WHY A HART BATH?

Each year we sell more baths for temperature calibration than any other bath maker in the world. Metrologists are, by nature, extremely concerned about instrument performance. In this market you don't reach this level of acceptance through aggressive salesmanship. You have to deliver a measurable difference.

The baths described in this section were each designed specifically for metrology. They are not adaptations of equipment designed for biology or chemistry labs.

There's nothing mysterious or magical about our baths. We don't expect you to simply believe us. We want you to be skeptical so we can prove to you how good our baths are. We'll tell you how a Hart bath is made and why it performs better than any other bath in the world.

Controllers

The first step in evaluating a bath is to look at its temperature controller. We designed our own proprietary control technology to deliver stability to ±0.0001°C with features that make your work go more quickly. Our hybrid analog and microprocessor design is unique. Set-point resolution is 0.01°C (0.002°C on some models), and our "Super-Tweak" resolution mode offsets the set-point so you can adjust the bath set-point to the fifth decimal place. Although thermal noise in the bath is measured at four decimal places, the "Super-Tweak" function still gets you closer to an absolute temperature than any other controller. If you need a bath set at exactly 25.000°C, a Hart bath gets you there with less effort than any other bath.

Eight of your most frequently used set-point temperatures are stored for quick recall and faster bath setup. Temperature can be easily switched between Celsius and Fahrenheit. Safety cutout temperatures are also set on the LED display.

Hart baths are each fitted with a high-stability PRT or thermistor as the control sensor. Our controller uses special noise-rejection techniques to allow us to measure the very tiny resistance changes required for this level of bath stability. In this design we use AC bridges to cancel thermal EMFs. Custom, high-precision, low-coefficient resistors aid the short- and long-term stability of the temperature setting, and advanced filtering techniques force out line noise along with stray EMIs and RFIs.

A proportional, integrating control function directs power to the bath heaters. Factory tuning eliminates most overshoot and allows the bath to achieve maximum stability within 10 to 15 minutes after reaching the setpoint temperature.

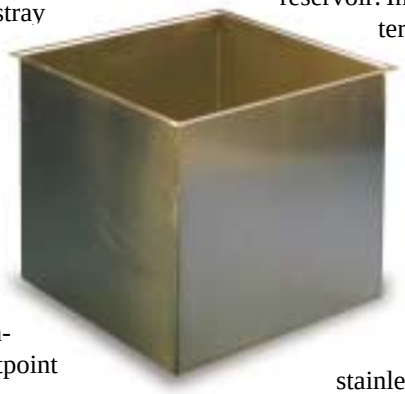
Automation

Another bath issue is automation. Hart offers a number of options. You can select from an RS-232 interface or IEEE-488. The RS-232 packages come complete with Interface-*it* software so you can immediately start controlling your bath from a PC without any programming skills.

Hart's compact bath series uses a simple on/off function to control refrigeration power. However, our higher performance baths use a heating/cooling equilibrium design that's unique in the industry. A manual valve adjusts the cooling power to properly balance the refrigeration against the active control of the resistance heaters. Hart's bath interface packages include automated valves to make these adjustments automatically by your PC.

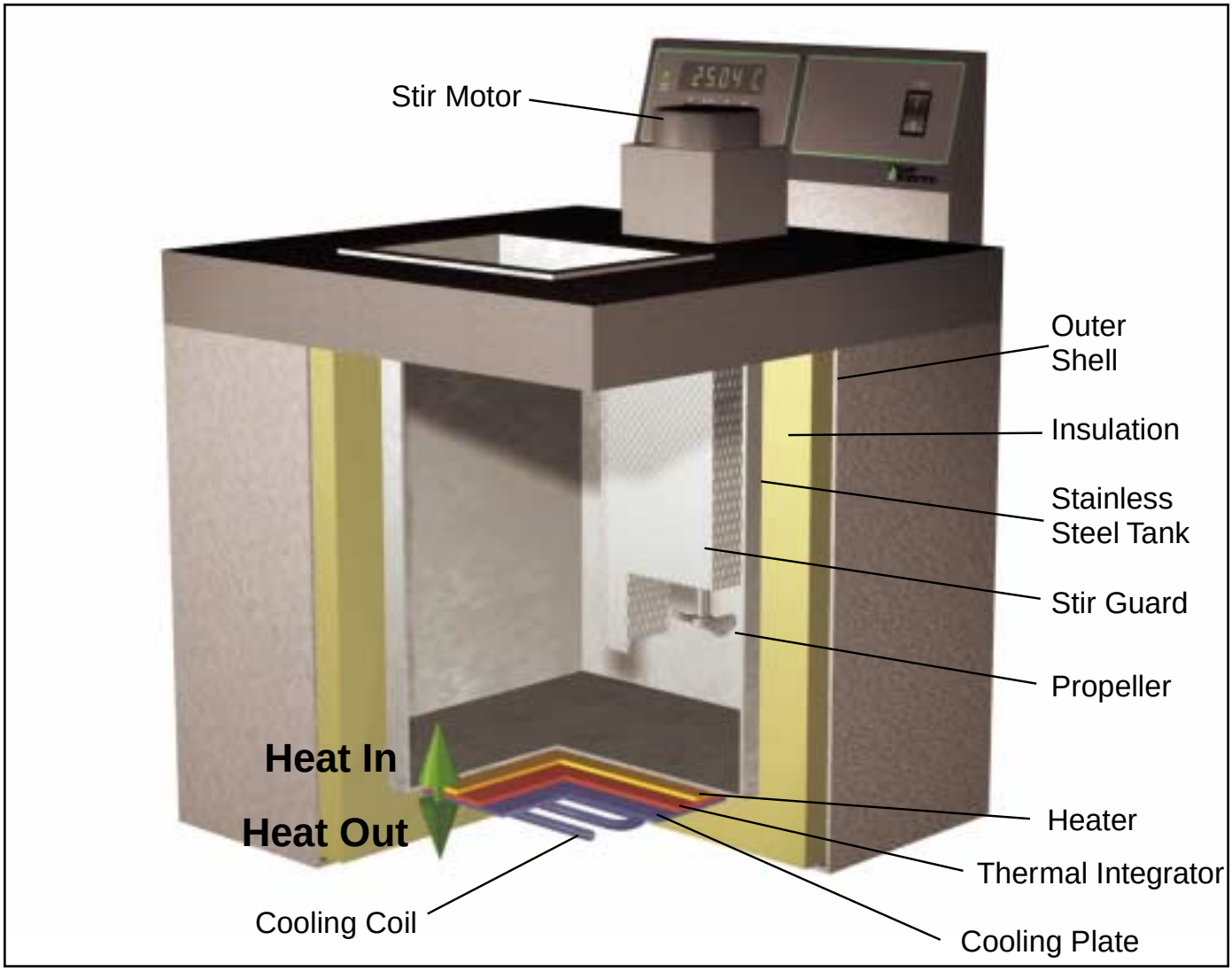
Heat-Port Technology

A major factor in Hart's bath performance is our heat port technology. Some manufacturers place separate heating and cooling coils directly in the bath reservoir. In this scheme, heat enters and exits the bath at two different locations. Hart improves bath uniformity and stability by reducing the heat paths from two to one. The cooling coil and the heater are sandwiched to the outside of the bath's stainless steel tank. The tank bottom becomes the heat port with most of the heat entering and exiting the bath through a single location. Other heat leaks are minimized by providing well-designed insulation around the tank.



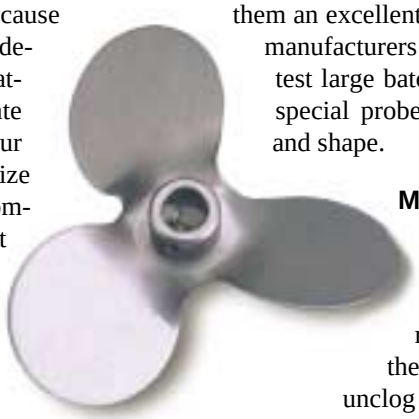
Mixing

For mixing the bath fluid, Hart uses a carefully balanced stirring mechanism.



The number of propellers and the pitch of the blades are adjusted to thoroughly mix the bath medium and eliminate both horizontal and vertical gradients. We don't use circulating pumps, because the tubular inlet and outlet design cause thermal-flow patterns in the bath that create unnecessary gradients. Our mixing scheme and the size and shape of our tanks all combine to deliver great performance.

All our baths use tanks made of heavy-gauge stainless steel that is fabricated and welded in our own factory so we can control quality. After more than 20 years we haven't had a single Hart bath weld develop a leak. Hart baths have larger well openings than other baths. This makes them an excellent choice for sensor manufacturers and others that test large batches of sensors or special probes of unusual size and shape.



Maintenance

Hart baths are easy to maintain because our stir motors last longer; there are no pumps to unclog or repair. Our bath tanks are easier to clean because they don't have heating and cooling coils in them. We don't make our money selling replacement parts. You won't need belts, seals, gaskets, or any other aggravating doodads.

There's a reason we sell more temperature calibration baths than anybody else. You'll never have to apologize to your boss for having bought one.

Get the latest product information at www.hartscientific.com