, 9122 and 9123 dry-wells.



Combine a Tweener with Hart's new "Let's Do Lunch" dry-well and you'll never have to leave the lab.

HIGH-ACCURACY DRY-WELLS

Specifications	9105	9122	9123
Range	–25°C to 140°C (–13°F to 284°F)	35°C to 600°C (95°F to 1112°F)	35°C to 600°C (95°F to 1112°F)
Accuracy	±0.1°C	Center Well: ±0.1°C at 100°C ±0.1°C at 300°C ±0.3°C at 600°C	±0.1°C to 300°C ±0.5°C to 600°C
Stability	±0.02°C	±0.02°C at 100°C ±0.03°C at 300°C ±0.05°C at 600°C	±0.02°C to 400°C ±0.05°C to 600°C
Uniformity	Drilled wells: ±0.05°C	±0.05°C at 100°C ±0.12°C at 300°C ±0.45°C at 600°C	up to ±0.05°C in multiple-hole inserts
Well Depth	6 inches		
Computer Interface	RS-232 Interface included with Model 9930 Windows® control software		
Heating Time to Max	10 minutes	45 minutes	15 minutes
Test Wells	5 wells: 2 at 1/4" (6.35 mm), 1 at 3/16" (4.8 mm), 1 at 1/8" (3.2 mm), and 1 interchangeable	9 wells: 4 interchangeable and 5 at 1/4" (6.35 mm)	1 interchangeable well
Resolution	0.01°C or °F		
Display	LED, °C or °F, user-selectable		
Size	12.5" H x 8" W x 10.5" D (318 x 203 x 267 mm)		
Weight	30 lb. (13.6 kg)	25 lb. (11.3 kg)	15 lb. (6.8 kg)
Power	110 VAC, 60 Hz (220 VAC, 50 Hz optional)		

Ordering Information 9105

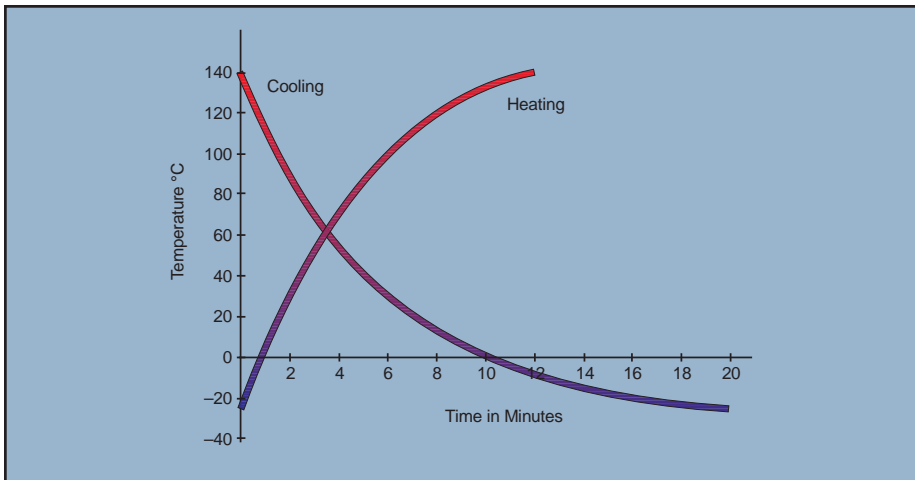
9105	Low-Temp Dry-Well, includes 1/4" insert
2125	IEEE-488 Option
2168	Blank Insert
2169	1/16" Insert (1.6 mm)
2170	1/8" Insert (3.2 mm)
2171	5/32" Insert (4 mm)
2172	3/16" Insert (4.8 mm)
2173	1/4" Insert (6.35 mm)
2174	5/16" Insert (7.9 mm)
2175	3/8" Insert (9.5 mm)
2176	1/2" Insert (12.7 mm)
2177	5/8" Insert (15.9 mm)
2181	1 User-specified Hole
2182	2 User-specified Holes
9304	Carrying Case

Ordering Information 9122

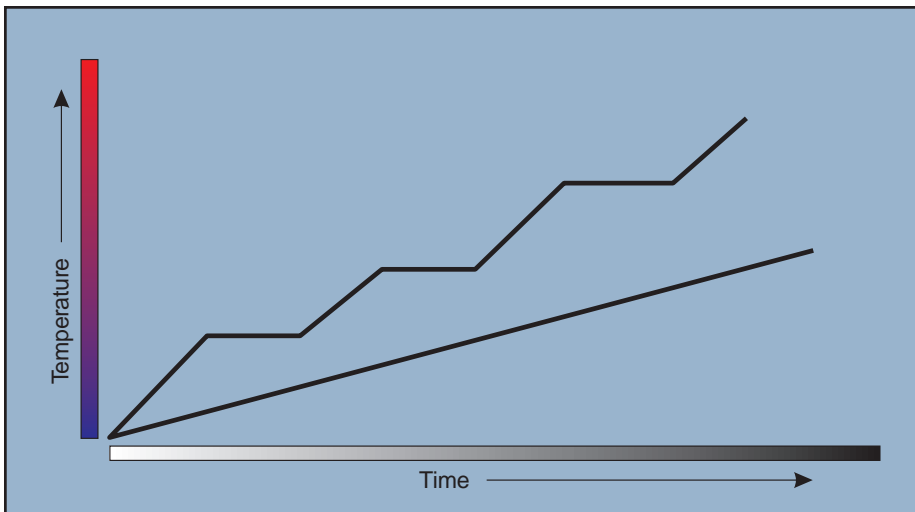
9122	High-Capacity Dry-Well, includes 1/8", 3/16", 3/8", and 1/4" inserts
2125	IEEE-488 Option
2152	Blank Insert
2154	1/8" Insert (3.2 mm)
2155	5/32" Insert (4 mm)
2156	3/16" Insert (4.8 mm)
2157	1/4" Insert (6.35 mm)
2158	5/16" Insert (7.9 mm)
2159	3/8" Insert (9.5 mm)
2160	1/2" Insert (12.7 mm)
2161	5/8" Insert (15.9 mm)
2162	1 User-specified Hole
2163	2 User-specified Holes
9304	Carrying Case

Ordering Information 9123

9123	High-Speed Dry-Well, includes 1/4" insert
2125	IEEE-488 Option
2131	Blank Insert
2133	1/8" Insert (3.2 mm)
2134	5/32" Insert (4 mm)
2135	3/16" Insert (4.8 mm)
2136	1/4" Insert (6.35 mm)
2137	5/16" Insert (7.9 mm)
2138	3/8" Insert (9.5 mm)
2139	1/2" Insert (12.7 mm)
2140	5/8" Insert (15.9 mm)
2141	3/4" Insert (19 mm)
2142	7/8" Insert (22 mm)
2150	1 User-specified Hole
2151	2 User-specified Holes
9304	Carrying Case



9105 heating and cooling rates.



The programmable ramp and soak function lets you perform semi-automated sensor testing—or you can set a single controlled ramp to test thermal cutouts.



Use these dry-wells with a 1560 Black Stack and Hart's Calibrate-it software for the most advanced and complete automated sensor calibration system.

Technical Tip

Maximum Accuracy

To get the most accurate calibrations possible from a dry-well calibrator, you should use an external reference thermometer. If, however, you are NOT using an external reference, there are a few important things you should keep in mind.

First, you are using a reference. You're comparing the reading of your test probe against the display of the dry-well. The dry-well display is based on its own control sensor, usually located at the bottom of the well. Therefore, to make the best comparison, your test probe should be inserted to the same depth as the control sensor. This was the method used when the dry-well's display was calibrated at the factory.

Second, your test probe should fit snugly into one of the test wells. Again, this is how it was originally calibrated at the factory. If your probe is too loose, thermal contact is naturally poor and a large error has been introduced. Custom inserts are available to help solve this problem.

Third, you should not introduce fluids into the wells of a dry-block in an attempt to improve thermal contact. It is too dangerous. If thermal contact is so poor that you're thinking about doing this, consider buying a bath instead. Micro-baths are now available that are just as portable and easy to use as dry-wells.

The point here is that the accuracy specs of your dry-well are based upon how the manufacturer calibrates it. If you're relying on those specs, you need to use the dry-well the same way they do—with a good, snug fit at the bottom of the well.