Instruction Manual

Digital Dry Baths

Models BSH1001,

BSH1002

and BSH1004

BSH1004

BSH1001

BSH1002

Introduction

Benchmark's Digital Dry Baths are highly accurate, microprocessor controlled, dry block heating units. Three models are available to accept one, two or four aluminum blocks. The baths provide unsurpassed temperature uniformity and accuracy for heating microtubes, test tubes and other small vessels such as 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. Blocks must be purchased separately.

Please read this manual thoroughly before attempting to operate the Digital Dry Bath.

CAUTION: Ensure that the local voltage matches the voltage of the instrument.
CAUTION: Hot surfaces, especially on the block, can cause serious injury or burns.
CAUTION: Do not put water or liquids into the dry bath well as shock, serious injury may occur.
CAUTION: Do not heat flammable or explosive substances as serious injury may occur.

I. Specifications

	BSH1001	BSH1002	BSH1004
Block capacity	1 block	2 blocks	4 blocks
Temperature range	Ambient +5°C to 150°C		Ambient - +5°C to 130°C
Display resolution	0.1°C		
Temp. uniformity	±0.2°C		
Temp. accuracy	±0.2°C		
Timer	Off or 1-999 minutes in 1 minute increments		
Dimensions	20x23x8cm 7.8x9x3.2"	22x26x8cm 8.7x10.3x3.2"	22x35.5x8cm 8.7x14x3.2"
Weight	2.2kg (4.8lb)	2.5kg (5.5lb)	3.5kg (7.7lb)
Wattage	200W	400W	600W
Electrical	115or 230V, 50-60Hz		
Warranty	2 years, parts and labor		

II. Product Set-Up

Remove the dry bath and any accessories from the box. Keep all packing materials until the unit is shown to be in good working order. Check the label on the back of the dry bath to ensure a unit of the proper voltage has been received. If the voltage is not appropriate, do not use the dry bath and contact your local Benchmark dealer.

Place the dry bath on a clean, stable surface near a properly grounded electrical outlet and away from air vents and equipment exhaust vents. Locate the power switch on the back of the bath and turn it to the off position. Plug the dry bath into the electrical outlet.

III. Product Operation

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. Each digit on the display will light briefly, from left to right and the LED lamps will light while the unit performs a self test. After the self test, the display will show the actual temperature of the block, and begin heating to the set temperature. While the unit is heating the **Heating** lamp will flash.

IV. Setting the Temperature

Block temperature is set by using the **Up** and **Down** arrow buttons. Temperature can be set in tenths of a degree. Once the temperature is set, the display will revert to showing actual temperature and the **Heating** lamp will flash until the set temperature has been reached. The temperature setting is automatically remembered if power is turned off or interrupted.

V. Setting the Timer

The dry bath has a built-in, independent, digital timer function that alerts the user with a "beep" alarm when the set time has elapsed. *The timer is completely independent of the heating function and does **NOT** turn off the heater when set time is reached.*

Press the **Mode** button to illuminate the **Timer Set Mode** lamp. Use the **Up** and **Down** arrow buttons to set the desired time in one minute increments.. After time has been set, there will be a short delay of 3 seconds. The bath will then beep and the timer will start to count down. The display will revert to showing the block temperature and the red **Timer Set Mode** lamp will be extinguished. When the display shows the block temperature, pressing the **Mode** button will cause the display to show the remaining time in minutes.

When time has expired, the dry bath will "beep", the red **Heating** lamp will flash and the display will show "oVEr". *Sample heating will be unaffected.* Press the **Mode** button to start the timed cycle over again or press the **Down** arrow to return the display to the current block temperature without restarting the timer.

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

VI. User Calibration Function

The dry baths are highly accurate and calibrated at the factory to certified standards. Should calibration be required to laboratory standards, it should only be attempted by using certified temperature sensing equipment. The dry bath can be calibrated using the following procedure:

1. Turn the dry bath off using the power switch on the back of the unit. Press and hold down the **Mode** button. Turn the power on, continuing to hold the **Mode** button.

2. The digits on the display will light in succession. The current temperature will then be shown with the right most digit flashing. Release the **Mode** button when the digit begins to flash.

3. Set the temperature where you wish to calibrate the unit using the **Up** and **Down** arrow 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 temperature. The right hand digit will begin flashing again when the dry bath has equilibrated at the calibration temperature.

6. 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 different temperature than the display, use the **Up** and **Down** arrow buttons to change the display to match the reference thermometer.

7. After making any necessary adjustments, press the **Mode** button to exit the calibration mode. The dry bath is now calibrated to the reference thermometer at the selected temperature point and ready for operation.

VII. Care and Maintenance

The dry baths are electrical instruments and care must be taken in their handling. Clean any spills immediately. Keep the unit clean by wiping with a soft, damp cloth. Do not immerse the unit in water. Avoid the use of organic solvents. No routine maintenance is required.

Blocks can be cleaned by wiping with a soft cloth. Wells in the block may be cleaned with a cotton swab dipped in alcohol.

VIII. ERR Code on the display

The dry bath is not designed to operate in temperatures below 4°C. Should the dry bath sense an ambient temperature below 0°C, ERR will

appear in the display. If the display shows ERR and the ambient temperature is above 0°C, the unit requires service

IX. Accessory Blocks

Use of the dry bath requires a block to hold samples. ***Liquids should never be placed into the dry bath chamber!*** Benchmark offers a variety of blocks to accommodate many sample containers. Custom machined blocks are also available.

BSW02	Block, 48 x 0.2ml tubes or 6 PCR strips of 8 tubes
BSW1500	Block, 24 x1.5ml centrifuge tubes (conical)
BSW1520	Block, 24 x 1.5ml or 2.0ml centrifuge tubes
BSW05	Block, 24 x 0.5ml centrifuge tubes
BSW5MT	Block, 12 x 5.0ml centrifuge tubes (17mm diameter)
BSW15	Block, 12 x 15ml centrifuge tubes
BSW10	Block, 20x10mm test tubes or 20x2.0ml centrifuge tubes
BSW13	Block, 20 x 12mm or 13mm test tubes
BSW50	Block, 5 x 50ml centrifuge tubes
BSW1516	Block, 12 x 15mm or 16mm test tubes
BSWCMB	**Quick-Flip™ Block**, 24 x 1.5ml tubes, or 32 x 0.2ml and 14 x 0.5ml tubes
BSWPCR1	Block, PCR plate 96 x 0.2ml, skirted or non-skirted **For 1-block dry bath only**
BSWPCR2	Block, PCR plate 96 x 0.2ml, skirted or non-skirted **For 2 or 4-block dry bath only**
BSWMT	Block, Micro Titer Plate, skirted or non-skirted **For 2 or 4-block dry bath only**
BSW01	Solid block for slides or custom machining
BSW01DR	Custom drilling for BSW01 (sold separately)

X. Service and Contact

For customer service or technical support, please contact **Benchmark Scientific** at **info@benchmarkscientific.com** or by phone in the USA: 908 769-5555, 8:30am to 5:00pm EST.

Notes

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