

HX-900 Recirculating Chiller

NESLAB Manual P/N 002762
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Instruction and Operation Manual

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PREFACE Compliance

Products tested and found to be in compliance with the requirements defined in the EMC standards defined by 89/336/EEC as well as Low Voltage Directive (LVD) 73/23/EEC can be identified by the CE label on the rear of the unit. This label indicates testing has demonstrated compliance with the following directives:

LVD, 73/23/EEC	Complies with UL 3101-1:93
EMC, 89/336/EEC	EN 55011, Class A Verification EN 50082-1:1992 IEC 1000-4-2:1995 IEC 1000-4-3:1994 IEC 1000-4-4:1995

For any additional information refer to the Letter of Compliance that shipped with the unit (Declaration of Conformity).

Unpacking

Retain all cartons and packing material until the unit is operated and found to be in good condition. If the unit shows external or internal damage, or does not operate properly, contact the transportation company and file a damage claim. Under ICC regulations, this is your responsibility.

Warranty

Units have a warranty against defective parts and workmanship for one full year from date of shipment. See back page for more details.

After-sale Support

NESLAB is committed to customer service both during and after the sale. If you have questions concerning the operation of your unit, or the information in this manual, contact our Sales Department. If your unit fails to operate properly, or if you have questions concerning spare parts or Service Contracts, contact our Service Department.

Before calling, please refer to the serial number label on the rear of the control box to obtain the following information (see Section II, Description):

-unit part number _____

-unit serial number _____

Safety

Warnings

Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your unit. If you have any questions concerning the operation of your unit or the information in this manual, contact our Sales Department (see After-sale Support).

Installation, operation, or maintenance of the unit other than described in this manual may result in a hazardous situation.

Transport the unit with care. Sudden jolts or drops can damage the refrigeration lines.

Do not attempt to defeat any of the interlock switches or safety features built into the unit.

Observe all warning labels.

Never remove warning labels.

Never operate damaged or leaking equipment.

Never operate the unit without cooling fluid in the reservoir.

Make sure the unit is off before connecting or disconnecting the power cord or other cables.

Always turn off the unit and disconnect the power cord from the power source before performing any service or maintenance procedures, or before moving the unit.

Empty the reservoir before moving the unit.

Never operate any of your equipment with damaged power cords.

Refer all service and repairs of your unit to a qualified technician.

In addition to these safety warnings, warnings are posted throughout the manual. These warnings are designated by an exclamation mark inside an equilateral triangle with text highlighted in bold. Read and follow these important instructions. Failure to observe these instructions can result in permanent damage to the unit, significant property damage, or personal injury or death.

General Information

Description

The HX Recirculating Chiller is designed to provide a continuous flow of cooling fluid at a constant temperature and volume.

The unit consists of a water-cooled or air-cooled refrigeration system, a fluid reservoir, a fluid recirculation pump, and a temperature controller.

Throughout the manual, you will be asked to consult the unit's serial number label, or the pump identification label, or both, for specific information. Both labels are located on the rear of the unit.

Specifications

Temperature Range	+5°C to +35°C
Temperature Stability	±1.0°C
Cooling Capacity¹	38,000 Watts
Pumping Capacity	35 gpm @ 45 psi
Air-Cooled Unit Dimensions	
(H x W x D)	
<i>Inches</i>	63¾ x 46 x 29
<i>Centimeters</i>	162.0 x 116.8 x 73.6
Water-Cooled Unit Dimensions	
(H x W x D)	
<i>Inches</i>	50⅝ x 46 x 28¾
<i>Centimeters</i>	128.3 x 116.8 x 73.0
Reservoir Volume	
<i>Gallons</i>	15.0
<i>Liters</i>	57.0
Weight	
<i>Pounds</i>	1250
<i>Kilograms</i>	567

1. Circulating water at 25°C, at 20°C ambient. 31,500 watts for 50HZ units.

Cooling Capacity

The unit will retain its full rated capacity in ambient temperatures to approximately +75°F (+24°C). Above +75°F, reduce the cooling capacity 1% for every 1°F above +75°F, to a maximum ambient temperature of +95°F. In degrees Celsius, reduce the cooling capacity 1% for every 0.5°C above +24°C, to a maximum ambient of +35°C.

Cooling capacity varies depending on fluid temperature, ambient temperature, and cooling fluid.

Installation

Site (Air-cooled Units)

The unit should be located in a laboratory or clean industrial environment where ambient temperatures are inside the range of +55°F to +95°F (+13°C to +35°C).



Never place the unit in a location where excessive heat, moisture, or corrosive materials are present.

Positioned the unit so the air intake and discharge is not impeded.

Air is drawn through the front of the unit and discharged through the sides and rear. A minimum clearance of 2 feet (0.6 meter) on these three sides is necessary for adequate ventilation.

The minimum air flow requirement is 5600 cubic feet per minute.

In some applications where space is at a premium, the minimum ventilation clearance can be compromised. However, consult our Sales Department before positioning the unit in a location with less minimum clearance than listed above. Inadequate ventilation will cause a reduction in cooling capacity and, in extreme cases, compressor failure.

Excessively dusty areas should be avoided and a periodic cleaning schedule should be instituted (see Section VII, Condenser Cleaning).

Site (Water-Cooled Units)

The unit should be located in a laboratory or clean industrial environment with easy access to a facility cooling water supply and a drain.

All units are equipped with casters for easy movement. This allows the unit to be placed in a small area, as long as there is ample space for the unit to be moved for access on all four sides. A minimum clearance of 3 feet (1 meter) on two adjacent sides is recommended.

The facility cooling water supply must meet or exceed the flow rate requirements listed in the following table for the unit to operate at its full rated capacity. If the facility cooling water does not meet these standards, the cooling capacity will be reduced.

Temp	13°C	18°C	24°C	29°C
Flow Rate				
<i>GPM</i>	11	15	23.5	32

If the unit is being used with a building water supply, the back pressure of the drain must be less than the supply pressure.

A water regulating valve, located in the TAP WATER line, regulates the flow rate of the cooling water supply as it enters the unit. The valve regulates the flow rate based on the heat load. Flow through the unit stops automatically when the unit is shut off.

Electrical Requirements



The construction of this unit provides protection against the risk of electric shock by grounding appropriate metal parts. The protection may not function unless the power cord is connected to a properly grounded outlet. A proper ground connection must be provided.

Make sure the voltage of the power source agrees with the unit's voltage and frequency rating. The unit is designed to tolerate deviations of $\pm 10\%$ from the rated line voltage.

Volts	208	380/420
Hertz	60	50
Phase	3	3

Plumbing Requirements

Before installing the unit to an instrument that previously used tap water as a fluid, flush the instrument several times to remove any rust or scale that has built up.

The plumbing fittings used to connect your HX to your application are located on the right side of the unit (labelled SUPPLY and RETURN). These connections are one inch FPT.

Remove the plastic protective plugs from the SUPPLY and RETURN connections. Connect the SUPPLY fitting to the inlet of your application. Connect the RETURN fitting to the outlet of your application.

The RESERVOIR DRAIN connection, located on the rear of the unit, is a 1/2 inch FPT fitting connected internally to the unit reservoir. This fitting provides a means for draining the reservoir. The unit is shipped with a plug installed in this fitting. To drain the reservoir remove the plug and place the drain valve to the vertical position.

If the unit is "hard plumbed" to your application or, for water-cooled units, to the cooling water supply, damage can occur if the unit is bumped or jolted from its site. Provisions should be made to prevent the unit from being moved after installation. Once the unit is plumbed, secure the locking castors on the unit's base. If the unit is located in a heavy traffic area where there is a possibility of collision, it may be necessary to secure the unit to the site using blocks or mounting brackets.

Flexible tubing, if used, should be of heavy wall or reinforced construction. All tubing should be rated to withstand 110 psi at +100°C. Make sure all tubing connections are securely clamped. Avoid running tubing near radiators, hot water pipes, etc. If substantial lengths of tubing are necessary, insulation may be required to prevent loss of cooling capacity.

Keep the distance between the unit and the instrument being cooled as short as possible, and to use the largest diameter tubing practical. Tubing should be straight and without bends. If diameter reductions must be made, they should be made at the inlet and outlet of your application, not at the HX water chiller.

If substantial lengths of cooling lines are required, they should be pre-filled with fluid before connecting them to the unit.

For water-cooled units, the plumbing connections used to connect the condenser in the HX to the facility cooling water supply are located at the rear of the unit (labelled TAP WATER and DRAIN). These fittings are one inch FPT.

Remove the plastic protective plugs from the TAP WATER and DRAIN connections. Connect the TAP WATER fitting to the facility cooling water supply. Connect the DRAIN fitting to a drain.

Fluids

The selected cooling fluid must have a viscosity of 50 centistokes or less at the lowest operating temperatures.



Your unit is equipped with plate heat exchangers, do not use 100% pure water as a recirculating fluid. Due to the physical nature of a plate heat exchanger, and its response to temperature changes, using 100% water may cause the plate exchanger to rupture.



Never use flammable or corrosive fluids with the unit. Distilled and deionized water may be aggressive and cause material corrosion. Please contact NESLAB before subjecting the unit to prolonged exposure to distilled or deionized water.



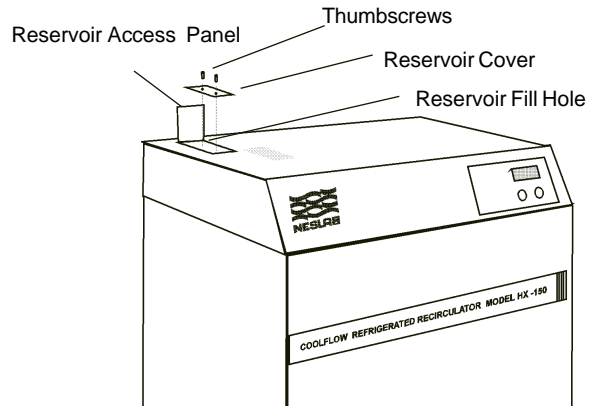
Do not use automobile anti-freeze. Commercial anti-freeze contains silicates that can damage the pump seal. Use of automobile anti-freeze will void the manufacturer's warranty.

Filling Requirements

Open the reservoir access panel on the top of the unit. Loosen the thumbscrews and remove the reservoir cover.

Fill the reservoir with fluid to within 1 inch of the top.

The fluid capacity of the hose connections and the application may be significant. To prevent lowering of the fluid level in the reservoir below the operating level, have extra fluid on hand to keep the reservoir filled to within 1 inch of the top.



Automatic Refill Device (Optional)

The automatic refill device is designed to maintain the correct level of cooling fluid in the reservoir. The device consists of a float switch in the reservoir and a solenoid valve on top of the reservoir. If the cooling fluid level falls, the float switch will drop, opening the solenoid valve and allowing make-up fluid to fill the reservoir. Once the cooling fluid level reaches the proper level, the float switch will rise and the solenoid valve will close.

The plumbing connection for the refill device is located at the rear corner of the unit and is labelled AUTO REFILL. This connection is a $\frac{3}{8}$ inch OD stainless steel barbed fitting.

Connect this fitting to a make-up fluid source using $\frac{5}{16}$ or $\frac{3}{8}$ inch ID flexible tubing. Make sure all tubing connections are securely clamped.

Tubing is available from NESLAB. Contact our Sales Department for more information (see Preface, After-sale Support).



A 50/50 mixture of ethylene glycol and water is required to prevent damage to the plate heat exchanger. When using the refill device, ensure the proper mixture is maintained.

Operation

Temperature Controller

Start Up

The unit has a compressor crankcase heater which warms the oil in the compressor and prevents refrigerant from mixing with the oil. Before start up, the unit must be connected to its power source for at least 12 hours. This allows time for the oil to be heated and separate from the refrigerant.

Before starting the unit, double check all electrical and plumbing connections and make sure the circulating system (the HX, the instrument being cooled, and the circulating lines) has been properly filled with cooling fluid.

For water-cooled units ensure that the facility water is turned on.

To start the unit place the ON/OFF POWER switch to the ON position and press the START switch. (Some units are not equipped with START switches, see Interlocks—Fault Response paragraph on this page.)

To stop the unit place the ON/OFF switch to the OFF position.

When the unit is shut off, wait approximately 5 minutes before restarting. This allows time for the refrigeration pressures to equalize. If the pressures are not allowed to equalize, the compressor will short-cycle (clicking sound) and no cooling will occur.

Temperature Adjustment

The COOL and IDLE indicators, located on the control panel, indicate the status of the refrigeration system. The IDLE indicator is lit when the unit is in the hot gas by-pass mode. The COOL indicator is lit when the refrigeration system is removing heat from the cooling fluid. As the fluid temperature approaches the temperature setpoint, the indicators cycle on and off to indicate the duty cycle of the system. The unit can be in the COOL or the IDLE mode, but never both at the same time. A balance between COOL and IDLE is needed to control temperature.

To display the temperature setpoint, press and hold the Setpoint/Actual Temp button. To adjust

the setpoint, press and hold the Setpoint/Actual Temp button and turn the Adjust dial until the desired temperature setpoint is indicated on the Temp°C LED display. Once the setpoint is adjusted, release the Setpoint/Actual Temp button. The Temp°C LED display will indicate the temperature of the fluid in the reservoir.

NOTE: Inadvertent movement of the Adjust dial will result in a change in the setpoint. The change will not be immediately reflected on the Temp°C display unless the Setpoint/Actual Temp button is pressed. The display will eventually change as the unit responds to the new setpoint

Interlocks (Optional)

Options

The temperature controller has up to four monitoring options: low temperature, high temperature, low fluid level, and low flow. The controller can be built with any combination of these four monitors.

Fault Response

Controllers with a START switch are configured to shut off in the event that a fault occurs. Controllers NOT equipped with a START switch will allow the unit to continue to operate if a fault occurs. This option is available for customers who are willing to accept the risk of damage to the unit in order to continue to provide cooling fluid to the instrument being cooled.

With either controller configuration, the relay contacts connected to the controller receptacle will open and the FAULT indicator will light if a fault occurs. The cause of the fault must be identified and corrected before the unit can be restarted.

Temperature Monitors

The optional high and low temperature monitors are connected to sensors that monitor the temperature of the cooling fluid as it exits the reservoir. The monitors protect the system from exposure to excessively hot or cold cooling fluid. A temperature fault occurs when the fluid temperature exceeds the set temperature limit.

To adjust either temperature monitor, turn the appropriate calibrated dial to the desired temperature limit.

Low Fluid Level Monitor

The low fluid level monitor is connected to a float switch in the reservoir. If the controller is equipped with a LOW LEVEL indicator, the low level monitor is not connected to the fault circuit. The indicator will light if the reservoir cooling fluid drops below the operating level. The indicator serves only as a warning. A fault will not occur as a result of a low level condition.

If the controller is NOT equipped with a LOW LEVEL indicator, the low level monitor is connected to the fault current. A fault will occur if the reservoir cooling fluid level drops below the operating level.

Low Flow Monitor

The optional low flow monitor is connected to a flow switch in the RETURN line. A low flow fault occurs when the flow rate of the returning cooling fluid drops below 0.3 gallons per minute (1.0 liters per minute).

When starting a unit with a controller equipped with both a low flow monitor and a START switch, the START switch must be held in the ON position until the flow switch "closes" (2 or 3 seconds). If time is not allowed for the flow switch to close, the unit will stop when the START switch is released.

Interlock Relay Contacts

A set of contacts are connected to a receptacle on the operator panel. The contacts are rated 15A, 125V. This is not a power inlet or outlet. The receptacle is isolated from the circuitry. Its ground pin is connected to the chassis. The contacts are normally open: they are closed when the unit is running normally (no faults present), and they are open when the unit is off or when a fault occurs.

Flow Control

The flow control handle is connected to a valve that controls the flow of the cooling fluid to your application. The handle is on the right side of the unit.

When the handle is in the OPEN position, the valve is open and all possible fluid is supplied to your application. When the handle is in the CLOSED position, the valve is closed and no fluid is supplied to your application. When the handle is between these two positions, the flow rate of the fluid is between full flow and no flow.



Never "crank" the valve wide open from the closed position.

Pressure Gauge

The RECIRCULATING PRESSURE gauge indicate the operating pressure of the system

Remote Condenser (Optional)

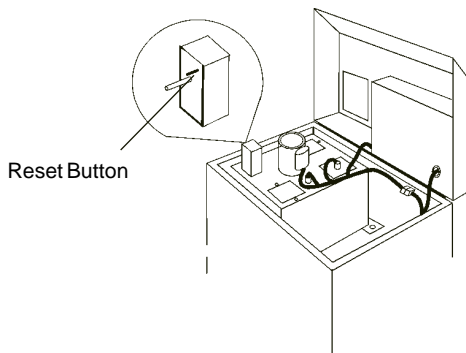
Units with the optional remote air-cooled condenser are equipped with high and low refrigeration pressure monitors. The monitors are connected internally to a pressure gauge that monitors refrigeration pressure at the suction side of the compressor. The monitors protect the refrigeration system from operating under excessively high and low refrigeration pressures. A pressure fault occurs when the refrigeration pressure exceeds the set pressure limit.

The status of the monitors is indicated by the COMPRESSOR LOW PRESSURE and COMPRESSOR HIGH PRESSURE indicators located on the operator panel.

In the event of either a low or high refrigeration pressure fault, the unit will shut down. The unit must be manually restarted after the cause of the fault has been identified and corrected. If both indicators are lit simultaneously, an interruption in the main power supply has occurred.

Heater Package (Optional)

The heater package option consists of an immersion heater in the unit's fluid reservoir, a high temperature limit device, a solid state zero-crossing relay, a heater ENABLE/DISABLE switch and a FAULT indicator. The ENABLE/DISABLE switch and the FAULT indicator are located on a small control box appended to the right side of the case top. The FAULT indicator will light if the high temperature limit device is tripped. The high temperature limit device will disconnect power to the heater if the heater surface temperature exceeds a preset limit.



High Temperature Limit Device

With the ENABLE/DISABLE switch set to ENABLE, the heater will cycle on and off under the control of the temperature controller. With the switch in the DISABLE position, the heater will remain off.

The heater high temperature limit device senses the surface temperature of the heater. If the heater temperature becomes too high, the limit device opens a mechanical relay to remove power from the heater.

The heater surface temperature may operate several degrees higher than the reservoir fluid. The limit device is factory set to a temperature above the upper limit of the temperature controller's range.



For personal safety and equipment reliability, the following procedure must only be performed by a qualified technician. Contact our Service Department for assistance (see Preface, After-sale Support).

To reset a tripped temperature limit device, lift and open the case top. The case top is secured to the unit base by a hinge between the case top and the base (along the rear of the unit), and by two spring clips located at the front corners. To gain access to the temperature limit device, disengage the spring clips with a flat bladed screw driver and lift the front of the case top and tilt it back. A support brace, located on the right side of the inner case, will stop and support the case top.

You must identify and correct the fault before restarting the unit.

The protection device and the heater power connections are located in a small stainless steel box on top of the fluid reservoir. The protection device has a reset button and a temperature limit adjustment shaft. Press the reset button to restore operation. **NOTE:** On units without a reset button cycle the power switch.

Pump Motor Overload Protector

The overload protector prevents the pump motor from exposure to excessive current. If an overload fault occurs, due, for example, to excessive pressure or flow, or excessive ambient temperature, the overload protector will shut off the motor.

The overload protector automatically resets when the condition clears

Depending on your electrical configuration, the unit may continue to run if an overload fault occurs. To start the pump after the protector resets press the START switch on the controller.

High Pressure Cutout

For water-cooled units, should the refrigeration discharge pressure become too high the high pressure cutout will activate and shut down the unit. High pressures can be caused by a lack of cooling water to the compressor or debris in the refrigeration lines.

Locate the reset switch. Press in on the switch until a "click" is heard. If the reset does not "click" the cutout was not activated and the unit shut down occurred for another reason.

Maintenance & Service

Service Contracts

NESLAB offers on-site Service Contracts that are designed to provide extended life and minimal down-time for your unit. For more information, contact our Service Department (see Preface, After-sale Support).

Condenser Cleaning (Air-cooled units only)

For proper operation, the unit needs to pull substantial amounts of air through a finned condenser. A build up of dust or debris on the fins of the condenser will lead to a loss of cooling capacity.

The frequency of cleaning depends on the operating environment. We recommend that a visual inspection of the condenser be made monthly after initial installation. After several months, the frequency of cleaning will be established.

Periodic vacuuming of the fins on the condenser is necessary.



Exercise caution not to damage the condenser fins or coil. Condenser fin or coil damage can result in a loss of performance and, in extreme cases, refrigeration system failure.

Algae

To restrict the growth of algae in the reservoir we recommend the reservoir cover be kept in place and that all circulation lines be opaque. This will eliminate the entrance of light which is required for the growth of most common algae.

NESLAB recommends the use of Chloramine-T, 1 gram per 3.5 liters.

Configuration

Case Top

The unit has a hinged case top to allow service access. The case top is secured to the top of the unit base by a hinge between the case top and base (along the rear of the unit), and by two spring clips located at the front corners. To gain access to the pump assembly or the reservoir area, disengage the spring clips with a flat bladed screw driver and lift the front of the top cover and tilt it back. A support brace, located on the right side of the inner base, will stop and support the case top. Ensure the spring clips engage when the top is lowered back into position.

Reservoir Cover

Access to the inside of the fluid reservoir is necessary to clean the reservoir.



Disconnect the unit from its power source before removing the reservoir cover.

Remove the stainless steel screws that secure the reservoir cover to the reservoir. Lift the cover high enough to ensure the sensors underneath it will clear and then carefully place the cover to the side.

Service Access Panels

Service panels on your unit allow easy access to the pump and refrigeration assemblies. The panels are designed to allow removal without disconnecting the HX from the instrument being cooled.



Disconnect the unit from its power source before removing any of the access panels.

Reservoir Cleaning

Periodic reservoir cleaning is necessary. It is recommended that a visual inspection of the reservoir be made monthly after initial installation. After several months, the frequency of cleaning will be established.



Disconnect the unit from its power source and drain the reservoir before cleaning the reservoir.

Lift the top cover to access the reservoir. Remove the reservoir cover as described earlier in this section.

Clean the reservoir with a cleaning fluid compatible with the recirculating system and the cooling fluid.



Do not use steel wool or other abrasive materials. They can scratch the stainless steel surface and initiate rusting.

When the reservoir is clean, re-assemble the cover assembly and close the case top.

Refer to Section III, Filling Requirements for instructions on replacing the cooling fluid.

Pressure Relief Valve Adjustment

To adjust the operating pressure of your unit close the flow control handle. Locate the set screw above the pump motor. Turning the screw clockwise raises the pressure, turning it counter clockwise lowers the pressure.

Hoses

The unit's hoses should be inspected and tightened on a semi-annual basis.

Troubleshooting

Checklist

Unit will not start

Check power source for correct voltage output. Refer to the serial number label on the rear of the unit or rear of analog temperature controller for the specific electrical requirements of your unit. Power source must be specified voltage, $\pm 10\%$.

Check house circuit breaker.

On water-cooled units, make sure the cooling water supply is connected to the TAP WATER connection, not the DRAIN connection. *Ensure the facility water is turned on.*

Also on water-cooled units, check the High Pressure Cutout, it may need to be reset (see Section V, Operation).

Unit will not circulate fluid

Check the tubing between the unit and your application for obstructions.

Inadequate temperature control

Make sure the installation of the unit is in compliance with the conditions described in Section III.

Make sure the heat load of the instrument being cooled is not greater than the cooling capacity of the unit.

When the unit is shut off, wait approximately five minutes before restarting. This allows time for the refrigeration pressures to equalize. If the pressures are not allowed to equalize, the compressor will short-cycle (clicking sound) and no cooling will occur.

Service Assistance

If, after following these troubleshooting steps, your unit fails to operate properly, contact our Customer Service Department for assistance (see Preface, After-sale Support). Before calling, please obtain the following information:

- *unit part number*
- *unit serial number*
- *voltage of unit*
- *voltage of power source*

WARRANTY

NESLAB Instruments, Inc. warrants for 12 months from date of shipment any NESLAB unit according to the following terms.

Any part of the unit manufactured or supplied by NESLAB and found in the reasonable judgment of NESLAB to be defective in material or workmanship will be repaired at an authorized NESLAB Repair Depot without charge for parts or labor. The unit, including any defective part must be returned to an authorized NESLAB Repair Depot within the warranty period. The expense of returning the unit to the authorized NESLAB Repair Depot for warranty service will be paid for by the buyer. NESLAB's responsibility in respect to warranty claims is limited to performing the required repairs or replacements, and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sales of any unit.

With respect to units that qualify for field service repairs, NESLAB's responsibility is limited to the component parts necessary for the repair and the labor that is required on site to perform the repair. Any travel labor or mileage charges are the financial responsibility of the buyer.

The buyer shall be responsible for any evaluation or warranty service call (including labor charges) if no defects are found with the NESLAB product.

This warranty does not cover any unit that has been subject to misuse, neglect, or accident. This warranty does not apply to any damage to the unit that is the result of improper installation or maintenance, or to any unit that has been operated or maintained in any way contrary to the operating or maintenance instructions specified in NESLAB's Instruction and Operation Manual. This warranty does not cover any unit that has been altered or modified so as to change its intended use.

In addition, this warranty does not extend to repairs made by the use of parts, accessories, or fluids which are either incompatible with the unit or adversely affect its operation, performance, or durability.

NESLAB reserves the right to change or improve the design of any unit without assuming any obligation to modify any unit previously manufactured.

THE FOREGOING EXPRESS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

NESLAB'S OBLIGATION UNDER THIS WARRANTY IS STRICTLY AND EXCLUSIVELY LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE COMPONENT PARTS AND NESLAB DOES NOT ASSUME OR AUTHORIZE ANYONE TO ASSUME FOR IT ANY OTHER OBLIGATION.

NESLAB ASSUMES NO RESPONSIBILITY FOR INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO LOSS OR DAMAGE TO PROPERTY, LOSS OF PROFITS OR REVENUE, LOSS OF THE UNIT, LOSS OF TIME, OR INCONVENIENCE.

This warranty applies to units sold in the United States. Any units sold elsewhere are warranted by the affiliated marketing company of NESLAB Instruments, Inc. This warranty and all matters arising pursuant to it shall be governed by the law of the State of New Hampshire, United States. All legal actions brought in relation hereto shall be filed in the appropriate state or federal courts in New Hampshire, unless waived by NESLAB.