HYDRONIC SPACE HEATING MODELS

(FOR SPACE HEATING APPLICATIONS)

OWNER'S MANUAL

READ THE GENERAL SAFETY SECTION BEGINNING ON THE NEXT PAGE AND THEN THIS ENTIRE MANUAL BEFORE INSTALLING OR OPERATING THIS UNIT. IF YOU DON'T FOLLOW THESE SAFETY RULES, THE UNIT MAY NOT OPERATE PROPERLY AND COULD CAUSE, SERIOUS BODILY INJURY, PROPERTY DAMAGE AND/OR DEATH.

READ YOUR WARRANTY. WARRANTY OF YOUR UNIT WILL DEPEND ON PROPER INSTALLATION AND OPERATION. THE WARRANTY SHALL BE VOID IF THE UNIT HAS BEEN ALTERED IN ANY WAY WHATSOEVER. THE MANUFACTURER OF THIS HEATER WILL NOT BE LIABLE FOR ANY DAMAGES DUE TO FAILURE TO COMPLY WITH THE INSTALLATION AND OPERATING INSTRUCTIONS OUTLINED ON THE FOLLOWING PAGES.

THE INSTALLATION MUST CONFORM TO ALL INSTRUCTIONS IN THIS MANUAL AND TO ALL LOCAL AND NATIONAL CODES.

IF YOU HAVE ANY QUESTIONS OR REQUIRE ANY ASSISTANCE WITH THE INSTALLATION OF THIS UNIT, PLEASE CALL OUR CUSTOMER SERVICE DEPARTMENT AT THE NUMBERS LISTED BELOW. PLEASE HAVE THE INFORMATION LISTED BELOW WHEN CALLING :

SERIAL #: _____ MODEL #: _____ INSTALLATION DATE: _____

SEISCO INTERNATIONAL LIMITED

241 Airtex Dr. • Houston, TX 77090

•Toll Free (888) 296-9293

Phone (281) 876-3300• Fax (281) 876-3338 ●seisco.com

GENERAL SAFETY

SEISCO hydronic space heating models are designed to normal domestic heating applications to a maximum of 145°F.

The unit is supplied with ¾" NPT plumbing connections. Do not use a torch on any pipe connected to the heater, as serious damage will result. Use Teflon tape, ensuring no debris enters the heater. Do not use any petroleum based pipe dope or PVC primers or glue on the unit or any fittings connected to the unit.

Ensure that the plumbing lines are clear of installation debris before connecting the unit.

WARNING

VERIFY THAT THE HEATER HAS THE CORRECT NUMBER OF DEDICATED UNIQUE 208/240V CIRCUITS, USING CORRECTLY RATED WIRES AND CIRCUIT BREAKERS AND THAT CIRCUIT BOARD JUMPERS ARE INSTALLED WHERE NECESSARY. FAILURE TO **GROUND THE SYSTEM** MAY RESULT IN DEATH OR SERIOUS INJURY

WARNING

IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE **DEATH, SERIOUS BODILY INJURY OR PROPERTY DAMAGE**. REFER TO THIS MANUAL FOR ASSISTANCE OR CONSULT QUALIFIED PERSONNEL.

WARNING

HAZARD OF ELECTRICAL SHOCK! BEFORE REMOVING THE COVER OR SERVICING THE UNIT, MAKE SURE THE ELECTRICAL SUPPLY TO THE UNIT IS DISCONNECTED. FAILURE TO DO THIS COULD RESULT IN DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE. DEPENDING ON YOUR INSTALLATION, IT MAY BE NECESSARY TO TURN OFF **MULTIPLE BREAKERS** TO COMPLETELY POWER DOWN YOUR UNIT.

WARNING

WHEN INSTALLING THE UNIT IN ANY AREA WHERE LEAKS OF ANY NATURE COULD CAUSE PROPERTY DAMAGE, A **DRAIN PAN** WITH A 1" MINIMUM DIAMETER DRAIN HOLE AND DRAIN LINE SUFFICIENT TO CONTAIN THE FLOW OF WATER PROVIDED BY THE SUPPLY LINE ***MUST*** BE INSTALLED.

FOR HYDRONIC HEATING APPLICATIONS, A **30-PSI MAXIMUM PRESSURE RELIEF VALVE** WITH DRAIN LINE ***MUST*** BE INSTALLED.

WARNING

QUALIFIED SERVICE PERSONNEL SHOULD ONLY ATTEMPT SERVICE. HAZARD OF ELECTRICAL SHOCK! IMPROPER ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE **DEATH, SERIOUS BODILY INJURY OR PROPERTY DAMAGE**. CONTACT SEISCO FOR ASSISTANCE IN LOCATING QUALIFIED SERVICE PERSONNEL IN YOUR AREA

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INTRODUCTION TO SEISCO

Congratulations on your purchase of the:

SEISCO TANKLESS HYDRONIC SPACE HEATER

You are now in a rapidly growing and highly discriminating group of individuals and businesses that:

- Prefer the freedom of managing ones own lifestyle through technologically advanced equipment
- Have the need and desire for hydronic heating WHEN they want it from an ENDLESS SUPPLY.

SEISCO® Hydronic Technology

- Metal parts used in demanding applications have be replaced with glass fiber reinforced, heat stabilized nylon resin.
- Micro-control has reached a new high level of speed and proficiency

The **SEISCO®** uses a patented* technology that combines and implements the best of both.

Only SEISCO has been able to develop a unit that is highly energy efficient, modular, rust free, scale resistant, and endlessly responsive to the varying demands.

Your **SEISCO®** heater's patented technology represents the culmination of over 10 years and millions of dollars of intensive development and testing.

Congratulations again. We know you are already beginning to enjoy the benefits of your new

SEISCO CONTINUOUS HYDRONIC HEATING SYSTEM

***U.S. Patents**: #6,246,831 issued June 12, 2001;
#6,080,971 issued June 23, 2000;
#5,866,880 issued February 2, 1999;
#5,325,822 issued July, 1994;
#5,216,743 issued June, 1993.

In addition to the U.S. patents, there are many foreign patents issued and in process.

FEATURES & BENEFITS

Your **SEISCO®** is a HYDRONIC HEAT SOURCE. Seisco International Limited is the exclusive manufacturer of the **SEISCO®** line of hydronic heaters. Your new **SEISCO®** may be the last unit you will own. The ten-year limited warranty on the heat exchanger and electronic controls reflect the quality of the unique design, materials and the construction of this unit (READ YOUR WARRANTY). Your **SEISCO®** unit will provide you with a continuous heat for all your hydronic heating requirements.

YOU CAN SAVE MONEY BY NOT WASTING ENERGY

Your **SEISCO®** saves energy by heating only as required. Additional savings can be achieved by insulating the connections to your SEISCO and any accessable heating pipes in your home.

REDUCTION IN SCALING AND MINERAL DEPOSITS

Over a short period of years, a conventional storage tank heater can accumulate large amounts of mineral deposits and scale that are very difficult to remove. This buildup reduces the efficiency of the heater and contributes to the failure of the tank. The use of glass fiber reinforced, heat stabilized nylon resin in molding of the **SEISCO®** chamber body, combined with its patented electronically controlled electrical delivery system, results in marked reduction in scaling and mineral deposits. Any deposits that occur in your **SEISCO®** are easily and completely discharged by occasional removal of the service base plates.

ANOTHER WAY YOU SAVE

Because of the state-of-the-art design, you can expect a long service life from the heater components. All maintenance, even major requirements, including replacement of the electronic control board can easily be diagnosed and completed in minutes. In the unlikely event you do have a problem, the ten year limited warranty (READ YOUR WARRANTY) assures you low cost replacement even for major components.

CONTINUOUS NEVER ENDING HEATING

As long as you need heat, your **SEISCO®** heats, AS YOU NEED IT – CONTINUOUSLY.

ENJOY IT ANYWHERE

Because of its compact, lightweight size, your **SEISCO®** not only saves space, but can be installed anywhere electric service is available - even your second home, ranch, room addition, cabin, casita or pool house.

SAFETY

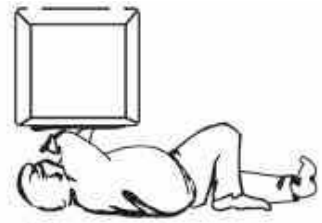
Your **SEISCO®** provides safe operation with multiple safety features. For example: (1) The solid state circuitry provides temperature control, (2) high temperature detection is used to alert the control system and disengage the power supply if overheating occurs, (3) fluid level detector circuitry minimizes the chance of chamber body and element damage when there is not adequate fluid in the **SEISCO®**; (4) In addition to surge suppression circuitry, the high power elements of your unit are automatically disengaged from the main power supply when not in use, (5) built-in leak detector and alarm on the unit can warn you in time to shut off the valves to prevent flooding.

COMPLIANCE LISTINGS

ANSI/UL 834 Listed, US and Canada, "Heating, Water Supply, and Power Boilers - Electric"
U.L. Certified in accordance with NSF/ANSI 372 for Lead Content of Products in Contact with Potable Water
U.L. – NSF Compliance with ANSI Standards 61 & 51
HUD, NEC

DOs & DON'Ts

Your **SEISCO®** is designed for easy maintenance. **AVOID INSTALLATION IN CONFINED SPACES.** Allow at least 18 inches of working space above and below your unit. Installing any water heater in your attic or any other location that is not easily monitored can result in unexpected property damage. Your **SEISCO®**is so small and attractive, you should NEVER need to install it in attics or areas difficult to monitor or service.



WHEN INSTALLING THE UNIT IN ANY AREA WHERE LEAKS OF ANY NATURE COULD CAUSE PROPERTY DAMAGE, A **DRAIN PAN** WITH A 1" MINIMUM DIAMETER DRAIN HOLE AND DRAIN LINE SUFFICIENT TO CONTAIN THE FLOW OF WATER PROVIDED BY THE SUPPLY LINE ***MUST*** BE INSTALLED.

FOR HYDRONIC HEATING APPLICATIONS, A **30-PSI MAXIMUM PRESSURE RELIEF VALVE** WITH DRAIN LINE ***MUST*** BE INSTALLED.

Your **SEISCO®** should require very little maintenance. In areas of hard water, it is advisable annually, to remove its detachable base plates and clean out any mineral deposits from the chambers.

NEVER POUR OR SPRAY LIQUIDS DIRECTLY ON THE UNIT THAT MIGHT ENTER THE CASE, POSSIBLY CAUSING DAMAGE TO YOUR UNIT.

Your **SEISCO®** is designed for safe operation and ease of service. Qualified service personnel must service your unit only. **BEFORE YOUR UNIT IS TO BE SERVICED, ALWAYS TURN OFF ALL MAIN, POWER CIRCUIT BREAKERS TO THE UNIT.** After servicing, always **RUN WATER** through your unit before turning the power on.

YOUR SEISCO® MUST BE INSTALLED AND SERVICED BY QUALIFIED PERSONNEL. DAMAGE TO YOUR UNIT, SERIOUS PERSONAL INJURY OR DEATH MAY OCCUR IF INSTALLED OR HANDLED IMPROPERLY. CARE MUST ALWAYS BE USED TO AVOID ELECTRICAL ACCIDENTS WHEN INSTALLING OR SERVICING. NEVER USE PARTS THAT ARE NOT ORIGINAL EQUIPMENT OR APPROVED ALTERNATE REPLACEMENT PARTS.

Protect your **SEISCO®** from the weather. It is an appliance, and you must avoid installing this **SEISCO®** in unprotected areas where it might be exposed to rain, excess humidity, freezing conditions, etc.

Your **SEISCO®** is designed to operate ONLY when mounted vertically. Do not attempt to mount any other way as permanent damage to your unit will result with possible catastrophic failure and significant water leakage.

INSTALLATION GUIDE

GENERAL

Unpack the unit from the shipping carton carefully. **DO NOT CUT THE SHIPPING CARTON WITH A SHARP INSTRUMENT.** Stand the unit upright and remove the plastic wrap. Locate the four (4) mounting holes in the metal back plate. Position the unit against the wall with the two inlet and outlet fitting tubes pointed up toward the ceiling. Refer to Mounting Clearances in this section of the manual. Make sure the unit is level and attach to the wall with inch or larger lag bolts that are at least 1½ inches long. If attaching to sheet-rock or paneling, anchors or molly bolts should be used to prevent the screws from pulling through the wall. If the unit is to be installed on a cinder block or concrete wall, attach a ½ or ¾ inch section of plywood (20 x 20 inches square) to the wall first, then use wood screws to attach the unit to the plywood.

ATTACHING THE PLUMBING CONNECTIONS

WARNING #1: Always use two wrenches when making any attachments of the supply and return lines. Hold the unit's inlet and outlet fittings secure while attaching the lines. Never attempt to attach the lines to the unit's fittings without using a second wrench to hold the fittings secure. The unit's inlet and outlet fittings are designed to turn freely.

WARNING #2: Never solder plumbing supply and return lines to the unit's fittings. Heat from the soldering may damage the fittings or heat exchanger.

WARNING #3: Do not use Plumber's Putty or PVC/CPVC primer and glue on the threads of the unit's inlet and outlet fittings. Some of the putty compounds on the market are very aggressive and could potentially dissolve the threads on the heater's fittings. PVC/CPVC primer and glue will also dissolve the threads on the heater's fittings. Teflon Tape is the only sealer that should be used on the threads of the inlet and outlet fittings.

DRAIN PAN

If the SEISCO heater is installed in any area where leakage of the tank or connections would result in property damage of any kind, or where such a location is unavoidable, a suitable drain pan MUST be installed. When a drain pan is used, the pan must meet all applicable plumbing codes and be at least 2 1/2" deep, extending not less than 1" above the unit's bottom, must protect an area at least 1-1/2" greater than the lower external dimensions of the heater, and have an unobstructed drain hole of at least 1" in diameter capable of containing the full flow of water to the heater under pressure.

PRESSURE RELIEF VALVE & EXPANSION TANK

FOR HYDRONIC HEATING APPLICATIONS, A **30-PSI MAXIMUM PRESSURE RELIEF VALVE** WITH DRAIN LINE ***MUST*** BE INSTALLED ALONG WITH A PROPERLY SIZED EXPANSION TANK

AIR ELIMINATION

Seisco requires the installation of an active air eliminator with a coalescing medium to trap and eliminate air from the system. The Air separator should be installed immediately before the inlet to the pump. Remove all air from the system by running the pump with the Seisco power off. Do not activate the Seisco until all air has been eliminated.

INSTALLATION GUIDE

SEISCO highly recommends that you contact a mechanical contractor or engineer trained in hydronic space heating design. This manual is designed to give an overview of the issues to be considered when using Hydronic Heaters.

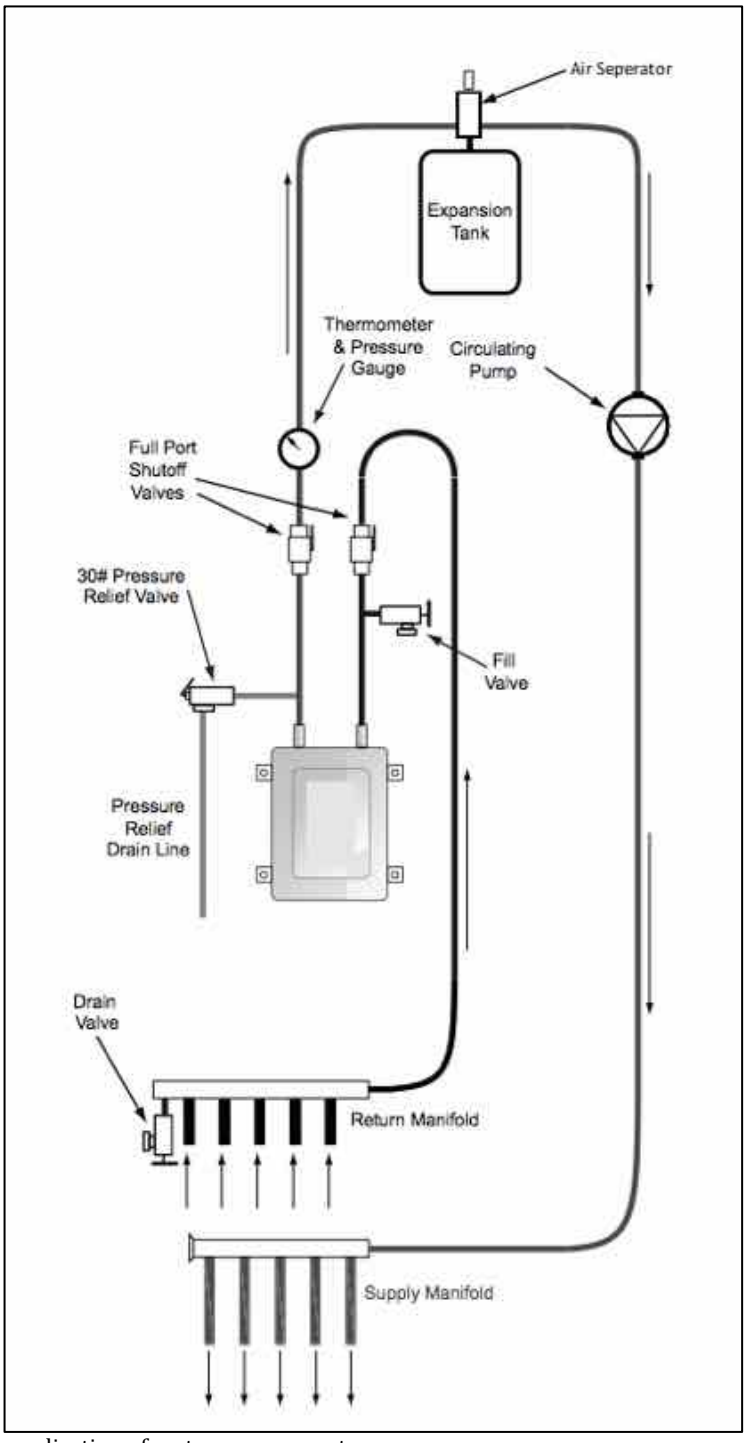
The maximum temperature of the heating fluid from the Seisco Hydronic Heater is 90°F to 145°F. The length of the tubing as well as the spacing determines how much heat is radiated through the surrounding environment. Since PEX tubing lengths can be up to 300 ft. for ½", the amount of surface area is high. With a high surface area for radiating heat, the temperature of the heating fluid can be lowered.

Heat transfer fluid is also a design consideration. Hydronic heating systems may use 100% water or a water propylene glycol mixture, commonly 20-30% but as high as 50%. Composition of the heat transfer fluid affects pressure drop throughout the system. Pressure drop and flow rate determine pump size.

Use radiant tubing manufactured with a barrier to prevent oxygen diffusion. Oxygen diffusion is a process whereby dissolved oxygen permeates the walls of the tubing and enters the heating fluid..

Hydronic piping systems commonly use headers or manifolds as connections for supply and return lines. Headers allow a large amount of heating fluid to be pumped to a common location and then distributed throughout branches or loops of tubing. Electronic control of the entire system is beyond the scope of this manual. *See page 20 for wiring diagram.*

Eliminating air is critical in hydronic space heating systems. Air and oxygen cause corrosion, improper flow of heating fluid throughout the system and a host of other problems. ***Seisco requires the installation of an active air eliminator with a coalescing medium to trap and eliminate air from the system.*** The Air separator should be installed immediately before the inlet to the pump. **Remove all air from the system before activating the seisco.**



Pressure and temperature gauges allow the installer and user a way to monitor the system's operation. Expansion tanks are used to eliminate excessive pressure buildup in the system as the heating fluid expands and contracts due to heating cycles. The size of the expansion tank is based on the amount of fluid the system holds and the temperature rise of the heating fluid. Pressure relief valves serve to protect the system should an overpressure situation occur. They are not designed as a control valve to constantly relieve pressure. Consult with component suppliers for proper application of system components.

A 30-psi maximum pressure relief valve with drain line is required. The discharge from the temperature and/or pressure relief valve should be piped to prevent burn hazards. Water discharged from the relief valve could cause severe burns instantly, scalds, or death. The temperature and/or pressure relief valve must be manually operated once a year to check for correct operation. DO NOT place any other type valve or shut off device between the relief valve and the unit. Do not plug the temperature and/or pressure relief valve and do not install any reducing fittings or other restrictions in the relief line. The relief line should allow for complete drainage of the valve and the line. If a temperature and/or pressure relief valve discharges periodically, contact your installer on how to correct this situation. Do not plug the relief valve.

ELECTRICAL INSTALLATION GUIDE

CONNECTION TO POWER SUPPLY

WARNING:YOUR SEISCO® MUST BE INSTALLED AND SERVICED BY QUALIFIED PERSONNEL. DAMAGE TO YOUR UNIT, SERIOUS PERSONAL INJURY OR DEATH MAY OCCUR IF INSTALLED OR HANDLED IMPROPERLY. CARE MUST ALWAYS BE USED TO AVOID ELECTRICAL ACCIDENTS WHEN INSTALLING OR SERVICING. NEVER USE PARTS THAT ARE NOT ORIGINAL EQUIPMENT OR APPROVED ALTERNATE REPLACEMENT PARTS.

NOTE: THIS UNIT MUST BE INSTALLED TO MEET THE CURRENT NATIONAL ELECTRIC CODE, AND ANY APPLICABLE LOCAL PLUMBING, ELECTRICAL, HEATING AND AIR CONDITIONING CODES**.**

Install wiring (see wiring diagram) from the unit to the Main Power Circuit Breaker Panel. Connect the wiring to the unit as shown on the wiring diagram attached to the inside of the unit's cover.

WARNING

MOST MODELS REQUIRE MULTIPLE POWER SOURCES. WHEN WIRED DIRECTLY TO THE BREAKER BOX, THEY REQUIRE MORE THAN ONE DOUBLE POLE CIRCUIT BREAKER.

RISK OF ELECTRICAL SHOCK. HEATING ELEMENT IS NOT GROUNDED. ALL UNITS CAN HAVE MULTIPLE POWER SUPPLIES. DISCONNECT ALL POWER SUPPLIES BEFORE SERVICING.

IF USING STRANDED WIRE, MAKE SURE THAT ALL STRANDS ARE IN SECURELY PLACED IN THE TERMINAL BLOCK. A LOOSE STRAND IN CONTACT WITH THE CIRCUIT BOARD CAN IMPAIR PERFORMANCE OR DAMAGE THE BOARD.

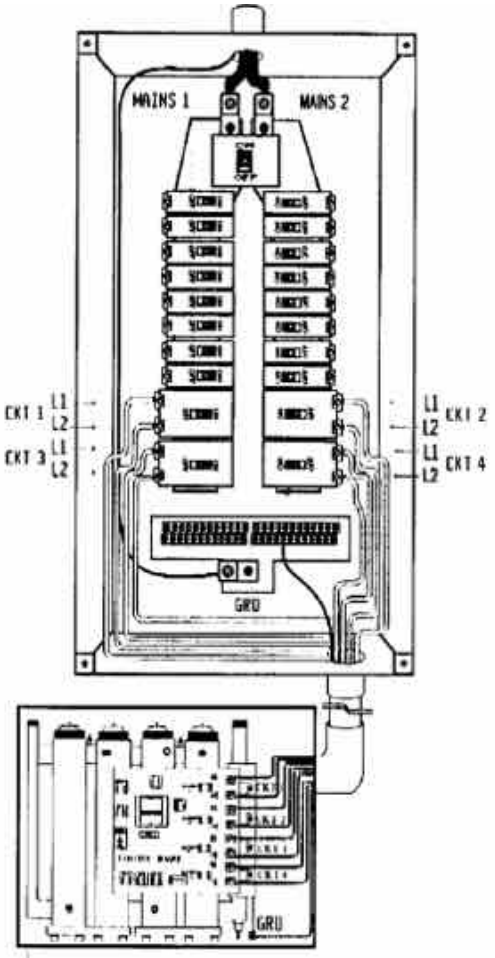
HEATER SUPPLY SIDE CONNECTION

FOR TWO CHAMBER MODELS INSTALLED WITH A SINGLE BREAKER AND WITH JUMPERS INSTALLED ON THE CIRCUIT BOARD, ONE PAIR OF WIRES SHOULD BE ATTACHED WITHIN THE UNIT AT POWER CIRCUIT 1 (CKT 1)-ONE WIRE TO L1 AND ONE WIRE TO L2. FOR TWO CHAMBER MODELS INSTALLED WITH A TWO BREAKERS AND WITH JUMPERS REMOVED (OR FOUR CHAMBER MODELS WITH JUMPERS INSTALLED), A SECOND PAIR OF WIRES MUST ALSO BE ATTACHED AT POWER CIRCUIT 2 (CKT2)- ONE TO Ll AND ONE TO L2.

FOR FOUR CHAMBER MODELS WITH JUMPERS REMOVED, A THIRD AND FOURTH PAIR OF WIRES ARE REQUIRED FOR POWER CIRCUITS 3 AND 4 (CKT 3 & CKT 4).

JUMPERS ARE FACTORY INSTALLED ON SMALLER KW MODELS AND ARE INCLUDED IN THE BOX FOR OPTIONAL INSTALLATION ON LARGER KW MODELS. CONSULT THE WIRING DIAGRAMS OR SEISCO CUSTOMER SERVICE FOR ADDITIONAL INFORMATION.

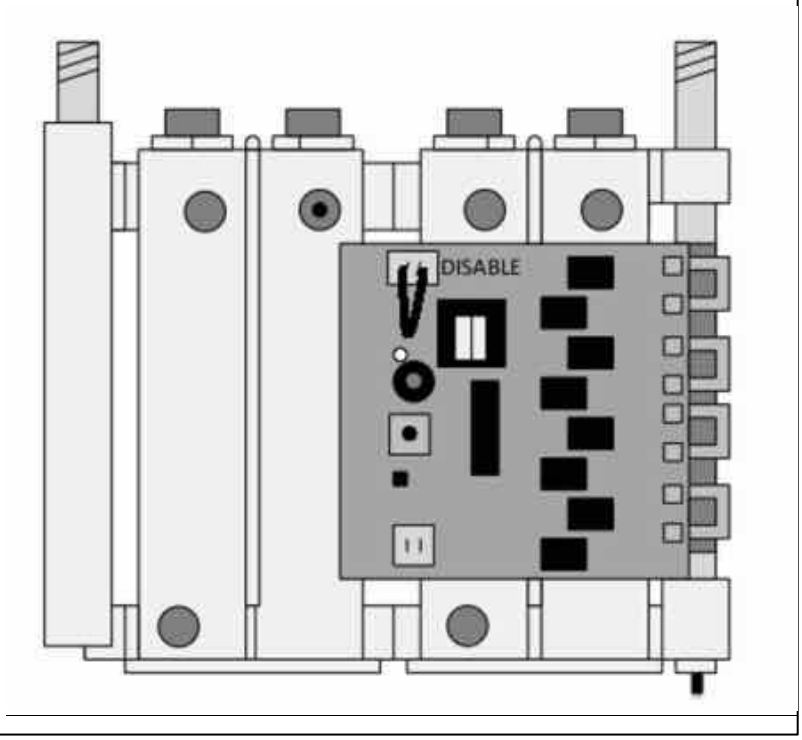
MAIN POWER CIRCUIT BREAKER

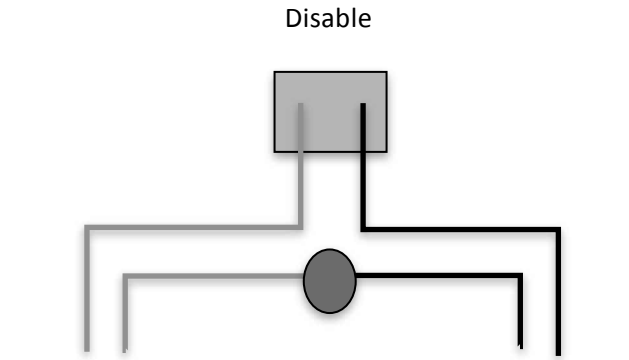


WHERE REQUIRED BY CODE USE A DISCONNECT SWITCH ADJACENT TO THE UNIT. WHEN MAKING THIS TYPE OF INSTALLTION, BE SURE THE MAIN FEEDER WIRES USED ARE PROPERLY SIZED.

DISABLE/CONTROL INSTALLATION GUIDE

DISABLE JUMPER





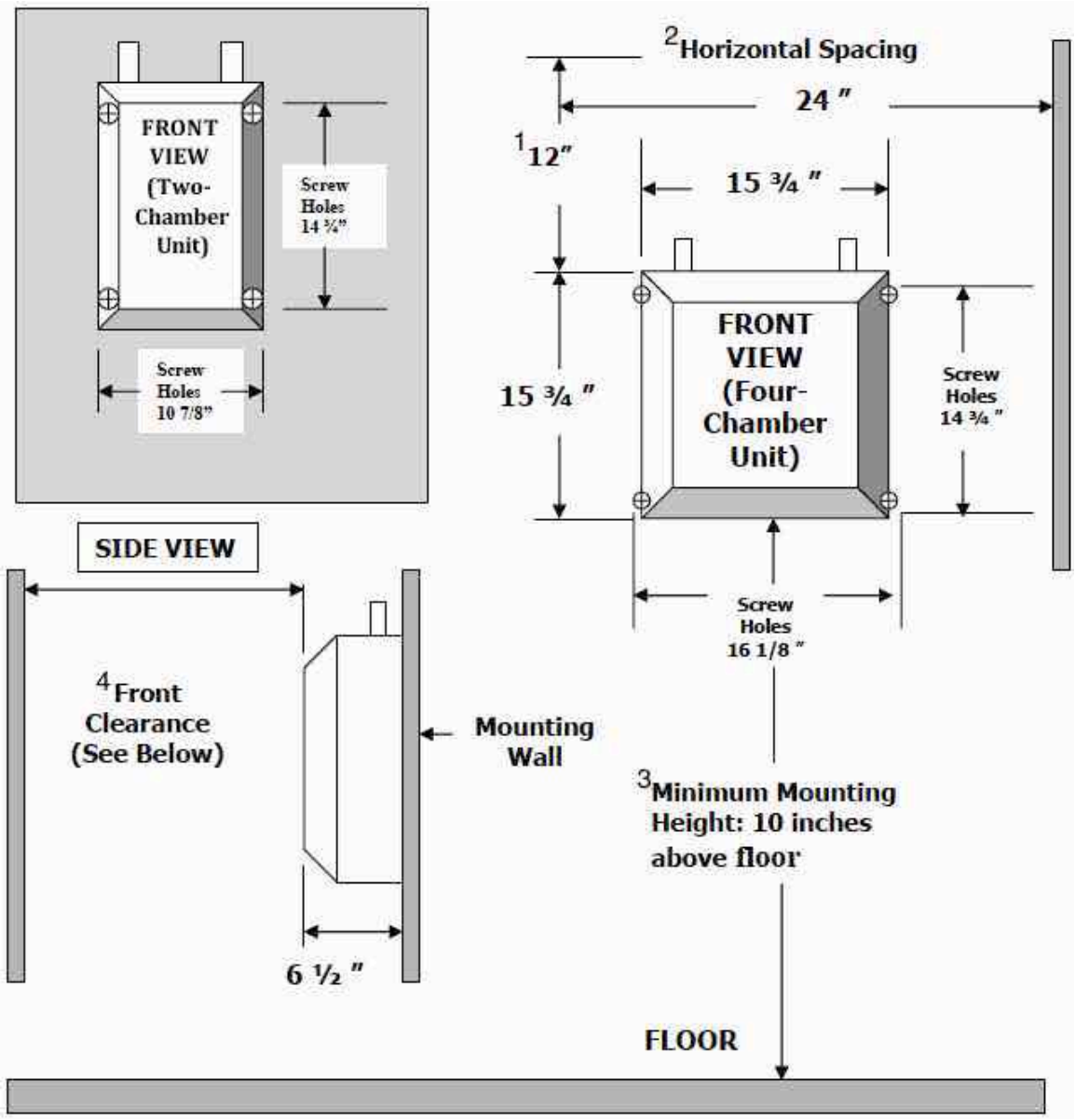
DISABLE CIRCUIT

The factory-installed jumper must remain for the unit to operate without external control. The disable is the blue jumper wire at the top left of the control board shown in the diagram to the left. This circuit can be used to activate utility demand disable of the unit.

Many experienced installers recommend the use of a 3rd Party intelligent zone controller relay system. These 3rd party zone controller relay devices have a 24VAC thermostat connection; 120VAC pump connection and a contact closure for the boiler that is connected to these disable terminals in place of the jumper. Without this functionality, the heater is designed to activate with any fluid movement in the system (even when the thermostat is not calling for heat). Depending on your system design, this may result in more frequent service and higher electric costs.

To use both a utility demand disable and a zone control relay, they must be connected to the terminal in series so that if either contact opens, the heater will turn off. See Figure to the left. . (Both devices must be normally closed non-powered contacts to work correctly and avoid damage to the Seisco or Zone Controller)

SEISCO MOUNTING CLEARANCES



1 **Top Clearance:** For removal of heating elements and to provide room for plumbing connections, a minimum of 12 inches is required.

2 **Side Clearance:** Allow an overall minimum horizontal space for the heater of 24 inches for removal of protective cover screws and access to electrical wires entering the heater from the side.

3 **Mounting Height:** For safety, ease of installation and service, the suggested height above the floor is 42 to 48 inches, (minimum 10 inches). Do not install electrical disconnect or sub-panels below heater as this may interfere with access to the clean out plates located under the heater.

4 **Front Clearance:** In the absence of a door or removal access panel in front of the heater, allow 32 to 36 inch clearance in front of the heater for protective cover removal and ease of service.

START-UP FUNCTIONAL CHECKS

PRE-POWER CHECK

- Verify all power connections and PURGE ALL AIR FROM THE SYSTEM BEFORE ACTIVATING POWER.

POWER CHECK

- Check only after the Pre-Power Check has been completed and the unit filled with water. Turn on the Main Power Circuit Breakers. Verify that the unit's GREEN POWER-ON "FLASHING" indicator light is illuminated.

OPERATIONAL CHECKS

- Activate the pump to create flow through the system. You will hear a "click" as the relays on the circuit board engage. It is normal to hear a "hissing" or "crackling" noise from the heat exchanger after the unit is started.
- USE CARE TO AVOID ANY FLUID OR METAL COMING IN CONTACT WITH THE CIRCUIT BOARD OR POWER SUPPLY WHILE PERFORMING ANY TESTS, ADJUSTMENTS OR MAINTENANCE.

SEISCO PROVIDES ON-BOARD SELF-DIAGNOSTICS

In the event that the LED light continues to flash a red sequence after power-on, then there may be a need for further investigation. The heater's control provides self-diagnostics by emitting a red flashing code. The code definitions and possible solutions can be found in the Troubleshooting section of this Manual.

THE SEISCO HEATER ALERTS THE USER OF LEAKS!

Check equipment connected nearby the unit for the possibility of leaks and spraying onto the unit. It is important to turn off the circuit breakers to the unit whenever a leak is detected to prevent possible damage to the control board. After the leak is discovered and repaired, it is important to dry any moisture or accumulation on the unit. This can be done with a standard household hair dryer or dry towel. Any attempts to dry the unit should be done with all the power off to the unit.

TEMPERATURE ADJUSTMENT

After the unit has been installed and the operational checks are completed, the output of the hot water can be measured and adjusted if necessary. The temperature-adjusting potentiometer can be found on the top of the control board. The factory setting is 120 degrees F. Turning the setting to the left decreases the temperature and turning it to the right increases the temperature.

A QUALIFIED AND LICENSED CONTRACTOR MUST PERFORM THIS INSTALLATION. Refer to your local electrical and plumbing codes for additional information

NOTE: THIS UNIT MUST BE INSTALLED TO MEET THE CURRENT NATIONAL ELECTRICAL CODE, AND ANY APPLICABLE LOCAL PLUMBING, ELECTRICAL, OR HEATING AND AIR CONDITIONING CODES AS WELL AS THE INCLUDED MANUFACTURER'S REQUIREMENTS.

LIMITED WARRANTY

What is covered?

This Warranty covers any defects in materials or workmanship when the product is installed and operated according to these written installation instructions, subject to the terms within this Limited Warranty. This Warranty applies only to products that are installed in accordance with the National Electric Code, all applicable plumbing codes, all local ordinances and regulations and these installation instructions. Improper installation may void this Warranty. This Warranty extends to the original purchaser and subsequent owners, but terminates if the product is reinstalled at a new location.

How long does coverage last?

Initial Warranty Period:

Item	**Period of Coverage**
Tank	Three Years
Electronic Controls	Eighteen Months
Other Electrical Components	One Year
Reasonable Labor Expenses	Up to $95 in the first year

Extended Warranty Period (subject to replacement charge):

Item	**Period of Coverage**
Tank	After Three up to Ten Years*
Electronic Controls	After 18 Months up to Ten Years*
*Subject to replacement charge not to exceed 25% of the current MSRP of the complete product	

Replacements and/or repairs furnished under warranty carry only the unexpired portion of the original warranty or 90 days whichever is longer. *All costs for shipping and handling are NOT included in this warranty including the cost of return.*Seisco may require a deposit to ensure the return of defective parts and units when advance shipping of replacements are requested.

What will Seisco do?

Subject to the terms of coverage listed above, Seisco will repair or replace the product or any part or component that is defective in materials or workmanship and pay reasonable labor charges associated with the repair or replacement of any part or component as set forth as follows. All repair parts must be genuine Seisco parts. All repairs or replacements must be performed by an individual or servicing company that is properly trained, qualified or licensed to do the type of repair. Only Seisco can authorize the replacement of the product. Seisco does not authorize any person or company to assume for it any obligation or liability in connection with the replacement of the product. If Seisco determines that repair of a product is not possible, Seisco will replace the product with a comparable product, at Seisco's discretion. If a component or product returned to Seisco is found to be free of defects in material or workmanship, or damaged by improper installation or damaged during return shipping, the warranty claim for product, parts and labor may be denied.

How do I get service?

You must contact Seisco or a qualified/authorized service provider for the repair of a product under this Warranty. For the name of a qualified/authorized service provider please contact your place of purchase, visit the Seisco website (www.seisco.com), call Seisco at 1-888-296-9293 or write to Seisco at 241 Airtex Drive, Houston, TX 77090. Proof of purchase is required to obtain warranty service. You may show proof of purchase with a dated sales receipt, or by registering within 30 days of purchasing the product. Please mail the registration card to Seisco at the address shown on the card. Receipt of registration by Seisco will constitute proof-of-purchase for this product. However, registration is not necessary in order to validate this Warranty.

What is not covered?

This Warranty does not cover any failures or operating difficulties due to accident, abuse, misuse, alteration, misapplication, force majeure, improper installation, improper maintenance or service, inadequate water quality, scale buildup, freeze damage, or for any other causes other than defects in materials or workmanship. This Warranty does not apply to any product whose serial number or manufacture date has been defaced. This Warranty does not cover any product when used for other than its intended purpose. This warranty does not apply if the unit is not property installed in compliance with the National Electric Code, all applicable plumbing codes, all local ordinances and regulations and these installation instructions.

Seisco is not liable for any special, incidental, indirect or consequential damages that may arise, including damage to person or property, loss of use, failure to install drain pan under unit, or inconvenience. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

Limitation on implied warranties

Any implied warranties of merchantability and fitness arising under state law are limited in duration to three years, unless the period provided by state law is less. Some states do not allow limitations on how long an implied Warranty lasts, so the above limitation may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

WARRANTY CLAIMS PROCEDURE

RETURN MATERIAL AUTHORIZATION (RMA) – Upon verifying that a unit or part is covered under warranty, service personnel must complete a "Return Material Authorization" with the following information:

1. Model and SERIAL NUMBER
2. Name of owner
3. Service address
4. Defective part
5. Date of original installation
6. Customer's replacement parts
7. Shipping address
8. Payment information for Shipping

Replacement unit/parts(s) will be shipped when the unit/part(s) have been received, inspected and verified to be under warranty. Or if the customer desires, the unit/parts will be advance shipped with prepayment immediately. If the unit/part(s) are advance shipped Seisco will reimburse the customer for the cost of the unit/part(s) upon receipt inspection and verification that a defective unit/part is covered by a warranty. SHIPPING COSTS FOR PARTS OR UNITS RETURNED TO THE MANUFACTURER ARE TO BE PREPAID BY CLAIMANT AND SUCH SHIPPING COSTS ARE NOT COVERED IN THE WARRANTY. Return the completed "Return Merchandise Authorization" to Seisco International Limited clearly identifying the unit or part(s) and nature of defect. Any return shipment must have the RMA number clearly marked on the package or it may be refused.

If service personnel have repaired the unit to operable condition with their own inventory, Seisco International Limited, upon receipt of defective parts, will replace or issue credit for those parts verified to be under warranty.

Owner must promptly notify the installing contractor/dealer to obtain service under warranty. Prepare to give the nature of the problem, the model and serial number of the heater, and the date of original purchase. If for any reason the installing contractor/dealer cannot be located or fails to provide satisfactory warranty service, the Owner should contact Seisco International Limited by telephone or mail.

Seisco International Limited
241 Airtex Dr.
Houston, TX 77090
(281)876- 3300
service@seisco.com

REFER TO YOUR MANUFACTURER'S LIMITEDWARRANTY FOR COMPLETE DETAILS

This product was manufactured under quality control guidelines established by the manufacturer. Certification Approvals received by this product after extensive testing were received with the component parts chosen and installed by the manufacturer.

FAIURE TO USE EQUIPMENT, COMPONENT PARTS APPROVED BY THE MANUFACTURER VOIDS ALL WARRANTIES. FAILURE TO USE MANUFACTURER'S APPROVED COMPONENT PARTS MAY RESULT IN BODILY INJURY INCLUDING DEATH AND/OR DAMAGE TO PROPERTY.

TROUBLESHOOTING GUIDE

TROUBLESHOOTING SHOULD ONLY BE PERFORMED BY QUALIFIED AND TRAINED SERVICE CONTRACTORS – CALL SEISCO AT 888-296-9293 FOR ASSISTANCE IN LOCATING A CONTRACTOR IN YOUR AREA.

The Seisco control depends on the temperature information it receives from each of the temperature sensors to detect water flow and maintain proper temperature. If any sensor or its connection to the control board is bad, the unit may not turn on at all or if it does, the temperature may fluctuate. Whenever servicing a unit, the proper operation of the sensors and the control board should **always** be verified regardless of the trouble code. Seisco recommends you follow the pre-service checklist every time you service the unit to verify proper operation and avoid callbacks.

PRE-SERVICE CHECKLIST:

Verify Installation:

- Verify proper plumbing, cold to the inlet, hot to the outlet (Cold is on the right on Signature Models).
- Verify flow rate matches the specifications of the unit (especially at times when incoming water is colder than normal).
- Verify the heater is mounted correctly on the wall with the fittings of the heater on the top. (Fittings must point up on Signature models).
- Make a note of serial number in case you need to contact SEISCO Customer Service.

Tests with Power OFF:

- Verify water flow through the heater. Check that shut off valves are in the open position and that all air has been purged from the heating chamber(s).
- Check the plumbing and the heating chamber for any signs of leaks.
- Check for any loose wires to the control board and verify the power connections are tight. If stranded wire is used, check that all strands are inside the lug. Check high limit switch and reset as necessary (4CH Signature Models only).

Tests with Power ON:

- Verify circuit breaker(s) are turned on and labeled correctly (Signature models can have 2 to 4 breakers).
- Verify power to all circuits connected to the heater. Check the voltage across the lugs labeled L1 & L2 for each circuit.
- Finally, check the control board LED for any diagnostic codes. (Note: the control board will blink red and beep when breakers are turned on, then remain blinking green during normal operation)

HEATER TESTING – TEST WITH POWER OFF AND METER SET TO MEASURE RESISTANCE

COMPONENT	EXPECTED RESULTS
Temperature sensors	Readings should be taken after the unit has been cooled down so that the temperature in the chamber is uniform. Run pump with power off for 5-10 minutes. All sensors should read approximately the same value and not vary more than 10% from each other.
High Limit Switch(es)	Should read zero ohms. If switch with manual reset shows open, press the red reset button and retest. If button feels loose its already set.
Heating Elements	Read across screws at the Red & Black wires. Readings vary depending on wattage
Level Detect(s)	Each contact should read zero ohms to ground.
Moisture Detect Switch	Should normally read open. If closed, check for water leaks or water on the switch pad (mounted on the bottom of the base pan). Correct the leak, dry the switch and retest.

POWER ON TESTS

COMPONENT	TEST	EXPECTED RESULTS
Incoming Power Lugs	Voltage	L1 to L2: 208-240VAC (depending on model); L1 to Ground 110-120VAC; L2 to Ground 110-120VAC.
Heating Element	AMPS	Measure AMPS on wires leading to each element. Typical readings vary depending on element size. (Max reading calculated as element WATTS/Voltage)
Heating Element	AMPS	With power on and pump running, check amps at each element. Power should modulate and amp readings may fluctuate, but readings should be approximately the same across all elements.

TROUBLESHOOTING GUIDE

READING DIAGNOSTIC CODES: The LED status lamp located on the control board will flash a three-part sequence of red flashes, each representing the individual digits of the code. After each sequence, the LED will flash green and then repeat the diagnostic code. THERE MAY BE MULTIPLE CODES SO VERIFY ALL SEQUENCES. Press the small blue mode button on the control board for two seconds, and the speaker will audibly beep the code as it flashes.

DIAGNOSTIC CODES

Code	Description	Action
111 112 113 114 115	TH-IN Sensor TH 1 TH 2 TH 3 TH 4	Turn off all the power to the heater. Cool down the heater by running the pump for about 5 minutes. Check the resistance measurement for all temperature sensors.
117	Shorted Temp Sensor	Indicates sensor is shorted closed. Check wiring, replace as necessary
118	Open Temp sensor	Indicates sensor is open. Check wiring, replace as necessary
121	Disable Switch Open	Install jumper on circuit board or verify operation of demand meter, pump relay or any other device connected to disable circuit
122	High Limit Switches	Turn off all power to the heater. Reset the switch by pushing in the button on the switch itself. Check the switch and brown wires for continuity**. (Check Temperature sensors and run matching procedure before replacing Limit Switch)**
123	Level Detect(s)	Check that the heater is filled with fluid and that there is no air trapped inside. Check operation of Air Separator. If the heater is filled and there are no leaks, connect level detect spades on the board to ground. If code is accompanied with a clicking sound that is present when water is running check the heating elements.
124	High Temperature Shutdown	Code 124 is triggered when the temperature of the water is more than 10 degrees higher than the set point at the last sensor or THIN.
126	Moisture Detect	Immediately shut off all power to the heater. Check for fluid leaks. Completely dry control board before restoring power.
132	High Voltage	Voltages higher than 10% above the nominal rating should be corrected. Code will clear when voltage returns to nominal range.
133	Low Voltage	Low voltage may reduce heating capacity of the heater. Sustained voltages below 20% of the nominal rating may cause the heater to shut down. Code will clear when voltage returns to nominal range.
134 135 136 137	Element #1 Element #2 Element #3 Element #4	Check elements. Check Temperature Sensors. Check Wiring and Breakers. Verify proper heater sizing, if necessary reduce unit temperature from maximum setting.
142	Data Reading Error	The heater needs to be reset. Turn off all breakers to the heater for approx. 30 seconds. Turn on breakers, the LED should flash all green and unit should heat. If the code remains, reset the breakers again. If code persists, test sensors and perform Matching Procedure. If the code does not clear, replace control board and/or sensors.

SENSOR MATCHING PROCEDURE

- Turn off power and run hot water for 5 minutes or until cold. With water running:
- Unplug the brown wire at the limit switch above the left hand corner of the control board.
- Restore power to the unit it will beep four times, and then pause. You will then get one audible beep, a pause, two beeps, a pause, and two beeps.
- Press and hold the blue reset button for approximately 8-10 seconds, then release. You should hear a short, low tone buzz.
- Turn off power; Turn off the water; Reconnect the brown wire to the limit switch.
- Restore power to the unit. You will hear 4 beeps then listen for the unit to "click" (takes up to 45 seconds) then turn on the hot water at a sink and test for temperature and normal operation.

PRODUCT SPECIFICATIONS

PHYSICAL DESCRIPTION

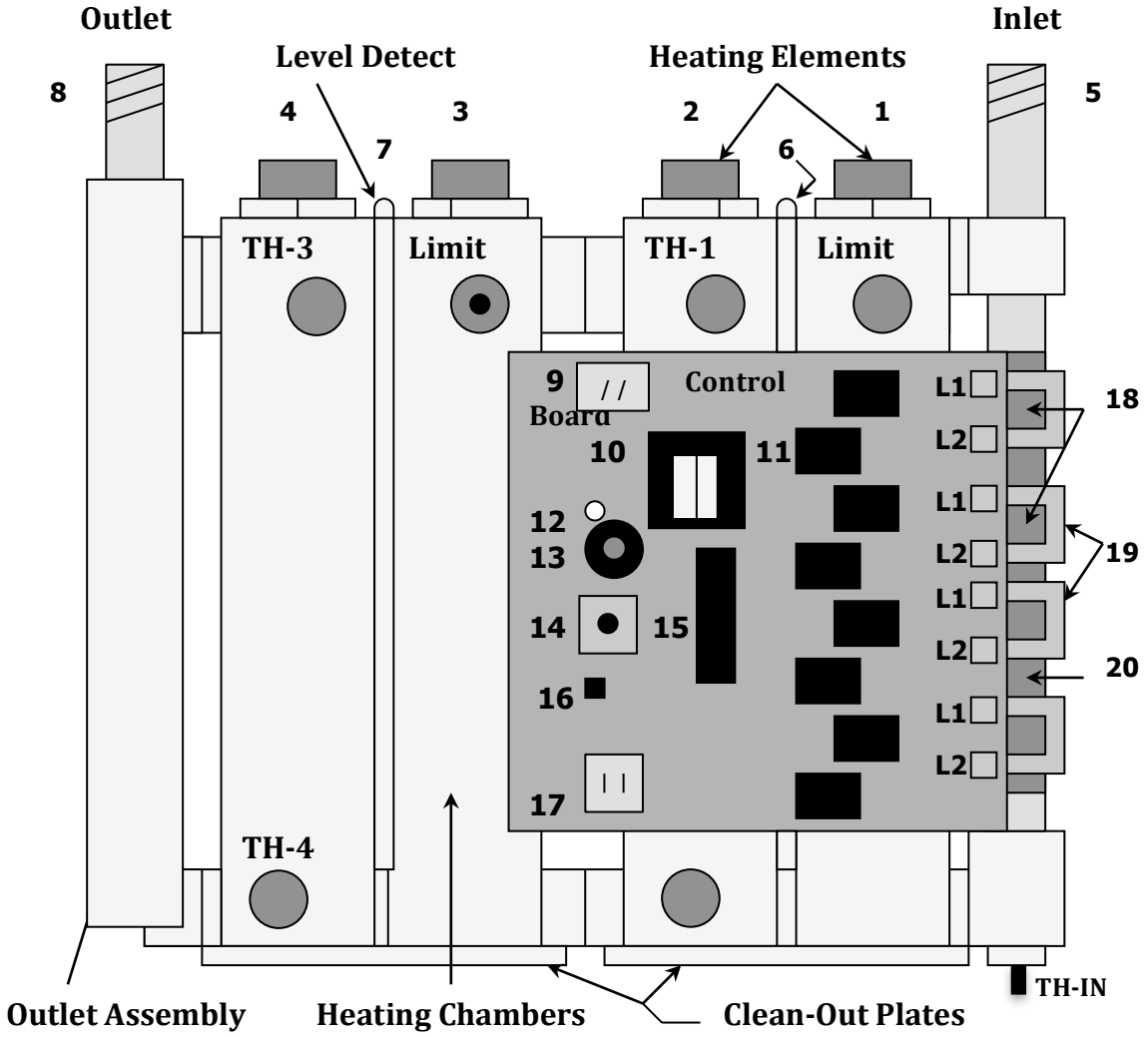
Model & Number	Height	Width	Depth	Pipe Size (NPT)	Approx. Shipping Weight
Two Chamber	15 ¾ "	10 ¼ "	6 ¼ "	¾ "	17 lbs.
Four Chamber	15 ¾ "	15 ¾ "	6 ¼ "	¾ "	23 lbs.

Model & Number	CH	KW	Volts	AMPS	Number of Circuit Breakers , Type & Amp Rating	
					Without Jumpers	With Jumpers
SH-05	2	5	240	21		(1) 2-pole, 30A
SH-07	2	7	240	30		(1) 2-pole, 40A
SH-09	2	9	240	38	*(2) 2-pole, 25A*[1]	(1) 2-pole, 50A
SH-11	2	11	240	46	*(2) 2-pole, 30A*[1]	(1) 2-pole, 60A
SH-14-208	2	14	208	67	*(2) 2-pole, 40A*[1]	(1) 2-pole, 80A
SH-14-4	4	14	240	60	*(2) 2-pole, 40A*[1]	(1) 2-pole, 75A
SH-18	4	18	240	75	*(4) 2-pole, 25A*[1]	(2) 2-pole, 50A
SH-22	4	22	240	92	(4) 2-pole, 30A	*(2) 2-pole, 60A*[1]
SH-28-208	4	28	208	134	(4) 2-pole, 40A	*(2) 2-pole, 80A*[1]
SH-28	4	28	240	117	(4) 2-pole, 40A	*(2) 2-pole, 75A*[1]

[1] Optional wiring method shown in italics – **VERIFY CORRECT JUMPER INSTALLATION** on control board when using a single breaker for two Chamber Models or 2 breakers for Four Chamber models. Be sure to **REMOVE JUMPERS** when using two breakers for two chamber models or 4 breakers for four chamber models. Jumpers are included with heater when not factory installed for use with optional wiring methods.

FOUR CHAMBER MODELS

INTERNAL WORKINGS AND PARTS IDENTIFICATION



LEGEND

1 – Heating Element #1
2 – Heating Element #2
3 – Heating Element #3
4 – Heating Element #4
5 – Inlet Water Tube, ¾" NPT
6 – Water-Level Detect Screw
7 – Water-Level Detect Screw
8 – Outlet Water Tube, ¾" NPT
9 – Disable, Demand Control Jumper
10 – Transformer
11 – Heating Element Relays (8 ea.)
12 – LED Light Indicator
13 – Audible Speaker
14 – Output Temperature Control
15 – Microprocessor Control Chip

LEGEND

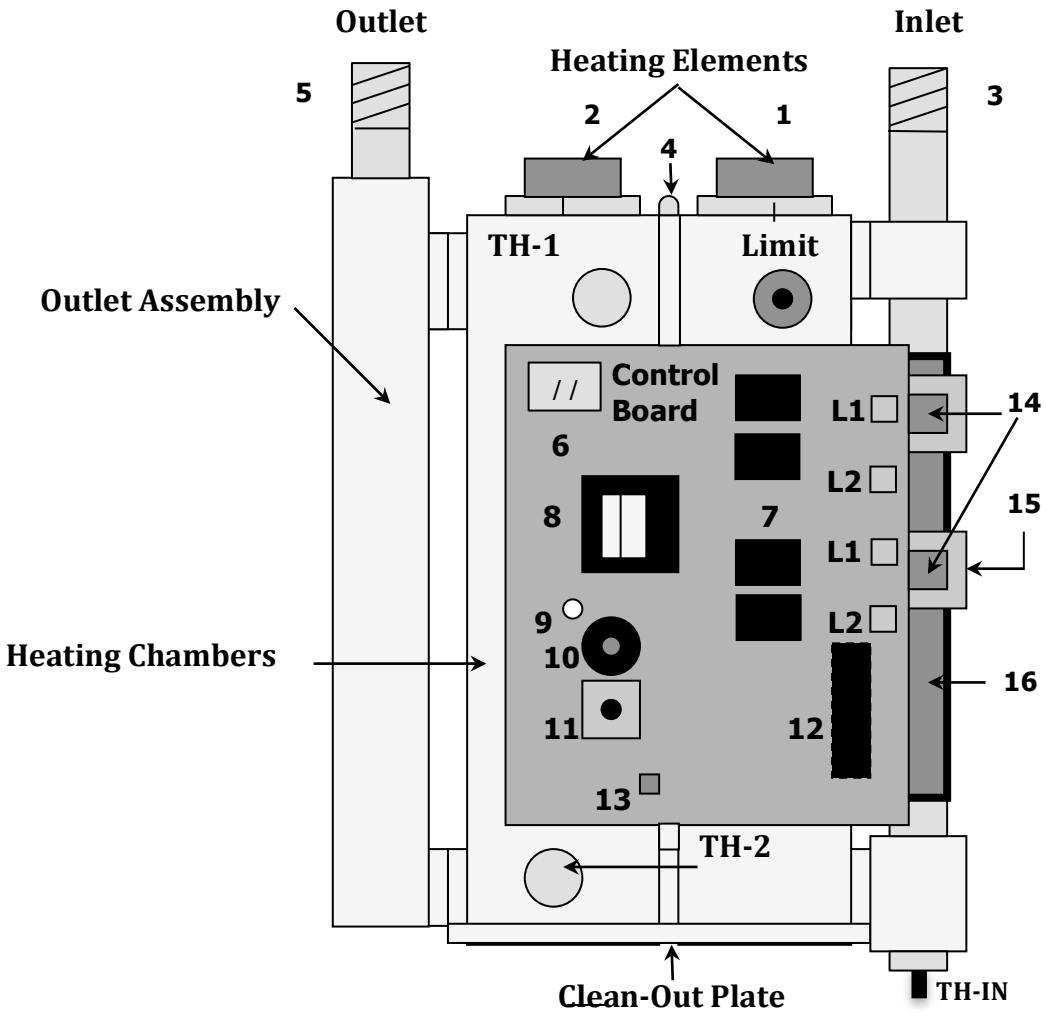
16 - Blue Button; Manual Audible Activation
17 – Terminal Spades for Leak Detect Wires
18 – Triacs (4 each)
19 – Triac Mounting Blocks to Heat Sink (4 ea.)
20 – Copper Heat Sink Tube
L1 – Power Connection Lugs (208 – 240 VAC)
L2 – Power Connection Lugs (208 – 240 VAC)

Limit: Over Temperature Limit Switches (2)

TH-IN: Inlet Temperature Sensor
TH-1: Chamber Temperature Sensor #1
TH-2: Chamber Temperature Sensor #2
TH-3: Chamber Temperature Sensor #3
TH-4: Chamber Temperature Sensor #4

TWO CHAMBER MODELS

INTERNAL WORKINGS AND PARTS IDENTIFICATION



LEGEND

1 – Heating Element #1
2 – Heating Element #2
3 – Inlet Water Tube, ¾" NPT
4 – Water-Level Detect Screw
5 – Outlet Water Tube, ¾" NPT
6 – Disable, Demand Control Jumper
7 – Heating Element Relays (4)
8 – Transformer
9 – LED Light Indicator
10 – Audible Speaker
11 – Output Temperature Control
12 – Microprocessor Control Chip
13 – Blue Button; Manual Audible Activation

LEGEND

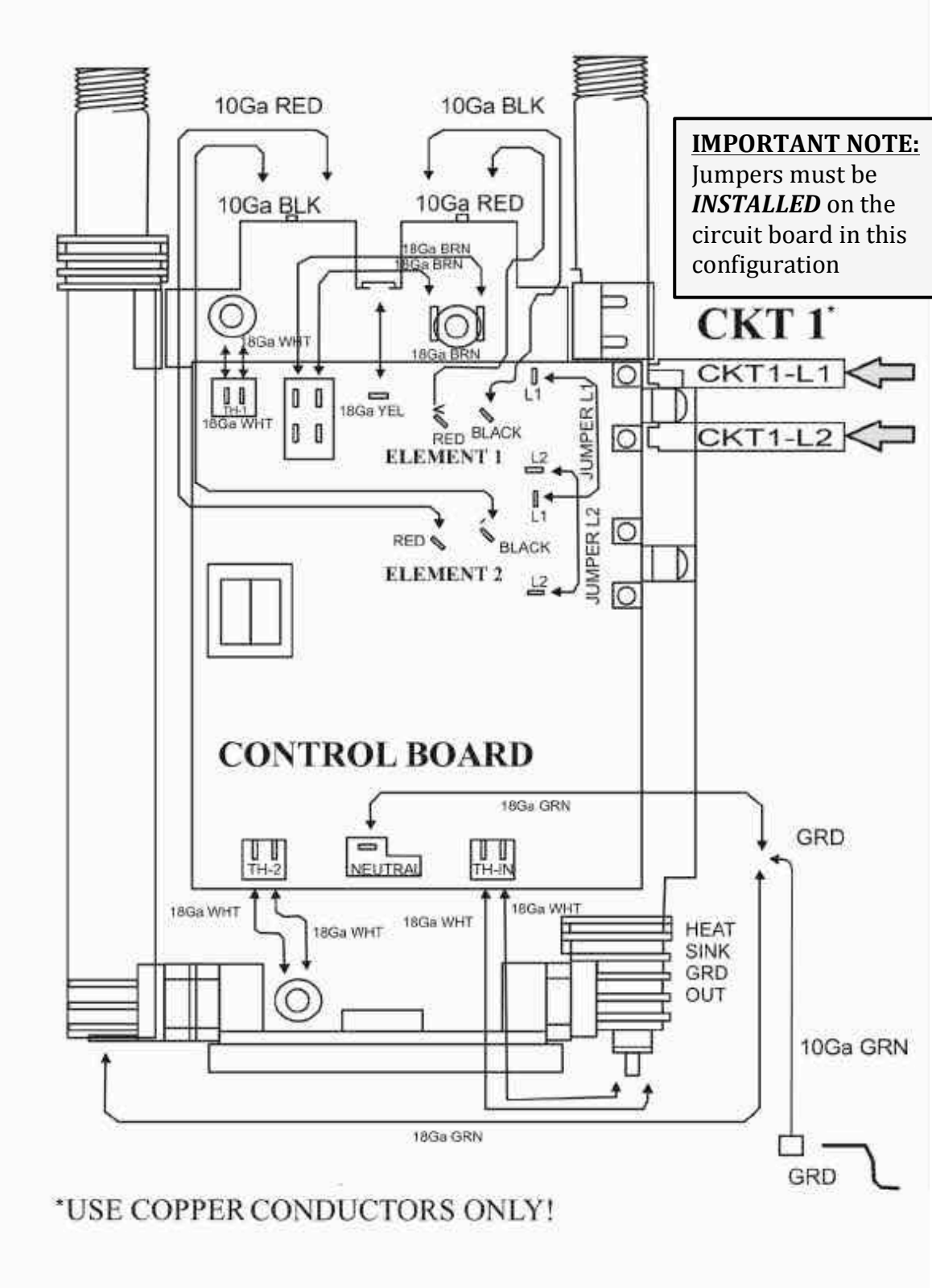
14 – Triacs (2)
15 – Triac Mounting Blocks to Heat Sink (2)
16 – Copper Heat Sink Tube

L1 – Power Connection Lugs (208 – 240 VAC)
L2 – Power Connection Lugs (208 – 240 VAC)

Limit: Over Temperature Limit Switch
TH-IN: Inlet Temperature Sensor
TH-1: Chamber Temperature Sensor #1
TH-2: Chamber Temperature Sensor #2

WIRING DIAGRAMS

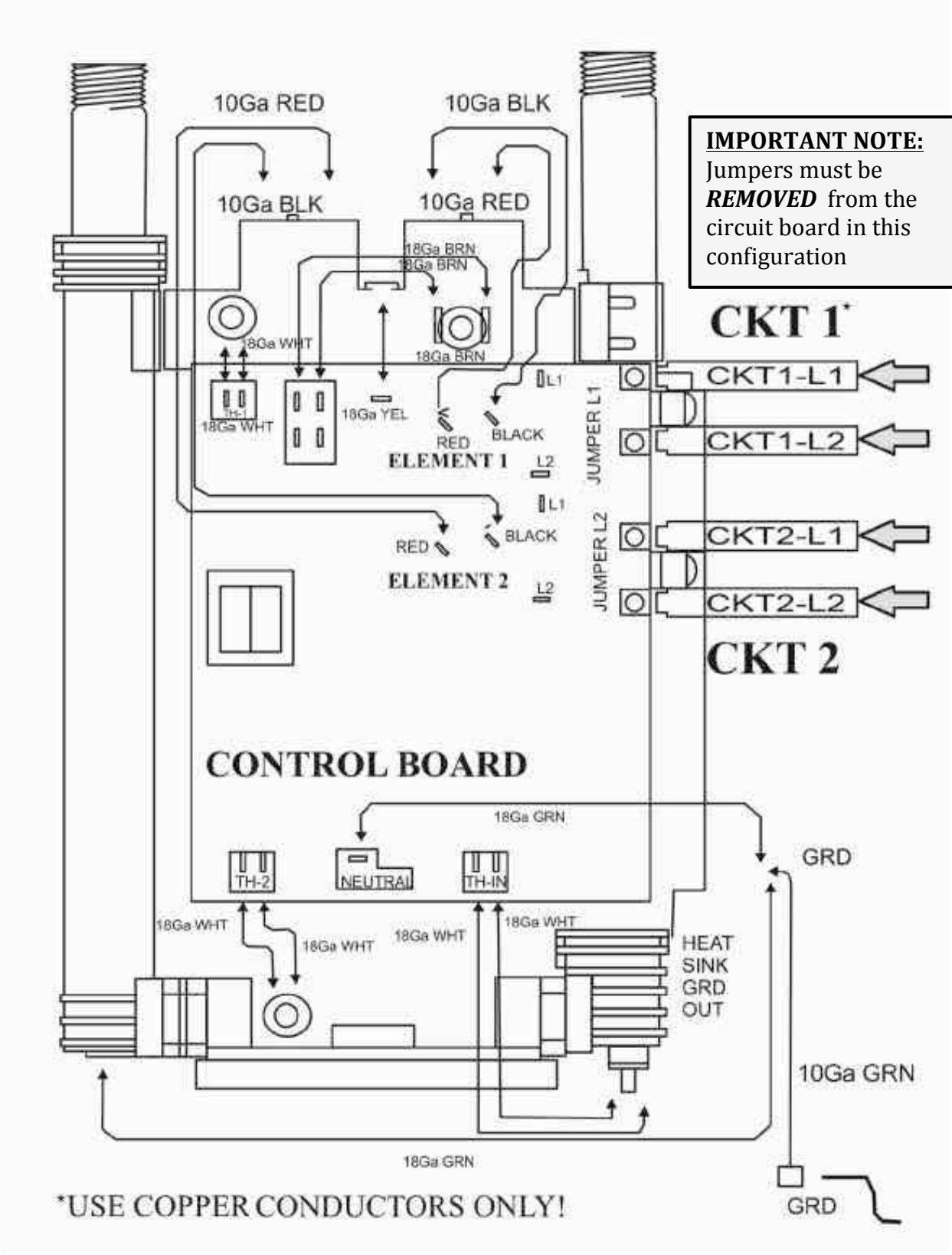
TWO CHAMBER – SINGLE CIRCUIT



IMPORTANT NOTE:
Jumpers must be ***INSTALLED*** on the circuit board in this configuration

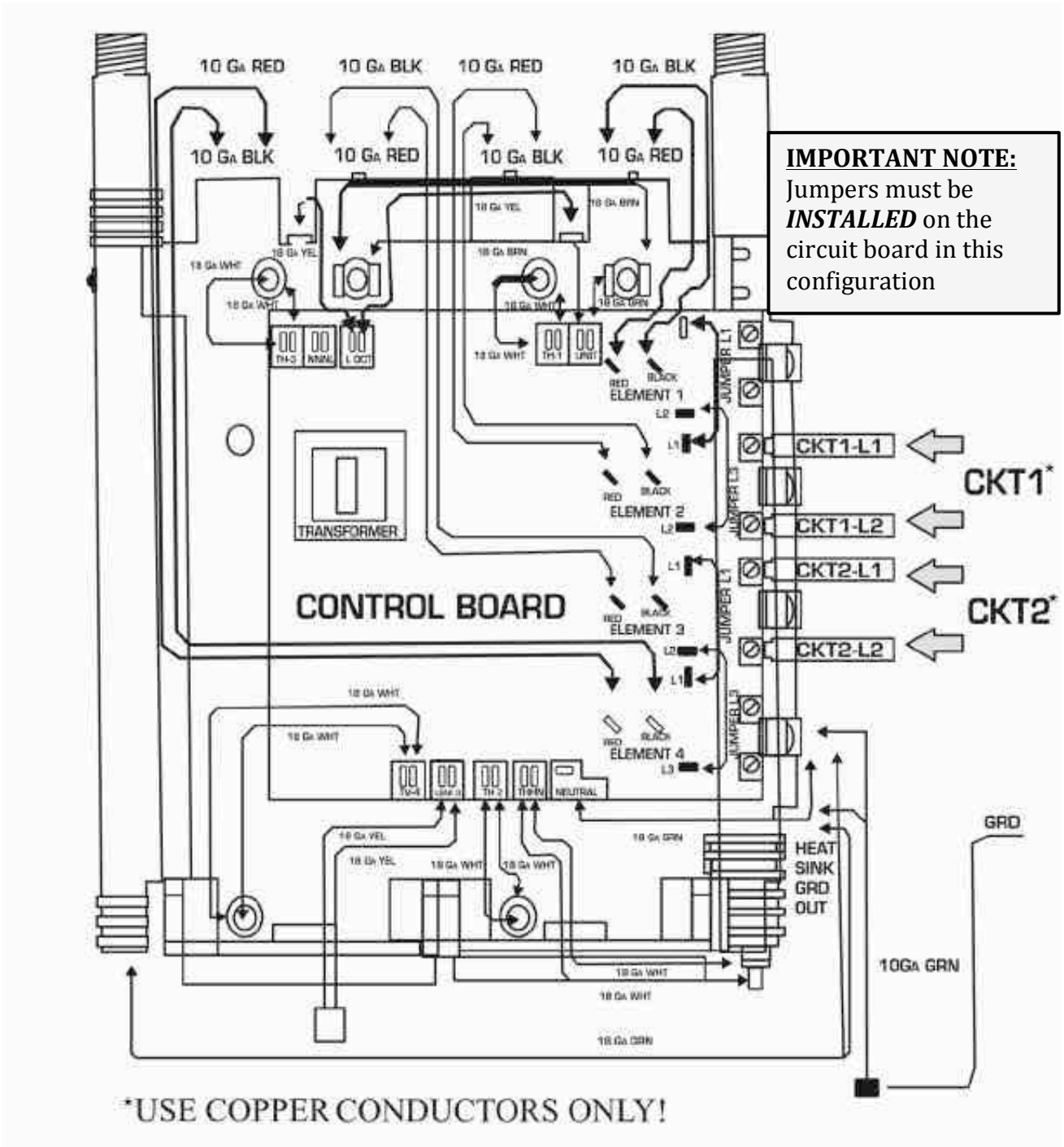
WIRING DIAGRAMS

TWO CHAMBER – DUAL CIRCUITS

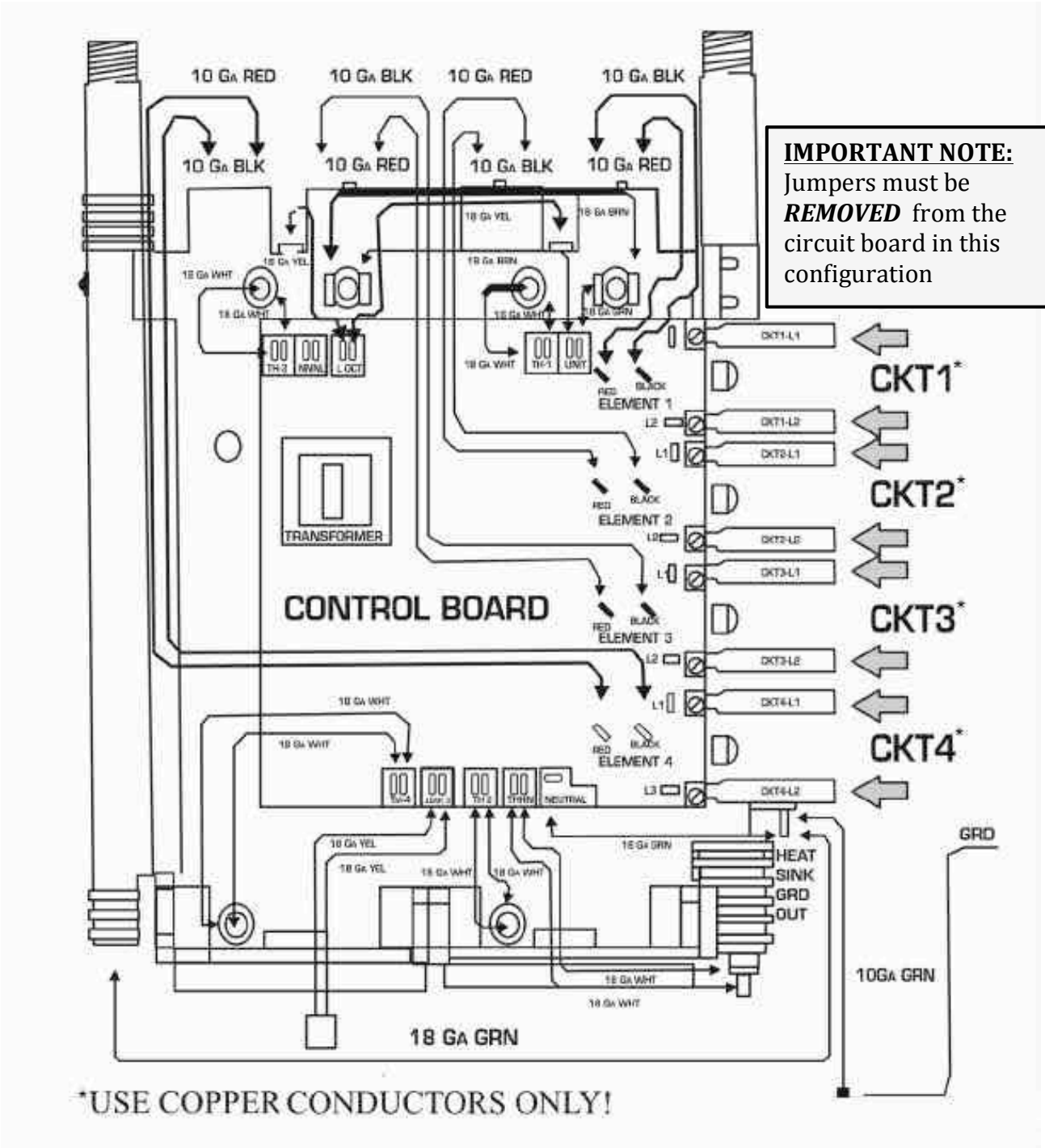


IMPORTANT NOTE:
Jumpers must be ***REMOVED*** from the circuit board in this configuration

WIRING DIAGRAMS
FOUR CHAMBER – DUAL CIRCUITS



WIRING DIAGRAMS
FOUR CHAMBER – FOUR CIRCUITS



IMPORTANT NOTE:
Jumpers must be ***REMOVED*** from the circuit board in this configuration

SERVICE & WARRANTY RECORD

Purchased from: _____

Date of Purchase:_____ Serial #:_____

Name:_____ Model #: _____

Address:_____ Phone: _____

_____

_____

NOTES AND SERVICE

Your SEISCO can be serviced by most major brand authorized appliance repair or heating and plumbing centers in your area. If your preferred service center does not already have service information, **Seisco International Limited** will, upon request and with no charge, promptly fax the information to the service center. For information regarding service companies in your immediate area you may contact your original installer or **Seisco International Limited**.

SEISCO INTERNATIONAL LIMITED

241 Airtex Dr. • Houston, TX 77090

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