

**Digital Water Bath  
MH700**

Impact Test Equipment Ltd  
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User Guide  
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## TABLE OF CONTENTS

TABLE OF CONTENTS .....	1
<b>1 INTRODUCTION .....</b>	<b>2</b>
<b>2 SAFETY &amp; ASSEMBLY .....</b>	<b>3</b>
<b>3 OPERATION .....</b>	<b>4</b>
<b>3.1 IMPORTANT .....</b>	<b>4</b>
<b>3.2 SET POINT TEMPERATURE.....</b>	<b>4</b>
<b>3.3 CALIBRATION .....</b>	<b>4</b>
<b>4 DETAILED OPERATION OF THE CONTROLLER... 5</b>	<b>5</b>
<b>4.1 SET POINT TEMPERATURE.....</b>	<b>5</b>
<b>4.2 OFFSET FUNCTION.....</b>	<b>5</b>
<b>4.3 INTEGRAL FUNCTION.....</b>	<b>5</b>
<b>5 WARRANTY .....</b>	<b>6</b>
<b>6 SPECIFICATIONS.....</b>	<b>7</b>

## **1 INTRODUCTION**

This Calibration Bath provides a simple and accurate method of checking the accuracy of thermometer sensors.

These units are ideal for use in a variety of industrial and process applications, checking probes or temperature data loggers.

For further confidence in calibration, each unit can be issued with a traceable certificate of calibration showing actual test data, which can be used as part of a quality assurance programme.

For improved accuracy of calibration, a reference thermometer with a UKAS certificate of calibration can be used in conjunction with the bath. For details of reference thermometers, please contact the Impact Sales team.

## 2 SAFETY & ASSEMBLY

- This Calibration Bath should only be operated by a person who has thoroughly read and understood this manual
- The Bath consists of three main parts.
  - ✓ The Base
  - ✓ The Lid, and
  - ✓ The Heater Unit
- When assembling the bath, the heater unit must be placed to the left-hand side. The vents from the Heater unit must be towards the outside.
- The bath **MUST** contain sufficient water to cover the stirrer and heater coil by at least 30mm.
- Do not remove the heater unit from the bath with the power lead still connected to a power source.
- The heater coil can operate to a very high temperature.



Precautions **MUST** be taken to prevent personal injury or damage to surrounding objects. The unit will remain hot for several minutes after switching off. Allow to cool before storage.

- This calibration bath is designed to be rugged and durable but does contain electronics that must be protected from splashing of water.
- Connect input power lead to only a 230 V, 50-60 Hz grounded a.c. power supply.
- Mains plug fuse rating to be 13 Amp.
- Calibration baths are programmed and calibrated at the factory for optimum



performance and should not need adjusting. The heater unit is equipped with a circuit breaker electrical fuse. If the fuse blows, allow the unit to cool before pressing the reset button. If the fuse will not reset, return to the supplier for inspection and repair. **THERE ARE NO USER SERVICEABLE PARTS INSIDE.**

### **3 OPERATION**

#### **3.1 Important**

Do not turn on the heater unit unless there is sufficient water in the bath. i.e. at least 30 mm of cover to the heater and stirrer.

#### **3.2 Set Point Temperature**

To set the required temperature push the centre “up” button, or right “down”, button as required.

After the temperature has been set the display will return to indicate the temperature of the water in the bath.

Leave the bath for twenty minutes until the display has stabilised.

If the water temperature is not as the set point, adjust the offset using the left button.

See section 4 for detailed instructions of the controller’s operation.

#### **3.3 Calibration**

It is recommended that a reference thermometer be used in conjunction with the bath to enhance the accuracy of the calibration procedure.

## **4 DETAILED OPERATION OF THE CONTROLLER**

### **4.1 Set Point Temperature**

Pushing the centre “up” button, or right “down”, button as required sets the required temperature. After the temperature has been set the display will return to indicate the temperature of the water in the bath.

As the thermal mass of the water bath is large, it is preferable to minimise any overshoot in temperature, as the time taken to return to the set point is dependent on the temperature of the bath and the ambient temperature.

To avoid temperature overshoot the unit is initially configured as a proportional only controller with a proportional band of 10 Deg C.

In the steady state (i.e. the water temperature has become stable) the indicated temperature may be lower than the required set point. In this case the offset function will need to be set to reduce the difference.

### **4.2 Offset Function**

Press the left-hand button once and the display will indicate “ofst”, adjustment of the up/down buttons will adjust the offset value.

Offset is measured in % with range 0-100% of the 10 Deg C proportional band.

Therefore 1% will correct for a difference of 0.1°C. Small 0.5% changes will avoid any overshoot.

An alternative configuration to the above is proportional plus Integral action, this will avoid the need to keep manually correcting for any set point difference and will shorten the time taken to reach set point.

However there will be an overshoot in temperature.

### **4.3 Integral Function**

Press the left-hand button twice and the display will indicate “ti 1”, adjustment of the up/down buttons will adjust the Integral value.

Integral time is measured in seconds with range 0 – 1000 Seconds.

Zero seconds means that the integral is off. Note: setting the integral will inhibit the offset function.

The shorter the integral time the faster the set point is achieved, but the larger the overshoot.

At 70 Deg C a fifty-second integral time will give reasonable response time with a short settling time.

All settings are retained when the unit is turned off so once set, further adjustment should not be required.

## **5 WARRANTY**

This instrument carries a twelve-month warranty and guarantee against defects in either components or workmanship. During this period, products that prove to be defective will, at the discretion of the manufacturer, be either repaired or replaced without charge.

The product warranty and guarantee does not cover damage caused by fair wear and tear, abnormal storage conditions, incorrect use, accidental misuse, abuse, neglect, misapplication or modification, or use with non-approved hardware/software. No warranty of fitness for a particular purpose is offered and the user assumes the entire risk of using the product. Any liability by the manufacturer is limited only to the replacement of defective materials or workmanship, and the manufacturer accepts no responsibility for consequential loss. In line with our policy of continuous development, we reserve the right to amend our product specification without prior notice.



**SPECIFICATIONS**

Temperature Range +30 to +100°C Note that at above 80°C an alternative liquid to water should be considered. Please contact Impact Service Dept for advice.

Resolution	0.1°C
Accuracy	±0.5°C
Stability	±0.5°C
Power	230 Volt AC 50-60 Hz 1700 Watt