

# Industrial dual-block calibrator



- Temperatures from  $-15\text{ }^{\circ}\text{C}$  to  $350\text{ }^{\circ}\text{C}$  in one unit
- Two wells in each block for simultaneous comparison calibrations
- Rugged, lightweight, watertight enclosure

Hart's 9009 Industrial Dual-Block Calibrator lets you calibrate at hot and cold temperatures at the same time. Double your productivity or cut your calibration time in half—either way you look at it, your in-field temperature calibrations just got easier.

The 9009 includes two independently controlled temperature blocks. The hot block provides temperatures from  $50\text{ }^{\circ}\text{C}$  to  $350\text{ }^{\circ}\text{C}$ , while the cold block covers the range  $-15\text{ }^{\circ}\text{C}$  to  $110\text{ }^{\circ}\text{C}$ . Each block is controlled by a precision Hart Scientific temperature controller. These aren't some off-the-shelf controllers we glued into a box. These are Hart Scientific controllers from the leading temperature company in the world.

Each temperature block includes two wells with removable inserts. You can calibrate four probes at once, or you can calibrate two probes at the same time with an external reference (like Hart's 1521 Little Lord Kelvin Thermometer on page 58), or you can use the two temperature wells to get quick "zero" and "span" references for transmitter calibrations.

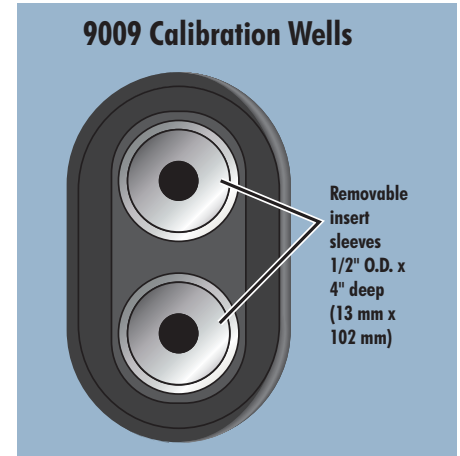
Need portability and durability? The 9009 is housed in a tough Pelican™ case that is both airtight and watertight. It's a small package weighing only 10 pounds, yet it fits everything you need, including a power cord and four extra inserts. Inserts are available to accommodate sensors of any size from  $1/16\text{''}$  (1.6 mm) to  $7/16\text{''}$  (11.1 mm). This rugged system can go anywhere.

Of course, the 9009 also delivers the performance you expect from a Hart Scientific temperature source. The cold block is calibrated to within  $\pm 0.2\text{ }^{\circ}\text{C}$  with stability of  $\pm 0.05\text{ }^{\circ}\text{C}$ . The hot block's display is accurate to  $\pm 0.6\text{ }^{\circ}\text{C}$  with stability of  $\pm 0.05\text{ }^{\circ}\text{C}$ . A NIST-traceable calibration is included for each of the two test blocks.

For use with automated systems, the 9009 comes with an RS-232 connection and our Model 9930 Interface-it software, which allows you to control and monitor temperatures from your PC. For completely automated calibrations, Hart's MET/TEMP II software (page 97) also integrates with the 9009.

Two blocks in one unit, a total range of  $-15\text{ }^{\circ}\text{C}$  to  $350\text{ }^{\circ}\text{C}$ , portability, durability, versatility, performance, and automation. Hart Scientific delivers it all.

The 9009 is built into a small, lightweight, rugged enclosure that holds everything you need and comes in black or yellow.



Each block contains two wells, which accept removable inserts. A  $1/4\text{''}$  and a  $3/16\text{''}$  insert are included for each block. Additional sizes (including custom sizes) are available.

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Specifications	Hot Block	Cold Block
Range	50 °C to 350 °C (122 °F to 662 °F)	-15 °C to 110 °C (5 °F to 230 °F) (-8 °C [18 °F] with hot block at 350 °C [662 °F])
Accuracy	± 0.6 °C	± 0.2 °C
Stability	± 0.05 °C	
Well-to-Well Uniformity	± 0.1 °C	
Display Resolution	0.1 °	
Heating Times	30 minutes from 25 °C to 350 °C	15 minutes from 25 °C to 110 °C
Cooling Times	40 minutes from 350 °C to 100 °C	16 minutes from 25 °C to -15 °C
Stabilization Times	8 minutes	
Well Depth	4" (102 mm)	
Removable Inserts	Two 6.4 mm (1/4 in) and two 4.8 mm (3/16 in) inserts included; see Ordering Information for other available inserts	
Computer Interface	RS-232 included with free Interface-it software	
Power	115 V ac (± 10 %), 3 A, or 230 V ac (± 10 %), 2 A, specify, 50/60 Hz, 280 W	
Size (HxWxD)	178 x 267 x 248 mm (7 x 10.5 x 9.75 in)	
Weight	4.5 kg (10 lb)	
NIST-Traceable Calibration	Data at 50 °C, 100 °C, 150 °C, 200 °C, 250 °C, 300 °C, and 350 °C	Data at -8 °C, 0 °C, 25 °C, 50 °C, 75 °C, 100 °C, and 110 °C

## Ordering Information

9009-X	Industrial Dual-Block Dry-Well (X = case color. Specify "B" for black or "Y" for yellow.) Includes two 1/4 in (6.4 mm) and two 3/16 in (4.8 mm) inserts.
3102-0	Insert, Blank
3102-1	Insert, 1/16 in (1.6 mm)
3102-2	Insert, 1/8 in (3.2 mm)
3102-3	Insert, 3/16 in (4.8 mm)
3102-4	Insert, 1/4 in (6.4 mm)
3102-5	Insert, 5/16 in (7.9 mm)
3102-6	Insert, 3/8 in (9.5 mm)
3102-7	Insert, 7/16 in (11.1 mm)
3102-8	Insert, 5/32 in (4 mm)

## 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 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 fluid bath instead. Micro-Baths are available that are just as portable and easy to use as dry-wells.

The point 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.