



Operators Manual

Microprocessor Controlled

Water Baths

Table of Contents

Section 1 -	General Information
1.1	Warranty
1.2	Unpacking
1.3	Package Contents
1.4	Description
Section 2 -	Set Up
2.1	Location
2.2	Reservoir Fluids
2.3	Assembly & Power
2.4	Startup
Section 3 -	Operation
3.1	Control Panel
3.2	Setting Temperature
3.3	Setting Temperature Units / Defaulting Water Bath
3.4	Setting Safety Set Point
3.5	Setting High Limit
3.6	Defining and Using Preset Temperature Buttons
3.7	Enabling / Disabling Local Lockout
3.8	Calibration Offset
3.9	Display Messages
Section 4 -	Maintenance
4.1	Cleaning
4.2	Disassembling the Bath
4.3	Replacement Parts
Section 5 -	Troubleshooting & Technical Support
5.1	No Display
5.2	No Heating
5.3	Insufficient Heating
5.4	Poor Accuracy
5.5	Technical Support



This symbol indicates hazardous voltages may be present.



This symbol marks chapters and sections of this instruction manual which are particularly relevant to safety. When attached to the unit, this symbol draws attention to the relevant section of the instruction manual.

Read all instructions pertaining to safety, set-up, and operation.
Proper operation is the users' responsibility.

Section 1 - General Information

1.1 Warranty

Thank you for purchasing this water bath. We are confident it will serve you for a long time. Our warranty to you is as follows:

The manufacturer agrees to correct for the original user of this product, either by repair, or at the manufacturer's election, by replacement, any defect that develops after delivery of this product within the period as stated on the warranty card. In the event of replacement, the replacement unit will be warranted for 90 days or warranted for the remainder of the original unit's parts or labor warranty period, whichever is longer.

If this product requires service, contact the manufacturer/supplier's office for instructions. When return of the product is necessary, a return authorization number will be assigned and the product should be shipped, (transportation charges pre-paid), to the indicated service center. To insure prompt handling, the return authorization number should be placed on the outside of the package and a detailed explanation of the defect enclosed with the item.

This warranty shall not apply if the defect or malfunction was caused by accident, neglect, unreasonable use, improper service, or other causes not arising out of defects in material or workmanship. There are no warranties, expressed or implied, including, but not limited to, those of merchantability or fitness for a particular purpose which extends beyond the description and period set forth herein.

The manufacturer's sole obligation under this warranty is limited to the repair or replacement of a defective product and shall not, in any event, be liable for any incidental or consequential damages of any kind resulting from use or possession of this product. Some states do not allow: (A) limitations on how long an implied warranty lasts; or (B) the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights. You may have other rights that vary from state to state.

1.2 Unpacking

Your water bath is shipped in a special carton. Retain the carton and all packing materials until the unit is completely assembled and working properly. Set up and run the unit immediately to confirm proper operation. Beyond one week, your unit may be warranty repaired, but not replaced. If the unit is damaged or does not operate properly, contact the transportation company, file a damage claim, then contact the company where your unit was purchased.

1.3. Package Contents

- Water Bath
- Lid Assembly
- Sample Tray
- Operators Manual
- Warranty Card
- Power Cord

1.4 Description

Water Baths offer the versatility needed to handle virtually any laboratory procedure including: incubation, inactivation, and agglutination, as well as most pharmaceutical, serological, biomedical, and industrial procedures.

Your water bath utilizes an energy efficient, large-area heater and thermostatic control to provide temperature uniformity. PID microprocessor control (Proportional Integral Derivative) provides proportional heat control by anticipating the approach to your set temperature and preventing overshoot. A redundant safety thermostat is standard on all models.

Current Requirements	@ 120V, 60Hz		@ 240V, 50Hz	
2 Liter	2.5 Amps		1.25 Amps	
2L Shallow	2.5 Amps		1.25 Amps	
5 Liter	4.2 Amps		2.1 Amps	
10 Liter	4.2 Amps		2.1 Amps	
20 Liter	8.3 Amps		4.15 Amps	
28 Liter	8.3 Amps		4.15 Amps	
Overall Dimensions	L x W x H - Inches / Centimeters			
2 Liter	8.94" x 7.90" x 8.13"		22.71cm x 20.07cm x 20.65cm	
2L Shallow	9.44" x 13.65" x 8.13"		23.98cm x 34.67cm x 20.65cm	
5 Liter	9.44" x 13.65" x 8.13"		23.98cm x 34.67cm x 20.65cm	
10 Liter	15.43" x 14.90" x 8.13"		39.19cm x 37.85cm x 20.65cm	
20 Liter	15.19" x 21.65" x 8.13"		38.58cm x 54.99cm x 20.65cm	
28 Liter	15.19" x 21.65" x 10.13"		38.58cm x 54.99cm x 25.73cm	
Reservoir Dimensions	L x W x H - Inches / Centimeters			
2 Liter	5.31" x 5.88" x 5.81"		13.49cm x 14.94cm x 14.76cm	
2L Shallow	5.81" x 11.69" x 2.50"		14.76cm x 29.69cm x 6.35cm	
5 Liter	5.94" x 11.75" x 5.94"		15.09cm x 29.85cm x 15.09cm	
10 Liter	11.69" x 12.75" x 5.94"		29.69cm x 32.39cm x 15.09cm	
20 Liter	11.50" x 19.50" x 5.88"		29.21cm x 49.53cm x 14.94cm	
28 Liter	11.63" x 19.56" x 7.94"		29.54cm x 49.68cm x 20.17cm	
Unit Weight	(Lbs)		(kgs)	
2 Liter	7 lbs		3.2 kg	
2L Shallow	9 lbs		4.1 kg	
5 Liter	11 lbs		5.0 kg	
10 Liter	15 lbs		6.8 kg	
20 Liter	21 lbs		9.5 kg	
28 Liter	24 lbs		10.9 kg	
Heater Wattage				
2 Liter	300 Watts			
2L Shallow	300 Watts			
5 Liter	500 Watts			
10 Liter	500 Watts			
20 Liter	1000 Watts			
28 Liter	1000 Watts			
Temperature Range				
All Units	°C	Ambient +5°C to 100°C (60°C without cover)		
	°F	Ambient +9°F to 212°F (140°F without cover)		
Temperature Uniformity				
All Units	±0.2°C @ 37°C			
Temperature Setability				
All Units	±0.1°C			
Temperature Accuracy				
All Units	±0.5°C @ 37°C			

Section 2 - Set Up

2.1. Location

Set your water bath on a table or bench that is level and in an area that is free from drafts and wide ambient temperature variations, such as near heater or air conditioning vents.

2.2 Reservoir Fluids

Fill bath so that liquid level is approximately one inch from top when samples are placed in bath.

To ensure accurate reading of temperature, the fluid level should not be less than 2 inches (5.08 cm) from the bottom of the unit. Operation of the bath without fluid will not damage the heater but will cause permanent discoloration of the tank and will not provide accurate temperature information.

Distilled water is preferred, but a variety of fluids can be used with the bath depending on the application. The fluid must be compatible with 300 series stainless steel. Use fluids that satisfy safety, health and compatibility requirements. If using water, a few drops of Lab Algicide should be used to deter algae formation.

The following fluids are not recommended and may cause damage to the unit:

- Any flammable fluids
- Deionized water
- Chlorides or bleach
- Automotive antifreeze with additives
- Most photographic solutions
- Strong concentrations of any acid or bases
- Any acid, even in minor concentrations, with the following elements (or Halides) in their formulas: Chlorine (Cl), Fluorine (F), Sulfur (S), Chromium salts

NOTE: Fumes from acidic solutions may cause corrosion of the stainless steel reservoir. Care should be taken to maintain a neutral pH at all times.



Warning! Do not operate unit with any potentially flammable materials, as a fire hazard may result.

Stay within the fluid's normal range for best temperature stability and low vaporization. At fluid's high temperature extreme:

- A fume hood may be required to prevent the buildup of vapors inside the room.
- Fluid lost from vapor will have to be frequently replenished.
- Caution must be taken to stay well below the fluid's flashpoint.

FLUID DESCRIPTION	SPECIFIC HEAT @25°C	NORMAL RANGE	EXTREME RANGE
Distilled Water	1.00	10°C — 90°C	2°C — 100°C
Ethylene Glycol 30% / Water 70%	.90	0°C — 95°C	-15°C — 107°C
Ethylene Glycol 50% / Water 50%	.82	-20°C — 100°C	-30°C — 100°C
Dynalene™-HC 50	.76	-50°C — 60°C	-62°C — 60°C
DC510 50 cs Silicone Oil	.39	50°C — 150°C	5°C — 270°C*
DC550 125 cs Silicone Oil	.42	100°C — 200°C	80°C — 232°C*
DC710 500 cs Silicone Oil	.45	150°C — 250°C	125°C — 260°C*

*WARNING - Fluid's flashpoint temperature.

DC fluids are manufactured by Dow Corning.

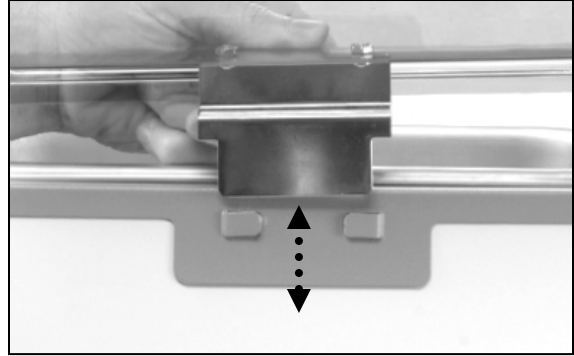
2.3

Assembly & Power

Your water bath comes fully assembled for your convenience. To achieve stable operating temperatures above 60°C/140°F, use of the included lid is required. To attach the lid, insert the lid's hinge into the bracket on the rear of the bath housing (see Fig. A).

When properly installed, the lid tilts up to a 90° position, allowing condensate to drain back into the bath.

Fig. A – Attaching lid



Ensure that the power outlet to be used provides power consistent with the requirements of the water bath, as indicated on the serial tag located on the rear of the unit (see also Sec. 1.5 – Specifications)

Insert female end of included IEC line cord into the IEC power outlet on rear of the water bath (see Fig. B). Insert the male end of the line cord into a properly grounded wall outlet.

Once the unit is plugged in, ● ● will be displayed on the controller, indicating the unit is in stand-by mode. The unit will stay in stand-by mode until powered on.

Power Receptacle

Fuse Cover

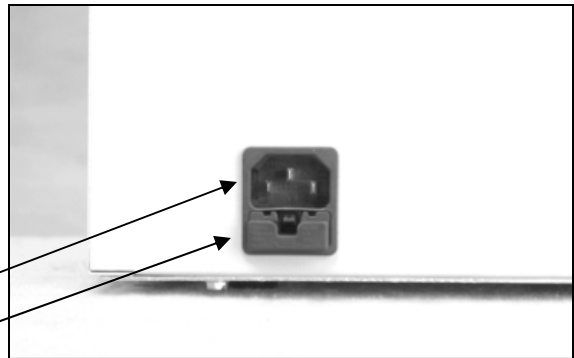


Fig. B - Water bath power receptacle

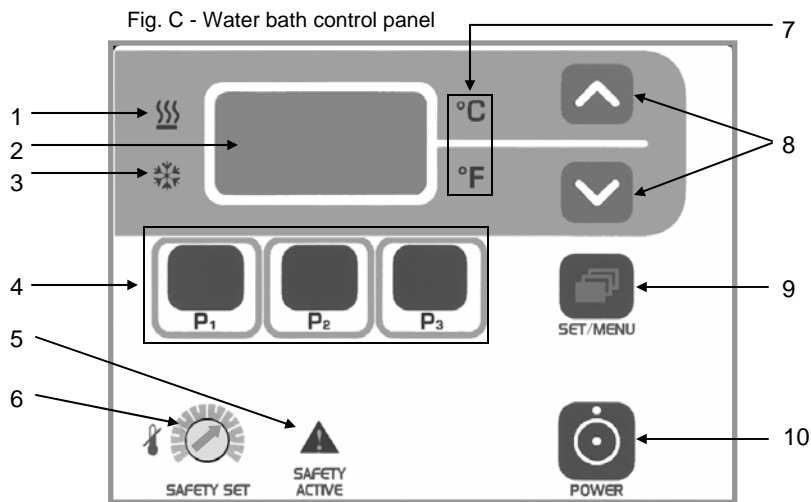
2.4

Startup

1. Fill bath so that liquid level is approximately one inch (2.54 cm) from top when samples are placed in bath.
2. Press the power button (see Sec. 3.1 – Control Panel). The display briefly shows the firmware version, then the set point is displayed. After 10 seconds, the actual temperature is displayed. If the display does not illuminate, check that the power cord is firmly inserted into the rear of the unit and the wall outlet (see also Sec. 4.3 – Replacing Fuses)

Section 3 - Operation

3.1 Control Panel







1	Heat Indicator – Lit when heater is active
2	Display - Temperature and options will be displayed here.
3	Not Used
4	Temperature Preset Buttons (P1, P2, P3) - Used to quickly select one of three user definable set point temperatures. Also used, in combination, to set operational features
5	Over Temperature Safety Indicator - Lights when bath temperature exceeds safety set point.
6	Safety Set Knob - Used to adjust safety set point.
7	Temperature Units Indicator – Indicates whether temperature is being displayed in °C or °F (user selectable)
8	Selection Buttons - Used to increase or decrease temperature settings and option values.
9	Set/Menu Button - Press to allow changing of the set point and to switch between set point and actual temperature. Also used to enable/disable Local Lockout.
10	Power Button - Used to turn the unit on and off.

Operation notes:

- For optimum results, maintain fluid level throughout the operating period, adding fluid as needed. Attempt to refill fluid at same temperature as bath.
- Use the bath lid and/or hollow plastic floating balls to help prevent heat and vapor loss.
- This unit is designed for indoor use only with an allowable ambient temperature between +4°C to 35°C (95°F), and relative humidity not greater than 75%.

3.2 Setting Temperature



1. Press  Set point will be displayed, decimal point will flash.
2. Use  or  to adjust value to desired setting.
3. Press  again or allow unit to timeout to accept the change.

At anytime during normal operation, press  to switch between the set point and actual temperature.



3.3 Setting Temperature Units / Defaulting Water bath

Please note that changing the display units ($^{\circ}\text{C}$ or $^{\circ}\text{F}$) will also reset the set point, preset temperatures (P1, P2, & P3), and high limit to factory defaults. If a calibration value has been entered, this setting will be retained. The default unit of measure is $^{\circ}\text{C}$.

To Select $^{\circ}\text{C}$:

1. Remove the line cord from the back of the water bath.
2. Press and hold 
3. While holding , reinsert the line cord into the power receptacle on the rear of the unit.
4. **dEC** will be displayed. The unit will now operate and display in $^{\circ}\text{C}$.

To Select $^{\circ}\text{F}$:

1. Remove the line cord from the back of the water bath.
2. Press and hold 
3. While holding , reinsert the line cord into the power receptacle on the rear of the unit.
4. **dEF** will be displayed. The unit will now operate and display in $^{\circ}\text{F}$.

3.4 Setting Safety Set Point

The Safety Set Point feature automatically disconnects power to the heater in the event that the reservoir liquid level drops too low or a control failure occurs. It should be set at slightly higher than the Software High Limit temperature.

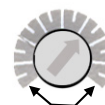
To set the Safety Set Point:

Note: Do not force the knob beyond the stops at either end of the temperature value range.

Use a flat blade screwdriver to rotate the Safety Set Knob to the maximum setting (rotate the knob fully clockwise)

Turn unit on. Set the unit to the desired temperature set point.

Use a flat blade screwdriver to slowly rotate the Safety Set Indicator Knob counter clockwise until the safety indicator light turns on. Rotate the knob very slightly clockwise until the safety indicator light turns off.








Activation of the Safety Set during normal operation will display **Ft3** on the readout.

3.5

Setting High Limit

This feature provides additional safety and protection by allowing a selectable upper temperature limit set point. The high limit can be set between 0°C/32°F and 100°C/212°F.

To set the High Limit:



1. Press  and  together, **100** will be displayed.
2. Use  or  to adjust value to desired setting.
3. Press  again or allow unit to timeout to accept the change.

If the High Limit value is at or below the set point, **EHI** will flash on the display. If this occurs, enter a higher value for High Limit or reduce the set point.
 If the actual bath temperature reaches the High Limit value, **FEL** will flash on the display and the heater will be deactivated until the actual bath temperature drops below the High Limit value.

3.6

Defining and Using Preset Temperature Buttons

Fig. D – Preset buttons with stick-on strips

1. With the unit on, press the desired Preset Button — P1, P2, or P3. The LED associated with the selected Preset Button will begin to flash.
2. Use  or  to adjust value to desired setting.
3. Press the selected Preset Button a second time to enter the new set point. The new set point temperature will not be saved unless the Preset Button is pressed.



The LED associated with Preset Button lights continuously whenever that preset value is controlling bath temperature. If more than one Preset Button is set at the same temperature set point, the LED associated with all Preset Buttons with that set point will light.

The water bath is supplied with two stick-on strips that can be applied beneath the Preset Buttons. These strips are removable and can be reapplied.

The user can write the set point temperature associated with each Preset Button on this strip. The use of an erasable medium, such as dry erase marker or flair tip pen is recommended. The former can be wiped off with a dry cloth or tissue; the later can usually be removed with simple glass cleaner and a cloth or tissue. Do not use a permanent marker or ballpoint pen. Always do an ink test before writing on these strips.

3.7


Enabling / Disabling Local Lockout

Local Lockout allows the user to lock all controls on the controller, except the power button. While the feature is activated, the set point, high limit, and calibration offset cannot be changed. If the power button is pressed, the unit can be turned off. However, the settings will remain after being turned back on and the unit will remain in Lockout mode.

To activate the local lockout feature:

Press and hold  for 10 seconds, until **LLo** is displayed. Local lockout is now enabled.







To disable the local lockout feature:

Press and hold  10 seconds, until **CAo** is displayed. Local lockout is now disabled.

3.8

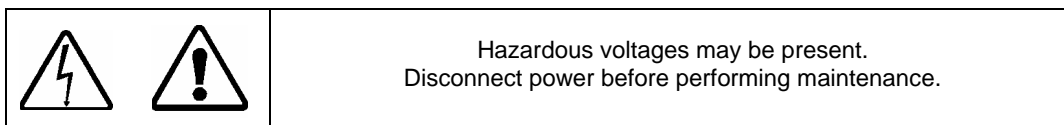
Calibration Offset

Calibration allows the user to match the Controller's bath temperature display to an external reference thermometer. Calibration is performed as follows:

1. Set the desired operating set point and allow temperature to stabilize.
2. Press  and  simultaneously and release and repeat until the display reads **0.0**
3. Press  and hold until **CAL** is displayed. This will take about 2 seconds.
4. At one second intervals, the displayed value will alternate between the actual bath fluid temperature and the current offset value, which is the difference between the factory calibration setting and the user's reference temperature sensor. The maximum offset is $\pm 3.0^{\circ}\text{C}$ from factory calibration. Use  or  to adjust value to desired setting.
5. Press  again or allow unit to timeout to accept the change.

Display	Description	Action Required
• •	Standby mode	Normal — Indicates that the unit is plugged in and the Power Switch is OFF
E x.xx	Power up self-test	Normal — Appears momentarily at startup, indicates software code version
0.0	Calibration offset value	Normal — Current calibration offset value (see Sec. 3.8)
CAL	Calibration Mode	Normal — Indicates unit is in Calibration mode (see Sec. 3.8)
H00	High Limit value	Normal — Current High Limit value (see Sec. 3.5)
LL0	Local Lockout Enabled	Normal — Indicates Local Lockout has been enabled (see Sec. 3.7)
CA0	Local Lockout Disabled	Normal — Indicates Local Lockout has been disabled (see Sec. 3.7)
EH1	High Limit set point too low	Error — The High Limit value entered is below the temperature set point (see Sec. 3.5). Lower set point or increase high limit value.
Ft1	High Limit value exceeded	Error — Indicates bath temperature has exceeded the High Limit value. Increase High Limit value or lower set point.
Ft2	EEPROM reset	Error — Default unit to factory settings (see Sec. 3.4). If error persists, contact Vendor.
Ft3	Safety Set temperature exceeded	Error — Bath temperature has exceeded the Safety set point. Lower temperature set point or increase Safety set point (see Sec. 3.4)
Ft4	Heating Triac failure	Error — Service required, contact Vendor
Ft5	Temperature probe failure	Error — Service required, contact Vendor
Ft6	Communication error	Error — Service required, contact Vendor
0.0	Internal fault	Error —Service required, contact Vendor
POx	Factory setting	Normal — Factory setting
ROx	Factory setting	Normal — Factory setting
- X.X	Factory Calibration Offset	Normal — Indicates calibration offset set by factory

Section 4 – Maintenance



4.1 Cleaning

Thoroughly clean the bath before each use. Use only mild soap and water when cleaning. Do not use steel wool as damage to the unit may result. Non-steel scouring pads are acceptable.

The entire unit is housed in a tough, well-insulated stainless steel casing that is corrosion and chemical resistant.

4.2 Disassembling the Bath

The following procedure should only be performed by a qualified service technician.

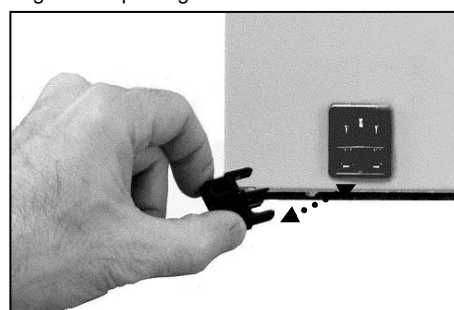
1. Unplug the bath from its power source.
2. Drain the bath of all fluid, and remove the cover, thermometer, clip and sample tray.
3. Turn the bath upside down to expose the bottom. Remove the 4 screws around the outer edge of the tank bottom plate.
4. At this point, all the internal components are accessible for replacement.

4.3 Replacing Fuses

To check / replace your water bath's fuses:

1. Unplug the power cord from the rear of the unit.
2. Locate and remove the fuse cover located on the top of the IEC power receptacle on the rear of the unit (see Fig E.)
3. Check and replace fuses as needed and replace cover

Fig. E – Replacing water bath fuse



4.4 Replacement Parts

Model(s)	Part Description	Part Number (120V, 60Hz)	Part Number (240V, 50Hz)
All Units (120V)	Fuse, 10 Amp	200-455	---
All Units (240V)	Fuse, 6.3 Amp	---	200-253
All Units	Line cord IEC-320-13	225-227	225-228
All Units	Rubber Feet	300-561	300-561
All Units	Controller	510-335	510-336
2Liter	2Liter Tank Assembly w/ Heater	505-102	505-103
2Liter Shallow	2Liter Shallow Tank Assembly w/ Heater	505-092	505-093
5Liter	5Liter Tank Assembly w/ Heater	505-094	505-095
10Liter	10Liter Tank Assembly w/ Heater	505-096	505-097
20Liter	20Liter Tank Assembly w/ Heater	505-098	505-099
28Liter	28Liter Tank Assembly w/ Heater	505-100	505-101

Section 5 – Troubleshooting & Technical Support

5.1 No display

- Check that power cord is plugged into an operating electrical outlet
- Check that fuses are in place and intact (see Sec. 4.3 – Replacing Fuses)
- Check that the controller power switch is on

5.2 Unit not heating

- Check set point and bath temperature to ensure that heating is required
- Check that the safety indicator light is not active (see Sec. 3.4 – Setting Safety Set Point)
- Check that High Limit is higher than current set point (see Sec. 3.5 – Setting High Limit)
- Ensure that liquid level is at least 2 inches from the bottom of the tank

5.3 Insufficient Heating

- Check for proper line voltage (see Sec. 1.5 – Specifications)
- Allow sufficient time for bath temperature to stabilize when changes in heat load or set point are made.
- Check that bath lid is in place

5.4 Poor Accuracy

- Perform bath calibration (see Sec. 3.8 Calibration Offset)

5.5 Technical Support

For technical assistance, contact the supplier from whom the unit was purchased. Have the following information available for the customer service person:

- Model, Serial Number, and Voltage (from back panel label)
- Date of purchase and purchase order number
- Supplier's order number or invoice number
- A summary of the problem