



## Digital Dry Bath II, models BSH1001, BSH1002 and BSH1004 Users Manual

Benchmark's Digital Dry Baths are highly accurate, microprocessor controlled, dry block heating units capable of heating one, two or four aluminum blocks or aluminum or glass pans. They provide unsurpassed temperature uniformity and accuracy for heating microtubes, test tubes and other small vessels, including microplates and slides. Each dry bath has a bright green LED display, easy to set temperature and time controls and comes complete with a block lifter.

<u>SPECIFICATIONS</u>	<u>SH1001</u>	<u>SH1002</u>	<u>SH1004</u>
Well size	1 block	2 block	4 block
Temperature range	Amb.+5C to 150C	Amb.+5C to 150C	Amb.+5C to 130C
Increments and display resolution	0.1C	0.1C	0.1C
Temperature uniformity	+/-0.2C	+/-0.2C	+/-0.2C
Temperature accuracy	+/-0.2C	+/-0.2C	+/-0.2C
Timer function / resolution	off (untimed) or on to 999 minutes in 1 minute increments		
Size wxdxh (in.) / Weight	7.9x9.1x3.2 (2.2kg)	8.7x10.7x3.2 (2.5kg)	8.7x14.3x3.2 (3.5kg)
Electrical 115/230VAC 50/60Hz	100 watts	150 watts	300 watts



WARNING!

**CAUTION:** Hot surfaces, especially on the block, can cause serious injury or burns.

**CAUTION:** Do not put water or liquids into the well as shock, serious injury and death may occur.

**CAUTION:** Do not heat flammable or explosive substances as serious injury and death may occur.

### SET UP and OPERATION

Place the dry bath on a stable, flat surface away from air vents and any equipment exhaust vents. Plug the dry bath into a properly grounded outlet of the correct voltage. Insert the block(s) into the heating well using the block lifter. **Caution: blocks may be hot!** Using the switch on the back of the unit, turn the power on. The dry bath will make a "beep" sound, illuminate each digit on the display left to right and briefly illuminate the red and green lamps while it performs a unit test. After the unit test, the display will begin showing the well temperature and the unit will begin heating the block to the previously set temperature and flashing the **Heating** lamp.

### Setting the Temperature

Use the **Up** and **Down** arrow buttons to increase or decrease the temperature setting. The temperature can be set in tenths of a degree C. Once the temperature is set, the display will then revert to showing the well temperature and the **Heating** lamp with flash until the set temperature has been reached. The temperature setting is automatically remembered if power is turned off or if the power is lost.

### Using and Setting the Timer

The dry bath has a built-in digital timer function that sounds a "beeping" alarm when the set time has been reached. The timer does **NOT** turn off the heater when the set time is reached. The Timer feature alerts the user that the time setting has been reached but does not disturb samples being heated. (continued on next page)

Press the **Mode** button to illuminate the **Timer** lamp and place the dry bath into the timer set mode. Use the **Up** and **Down** arrow buttons to set the desired time in one minute increments on the display. Once time has been set and after about 3 seconds, the dry bath will make a “beep” sound, illuminate the green **Temp-Run** lamp and automatically begin the timer. The display will revert to showing the well temperature and the red **Timer** lamp will be extinguished. When the display shows the well temperature, pressing the **Mode** button will cause the display to show how much time remains on the timer in minutes.

When time has expired, the dry bath will briefly sound the “beeping” alarm and flash the red **Heating** lamp. The display will show a set of characters that represent the word “oVER” with only a partial R shown. Sample heating will be unaffected. At this point the user can press the **Mode** button to start the timed cycle over again or press the **Down** arrow button to cause the display to show the current well temperature without re-starting the timer. The green **Temp-Run** lamp will remain illuminated until the Timer mode is entered again or the power is turned off.

It is best to allow the dry bath to first reach the desired temperature before setting and using the timer function. Because the timer does not affect sample heating, it can also be used as a general purpose timer for other lab activities. The timer setting is automatically remembered if unit power is turned off or if power is lost.

### **User Calibration Function**

The dry baths are calibrated at the factory and are highly accurate. The dry baths also have a user calibration feature which allows users to fine adjust the dry bath display to match certified lab reference thermometers or reference temperature sensing meters. Adjusting unit calibration should only be attempted using certified thermometers or temperature sensors with accuracy certificates. Use the following procedure to calibrate the dry bath:

1. The unit must be off. Press and hold down the **Mode** button. While holding down the **Mode** button, turn the unit on using the power switch at the back.
2. The display will step through the digits and then show the current temperature setting with the right hand digit flashing. Release the **Mode** button after the right hand digit begins flashing.
3. Set the temperature to the desired calibration temperature using the **Up** and **Down** buttons.
4. Press and release the **Mode** button. The unit will start heating to the set calibration temperature.
5. Allow 45 minutes for the dry bath to equilibrate at the set calibration temperature. The right hand digit will begin flashing again when the dry bath has equilibrated at the calibration temperature.
7. After the display begins flashing, use a **certified** reference thermometer or temperature sensor to check the block or sample temperature. If the reference thermometer shows a difference from the display, you can adjust the display to match the thermometer by using the **Up** and **Down** buttons.
8. After using the reference thermometer and adjusting the display if necessary, press the **Mode** button to exit the calibration mode. The dry bath will then be calibrated to the reference thermometer at the selected temperature point and ready for operation.

### **EER Code on the display**

If the dry bath temperature sensor is shorted or senses an ambient temperature below 0C, the display will show the error code EER.

**Warranty:** The dry bath comes with a 2-year warranty.