

RTE Series Refrigerated Baths/Circulators

NESLAB Manual P/N 000258
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Instruction and Operation Manual



NESLAB online

Product Service Information, Electronic Catalog,
Applications Notes, MSDS Forms, e-mail.

(603)427-2490

Set modem to 8-N-1 protocol, 1200 - 14400 baud

Voice Info: (800) 4-NESLAB

Comments on this manual can be sent to:

NESLAB@lifesciences.com

or visit our Web page at:

<http://www.neslabinc.com>

RTE-Series Refrigerated Bath/Circulator 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. The 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 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, contact our Sales Department. If your unit fails to operate properly, or if you have questions concerning spare parts or Service Contracts, contact our Customer Service Department. Before calling, please obtain the following information from the unit's serial number label:

- *BOM number* _____
- *Serial number* _____

Section I 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.

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

Transport the unit with care. Sudden jolts or drops can damage the refrigeration lines. The units weigh approximately: RTE-111, 86 pounds (390 kilograms); RTE-211, 99 pounds (45 kilograms); RTE-221, 106 pounds (48 kilograms). Units should be transported with equipment designed to lift these weights.

Observe all warning labels.

Never remove warning labels.

Never operate damaged or leaking equipment.

Never operate the unit without bath fluid in the bath.

Never use pure ethylene glycol as a bath fluid. A minimum 80/20 mixture of Ethylene Glycol and tap water is allowed.

For 220 - 240 volt units supplied without a line cord, use a harmonized (HAR) grounded 3-conductor cord, type H 0 5 V V - F , with conductors listed below. A suitable cord end is required for connecting to the equipment (see unit socket) and must terminate with an IEC approved plug for proper connection to power supply.

NON-BOOST HEATER UNITS	Nominal 1.0 mm² cross section rated 10 Amps Unit Socket: IEC - 320 C13
BOOST HEATER UNITS	Nominal 1.5 mm² cross section rated 16 Amps Unit Socket: IEC - 320 C19

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

Always empty the bath before moving the unit.

Never operate equipment with damaged line cords.

Refer service and repairs to a qualified technician.

In addition to the safety warnings 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, personal injury or death.

Section II General Information

Description

The RTE-Series Refrigerated Bath/Circulators are designed to provide temperature control for applications requiring a fluid work area or pumping to an external system.

Units consists of a non-CFC air-cooled refrigeration system, circulation pump, seamless stainless steel bath, work area cover, and a temperature controller.

Specifications

Temperature Range¹

Analog controller

Digital controller

Temperature Stability^{2,3,4}

Analog controller

Digital controller

Cooling Capacity^{2,5}

Watts

BTU/H

Pump Capacity

Heater (Watts)

60 Hz Models

50 Hz Models

Bath Work Area

(L x W x D)

Inches

Centimeters

Bath Volume

Liters

Case Dimensions

(H x W x D)

Inches

Centimeters

Power Requirements⁶

	RTE-111	RTE-211	RTE-221
Temperature Range ¹ <i>Analog controller</i> <i>Digital controller</i>	-25°C to +100°C -25°C to +150°C		-23°C to +100°C -23°C to +150°C
Temperature Stability ^{2,3,4} <i>Analog controller</i> <i>Digital controller</i>	±0.1°C ±0.01°C		
Cooling Capacity ^{2,5} <i>Watts</i> <i>BTU/H</i>	500 1705		
Pump Capacity	15 lpm at 0' (0 M) 0 lpm at 16' (4.9 M)		
Heater (Watts) <i>60 Hz Models</i> <i>50 Hz Models</i>	800 1000	800 1000	800/800 boost 1000/800 boost
Bath Work Area <i>(L x W x D)</i> <i>Inches</i> <i>Centimeters</i>	4 3/4 x 8 x 6 12.1 x 20.3 x 15.3	9 1/4 x 10 x 6 23.5 x 25.4 x 15.2	9 1/4 x 10 x 9 23.5 x 25.4 x 22.9
Bath Volume <i>Liters</i>	7.0	12.25	20.5
Case Dimensions <i>(H x W x D)</i> <i>Inches</i> <i>Centimeters</i>	25 x 10 5/16 x 15 7/8 63.5 x 26.2 x 40.3	25 x 12 3/8 x 18 3/8 63.5 x 31.4 x 46.7	27 7/8 x 12 3/8 x 18 3/8 70.8 x 31.4 x 46.7
Power Requirements ⁶	115 V, 60 Hz, 12 Amp 220/240 V, 50 Hz, 7.5 Amp	115 V, 60 Hz, 12 Amp 220/240 V, 50 Hz, 7.5 Amp	115 V, 60 Hz, 16 Amp 220/240 V, 50 Hz, 10 Amp

1. Low end temperature for analog and digital 50Hz units is -18°C, -23°C and -21°C respectively.

2. Specifications listed for units operating at +20°C bath temperature, +20°C (+70°F) ambient, with tap water as bath fluid.

3. For operation below 0°C, covering the bath work area may improve stability.

4. For some applications, agitation and stability above ambient may be improved by connecting a small length of hose between the pump connections on the rear of the unit.

5. 50 Hz RTE-111 units have a 375 watt cooling capacity.

6. Power Board Transformer Fuse—Analog T 0.5A 250V (Qty 1), Digital T 0.8A 250V (Qty 2)

[T=Time Delay]

Section III Installation

Site

The indentations on the unit's sides are designed to function as handles. Lift the unit by the handles and locate it on a sturdy work area. Ambient temperatures should be inside the range of +50°F to +80°F (+10°C to +27°C).



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

The unit has an air-cooled refrigeration system. Air is drawn through the front panel and discharged through the rear panel. The unit must be positioned so the air intake and discharge are not impeded. A minimum clearance of 12 inches (30 centimeters) at the front and rear of the unit is necessary for adequate ventilation. Inadequate ventilation will reduce cooling capacity and, in extreme cases, can cause compressor failure.

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

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

Electrical Requirements



Line voltage may be easily accessible inside the pump/control box. Always unplug the unit prior to removing pump/control box cover.

Refer to the serial number label on the rear of the unit to identify the specific electrical requirements of your unit.

Ensure the voltage of the power source meets the specified voltage, $\pm 10\%$.

The unit construction provides extra protection against the risk of electric shock by grounding appropriate metal parts. The extra protection may not function unless the power cord is connected to a properly grounded outlet. It is the user's responsibility to assure a proper ground connection is provided.



For 220 - 240 volt units supplied without a line cord, use a harmonized (HAR) grounded 3-conductor cord, type H 0 5 V V - F , with conductors listed below. A suitable cord end is required for connecting to the equipment (see unit socket) and must terminate with an IEC approved plug for proper connection to power supply.

BOOST HEATER UNITS	Nominal 1.5 mm² cross section rated 16 Amps Unit Socket: IEC - 320 C19
NON-BOOST HEATER UNITS	Nominal 1.0 mm² cross section rated 10 Amps Unit Socket: IEC - 320 C13

Plumbing Requirements



Ensure the unit is off before connecting tubing to the unit.

Hose Connections

The pump connections are located at the rear of the pump box and are labelled PUMP INLET and PUMP OUTLET. These connections are bent upward so the recirculating fluid will drain back into the reservoir when the hoses are disconnected. Both connections are capped with stainless steel serrated plugs.

The pump lines have ¼ inch male pipe threads for mating with standard plumbing fittings. For your convenience stainless steel adapters, ¼ inch female pipe thread to ⅜ inch O.D. serrated fitting, are provided. (To assure proper fit, they should be installed using Teflon® tape around the threads.)

Flexible tubing, if used, should be of heavy wall or reinforced construction. 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.

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

It is important to keep the distance between the unit and the external system 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, make them at the inlet and outlet of the external system, not at the unit.

If substantial lengths of cooling lines are required, they should be pre-filled with bath fluid before connecting them to the unit. This will ensure that an adequate amount of fluid will be in the bath once it is in operation.

Pumping

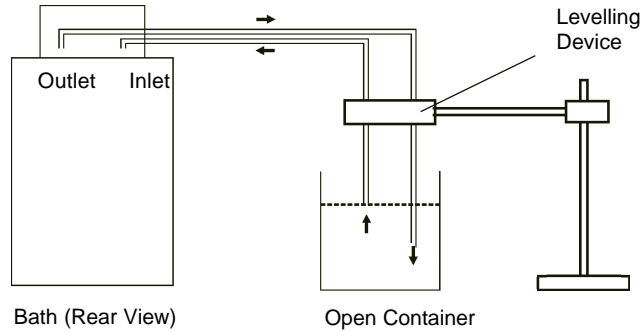
The pump is designed to deliver a flow of 15 liters per minute (4 gallons per minute) at 0 feet head. To prevent external circulation, the PUMP INLET and PUMP OUTLET lines on the rear of the unit are capped. The caps must be removed when external circulation is required.

To properly secure external hose connections to the unit, wrap Teflon® tape around the pipe line threads before installation. Once the hose connections are made, the hoses must be properly plumbed to an external system. *It is important the bath is not in operation until all plumbing is complete.*

NOTE: To increase agitation in the bath when not circulating externally, connect a short loop of hose between the inlet and outlet lines.

If the bath is not used for external circulation or increased agitation, make sure the stainless steel caps are in place prior to operating the bath.

Circulating to an open container



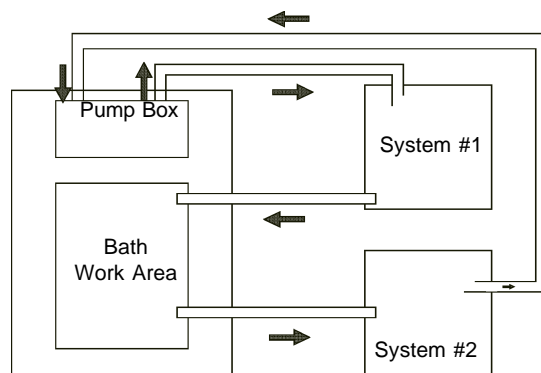
A stainless steel leveling device is available to aid circulation to an open vessel. Contact our Sales Department for more information (see Preface, After-sale Support).

Support the leveling device over the open container with a ringstand. Stagger the tubes in the leveling device so one tube is submerged in the vessel fluid, and the other tube is level with the fluid surface. Connect the deeper tube to the PUMP OUTLET and the shorter tube to the PUMP INLET.

Adjust the flow rate using the accessory flow control valve connected to the PUMP OUTLET, or by partially restricting the outlet tubing. When properly adjusted, the pump inlet will draw an occasional air bubble to prevent over flow, and the pump outlet will force fluid through the submerged tube to prevent aeration of the vessel.

To avoid siphoning the bath work area when the unit is shut off, lift the leveling device out of the vessel and above the level of the unit.

Circulating through two closed loops



Bath (Top View)

The pump can be used to circulate through two closed loop systems. Connect the shortest practical length of flexible tubing from the PUMP OUTLET to the inlet of external system #1. Connect the outlet of system #1 directly into the bath work area. Connect tubing from the bath work area to the inlet of system #2. Connect the outlet of system #2 to the PUMP INLET.

Drain



Ensure the temperature of the bath fluid is safe before draining the unit.

The unit is equipped with a drain located at the back of the unit at the base of the bath. The drain has ¼ inch male pipe threads and is capped with a stainless steel plug. To drain the reservoir simply remove the cap.

To assure proper fit when replacing the cap, be sure to line the threads with Teflon® tape.

Fluids



Never use flammable or corrosive fluids with this unit.

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

Tap water is the recommended fluid for operation from +8°C to +80°C.

For operation from +8°C to -30°C, a 50/50 mixture, by volume, of tap water and laboratory grade ethylene glycol is suggested.

Above +80°C and below -30°C, the user is responsible for fluids used.



Never use pure ethylene glycol as a bath fluid. A minimum 80/20 mixture of Ethylene Glycol and tap water is allowed.

Filling Requirements

The bath work area has a high and low level marker to guide filling. The markers are 1 inch horizontal slits located in the center of the stainless steel baffle separating the work area and the pump assembly. The correct fluid level falls between these two markers. The heating and cooling coils will be exposed and may become damaged if the correct fluid level is not provided.

When pumping to an external system, keep extra fluid on hand to maintain the proper level in both the circulating lines and the external system.



Never run the unit when the work area is empty.

Section IV Controllers

Controllers

Two standard temperature controllers are available with the unit: Analog and Digital. This section explains the installation and operation of the controllers.

Start Up

Before starting the unit, check all electrical and plumbing connections and make sure the work area has been properly filled with bath fluid.

To start 115V units press the I/O switch on the side of the controller to the **I** (power on) position. The pump will start and the POWER LED will light.

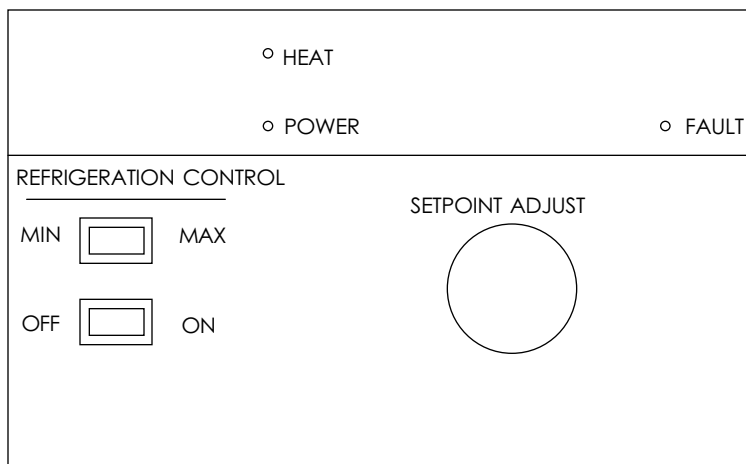
220V units have a circuit breaker instead of a switch. The circuit breaker is labeled **I** (power on) and **O** (power off). Ensure the circuit breaker is in the **I** position.

Two switches operate the REFRIGERATION system: ON/OFF and MIN/MAX. The REFRIGERATION switch should be ON for normal operation below 50°C. Above 50°C turn the REFRIGERATION switch ON only if you need a rapid cool-down.

We recommend you use MAX for operation between 0°C and 30°C.

MIN is for normal operation below 0°C and for maintaining temperature consistency in applications with low heat loads. MIN must be used for operation above 30°C.

The HEAT LED indicates the status of the heater. As the temperature of the fluid in the bath approaches the temperature setpoint, the lamp will cycle on and off to indicate the approximate duty cycle of the heater.



Analog Controller

Analog Temperature Adjustment

Units with Analog temperature controller are equipped with a glass tube thermometer. Insert the thermometer in the grommet located on the left side of the work area.

To adjust the bath temperature, turn the dial to the desired setpoint. Use the bath thermometer to make fine adjustments to the bath temperature.

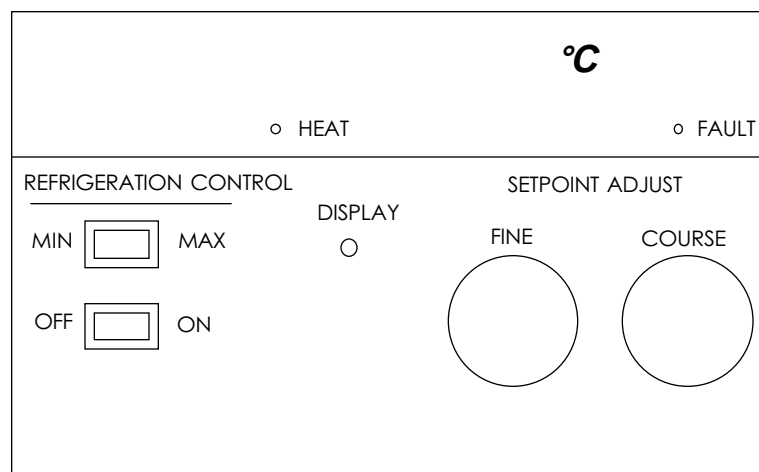
When the unit is shut off wait approximately five minutes before restarting. This allows time for the refrigeration pressures to equalize. If the pressures are not allowed to equalize, the compressor will short-cycle (clicking sound) and no cooling will occur.

Digital Temperature Adjustment

To display the temperature setpoint, press the DISPLAY switch. To adjust the setpoint, press and hold the DISPLAY switch and turn the COARSE and FINE dials until the temperature setpoint is indicated on the LED display.

NOTE: Inadvertent movement of the COARSE and FINE dials, regardless of the position of the DISPLAY switch, will result in a change of the setpoint. The change will not be immediately reflected on the LED display unless the DISPLAY switch is pressed. The display will eventually change as the unit responds to the new setpoint.

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.



Digital Controller

RTE-221 Boost Heater

All RTE-221 models have a boost heater. The boost heater is designed to provide additional heat to the unit's large work area to aid rapid heating.

To start the heater place the BOOST HEAT switch, located on the front of the temperature controller, to the ON position. Even though the switch automatically returns to the OFF position, the boost heater will start to function. (You can verify this by observing the fluid temperature rising.) The boost heater automatically ceases operation when the setpoint is reached.

If the REFRIGERATION switch is ON, placing the BOOST HEAT switch to ON automatically turns the refrigeration system off. The refrigeration system will restart once the boost heater turns off. Therefore, if you do not require the refrigeration system, the REFRIGERATION switch should be placed to OFF before turning the boost heater on.

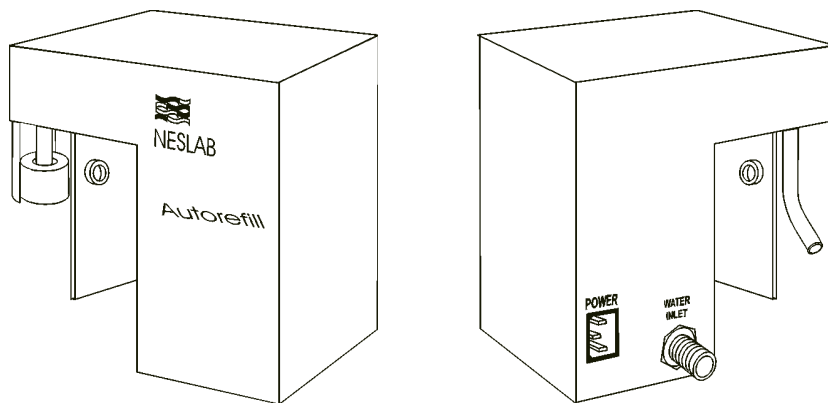
Autorefill (Optional)

An optional autorefill device is designed to maintain the correct level of cooling fluid in the reservoir. The device consists of a float switch and a solenoid valve. If the cooling fluid level falls, the float switch will open the solenoid valve and allow make-up fluid to fill the reservoir. Once the cooling level reaches the proper level, the float switch will rise and the solenoid valve will close.

The plumbing connection for the autorefill device, labeled WATER INLET, is located on the rear of the autorefill assembly. The connection is 3/8 inch OD stainless steel. Remove the nut and install the tubing from your make-up fluid source. Reinstall the nut and tubing on to the connection.

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

The autorefill device requires its own source of electrical power. The connector for the line cord (provided with the assembly) is also located on the rear of the autorefill device. The connector is labelled POWER.



Autorefill Device

High Temperature/ Low Liquid Level Safety

To protect your application, the adjustable High Temperature/Low Liquid Level Safety (HIGH TEMP/LOW LEVEL) ensures the heater will not exceed temperatures which can cause serious damage to your unit. A single temperature sensor, located on the heater coils in the bath, monitors both conditions. A High Temperature/Low Liquid Level fault occurs when the temperature of the sensor exceeds the set temperature limit.

In the event of a fault, the unit will shut down. The cause of the fault must be identified and corrected before the unit can be restarted.

The safety on single heater systems is not preset and must be adjusted during initial installation.

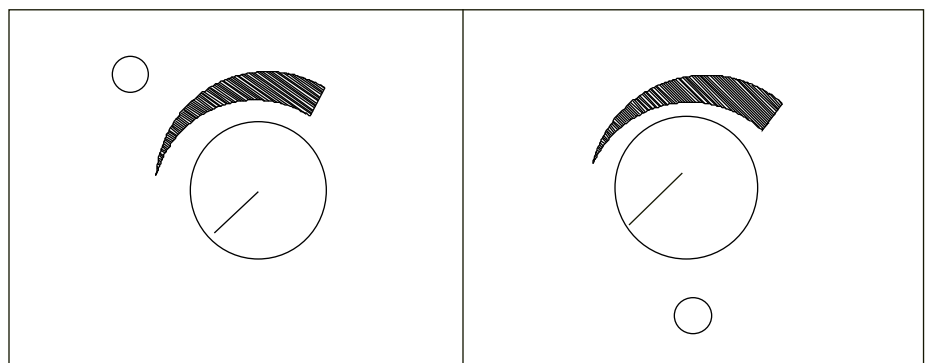
Units with a boost heater have an additional nonadjustable safety located behind the main safety. It has a red reset button but no adjustment knob.

To set the safety, locate the HIGH TEMP/LOW LEVEL SAFETY adjustment dial on the right side of the pump box. Turn the dial fully clockwise and press the red RESET switch located next to the adjustment dial. **NOTE:** On units without a reset switch turn the I/O switch off then back on.

Start the unit. Adjust the setpoint for a few degrees higher than the highest desired fluid temperature and allow the bath to stabilize at the temperature setpoint. Turn the HIGH TEMP/LOW LEVEL SAFETY dial counter-clockwise until you hear a click and the unit shuts down. The red FAULT LED on the temperature controller will light to indicate a fault has occurred.

Cool the bath and then, without moving the adjustment dial, press the red RESET switch or turn the I/O switch off then back on.

NOTE: For units with a reset switch, the minimum high temperature safety setting is 50°C. For units without a reset switch the safety has a temperature range of 0°C to 180°C.

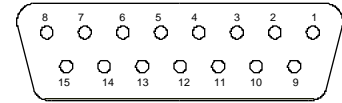


High Temperature/Low Liquid Level Safety Options
(Some units do not have a reset switch.)

15-Pin Accessory Connector

Digital units are equipped with a 15 pin D-subminiature female receptacle on the right side of the power box. An ENABLE/DISABLE switch is located just below the receptacle. Place the switch to the ENABLE position to control the bath via the receptacle connection. (The sensor temperature and setpoint, pin 7 and 8, can be read with the switch in either position.) The pin-out information is listed below.

Pin #	Function
1	Chassis ground.
2	No connection.
3	Span +. Indicates the maximum setpoint value the unit can be set to operate. The temperature scale is 10mV/°C, referenced to analog ground, pin 6 (example: +350mV = +35.0°C).
4	Span -. Indicates the minimum setpoint value the unit can be set to operate. The temperature scale is 10mV/°C, referenced to analog ground, pin 6 (example: +50mV = +5.0°C).
5	No connection.
6	Analog ground. The analog ground is physically separated from the power ground throughout the unit. To prevent offsets that result from ground currents, the analog and power grounds are only connected at the unit's power supply. Analog ground should only be used as a reference pin.
7	Sensor temperature (current limited through 2.7K OHM resistor). The fluid temperature, as measured by the controller's sensor located in the reservoir, can be read at this pin. The temperature scale is 10mV/°C, referenced to analog ground, pin 6 (example: +150mV = +15.0°C).
8	Setpoint out. The present temperature setpoint can be read at this pin. The temperature scale is 10mV/°C, referenced to analog ground, pin 6 (example: +150mV = +15.0°C).
9	Power Ground.
10	No connection.
11	No connection.
12	Digital display (input only). An external voltage can be displayed on the operator panel digital display by applying the voltage to this pin. The display has a low input resistance and a full scale rating of ±1.99VDC. Input is referenced to analog ground, pin 6. The maximum voltage applied to the display should be limited to ±2VDC.
13	- 5V. Power supply of -5VDC (15mA maximum).
14	+5V. Power supply of +5VDC (50mA maximum).
15	Setpoint in. The temperature setpoint can be controlled by applying a known voltage to this pin. The temperature scale is 10mV/°C, referenced to analog ground, pin 6 (example: +230mV = +23.0°C).



15 pin D-subminiature female receptacle

NOTE: With the switch in the ENABLE position and no input to pin 15, the bath will slowly go to the setpoint value set on the digital controller.

Section V Maintenance



To avoid electrical shock, disconnect the mains cord prior to removing any access panels or covers.

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

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

Periodic vacuuming of the condenser is necessary. To access the condenser the front grille must be removed.



The unit must be turned off before the front panel is removed.

RTE-111 units have a one-piece grille assembly. Pull forward to remove.

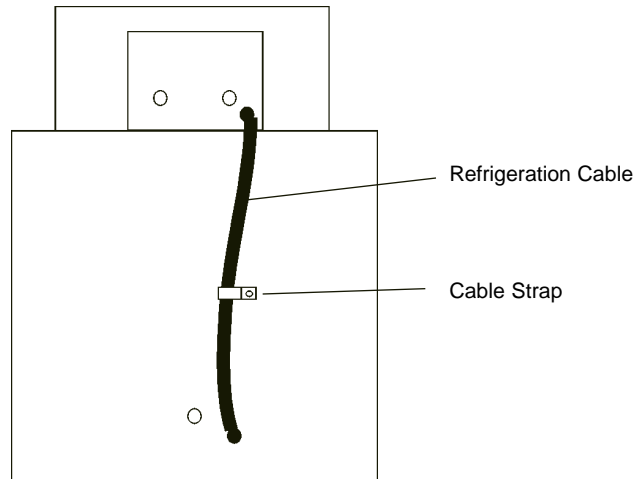
RTE-211 and RTE-221 units have a two piece grille assembly. First remove the left (blue-colored) section by simply pulling it forward. Pull forward on the remaining (white-colored) section to remove it.

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

Reservoir Cleaning

Routine cleaning can be achieved by simply sponging down the seamless stainless steel tank with tap water. (Dish washing detergent may be used but the tank must be thoroughly rinsed.)

To gain access to the entire reservoir the pump box and reservoir cover should be removed.



Remove the line cord from the rear of the unit and then remove the four screws (two on each side) securing the reservoir's cover.

To get slack on the refrigeration cable, remove the cable strap. The cable itself does not need to be disconnected.

Turn the cover assembly over and carefully place it on a supporting platform.

Algae

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

NESLAB recommends the use of Chloramine-T, one gram per gallon.

Section VI Troubleshooting

Checklist

Unit will not start

Make sure the voltage of the power source meets the specified voltage, $\pm 10\%$. Refer to the serial number label on the rear of the unit to identify the specific electrical requirements of your unit.

Check the High Temperature/Low Liquid Level Safety. If the FAULT light is on, make sure the fluid level in the bath is between the marks in the baffle and the HIGH TEMP/LOW LEVEL SAFETY setting is greater than the fluid temperature. Push the RESET switch(es), or, for units without reset switches, turn the I/O switch off then back on, and attempt to restart.

Loss of cooling capacity

Check the position of the REFRIGERATION switch.

Be sure the cooling capacity of the unit has not been exceeded if circulating to an external system.

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.

Proper ventilation is required for heat removal. Make sure ventilation through the front and rear panels is not impeded and the panels are free of dust and debris.

Ice build up on the cooling coils can act as insulation and lower the cooling capacity. Raise the temperature of the bath to de-ice the cooling coil and increase the concentration of non-freezing fluid.

No external circulation

Check for obstructions, kinks, or leaks in the circulation tubing.

Circulation will cease when the pump head has been exceeded.

Service Assistance and Technical Support

If, after following these troubleshooting steps, your unit fails to operate properly, contact our Customer Service Department for assistance (see Preface, After-sale Support). In addition to arranging warranty service, our Service Department can provide you with a wiring diagram and a complete list of spare parts for your unit. Before calling, please obtain the following:

Part number

Serial number

Voltage of unit

Voltage of power source

Appendix A International Quick Reference Guides

RTE - Serie Kurzbedienungsanleitung

Installation

Das Gerät verfügt über ein luftgekühltes Kühlsystem. Die Luft wird an der Vorderseite angesaugt und strömt an der Rückseite aus. Das Gerät muß so plaziert werden, daß der Luftstrom nicht behindert wird. Bei ungenügender Ventilation wird die Kühlleistung reduziert und kann in extremen Situationen zu einem Ausfall des Kühlsystems (Kompressors) führen.

Aufstellorte mit hoher Staubentwicklung sollten vermieden werden, und es sollte eine regelmäßige Reinigung des Gerätes durchgeführt werden. Um einwandfrei zu funktionieren, muß das Gerät große Luftmengen durch den Kondensator ansaugen. Bei Staub- und Schmutzablagerungen auf dem Kondensatorheizkörper kommt es zu einem Verlust von Kühlleistung.

Das Gerät behält seine maximale Kühlleistung bis zu einer Umgebungstemperatur von ca. +24°C.

Vergewissern Sie sich, daß die Spannung Ihrer Stromanschlüsse mit der für das Gerät vorgesehenen Spannung übereinstimmt ($\pm 10\%$).

Die Schlauchanschlüsse (1/4 Zoll MPT) des Gerätes befinden sich an der Rückseite und sind mit PUMP INLET und PUMP OUTLET bezeichnet. Entfernen Sie die Kappen, falls externe Zirkulation gewünscht wird. Schließen Sie den PUMP OUTLET-Anschluß an den Eingang Ihres Instruments und den PUMP INLET-Anschluß an den Ausgang Ihres Instruments an.

Füllen Sie das Reservoir bis zu einem Stand, der zwischen den horizontalen Markierungen liegt, die auf dem Blech markiert sind, das den Arbeitsbereich von der Pumpeneinheit trennt.

Verwenden Sie niemals entflammbare oder Korrosion verursachende Flüssigkeiten. Die gewählte Flüssigkeit muß eine Viskosität von maximal 50 Centistokes bei der niedrigsten möglichen Arbeitstemperatur haben. Für den Betrieb im Arbeits-Temperaturbereich von +8°C bis +80°C empfiehlt NESLAB Leitungswasser als Kühlmittel.

Wenn sie zu einem externen System zirkulieren, sollten Sie zusätzliche Kühflüssigkeit zur Hand haben, um den Kühflüssigkeitsstand in den Zirkulationsleitungen und dem externen System beibehalten zu können.

Betreiben Sie das Gerät niemals mit leerem Arbeitsbereich!

Inbetriebnahme

Vor Inbetriebnahme des Gerätes vergewissern Sie sich bitte, daß die elektrischen Anschlüsse und die Rohr- u. Schlauchanschlüsse sachgemäß installiert sind und daß das gesamte System mit Kühflüssigkeit gefüllt ist.

Geräte, die bei 220 Volt betrieben werden, verfügen über einen Stromkreisunterbrecher auf der Rückseite des Gerätes. Vergewissern Sie sich, daß dieser auf ON gestellt ist. Um das Gerät einzuschalten, müssen Sie den I/O-Schalter auf „I“ stellen. Die Power-Lampe leuchtet auf, wenn das Gerät in Betrieb ist. Um das Gerät abzuschalten, muß der I/O-Schalter auf „O“ gestellt werden.

Bei Normalbetrieb unter +50 °C sollte der REFRIGERATION-Schalter auf ON gestellt werden. Die MIN-Einstellung ist für den Normalbetrieb bei unter 0 °C und bei +30 °C bis +50 °C. Verwenden Sie die MAX-Einstellung beim Betrieb bei 0 °C bis +30 °C.

Die HEAT-LED-Anzeige zeigt den Status des Heizelements an. Sie leuchtet auf, wenn das Heizelement arbeitet. Wenn die Arbeitstemperatur den gewünschten Setpoint erreicht, blinkt die LED-Anzeige, um den ungefähren Arbeitsrhythmus des Heizelements anzuzeigen.

Nach dem Ausschalten des Gerätes sollten Sie vor dem Wiedereinschalten ca. 5 Minuten warten, damit das Kühlsystem einen Druckausgleich durchführen kann. Beachtet man diese Wartezeit nicht, kommt es zu kurzen Schaltfrequenzen des Kompressors und eine Kühlung ist nicht möglich.

Einstellung der Analog-Temperatursteuerung

Um die Temperatur einzustellen (setpoint), drehen Sie den SETPOINT ADJUST-Schalter an der Vorderseite des Gerätes auf die gewünschte Temperatur.

Einstellung der Digital-Temperatursteuerung

Um sich den Temperatur-Setpoint anzeigen zu lassen, drücken Sie den DISPLAY-Schalter und halten Sie ihn gedrückt. Um den Temperatur-Setpoint einzustellen, drücken Sie den Display-Schalter, halten diesen, und drehen gleichzeitig den SETPOINT ADJUST-Schalter so lange, bis die gewünschte Temperatur in der Digitalanzeige angezeigt wird. Wenn die Temperatur eingestellt ist, lassen Sie den Display-Schalter los. Die Digitalanzeige zeigt dann die Temperatur der Kühflüssigkeit im Reservoir an.

Wartung

Überprüfen Sie regelmäßig die Kühflüssigkeit im Reservoir. Sollte eine Säuberung notwendig sein, spülen Sie das Reservoir mit einer speziellen Reinigungsflüssigkeit, die mit dem Umlaufsystem und der Kühflüssigkeit kompatibel ist.

Das Kühlmittel sollten Sie regelmäßig erneuern. Wenn Sie das Gerät bei niedrigen Temperaturen betreiben, erhöht sich mit der Zeit der Wasseranteil in der Kühflüssigkeit. Dies führt zum Verlust von Kühlkapazität.

Vor Ersetzen der Kühflüssigkeit erhöhen Sie bitte die Betriebstemperatur des Gerätes so weit, daß die Kühlspulen eisfrei sind.

Regelmäßiges Absaugen des Kondensator-Heizkörpers ist erforderlich. Die Reinigungshäufigkeit hängt von der Betriebsumgebung ab. Eine monatliche Überprüfung des Kondensators ist empfehlenswert. So werden Sie nach einigen Monaten einen Reinigungsrhythmus gefunden haben.

RTE Kvik reference.

Installation:

Opstilles i rene omgivelser. Dette system er luftkølet, og luften trækkes ind forfra og udledes bagtil, sørg derfor for god cirkulation om instrumentet.

Steder med meget støv skal undgås, og periodisk rensning skal udføres, hvis utilsigtet nedbrud skal undgås. Opbygning af støv vil medføre fald i kølekapaciteten og i værste fald overophedning af systemet.

Check at netspændingen er den nominelle 240V +/- max. 10% og temperatur max. 24° C ved optimal udnyttelse.

Slangetilgang er på bagsiden mærket „Pump inlet“ til indgang på dit emne og „Pump outlet“ på udgangen.

Ledningsvand (ionbyttet) kan anvendes mellem +8 til 80° C, under +8° C skal væsken blandes op med ethylenglycol.

Fyldning af reservoiret foregår ved at fjerne panelet, som er forsynet med fingerskruer, og påfyld egnet rent kølevæske, max 5 cm fra toppen.

Betjening:

Før opstart checkes elektriske forbindelser, slangeforbindelser og væskestand. „REFRIGERATION“ skal være tændt under 50° C. MIN positioner er normalt under 0° C, max fra 0° C til 30° C.

Analog temperatur kontrol:

Drej på knappen mærket C til den rigtige temperatur.

Digital temperatur kontrol:

Setpunktet vises ved at holde „Display“ tasten inde, skal temperaturen ændres drejes herefter på „Adjust“ knappen. Slip „Display“ knappen og aktuel temperatur vises.

Flow kontrol:

Drej på „RECIRCULATING FLOW CONTROL“ + for at åbne og - for at lukke.

Periodisk vedligeholdelse:

Check standen af væske periodisk. Check med mellemrum vakuomet på pumpesiden, rens systemet og check for aflejringer, vækst, utætheder, check vakuumpumpen med kondenser og evt. filtre. Husk åben aldrig instrumentet uden strømmen er afbrudt, og strømkablet er taget ud!

RTE, Handleiding voor snelle installatieprocedure

Installatie

Het apparaat heeft een luchtgekoeld koelsysteem. Lucht wordt aangezogen aan de voorkant van het apparaat en weer vrijgegeven via de achterkant. Plaats het apparaat op een dusdanige manier dat luchttoevoer en afvoer niet worden belemmerd. Inadequate ventilatie kan leiden tot afname van van koelcapaciteit en, in extreme gevallen, tot het niet functioneren van de compressor.

Het is aan te raden stoffige ruimtes te vermijden en de condensor regelmatig schoon te maken. Voor een optimale werking dient via de condensor een voldoende hoeveelheid lucht te circuleren. Een opeenhoping van stof en vuil op de condensor kan leiden tot een verlies van koelcapaciteit.

Het apparaat behoudt haar integrale capaciteit bij een omgevingstemperatuur tot ongeveer +24°C.

Let erop dat de netspanning gelijk is aan het aangegeven voltage, +/- 10%.

De slangaansluitingen zijn bevestigd aan de achterkant van het apparaat en zijn voorzien van het label PUMP INLET en PUMP OUTLET. Deze aansluitingen zijn een 1/4 inch MPT. Verwijder de pluggen indien externe circulatie gewenst is. Bevestig de PUMP OUTLET aan de ingang van uw applicatie. Bevestig de PUMP INLET plug aan de uitgang van uw applicatie.

Vul het reservoir tot het volgende niveau: tussen de horizontale markeringen op de roestvrijstalen scheidingsplaat, die de werkruimte van het pompgedeelte scheidt.

Gebruik nooit brandbare of andere koelvloeistoffen, die het toestel kunnen aantasten. De vloeistof die u gaat gebruiken moet een viscositeit hebben van 50 centistokes of minder bij lage temperatuurwerking. Kraanwater wordt in het algemeen aanbevolen wanneer men met temperaturen werkt van +8°C. tot +80°C.

Wanneer men wil circuleren naar een extern systeem, dient u altijd extra vloeistof achter de hand houden om het juiste vloeistofniveau, zowel in het interne als het externe gedeelte van het systeem, te handhaven.

Gebruik het apparaat nooit wanneer het reservoir leeg is.

Operationeel gebruik

Alvorens het apparaat in gebruik te nemen, dient u eerst alle elektrische- en slangaansluitingen te controleren. Tevens dient u te controleren of het systeem gevuld is met koelvloeistof.

220 Volt apparaten hebben een z.g. "circuit breaker" aan de achterkant van het apparaat. Controleer of deze in werking is gesteld. Om het apparaat te starten, gelieve de de I/O knop aan de zijkant van het apparaat te draaien naar de I positie. Het lampje zal oplichten als indicatie dat het systeem in werking is gesteld. Om het apparaat uit te zetten, gelieve de I/O knop naar de O positie te draaien.

Voor dagelijks gebruik, dient de "REFRIGERATION" knop op "ON" te staan voor temperaturen beneden de 50°C. De "MIN" positie wordt gebruikt voor een normaal arbeidsproces beneden de 0°C. en van 30°C. tot 50°C. Gebruik de "MAX" positie voor temperaturen van 0°C. tot 30°C.

Het "HEAT LED" duidt de actuele status van het verwarmings-element aan. Het zal oplichten indien het verwarmingselement in werking is gesteld. Als de ingestelde temperatuur de setpoint heeft bereikt, zal de LED aan en uit gaan om het proces van de heater aan te duiden.

Wanneer het apparaat uitgeschakeld is, gelieve 5 minuten te wachten alvorens u het apparaat weer in werking stelt. Deze tijd is nodig om de koeldruk gelijk te stellen. Indien dit niet gebeurt, zal short-cycle binnen de compressor optreden (klikkend geluid) en er vindt geen koeling plaats.

Analog Controller Temperature Adjustment

Om de temperatuur setpoint aan te passen, draai de Setpoint adjust knop aan de voorkant van het apparaat naar de gewenste temperatuur.

Digital Controller Temperature Adjustment

Om de temperatuur setpoint af te kunnen lezen, houdt u de "DISPLAY" knop ingedrukt. Om de temperatuur setpoint aan te passen, houdt u de "DISPLAY" knop ingedrukt en draait u de "SETPOINT ADJUST" knop, totdat de gewenste temperatuur setpoint af te lezen is van de display. Als de setpoint is aangepast, kunt u de "DISPLAY" knop weer loslaten. De display zal nu de temperatuur weergeven van het koelvloeistof in het reservoir.

Periodiek Onderhoud

De vloeistof in het reservoir dient regelmatig gecontroleerd te worden. Indien reiniging noodzakelijk is, zal het reservoir schoongespoeld moeten worden met een vloeistof, welke verenigbaar is met het koelsysteem en de koelvloeistof.

De koelvloeistof dient regelmatig vervangen te worden. Wanneer u werkt bij lage temperaturen, zal de concentratie van het water in de koelvloeistof gedurende die periode toenemen, wat kan leiden tot verlies van koelcapaciteit.

Alvorens u de koelvloeistof vervangt, dient u de operationele temperatuur van het apparaat te verhogen om de koelspiralen vrij te maken van ijs.

Het periodiek reinigen van de condensor is noodzakelijk. Het aantal malen dat dit moet gebeuren hangt af van de omgeving waar het apparaat staat opgesteld en wordt gebruikt. Wij raden een algemene maandelijkse inspectie van de condensor aan na de installatie. Na enkele maanden zal duidelijk zijn hoe vaak men het apparaat dient te reinigen.

Kortfattad Bruksanvisning för RTE serie

Installation

Maskinen har ett luft kylt kylnings system. Luft tas in på framsidan av maskinen och släpps ut på sidan och baksidan av maskinen. Ställ maskinen så att intaget och uttaget inte är blockerade. Otillräcklig ventilation leder till minskad kylningskapacitet och i vissa fall kan kompressorn gå sönder.

Undvik dammiga områden och rengör maskinen periodvis. För att fungera ordentligt måste mycket luft passera genom kondensorn. Damm och smuts i kondensorn leder till minskad kylningskapacitet.

Maskinen har full kylningskapacitet upp till en temperatur av +75°F (24°C).

Röranslutning finns på baksidan av maskinen och har följande beskrivning: SUPPLY och RETURN. Anslutningarna är 1/4 inch MPT. Ta bort de skyddande plast bitarna från röranslutningarna. Anslut SUPPLY kopplingen till intaget av din anordning och RETURN kopplingen till uttaget.

Lösgör skruvarna och ta bort luckan för att fylla tanken. Ta bort tank pluggen och fyll tanken med ren kylnings vätska.

Använd aldrig eldfarliga eller frätande vätskor. Vätskan måste ha en viskositet av 50cST eller mindre vid den lägsta användnings temperaturen. Vanligt kran vatten är den rekommenderade vätskan vid en temperatur mellan +8°C och +80°C. Under +8°C måste en vätska som inte fryser användas. En blandning av vanligt vatten och etylenglykol (laboratorie kvalitet) föreslås.

Ha extra vätska redo om din anordning kräver det så att den rätta nivån behålls i cirkulations systemet.

Användning

Kontrollera alla elektriska och alla rör anslutningar innan maskinen startas. Se till att cirkulations systemen har fyllts med vätska.

220V maskiner har en ström brytare på baksidan av maskinen. För att starta maskinen, sätt I/O knappen på sidan av maskinen på I. Lampan lyser för att visa att maskinen är på. Sätt knappen på O för att stänga av den.

Under normal användning bör REFRIGERATION

knappen vara på när maskinen används under 50°C. MIN används när temperaturen är under 0°C och mellan 30°C och 50°C. Använd MAX från 0°C till 30°C.

Sätt start knappen på ON för att starta maskinen. COOL och IDLE på framsidan visar statusen på kylningssystemet. Cool lyser när värme tas bort från köldmedlet. När temperaturen närmar sig den förbestämda önskade temperaturen kommer de två att växla.

Efter att maskinen stängts av, vänta 5 minuter innan maskinen sätts på igen för att låta kylningstrycken att utjämnas. Ingen kylning kommer att utföras om inte trycken tillåts att utjämnas.

Analog Kontroll, Temperatur Ändring

För att ändra den önskade förbestämda temperaturen, vrid °C knappen på framsidan av maskinen tills den önskade temperaturen är nådd.

Digital Kontroll, Temperatur Ändring

Håll Display knappen intryckt för att visa den önskade temperaturen. Håll Display knappen intryckt och vrid Adjust knappen för att ändra den önskade temperaturen. Släpp Display knappen efter att den önskade temperaturen visas på kontroll panelen. Temperaturen på vätskan i tanken visas nu på kontroll panelen.

Periodiskt Underhåll

Inspektera vätskan i tanken periodiskt. Om rengöring är nödvändigt, spola tanken med en rengörings vätska som är förenlig med cirkulationssystemet och kylvätskan.

Kylvätskan bör bytas periodvis. När enheten används vid låga temperaturer kommer vätskans koncentration av vatten att öka vilket leder till minskad kylningskapacitet.

Periodisk rengöring av kondensorn är nödvändig. Hur ofta rengöring är nödvändig beror på miljön. Vi rekommenderar en visuell inspektion av kondensorn varje månad.

NOTICE D'UTILISATION

BAINS RTE

INSTALLATION

Ces appareils ont un condenseur refroidi par air. L'air est aspiré sur le devant et rejeté à l'arrière et sur les côtés. Positionner l'appareil afin que l'admission et l'émission ne soient pas obstruées. Une ventilation insuffisante serait la cause d'une réduction de la capacité de refroidissement, voir, d'une défaillance du compresseur.

Une zone excessivement poussiéreuse; un nettoyage périodique est recommandé. En mode de fonctionnement, l'appareil aspire de l'air à travers le condenseur. De la poussière et des particules sur la grille atténueraient sa capacité de refroidissement.

L'appareil conserve sa pleine puissance de refroidissement sur une plage de température allant de l'ambiante à + 24°C.

S'assurer que l'alimentation électrique soit celle requise à $\pm 10\%$.

Les connections sont situées à l'arrière de l'appareil et sont étiquetées " PUMP INLET " et " PUMP OUTLET ". Ces connections sont en inox d'un diamètre 3/8eme de pouce. Retirer les embouts en inox si vous souhaitez recirculer. Enficher le connecteur " PUMP OUTLET " à l'entrée de votre équipement et le connecteur " PUMP INLET " à la sortie.

Remplir le réservoir à un niveau compris entre les deux graduations " maxi " et " mini ".

Ne pas utiliser de liquide inflammable, corrosif, ou dont la viscosité serait inférieure à 50 centistokes aux températures les plus basses. Pour un fonctionnement entre 8 et 80°C, l'eau du robinet est la plus indiquée. En phase d'amorçage (au début de la recirculation), rajouter rapidement du liquide. Ne jamais l'utiliser sans liquide ou en dessous du niveau minimum.

Ces bains sont équipés d'un robinet de vidange situé à l'arrière.

MISE EN ROUTE

Vérifier les connections électriques, les tuyaux d'eau ainsi que le niveau de remplissage.

Les modèles en 220V ont un interrupteur général à l'arrière. Vérifier qu'il est sur " on ", placer l'interrupteur sur la position 1. La pompe, ainsi que le système de réfrigération se mettent en route. Le contrôleur de température numérique indique la température dans le bain. Pour éteindre, mettre l'interrupteur sur la position 0.

Le témoin lumineux " heat " indique que le bain fonctionne en mode " chauffage ". Quand la température approche de celle souhaitée, la diode s'éteint et s'allume.

Après avoir éteint l'appareil, attendre au moins cinq minutes avant de le rallumer, pour un bon équilibrage des pressions. Autrement, le cycle au niveau du compresseur serait trop bref et le refroidissement n'aurait pas lieu.

REGLAGE DU CONTROLEUR DE TEMPERATURE ANALOGIQUE

Tourner le potentiomètre situé à l'avant jusqu'à ce que la température désirée coïncide avec la graduation.

REGLAGE DU CONTROLEUR DE TEMPERATURE NUMERIQUE

Pour afficher la température souhaitée, maintenir appuyé l'interrupteur et tourner le bouton de réglage jusqu'à ce que la température souhaitée soit affichée. Relâcher ensuite l'interrupteur. L'affichage indique alors la température du fluide dans le réservoir.

MAINTENANCE PREVENTIVE

Vérifier régulièrement le fluide dans le réservoir,

Changer de temps à autre le liquide utilisé,

En cas de nettoyage, rincer avec un produit de lavage compatible,

Aux basses températures, la concentration en eau a tendance à augmenter ce qui peut générer une perte de puissance de refroidissement,

Avant de changer de liquide, recirculer à une température plus élevée pour réchauffer le serpentin,

Nettoyer régulièrement selon les conditions de travail la grille d'aspiration du condenseur. Nous recommandons d'effectuer la première inspection du condenseur un mois après l'installation,

PROCEDIMIENTOS DE OPERACION DE REFERENCIA RAPIDA

PARA LA SERIE RTE

INSTALACION

La unidad tiene un sistema de refrigeración por aire. El aire es dirigido hacia el frontal de la unidad y se descarga por la parte trasera y lateral. Sitúe la unidad para no impedir la entrada y descarga. Una ventilación inadecuada causará una reducción en la capacidad de enfriamiento y, en casos extremos, un fallo en el compresor.

Deben evitarse las zonas excesivamente polvorosas y debe instituirse un calendario de limpiezas periódicas. Para un funcionamiento adecuado, la unidad necesita empujar una cantidad sustancial de aire a través de un condensador. Un cúmulo de polvo o residuos en las aletas del condensador ocasionaría una pérdida de capacidad de enfriamiento.

La unidad retendrá su capacidad completa en temperaturas ambiente de hasta aproximadamente + 24 °C.

Asegúrese de que el voltaje de la fuente de energía sea igual que el voltaje especificado, +/- 10%.

Las conexiones de tuberías están situadas en la parte trasera de la unidad y están marcadas como PUMP INLET y PUMP OUTLET. Estas conexiones son 1/4" MPT. Saque las tapas cuando requiera circulación externa. Conecte el adaptador PUMP OUTLET a la entrada de su aplicación. Conecte el adaptador PUMP INLET a la salida de su aplicación.

Llene el reservorio a un nivel entre los marcadores horizontales situados en la puerta de acero inoxidable que separa la zona de trabajo de la bomba.

No utilice nunca fluidos inflamables o corrosivos. El fluido elegido debe tener una viscosidad de 50 centistokes o menos a las temperaturas de operación más bajas. Se recomienda agua corriente para funcionar entre + 8 °C a + 80 °C.

Cuando bombee a un sistema externo, tenga fluido extra a mano para mantener el nivel apropiado tanto en las líneas circulantes como en el sistema externo.

Nunca haga funcionar el instrumento con el área de trabajo vacía.

OPERACION

Antes de poner en marcha la unidad, compruebe todas las conexiones eléctricas y de tuberías. Asegúrese de que el sistema circulador se ha llenado con fluido.

Las unidades de 220 V. tienen un cortador de circuito en la parte trasera de la unidad. Asegúrese de que está en posición ON. Para poner en marcha la unidad, ponga el interruptor I/O situado en el lateral de la unidad en posición I. La lámpara Power se iluminará para indicar que el sistema está funcionando. Para apagarlo, ponga el interruptor de encendido en posición O.

Para operación normal, el interruptor REFRIGERATION debe estar en ON por debajo de 50 °C. La posición MIN es para operación normal por debajo de 0 °C y desde 30 °C a 50 °C. Utilice MAX de 0 °C a 30 °C.

El LED HEAT indica la situación del sistema del calentador. Se ilumina para indicar que el calentador está funcionando. A medida que la temperatura de funcionamiento se aproxima al punto fijado, el LED ciclará para indicar el ciclo de trabajo del calentador.

Cuando se apaga la unidad, espere aproximadamente cinco minutos antes de volver a ponerla en marcha. Esto da tiempo para que las presiones de refrigeración se equalicen. Si no se permite equalizarse las presiones, el compresor se cortocircuitará y no enfriará.

AJUSTE DE LA TEMPERATURA CON EL CONTROLADOR ANALOGICO

Para fijar el punto de ajuste de la temperatura, gire el dial °C situado en el frontal de la unidad hasta la temperatura deseada.

AJUSTE DE LA TEMPERATURA CON EL CONTROLADOR DIGITAL

Para que el punto de ajuste de temperatura aparezca en pantalla, mantenga presionado el interruptor DISPLAY. Para fijar el punto de ajuste de temperatura, mantenga presionado el interruptor DISPLAY y gire el botón ADJUST hasta que la pantalla digital indique el punto de ajuste de temperatura deseado. Una vez fijado el punto de ajuste, suelte el interruptor DISPLAY. La pantalla indicará la temperatura del fluido en el reservorio.

MANTENIMIENTO PERIODICO

Inspeccione periódicamente el fluido del reservorio. Si es necesaria una limpieza, rocíe el reservorio con un fluido de limpieza compatible con el sistema de circulación y el fluido refrigerante.

Antes de cambiar el fluido refrigerante, suba la temperatura de operación de la unidad para descongelar los serpentines de refrigeración.

Es necesario un vaciado periódico de las aletas del condensador. La frecuencia de limpieza depende del entorno en que funciona el aparato. Recomendamos una inspección visual mensual del condensador después de la instalación inicial. Después de varios meses, quedará establecida la frecuencia de limpieza.

Appendix Programming Software

NEScom Software

The NESLAB Communications Software is a user friendly software that allows you to automate your temperature control process. The software includes a 3½" disk, Comprehensive Operator's Manual and a toll-free number to a trained technical staff.

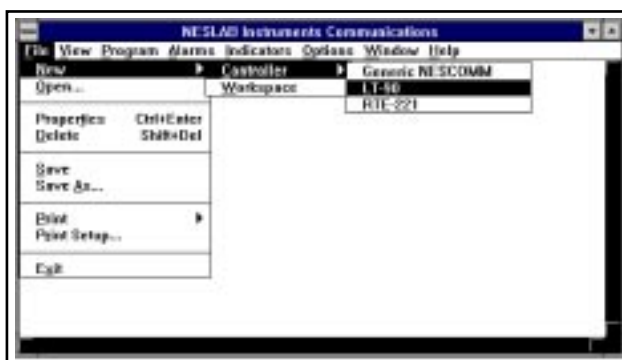
NEScom Software allows you to write custom temperature programs for our Digital or Microprocessor based temperature control apparatus. Choose upper or lower temperature limits and monitor system status with an alarm. NEScom can also record your results on a user selectable graph. NesCom must be used with an IBM or 100% compatible computer.

Select from easy to use product icons.

Create graphs and charts.

Easily configure ramping functions which set the setpoint over time.

View pop-up alarm windows which display if an alarm condition occurred.



Select software functions from the easy to use pull-down menus.



View a virtual controller screen which allows remote monitoring and operation of product control panel.

DeltaTemp

DeltaTemp programming software is now available for free download from NESLAB ONLINE BBS (Bulletin Board System) at 603-427-2490.

DeltaTemp software allows you to write custom temperature programs for NESLAB digital units (any unit with a digital temperature readout AND a 10-15 pin INTERFACE port). The menu-driven program provides a table format for entering temperature parameters and a visual graph confirmation of the program you have designed. Program time can range from 0 to 999 minutes with unlimited looping. Choose upper and lower temperature limits and monitor system status with an audible alarm. DeltaTemp can also record your results on a printed graph or file. DeltaTemp is a DOS program, and requires an IBM or 100% compatible computer.

DeltaTemp may require use of a computer interface device, depending on which NESLAB unit is being used. Refer to the setup diagram in the DeltaTemp folder for full details.

To download the software, go to: CONFERENCES / SOFTWARE / DeltaTemp.

The folder also contains the operating manual, setup diagrams, application notes, and directions on making your own interface cable.

NESLAB ONLINE is a FirstClass® system accessible by general terminal software (Windows Terminal accessory, ClarisWorks Communications, Z-Term, Pro-Comm, or similar).

To use the full graphics and features of the BBS we recommend using FirstClass® Client software. FirstClass® Client is available for Macintosh or Windows platforms. It is available from many sources:

NESLAB ONLINE

Mac: Conferences/Software/Macintosh

Windows: Conferences/Software/Windows

AMERICA ONLINE

Mac: Computing/software center/mac communications forum/industry connection/softarc

Windows: Computing/software center/communications programs

COMPUSERVE:

Mac: TWEUROPA/Teletools/FCMAC.ZIP

Windows: PCBBS/BBS programs/FC300.EXE

WORLD WIDE WEB

<http://www.softarc.com/try.htm>

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.