HX Series
Recirculating Chiller
Remote Condenser

NESLAB Manual P/N 002001
Rev. 07/15/98

Site Preparation and Installation Manual

NESLAB online
Product Service Information, Applications Notes, MSDS Forms, e-mail.

Call our bulletin board system
(603)427-2490
Contact us for free access software.

Voice Info: (800) 4-NESLAB

Comments on this manual can be sent to:

NESLAB@neslabinstruments.com

or visit our Web page at:

http://www.neslabinc.com

HX Series Recirculating Chiller Remote Condenser Site Preparation and Installation Manual

Table of Contents

Preface

Compliance

The CE label on the rear of the unit identifies products tested and found to be in compliance with the requirements defined in the EMC standards defined by 89/336/EEC. The testing has demonstrated compliance with the following standards:

EMC:

EN 55011, Class A Verification	Industrial, Scientific and Medical Emissions
IEC 801-2: 1991	Electro-Static Discharge
IEC 801-3: 1988	Radiated Electromagnetic Field
IEC 801-4: 1988	Conducted Electrical Fast Transient/Burst

For any additional information refer to the Letter of Compliance that shipped with the unit.

Unpacking

Unless it is otherwise impractical because of doorway or passage constraints, do not remove the remote condenser or the base unit from their shipping crates (or cartons) before the components are in their final location and are ready to be installed.

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.

Installation Assistance

NESLAB is committed to providing complete technical support throughout the installation process. We understand that the ability to complete an installation project on schedule is a large factor in the success of a remote condenser installation. We will cooperate fully with the customer to ensure that the installation proceeds smoothly and that you receive the prompt, courteous service and high quality product that you deserve.

This manual addresses the major considerations involved in site preparation and component installation. However, due to the large number of options available with our recirculating chillers and the many variables involved in installing a remote condenser, additional information may be necessary. If you have questions concerning the installation of your components, the information in this manual, or the installation process in general, please contact our Sales Department for assistance.

Section I General Information

Objective

This manual is intended as a guide to assist the NESLAB customer in selecting and preparing a site, and installing a remote condenser to an HX Series Recirculating Chiller. The focus of the manual is on the installation of the remote condenser in conjunction with the base unit (chiller).

This manual is not intended as a guide for installing the base unit to the instrument being cooled; this information is contained in the operation manual and is shipped with the base unit. Operation and maintenance instructions for the remote condenser are also included in the chiller's operation manual.

Overview of Responsibilities

In an effort to make the installation proceed as smoothly as possible, as well as, specify contractual responsibilities, the following overview is provided. The overview outlines both NESLAB's and your responsibilities during and after the installation process. Exceptions or deviations from these responsibilities must be approved, in writing, by NESLAB prior to installation.

NESLAB provides the base unit with a full charge of refrigerant, the remote condenser, and complete specifications on the installation of the remote condenser and its connection to the base unit.

The complete installation specifications are provided in two ways: the Site Preparation and Installation Manual; and the technical support provided by NESLAB's Sales, Service, and Engineering Departments.

After installation, an on-site inspection and certification by a NESLAB service technician is required to validate the warranty on the refrigeration system components.

The on-site inspection includes a complete inspection for conformance with the requirements outlined in this manual, evacuating the refrigerant lines between the condenser and the base unit, performing the initial start up of the unit, and providing any additional education requested concerning the operation or maintenance of the system.

You are responsible for providing all electrical connections and the proper voltage source, all refrigeration plumbing between the base unit and the remote condenser (including piping, valves, adequate venting, and a complete leak check of all tubes and joints), and all site requirements (service access, concrete pads, mounting hardware, etc.).

The corresponding chapters in this manual describe each of these requirements.

In addition, you are responsible for obtaining all licenses and approvals required for the installation, and installing the unit in compliance with all applicable construction codes.

The base unit and remote condenser have a one-year warranty against defective parts and workmanship from date of written approval certifying the installation. The warranty does not cover customer-installed parts or the workmanship of their installation. See the back page for complete details.

For long term reliable operation, the system must be maintained on a regular basis (see base unit operator's manual for service and maintenance procedures). If customer-provided care is not practical, contact the Service Manager at our Headquarters in New Hampshire for complete on-site service contract information. Failure to properly maintain the system can cause damage and may void the manufacturer's warranty.

Section II Safety

Warnings

Make sure you read and understand all instructions and safety precautions listed in this manual before installing your unit. If you have any questions concerning the installation of your unit or the information in this manual, please contact our Sales Department for assistance.

Performance of installation procedures other than those described in this manual may result in a hazardous situation and may void the manufacturer's warranty.

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

Observe all warning labels.

Do not remove warning labels.

In addition to the safety warning listed above, warnings are posted throughout the manual. These warnings are designated by an exclamation mark inside an equilateral triangle with text highlighted in bold print. 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.

Section III Installation

Accessibility

The installation site must be accessible from the delivery location. Ensure there is adequate clearance from the delivery location throughout the access route. Most units will require either a forklift or hydraulic pallet mover, which must be considered when calculating accessibility.

If the installation site is at a different level from the delivery location, be sure the lifting equipment, for example, an elevator, is rated to handle the combined size and weight of the unit and the moving equipment.

Refer to Table 1 to identify the specific size and weight of your components.

The exact method of handling and setting the unit depends on available equipment, size of unit, final location, and other variables. Use judgement to determine the specific method of handling the unit. All units are shipped on heavy skids and crated. Generally, it is advisable to bring the unit as close to its final location as possible before removing the crating. Units are provided with lifting ears near the four corners. Under no circumstances should the coil headers or return bends be used for moving the unit.

Contractor supplied spreader bars must be used and a safety sling should be used when lifting.

Table #1:

Base Unit

	HX-150	HX-200/HX-300	HX-500/HX-750	HX-900
Unit Dimensions (H x W x D) *Inches* *Centimeters*	39⅝ x 26¼ x 21⅛ 101 x 67 x 54	45¾ x 33¾ x 25¼ 117 x 86 x 64	50⅝ x 46 x 28¾ 128 x 117 x 73	
Crate Dimensions (H x W x D) *Inches* *Centimeters*	49 x 33 x 29 125 x 84 x 74	55 x 40 x 33 140 x 102 x 84	61 x 53½ x 36 155 x 136 x 91	
Shipping Weight *Pounds* *Kilograms*	320 145	505 229	800 362	1000 453

Remote Condenser

	HX-150/HX-200	HX-300	HX-500	HX-750	HX-900
Condenser Dimensions[1] (H x W x D) *Inches* *Centimeters*	28 x 22 x 37½ 71 x 56 x 95	44½ x 43 x 39¾ 113 x 109 x 101	44½ x 43 x 49¾ 113 x 109 x 126	44½ x 43 x 69¾ 113 x 109 x 177	50 x 45½ x 125 127x115.6x317.5
Crate Dimensions[2] (H x W x D) *Inches* *Centimeters*	54 x 31 x 52 137 x 79 x 132	54 x 51 x 52 137 x 130 x 132	54 x 51 x 61 137 x 130 x 155	54 x 51 x82 137 x 130 x 208	**NOT AVAILABLE**
Unit Weight *Pounds* *Kilograms*	114 51.7	180 81.6	260 117.9	470 213.1	700 317.5
Shipping Weight *Pounds* *Kilograms*	345 156	345 156	395 179	525 238	870 395

1. The height of the condenser for models HX-500 and HX-750 when mounted for vertical air flow is adjustable from 44½ inches (113 centimeters) to 54¾ inches (139 centimeters). The flow adjustment for HX-900 units is 50 inches (127 centmeters) to 62 inches (157.5 centimeters)
2. Crate dimensions are approximate.

Site

Base Unit

The base unit should be located in an area where ambient temperatures are inside the range of +55°F to +95°F (+13°C to +35°C).

The site must be large enough to allow free access on all four sides of the unit. A minimum clearance of 3 feet (1 meter) on all four sides is required. Refer to Table 1 to determine the width and depth of your base unit.

If these dimensions are not possible, consult our Sales Department for assistance.

The base unit must be in a location with adequate ventilation to discharge heat generated by the recirculation pump and other components. Typically, ventilation for a unit with the minimum access clearance in a room of 500 feet^2 (46.5 meters^2) or more is considered adequate. Additional ventilation may be required if the access clearance is compromised or the site is less than 500 feet^2 (46.5 meters^2).

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

Special attention should be given to the unit's location and position. The operator panel is located on the front of the unit. The remote condenser and refrigerant relief valve connections are located on the right side of the unit. Position the unit so the operator controls are convenient to the user and the remote condenser and relief valve connections can be easily accessed during installation or for future servicing.

Damage can occur to the plumbing that connects the base unit to the remote condenser if the base 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, lower the adjustable feet on the unit's base. If the unit is located in a heavy traffic area where the possibility of collision is imminent, secure the unit using blocks or mounting brackets.

Remote Condenser

The remote condenser should be located on a well-constructed, level surface, able to withstand the distributed weight of the condenser and the mounting hardware. The ambient temperature of the site should be within the range of -10°F to +110°F (-23°C to +43°C).

Remote condensers for HX-150s, HX-200s, and HX-300s are available with vertical airflow only. Condensers for HX-500s, HX-750s and HX-900s are available with either horizontal or vertical airflow.

Vertical airflow units should be located no closer than the width of the unit from a wall or other obstruction. Increased distance is preferred whenever possible. Sufficient free area should be left around and below the unit to avoid air restriction to the coil.

For multiple units placed side by side, the minimum distance between the units is the width of the largest unit. If the units are placed end to end, the minimum distance between the units is four feet.

If the unit is placed in a pit, the top of the unit should be level with the top of the pit and the side distance increased to twice the width. If the top of the unit is not level with the top of the pit, discharge cones or stacks must be used to raise discharge air to the top of the pit. This is a minimum requirement.

If the unit is placed behind a fence, the fence must have a 50% free area, with a one foot (minimum) undercut. The unit cannot be closer than the width of the unit to the fence, nor should the top of the fence exceed the height of the unit. If these requirements are not used, the unit must be installed like a unit in a pit.

Horizontal airflow units should be installed with the coil (inlet air side) facing the prevailing winds. If the coil faces a wall, there must be a minimum clearance of 4 feet (1.2 meters) for adequate air flow. Increased distance is preferred whenever possible.

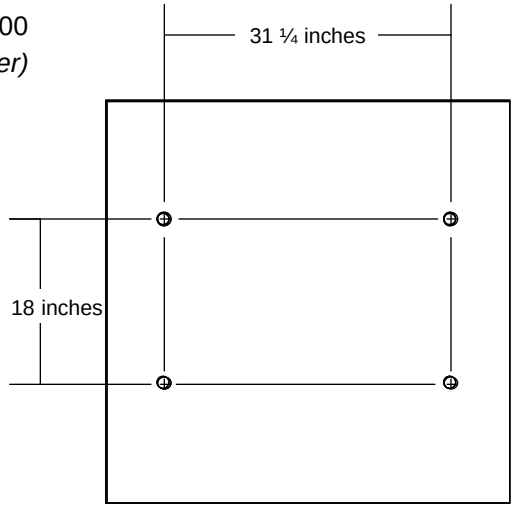
Inadequate air flow will cause a reduction in cooling capacity and, in extreme cases, refrigeration system failure.

The remote condenser must be securely mounted to the foundation on which it is installed (concrete pad, rooftop, etc.). The condenser frame has holes that allow the condenser to be lag bolted to its foundation. Refer to Figures 1 through 6 to identify the minimum pad size and the bolt pattern details for your remote condenser. Concrete slabs used for unit mounting should be installed level and be properly supported to prevent settling. We recommend a one-piece concrete slab with footings extended below the frost line.

Roof-mounted units should be installed level on steel channels or an I-beam frame to support the unit above the roof. Use of vibration pads or isolators is recommended. The roof must be strong enough to support the unit's weight.

Install units away from occupied spaces and above or outside utility areas, corridors, and auxiliary spaces to reduce the transmission of noise and vibration to occupied spaces. Refrigeration piping should be flexible enough to prevent the transmission of noise and vibration from the unit into the building. If the refrigeration lines are to be suspended from the building's structure, isolation hangars should be used to prevent vibration transmission. Where piping passes through the wall, pack fiberglass and sealing compound around the lines to minimize vibration and retain flexibility in the lines.

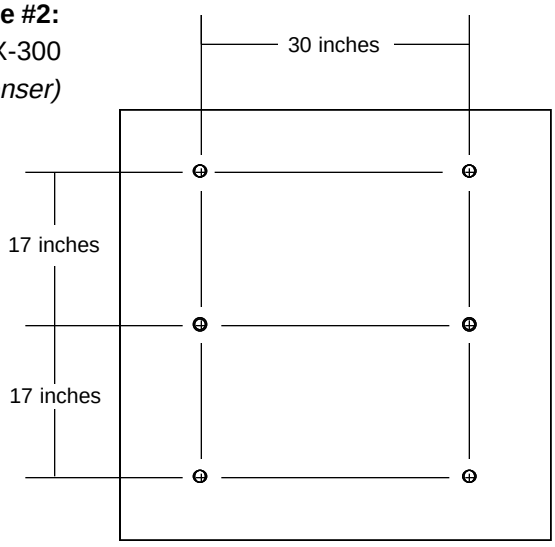
Figure #1:
HX-150/HX-200
(Vertical air flow condenser)



Minimum pad size: 44 inches x 44 inches (112 centimeters x 112 centimeters)

Lag bolt quantity and size: Four (4) 3/8 inch diameter bolts are required to secure the condenser.

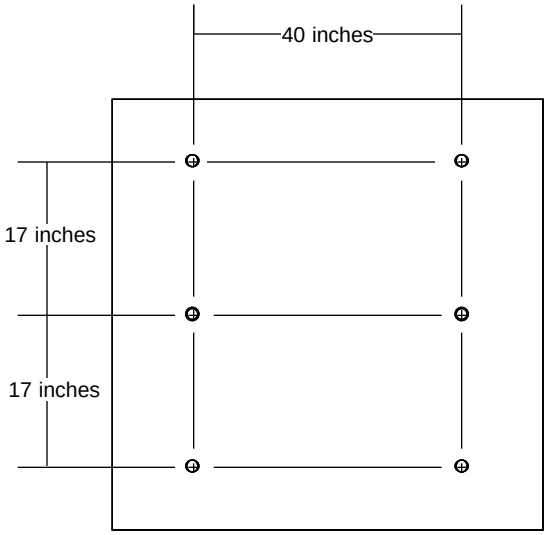
Figure #2:
HX-300
(Vertical air flow condenser)



Minimum pad size: 48 inches x 48 inches (122 centimeters x 122 centimeters)

Lag bolt quantity and size: Four (4) ½ inch diameter bolts are required to secure the condenser, six (6) bolts are recommended.

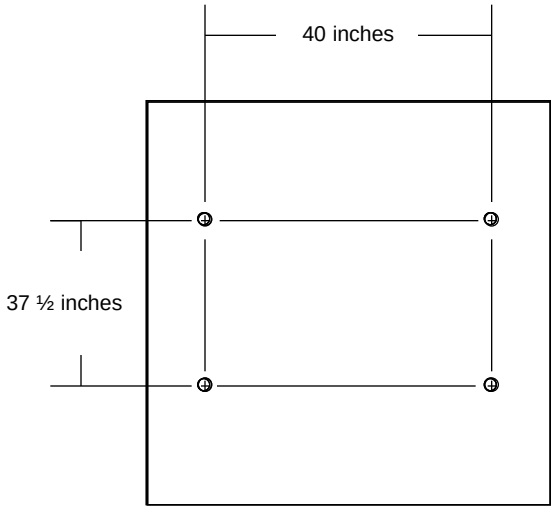
Figure #3:
HX-500
(Vertical air flow condenser)



Minimum pad size: 58 inches x 58 inches (147 centimeters x 147 centimeters)

Lag bolt quantity and size: Four (4) ½ inch diameter bolts are required to secure the condenser, six (6) are recommended.

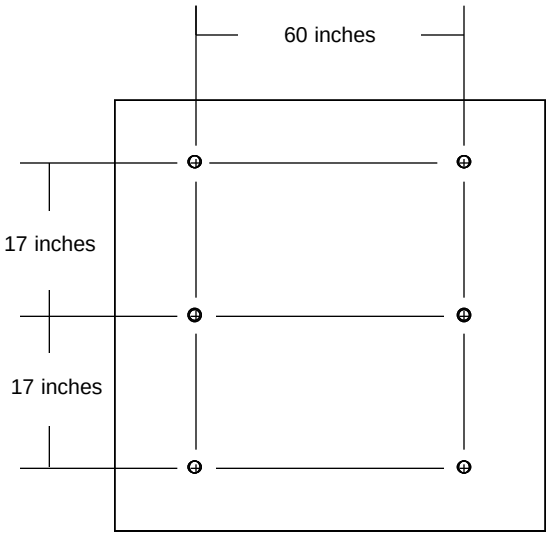
Figure #4:
HX-500
(Horizontal air flow condenser)



Minimum pad size: HX500 - 58 inches x 58 inches (147 centimeters x 147 centimeters)
HX 900 - 59 inches x 120 inches (150 centimeters x 305 centimeters)

Lag bolt quantity and size: Four (4) ½ inch diameter bolts are required to secure the condenser.

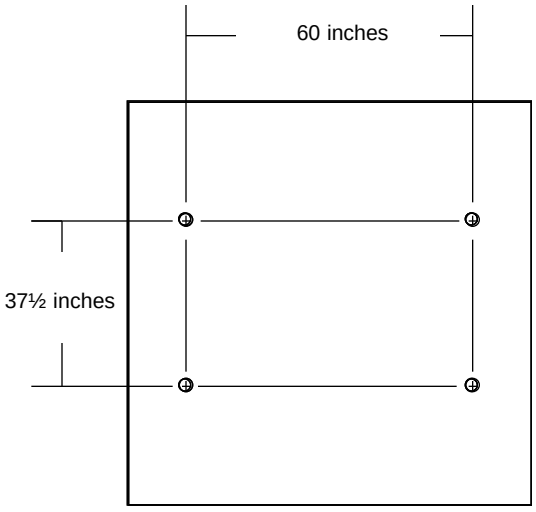
Figure #5:
HX-750
(Vertical air flow condenser)



Minimum pad size: 58 inches x 68 inches (147.3 centimeters x 172.7 centimeters)

Lag bolt quantity and size: Four (4) ½ inch diameter bolts are required to secure the condenser, six (6) bolts are recommended.

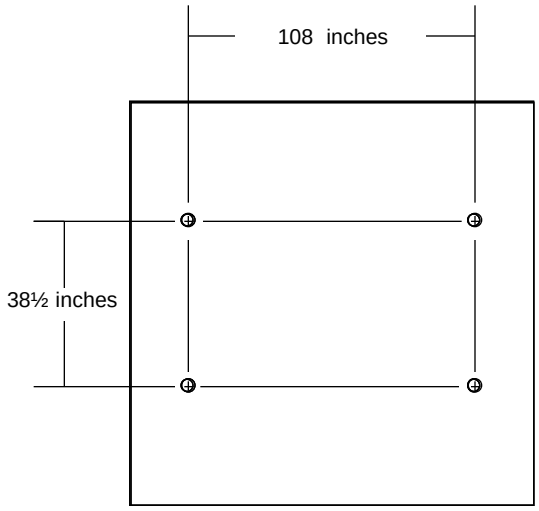
Figure #6:
HX-750
(Horizontal air flow condenser)



Minimum pad size: 58 inches x 68 inches (147.3 centimeters x 172.7 centimeters)

Lag bolt quantity and size: Four (4) ½ inch diameter bolts are required to secure the condenser.

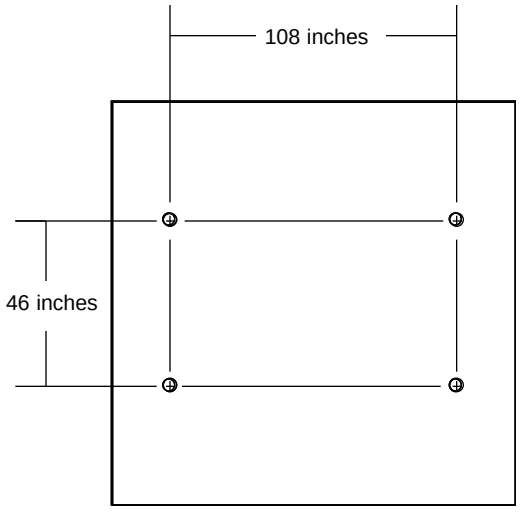
Figure #7:
HX-900
(Vertical air flow condenser)



Minimum pad size: 48 inches x 116 inches (121.9 centimeters x 294.6 centimeters)

Lag bolt quantity and size: Four (4) ½ inch diameter bolts are required to secure the condenser.

Figure #2:
HX-900
(Horizontall air flow condenser)



Minimum pad size: 50 inches x 116 inches (127 centimeters x 294.6 centimeters)

Lag bolt quantity and size: Four (4) ½ inch diameter bolts are required to secure the condenser.

Electrical Requirements

An electrical connection must be made from the remote condenser to the HX unit. The correct terminal board on the HX used for the electrical connections is found in the pull box and can be identified by locating the yellow sticker labelled:

ELECTRICAL CONNECTIONS FOR CONDENSER

The exact location of the sticker varies with the unit size.

The electrical requirements listed below in Table 2 are typical for each of the model sizes indicated. The requirements may vary depending on the size of the pump and compressor in your unit. Consult your NESLAB Sales Representative to verify the specific electrical requirements of your unit.

Table #2:

	HX-150	HX-200	HX-300/HX-500	HX-750	HX-900
Volts	220-240	208-230	208-230	208-230/460	
Hertz	50	60	60	60	
Phase[1]	1	1	3	3	
FLA Amps[2]	2.0		2.6	5.2/2.6	10.4/5.2
Number of fans	1			2	4
Fan Horsepower	0.25		0.33		
Minimum AWG	Consult local electrical codes				
Number of Conductors					

1. Consult your NESLAB Sales Representative for information on the specific phase requirements of your system.
2. Amp rating is for the remote condenser only. The requirements for the HX unit vary depending on the size of the pump and compressor. Consult your NESLAB Sales Representative to verify the specific electrical requirements of your unit.
3. All electrical connections must be made to the terminal blocks located inside the pull box on the HX unit.

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 ±10% from the rated line voltage.

A qualified electrician must make the electrical connections for both the base unit and the remote condenser. A wiring diagram is provided to assist electrical installation. If additional information is necessary, contact our Sales Department.

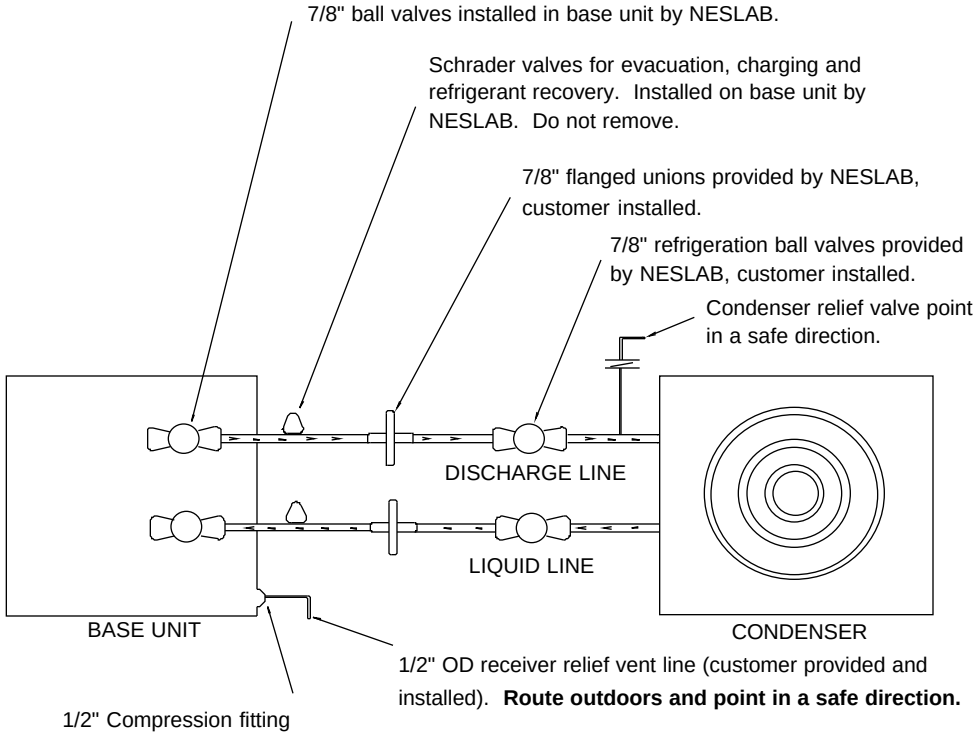
Wire the electrical connections in conformance with local, state, and federal codes. Double check all wiring to make sure it is properly connected and protected from the elements.

Refrigeration Requirements

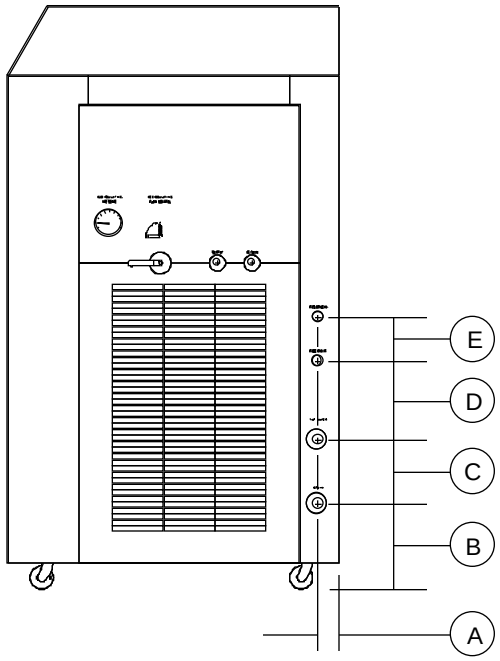
The base unit is equipped with isolation valves and is shipped with a full refrigerant charge.

The refrigeration lines that connect the base unit and the condenser, and the physical connection of the two components are the customer's responsibility. Use the flow diagram below to assist plumbing installation. If further information is necessary, contact our Sales Department.

Do not operate ball valves, refrigerant escape and system contamination will result.



Refer to Table 3 to determine the location of the refrigeration line connections on the base unit.



Base unit (rear for HX-150, right side for all others)

Table #3:

	HX/150/HX-200/HX-300	**HX-500/HX-750/HX-900**
Dimension A *Inches* *Centimeters*	1 ¾ 4.4	2 7/8 7.5
Dimension B *Inches* *Centimeters*	7 17.8	5 ¾ 14.6
Dimension C *Inches* *Centimeters*	4 10.2	4 10.2
Dimension D *Inches* *Centimeters*	5 7/8 14.9	2 ¾ 7
Dimension E *Inches* *Centimeters*	3 7.6	3 7.6

1. A is from the rear edge of the base unit to the center of all four connections.
2. B is from the floor to the center of the liquid line connection.
3. C is from the center of the liquid line connection to the center of the discharge line connectior.
4. D is from the center of the discharge line connection to the center of the refrigerant relief valve connection.
5. E is from the center of the refrigerant relief valve connection to the center of the reservoir drain plug.

The size of the tubing used to connect the base unit to the condenser depends on the one way tubing length between the base unit and the remote condenser. Refer to Table 4 to determine the correct tubing size. Sizes are listed as outside diameter (OD).

Table #4:

Discharge Line (OD)[1]

Equivalent tubing length[2]	HX-150/HX-200	HX-300	HX-500	HX-750	HX-900
up to 50 feet	7/8	7/8	7/8	1 1/8	1 1/8
51 feet to 100 feet	7/8	7/8	1 1/8	1 1/8	1 1/8
101 feet to 150 feet	7/8	7/8	1 1/8	1 3/8	*
151 feet to 200 feet	7/8	1 1/8	1 1/8	1 3/8	*

Liquid Line (OD)[1]

Equivalent tubing length[2]	HX-150/HX-200	HX-300	HX-500	HX-750	HX-900
up to 50 feet	3/8	1/2	1/2	5/8	7/8
51 feet to 100 feet	1/2	1/2	5/8	5/8	7/8
101 feet to 150 feet	1/2	1/2	5/8	3/4	*
151 feet to 200 feet	1/2	5/8	5/8	3/4	*

1. Outside diameter (OD) is listed in inches.
2. Tubing length is based on the one way length between the base unit and the remote condenser.
* Contact NESLAB

Each valve, fitting and bend in a refrigeration line contributes to the fiction pressure drop. Because computing these pressure drops can be complex, an equivalent length of straight tubing is normally used instead.

Use Table 5 to determine the equivalent lengths for commonly used valves and fittings.

Table #5:

Line Size O.D., In.	Globe Valve	Angle Valve	90° Elbow	45° Elbow	Tee Line	Tee Branch
½	9	5	0.9	0.4	0.6	2
5/8	12	6	1	0.5	0.8	2.5
7/8	15	8	1.5	0.7	1.0	3.5
1 1/8	22	12	1.8	0.9	1.5	4.5
1 3/8	28	15	2.4	1.2	1.8	6

NESLAB requires that all refrigeration lines be TYPE L (medium wall) refrigeration grade copper tubing. Refrigeration grade tubing is required since it is available cleaned, dehydrated, and capped to avoid contamination prior to installation. Refrigerant grade tubing is available from NESLAB. Contact our Sales Department for more information.

Isolation valves are installed on both the discharge and liquid lines. Refer to the flow diagram for more details. See Table 4 to determine the correct tubing size.

Both the base unit and the remote condenser are equipped with refrigerant relief valves. The valve connection on the base unit is a ½ inch compression fitting located on the right side of the unit. Refer to Table 3 to identify the location of the connection. Connect the valve on the base unit to ½ inch OD copper tubing that will vent any refrigerant discharge outdoors.

Do not vent the relief valve in an area where the vented gas could be breathed.

The relief valve on the remote condenser is supplied with vent tubing. The vent tubing on both valves must be positioned so it faces downward in order to ensure safe venting.

All sweat type fittings must be wrought copper or forged brass. An effort should be made to minimize the number of elbows and to keep the lines as straight as possible. All elbows must be the long radius type.

Install horizontal runs of the discharge line sloped downward in the direction of flow at a rate of 1 inch every 20 feet (2.54 centimeters every 6 meters). **Support all tubing at intervals of no more than every 8 feet (2.4meters), making sure supports are properly anchored.** Install rubber grommets between tubing and clamps to prevent chaffing.

All joints in the discharge line must be soldered using a silver solder alloy containing no less than 15% silver. Use only a suitable silver solder alloy on all copper to copper connections in the liquid line. **On copper to brass joints, where excessive heat can cause damage, use only 45% silver solder.** On copper to steel, brass to steel, and steel to steel joints, use a silver solder alloy containing at least 35% silver. **During the brazing operation, dry nitrogen must be bled through the piping at a very low pressure to prevent oxidation and scaling.**

Wrap the ball valves and the condenser relief valve with a wet cloth while brazing.

During operation, the discharge line may reach temperatures of as much as +150°F to +200°F (+65°C to +95°C). Cellular glass type insulation or permanent guards are required to prevent the possibility of burns or other injuries to operators or maintenance persons. Additionally, metal pipe sleeves are required where tubing passes through a concrete wall or floor. The space between the tubing and the sleeve must be filled using a mastic-insulating compound.

Refer to Table 3 for location of refrigeration line connections.

Thoroughly leak check all refrigeration lines and soldered joints. If any leaks are found, make sure they are repaired prior to the Service Technician's inspection visit.

Refrigeration lines must be evacuated for 24 hours prior to starting the unit.

Inspections

An on-site pre-installation inspection by NESLAB of all the electrical, plumbing, and site requirements is strongly recommended prior to operating the system. An inspection of the site prior to delivery can provide "insurance" against start up delays. Contact the Customer Service Department at least three weeks prior to the planned start up date to arrange an inspection (see Preface, Installation Assistance).

A representative of the refrigeration-plumbing contractor, the primary operator(s) and the maintenance person(s) should be present during the inspection visit. This will allow direct communication of any problems discovered during the visit and provide an opportunity to answer any operating or maintenance questions.

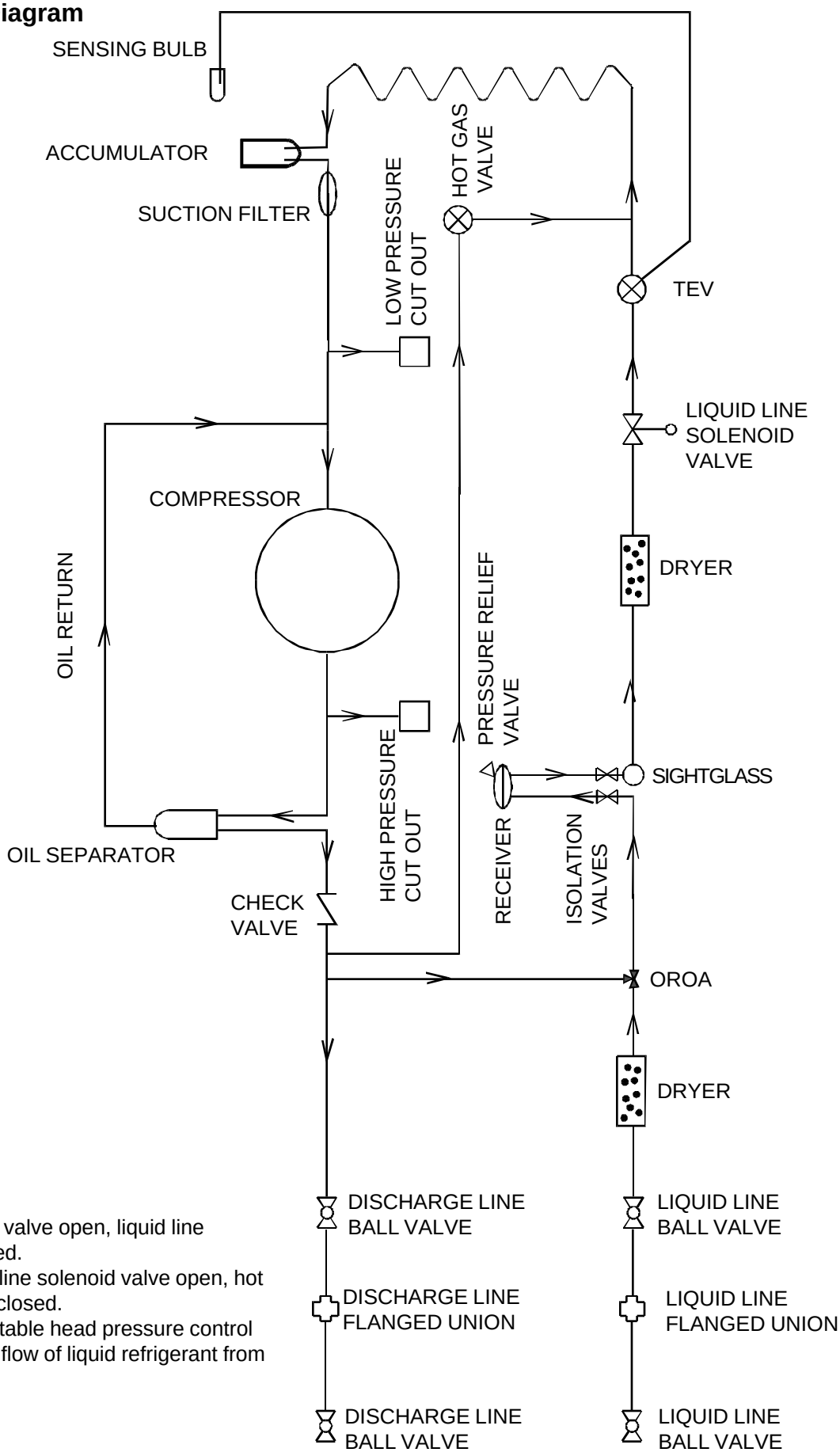
After installation, an on-site inspection and certification by a NESLAB service technician is required to validate the warranty on the refrigeration system components.

If any additional requirements are found during the inspection, NESLAB will submit a written report to you. After the requirements are satisfied, an additional follow-up inspection may be arranged.

During any follow-up inspection NESLAB will also double check all circulation lines connecting the base unit to your application, and make sure the circulation system has been properly filled with fluid. Once verified that the base unit has been properly connected to your application, NESLAB will start the unit. It is extremely beneficial to have your application operable at the time of the initial start up. This will allow NESLAB to ensure the system meets its specifications and make any necessary adjustments.

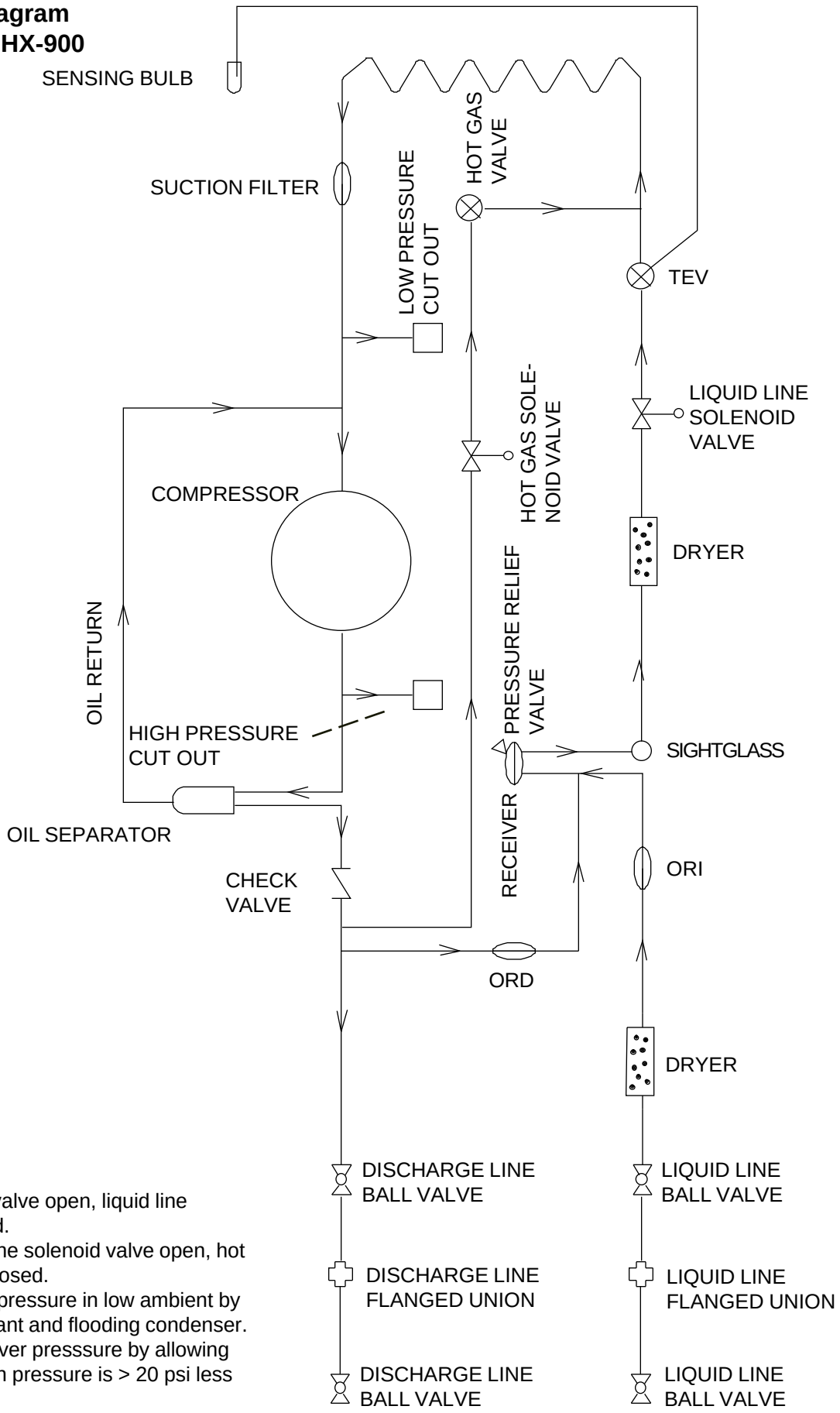
Contact our Customer Service Department at our Headquarters in New Hampshire for complete information concerning any inspection visit cost.

Refrigeration Diagram
HX-150



Idle Mode: Hot gas valve open, liquid line solenoid valve closed.
Cool Mode: Liquid line solenoid valve open, hot gas solenoid valve closed.
OROA: A nonadjustable head pressure control valve that limits the flow of liquid refrigerant from the condenser.

Refrigeration Diagram
HX-200 through HX-900



Idle Mode: Hot gas valve open, liquid line solenoid valve closed.
Cool Mode: Liquid line solenoid valve open, hot gas solenoid valve closed.
ORI maintains head pressure in low ambient by holding back refrigerant and flooding condenser.
ORD maintains receiver presssure by allowing hot gas to enter when pressure is > 20 psi less than discharge.

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 recision 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.