Laboratory Equipment Manufacturer
www.mrclab.com

Operation manual
Circulation water baths
WBH-100I/200I



These units are circulation water baths for professional, industrial, or educational use where the preparation or testing of materials is done at approximately atmospheric pressure and no flammable, volatile or combustible materials are being heated.

MRC LTD.
Hagavish 3 st.
HOLON 58817
ISRAEL
Tel (+972)-3-5595252
Fax (+972)-3-5594529
Email: udi@mrclab.com / service@mrclab.com
Website: www.mrclab.com

INTRODUCTION

Thank you for choosing a circulation water bath. These units are not intended for use at hazardous or household locations. Before you use the unit, read this entire manual carefully to understand how to install, operate, and maintain the unit in a safe manner. Your satisfaction with the unit will be maximized as you read about its safety and operational features.

Keep this manual on-hand so it can be used by all operators of the unit. Be sure all operators of the unit are given appropriate training before you put the unit in service.

Note: Use the unit only in the way described in this manual. Failure to follow the guidelines and instructions in this manual may be dangerous and illegal.

General Safety Considerations

Your water bath and its recommended accessories have been designed and tested to meet strict safety requirements.

For continued safe operation of your water bath, always follow basic safety precautions including:

- Read this entire manual before using the water bath.
- Be sure you follow any city, county, or other ordinances in your area regarding the use of this unit.
- Use only approved accessories. Do not modify system components. Any alterations or modifications to your water bath may be dangerous and will void your warranty.
- Always plug the unit's power cord into a grounded electrical outlet that conforms to national and local electrical codes. If the unit is not grounded, parts such as knobs and controls may conduct electricity and cause serious injury.
- Do not connect the unit to a power source of any other voltage or frequency beyond the range stated on the power rating overlay at the rear of the unit.
- Do not modify the power cord provided with the unit. If the plug does not fit an outlet, have a proper outlet installed by a qualified electrician.
- Avoid damaging the power cord. Do not bend it excessively, step on it, place heavy objects on it. A damaged cord can easily become a shock or fire hazard. Never use a power cord after it has become damaged.
- Do not position equipment in a manner that prohibits access to power cord.
- Do not attempt to move the unit during operation or before the unit has been allowed to cool.

RECEIVING YOUR UNIT

Before leaving our factory, all units are packaged in high quality shipping materials designed to provide protection from transportation related damage. Once a unit leaves our factory, however, safe delivery becomes the responsibility of the carrier who is liable for loss or damage to your unit. Damage sustained during transit is not covered under your unit warranty.
When you receive your unit, inspect it for concealed loss or damage to its interior and exterior. Should you find any damage to the unit, follow the carrier's procedure for claiming damage or loss.

Inspection Guidelines

Carefully inspect the shipping carton for damage. If the carton is damaged, report the damage to the carrier service that delivered the unit.
If the carton is not damaged, open the carton and remove its contents.
Carefully check all packaging before discarding. Save the shipping carton until you are sure everything is in order.

Returning Shipment

If you must return the unit for any reason, first contact your service representative for authorization. You will be asked to provide the data plate information. See Recording Data Plate Information.

Recording Data Plate Information

Once you have determined the unit is free from damage, locate the data label at the back of the unit. The data label indicates your unit's model number and serial number.

Section 3

INSTALLATION

Your satisfaction and safety require a complete understanding of this unit. Read the instructions thoroughly and be sure all operators are given adequate training before attempting to put the unit in service.
This equipment must be used only for its intended application; any alterations or modifications will void your warranty. Local city, county, or other ordinances may govern the use of this equipment. If you have any questions about local requirements, please contact the appropriate local agency. The end user may perform installation.
Customer service should be contacted for operating conditions outside these limits.

Environmental Conditions

Under normal circumstances these units are intended for use indoors, at room temperatures between 18ºC and 40ºC, at no greater than 80% relative Humidity (at 25ºC) and with a supply voltage that does not vary by more than 10% from the data plate rating.

Power Source

Check the data label for voltage, cycle, and ampere requirements. If matched to your power source, plug the power cord into a grounded outlet.
Voltage should not vary more than ± 10% from the data label rating.
These units are intended for 50/60-HZ application. A separate circuit is recommended to prevent damage to the unit due to overloading or circuit failure.

Location

In selecting a location, consider all conditions that might affect performance, such as heat from radiators, ovens, autoclaves, etc. Avoid direct sun, fast-moving air currents, heating and cooling ducts, and high traffic areas. Allow a minimum of 10 cm between the unit and any walls or partitions that might obstruct free airflow.

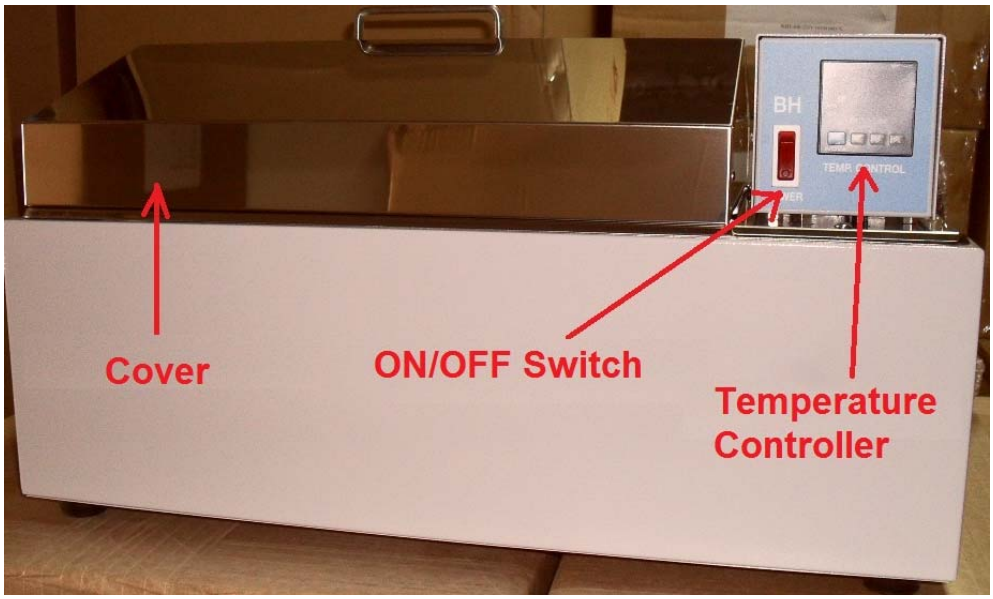
Lifting and Handling

These units can be heavy for some people and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. Units should only be lifted from their bottom surfaces. Handles and knobs are not adequate for lifting or stabilization. The unit should be completely restrained from tipping during lifting or transport.
All moving parts such as trays or covers should be removed during transfer to prevent shifting and damage.

Cleaning and Decontamination

In the event hazardous material is spilled onto or into the equipment appropriate decontamination must be carried out. If there is any doubt about the compatibility of decontamination or cleaning agents with parts of the equipment or with material contained, please contact the manufacturer.
Units are cleaned at the factory, but not sterilized. Remove any racks if assembled and clean the bath with a disinfectant that is suitable for your application. See **Maintenance Section** for cleaning instructions and precautions.

CONTROLS AND COMPONENTS OVERVIEW



Power Switch

The Red (On/Off) power switch, located in the top right hand corner of the control panel, controls all power to the unit. It must be in the **I** position to be ON and illuminated before any systems are operational. The on/off switch must remain easily accessible at all times.

Bath Cover

Using the bath cover supplied with your accessories will accelerate heat-up time and reduce evaporation.
The cover must be used to reach set points above 60ºC. The bath cover is not designed to be airtight and create a pressurized environment.

Digital Temperature Controller



This control is marked TEMP. CONTROL and consists of the digital display and UP and DOWN arrow pads for inputting set point temperatures and calibration.

PV - display of present value of the temperature inside bath.

SV - Set value temperature indicator.

AT- Automatic tuning for the P.I.D parameters

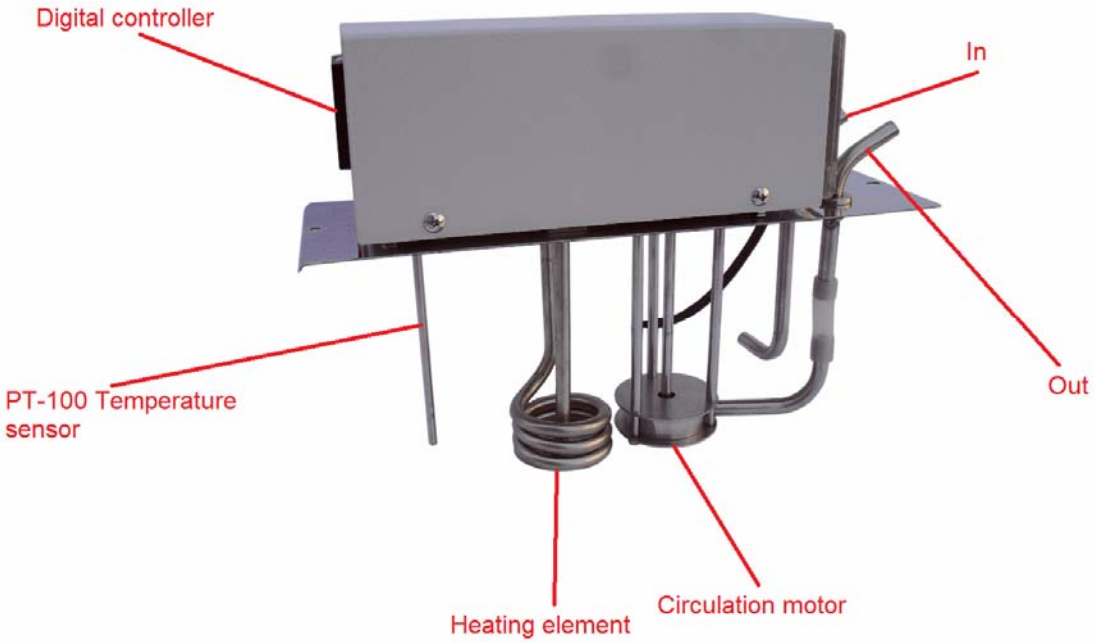
OUT- Heating output indicator

ALM - Over-temperature protection indicator.
Once the indicator is lit, it means the temperature is over the set-up temperature range for protection.

SET - If there is a temperature change, push this button first.
Then there is a 4-digit number shown on SV, and one of the lamps will be lit.
The lamp can be used to set up the temperature.
To push ◄button to move left, and ▲button to increase, ▼button to decrease.

3, Hagavish st. Israel 58817 Tel: 972 3 5595252, Fax: 972 3 5594529
mrc@mrclab.com

Internal bath components



3, Hagavish st. Israel 58817 Tel: 972 3 5595252, Fax: 972 3 5594529
mrc@mrclab.com

OPERATION

Warning: These baths are not intended for use as acid baths. Use as an acid bath will cause severe damage to bath components and void your warranty. Do not use deionized water, tap water, or chemicals. **USE DISTILLED WATER ONLY**.

Turning On the Unit

To turn on the unit, perform the following steps:

1. Check power supply against unit serial plate; they must match
2. Plug service cord into the electrical outlet. If supplied with a detachable cordset, plug the female end into the unit inlet and the male plug into the power supply.
3. Fill bath to your required depth with **DISTILLED WATER.**

DO NOT USE TAP WATER, DEIONIZED WATER, OR CHEMICALS. Normal depth is 5 ½ inches (14 cm), but depth must be at least 4.7 inches (12 cm) over the bottom of the rack. Check water level frequently, add water to appropriate levels if needed. At higher operating temperatures, or under circumstances where a cover cannot be used, it will be necessary to check the water level more frequently.

4. Push the Main power switch to the ON position.

Bath Cover

Using the bath cover supplied with your accessories will accelerate heat-up time and reduce evaporation.
The cover must be used to reach set points above 60ºC. The bath cover is not designed to be airtight and create a pressurized environment.

Setting Main Temperature Control

To enter set point mode on the control, push and release either the UP or DOWN arrow pad one time and the digital display will start to blink. While blinking, the digital display shows the set point that can be changed using the UP or DOWN or LEFT arrow pads to change the temperature setpoint and press on the SET button one time to confirm.
Allow at least two (2) hours for the temperature to stabilize.
Warning: If the tank boils dry while containing plastic ware, the plastic will melt. If you intend to use test tube racks, remember that plastic coated wire racks may wear and expose metal that can cause damage. Preferably, use all plastic racks.
Note: The heating element of this bath does not contact the tank bottom and burn out if the tank is allowed to run dry.

Never turn on the unit if the tank is empty from water or if the water level is too low!

Calibrating the Main Temperature Control (OFFSET)



We recommend that you calibrate your unit once it has been installed in its working environment and the chamber temperature has been stable at the set point for several hours.

Place a calibrated reference thermometer in the bath. Allow the thermometer to reach temperature and remain stable for one (1) hour.

1. Compare the reading on the reference thermometer with the temperature control display. If there is a difference, put the display into calibrate mode by pressing and holding the SET pad for 3 seconds until the "AL" will be shown. Press several times on the SET pad until "LoCK 1".Change the value from 1 to -1 with the DOWN pad and press one time on the "SET" pad to confirm. Press several times again on the "SET" pad until "bs"
2. Press the UP or DOWN arrow pad to adjust the display to match the reference thermometer. If the arrow pads are not pressed within 1 min (60) seconds the display will revert to showing the temperature within the bath.
3. Allow the unit to stabilize again, and repeat calibration if necessary.

3, Hagavish st. Israel 58817 Tel: 972 3 5595252, Fax: 972 3 5594529
mrc@mrclab.com

PID Auto tuning (AT)



The P, I and D terms need to be "tuned" to suit the dynamics of the process being controlled.
Temperature control using digital PID controllers have automatic auto-tune functions. During the auto-tune period the PID controller controls the power to the process and measures the rate of change, overshoot and response time of the plant. This is often based on the Zeigler-Nichols method of calculating controller term values. Once the auto-tune period is completed the P, I &D values are stored and used by the PID controller.

We recommend doing this AUTO TUNE if there is a temperature overshooting above your set point

1. Pressing and holding the "SET" pad for 3 seconds until the "AL" will be shown.
2. Press several times on the "SET" pad until "AT OFF".
3. Change "OFF" to "ON" with the "DOWN" pad and press one time on the "SET" pad to confirm.(the "MAN" LED will be light on or blinking)
4. Press and hold "SET" pad for 3 second to revert to showing the temperature within the bath
5. If the arrow pads are not pressed within 1 min (60) seconds the display will revert to showing the temperature within the bath.

During the AT process, do not touch the controller or turn off the unit until AT will be finished.

3, Hagavish st. Israel 58817 Tel: 972 3 5595252, Fax: 972 3 5594529
mrc@mrclab.com

MAINTENANCE

Warning: Prior to any maintenance or service on this unit, disconnect the power cord from the power supply and empty the water from the tank. Before reattaching the unit to its power supply, be sure all volatile and flammable cleaners are evaporated and dry.

Draining Tank

Position the left side of the water bath over a sink or appropriate receptacle large enough to hold the quantity of water to be drained (10 liters for the WBH-100I and 20 liters for the WBH-200I)

Cleaning

1. Clean the water bath with mild soap and water solution. DO NOT USE chlorine-based bleaches, as they will damage the tank interior. DO NOT USE spray cleaners that may contain solvents, which could leak through openings and cracks and harm electrical part coatings. Failure to do this may permanently damage the unit.
2. Rinse the water bath with clean water and wipe dry with a soft cloth. Stainless steel does not rust, but foreign materials in the tank may rust or leave rust spots. If corrosion is seen, scrub out the stains with a mild abrasive, never steel wool.

Storage

If the unit is to be shut down for an extended period of time, the tank must be emptied and cleaned as described above. No adjustments to controls should be necessary when the unit is put back in service.
If you are shutting the unit down for transport, perform the following steps:

1. Turn the unit off.
2. Disconnect from the power supply.
3. Remove the bath cover.
4. Empty and clean the tank.
5. Please see Lifting and Handling for further instruction.
6. No maintenance is required on any of the electrical components.