

# Resistor baths



- Three size options for any quantity of resistors
- Stability to  $\pm 0.0007$  °C
- Set-point resolution to  $0.00003$  °C
- Minimal long-term drift

Regardless of the size and number of standard resistors you have to maintain, Hart has a bath that will do the job for you. Choose one of the three models described here or call us for information on other sizes.

Like all Hart baths, these resistor baths have unbeatable stability and uniformity. No other baths limit long-term and short-term drift—as well as gradients—better than these baths. Hart's proprietary controller senses temperature changes as small as  $0.00001$  °C. This controller is the industry's best-selling temperature calibration controller for bath retrofits because it improves the stability of almost every other poorly performing bath. So why not buy the best to begin with?

Each bath can be delivered with any size resistor rack you want (a standard model is included with each bath), and the Model 7015 has several other special features that make your work easier.

## 7015

The 7015 has a 95-liter tank and a temperature range of 0 °C to 50 °C. It's stable to  $\pm 0.0007$  °C.

It has a one-piece stainless steel lid designed to drain spills and splashes back into the bath as you remove resistors. It has a large access opening to make handling large resistors, like the Thomas design standard resistors, easier. The tank has an electrically isolated resistor shelf.

This is truly a quality resistor bath, and it's backed by Hart's industry-leading service.

## 7009

This is a large bath with a tank  $27\frac{1}{2}$  inches long by 22 inches wide. It has a temperature range of 0 °C to 50 °C and a stability of  $\pm 0.0007$  °C.

For a bath this size and with these specs, it is priced extremely well. The Model 7009's large tank can handle many resistors of any size.

## 7108

This is the quietest resistor bath you've ever heard. The 7108 uses thermoelectric (Peltier) modules to provide heating and cooling over its range from 20 °C to 30 °C. Without a compressor, noise is dramatically reduced. Power requirements are also lower, so you save money running the bath and add less heat load to your lab.

# Resistor baths

Specifications	7015	7009	7108
Range	0 °C to 50 °C†	0 °C to 50 °C†	20 °C to 30 °C
Stability at 25 °C	± 0.0007 °C (water) ± 0.001 °C (mineral oil 5011)		± 0.002 °C (water) ± 0.004 °C (mineral oil 5011)
Uniformity	± 0.003 °C at 25 °C (water) ± 0.005 °C at 25 °C (mineral oil 5011)		± 0.005 °C (water) ± 0.008 °C (mineral oil 5011)
Temperature Setting	Digital display with push-button data entry		
Set-Point Resolution	0.001 °C; high-resolution mode, 0.00003 °C		
Display Resolution	0.01 °C		
Digital Setting Accuracy	± 1 °C		± 0.5 °C
Digital Setting Repeatability	± 0.01 °C		
Heaters	500 and 1000 Watts		Peltier heating/cooling
Cooling Capacity	100 to 200 Watts		100 W in ambient 23 °C
Access Opening	699 x 279 mm (27.5 x 11 in)	699 x 559 mm (27.5 x 22 in)	356 x 356 mm (14 x 14 in)
Bath Chamber Dimensions (HxWxD) (unobstructed space)	699 x 279 x 330 mm (27.5 x 11 x 13 in)	669 x 559 x 330 mm (27.5 x 22 x 13 in)	355 x 203 x 355 mm (14 x 8 x 14 in)
Depth	330 mm (13 in)		203 mm (8 in)
Wetted Parts	304 stainless steel		Tank: 304 stainless steel Resistor rack: hard-anodized, perforated aluminum
Safety Cutout	Factory-set high temperature		n/a
Power	115 V ac (± 10 %), 60 Hz, 15 A or 230 V ac, 50 or 60 Hz, 8 A, specify	230 V ac (± 10 %), 50 or 60 Hz, 12 A (specify frequency)	115 V ac (± 10 %), 50/60 Hz, 3 A or 230 V ac (± 10 %), 50/60 Hz, 1.6 A, specify
Volume	95 liters (25 gallons)	167 liters (44 gallons)	51 liters (13.2 gallons)
Weight	141 kg (310 lb)	150 kg (330 lb)	35 kg (75 lb)
Size (HxWxD)	1219 x 1118 x 559 mm (48 x 44 x 22 in)	1092 x 1130 x 864 mm (43 x 44.5 x 34 in)	489 x 413 x 635 mm (19.25 x 22 x 25 in)
Automation Package	Interface- <i>it</i> software and RS-232 computer interface are available for setting the bath temperature via an external computer. (Both come standard with a 7108.) For IEEE-488, add the 2001-IEEE to the automation package.		

†Although the 7015 and 7009 baths are capable of reaching higher temperatures, they are designed for use with standard resistors. Therefore, the soft cutout of the instrument has been set at the factory to 50 °C to protect standard resistors placed in the bath.

With a 51-liter (13.2-gal) tank, the 7108 holds plenty of resistors. A large 14" x 14" (356 x 356 mm) access opening allows you to easily move resistors in and out of the bath. A resistor rack comes with each unit that fits across the bottom of the tank. Made from hard-anodized perforated aluminum, this rack maintains the necessary electrical isolation between your resistors.

Hart baths have been used in primary temperature and electrical labs for years. Why shouldn't they be? They're the most stable baths in the world. Now they're even better. Try one.

## Ordering Information

<b>7015</b>	Resistor Bath
<b>7009</b>	Resistor Bath, high capacity
<b>7108</b>	Resistor Bath, Peltier-cooled, includes RS-232
<b>2001-7015</b>	Automation Package for 7015
<b>2001-7009</b>	Automation Package for 7009
<b>2001-IEEE</b>	Add for IEEE-488 (requires Automation Package)
<b>5011-18.9L</b>	Fluid, Mineral Oil, 18.9 L (5 gal.)
<b>5011-3.8L</b>	Fluid, Mineral Oil, 3.8 L (1 gal.)

## Improving uniformity performance

Want to reduce your bath uncertainties? Non-uniformity can be a significant factor in calibration uncertainty. Our uniformity specs cover the entire working volume of the bath. The "working volume" is typically one inch from all of the walls and three inches below the fluid surface.

For better results, keep your probes close together and adequately immersed. Bath uniformity is better within a small portion of the bath than it is over the entire working volume. Leave about one-half inch of space around each probe to permit adequate fluid flow. Any more than that is unnecessary.