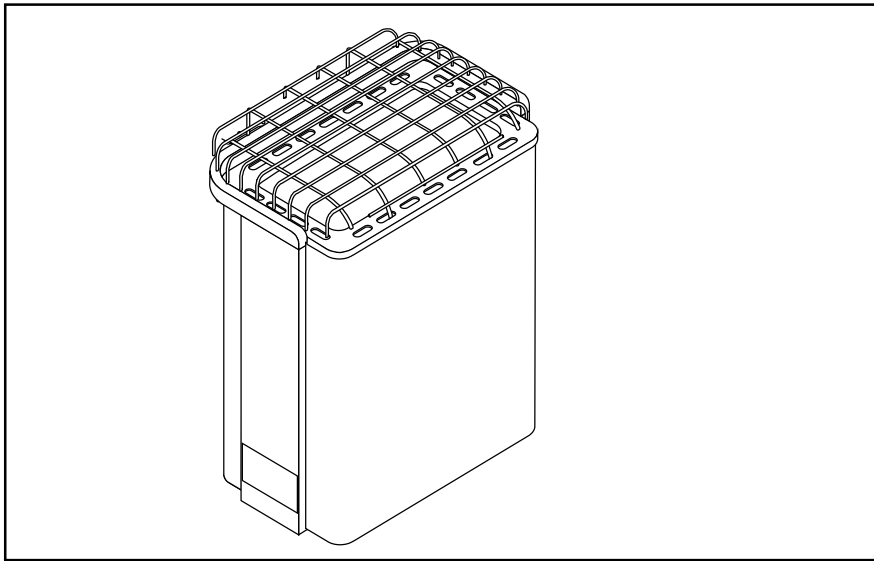


# "Maxi" Series Heater Installation & Operation Instructions



## FINNLEO "MAXI" SAUNA HEATERS Models FSO-45-BE, FSO-60-BE, FSO-80-BE (With separate control)

Read all instructions carefully before installation. Please leave all instructions and warranty with the owner.

### **WARNING**

*Prolonged exposure to elevated temperatures is capable of inducing hyperthermia. Hyperthermia occurs when the internal temperature of the body reaches several degrees above the normal body temperature of 98.6°F. The symptoms of hyperthermia include an increase in the normal temperature of the body, dizziness, lethargy, drowsiness, and fainting. The effects of the hyperthermia include failure to perceive heat, failure to recognize the need to exit the room, unawareness of impending hazard, fetal damage in pregnant women, physical inability to exit the room and unconsciousness.*

### **WARNING**

*The use of alcohol, drugs, or medication is capable of greatly increasing the risk of fatal hyperthermia.*

## SECTION 1: GENERAL INFORMATION

These heaters are UL approved for permanent installations and electrical connections. Built with splash proof construction, the conducting parts are protected against water. All wiring must be performed in accordance with local codes. See Diagram 4 for wire and room size requirements.

These heaters are wall mounted, 18<sup>3</sup>/<sub>4</sub>" W x 11" D x 24<sup>1</sup>/<sub>4</sub>" H, with wall mounted controls.

### **WARNING**

*Do not take a sauna if using alcohol, drugs or medications.*

*Pregnant women or persons with poor health should consult their physician before using any sauna.*

*Caution fire hazard: Do not use the sauna room for drying clothes, bathing suits, etc. Do not hang towels above heater or place any object other than the rocks supplied on the heater. If any darkening of the wall around the heater is noticed discontinue sauna use immediately.*

*Inspect sauna regularly for required maintenance to heater, control and benches. Replace wood surfaces which show any signs of deterioration.*

*The heater gets extremely hot during operation and should not be touched or burns may result.*

*Minors should be adequately supervised whenever near a hot or warming sauna.*



# "Maxi" Series Heater Installation & Operation Instructions

## DIAGRAM 1

### MOUNTING BRACKET LOCATION AND MINIMUM DISTANCE TO COMBUSTIBLE MATERIAL

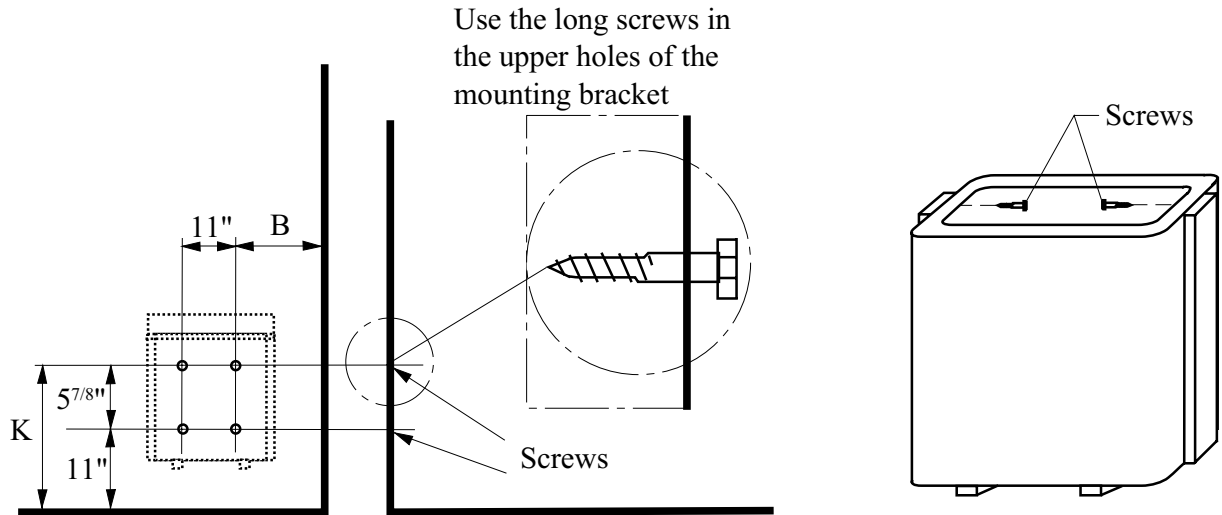
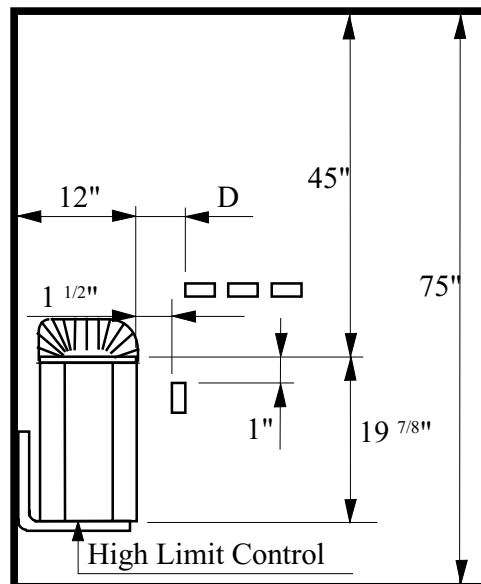
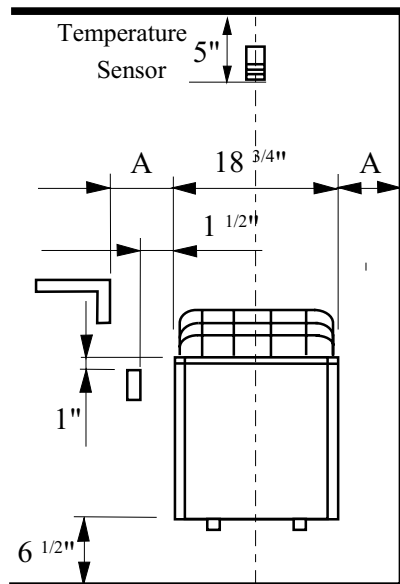


Table 1

HEATER	MINIMUM			
	"A" DISTANCE	"B" DISTANCE	"D" DISTANCE	"K" DISTANCE
MAXI 4.5 BE	1 1/4"	5 1/8"	3.0"	16 7/8"
MAXI 6.0 BE	2 1/4"	6 1/8"	4.0"	16 7/8"
MAXI 8.0 BE	3 1/4"	7 1/8"	5.0"	16 7/8"



# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 2: MOUNTING OF SAUNA HEATER

**HANGING THE HEATER** Using the template provided, drill four 9/64" holes to fasten the heater brackets to the wall. Install two 1/4" x 1 1/2" hex head lag screws (supplied with the heater) through the top holes on the mounting brackets (one screw per bracket). Tighten these screws. The screws must be threaded through the wall into a framing member or backing board to support the heater weight. Locate the two 1/4" x 1" hex head lag screws (supplied with the heater) then install them into the two lower mounting holes. Tighten to lock the heater brackets in place.

Place the heater on the wall brackets and fasten with screws. See Diagram 1 & 2 for the heater location details and the necessary clearances to combustible materials.

## SECTION 3: PLACING OF ROCKS

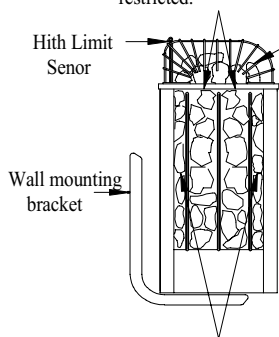
The rocks supplied with the heater have been chosen to provide the best heater performance. Use of any other type of rock may void the heaters warranty. Never operate the heater without rocks in place!

Rinse the rocks with water before placing in the heater. Packing the rocks too tightly may cause the heater high limit switch to trip. Follow the below rock placement instructions. After completion, attach the guard with the screws provided.

On a yearly basis, remove all rock clean rock fragments and reinstall reusable rocks. Follow the directions below for placement and the amount to use of rocks to install.

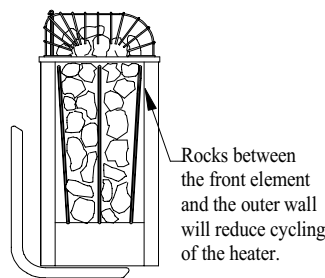
a. Loosely place rocks between the elements so air flow is not restricted.

c. Loosely cover the tops of all elements a minimum of 2" to 3".



b. Rocks must be placed between the elements and the wall of the rock compartment.

**Incorrect Placement of Rocks**



1. Put smaller rocks in first around the outer perimeter of the heating chamber.
2. Completely fill all four sections (front, 2 center sections between elements, and back).
3. In the outer sections, use smaller rocks placed more tightly (see note b).
4. Place rocks loosely in the center 2 sections (see note a).
5. Be sure rocks completely cover the elements (see note c).
6. Loosely cover the tops of all elements a minimum of 2" to 3".

## WARNING

*Fire sprinkler systems used inside any sauna room should be properly rated for sauna room temperatures.*

*Do not pour chlorinated pool or spa water on heater. Excessive water use on heater may cause damage and void warranty.*

*Do not install a shower in the sauna room.*

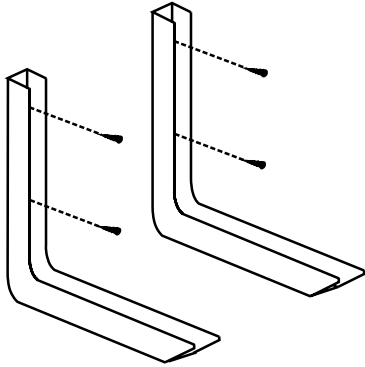
*Electric Shock Hazard - High voltage exists within this equipment. There are no user serviceable parts in this equipment. All installation and service to this equipment should be performed by qualified licensed personnel in accordance with local and national codes.*

*Do not construct sauna room so as to restrict air flow through the bottom of the heater.*

*Packing the rocks too tightly may cause the heater high limit switch to trip.*

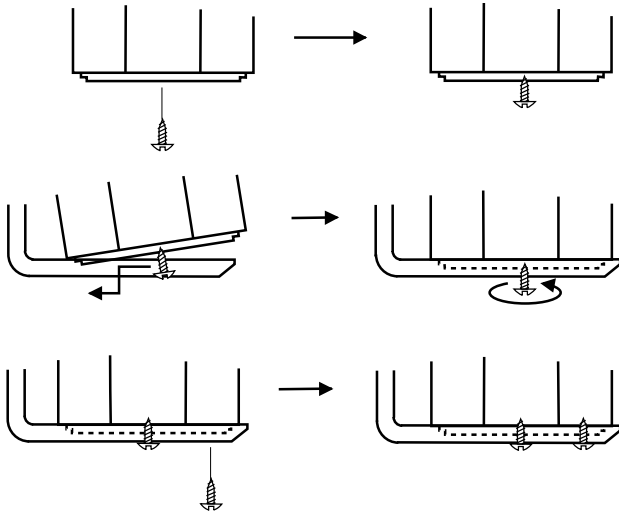
# "Maxi" Series Heater Installation & Operation Instructions

**DIAGRAM 2**



**DIAGRAM 3**

This diagram intentionally left blank.



**DIAGRAM 4**

HEATER MODEL Product Number	kW	MINIMUM ROOM			MAXIMUM ROOM		PHASE	VAC	AMPS	WIRE SIZE
		Floor Area	Ceiling Height	Volume Cu. Ft.	Ceiling Height	Volume Cu. Ft.				
<b>MAXI 4.5</b> FSO-45-BE 1714-45-0205	4.5	16 sq. ft.	75"	100	96"	210	1	208	21.6	10-2 W/G
							1	240	18.8	10-2 W/G
							3	208	12.5	12-3 W/G
							3	240	10.8	12-3 W/G
<b>MAXI 6.0</b> FSO-60-BE 1714-60-0205	6	28 sq. ft.	75"	175	96"	310	1	208	28.8	8-2 W/G
							1	240	25	10-2 W/G
							3	208	16.7	12-3 W/G
							3	240	14.4	12-3 W/G
<b>MAXI 8.0</b> FSO-80-BE 1714-80-0205	8	40 sq. ft.	75"	250	96"	425	1	208	38.5	8-2 W/G
							1	240	33.3	8-2 W/G
							3	208	22.2	10-3 W/G
							3	240	19.2	10-3 W/G

# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 4: ELECTRICAL HOOK-UP

Electrical installation must be made by a licensed electrician in accordance with the National Electrical Code and local regulations.

Remove the control knobs by pulling them straight off; and remove the screws from the left and right sides of the electrical box. Remove the painted cover from the side of the heater. Route the feed wires through the holes provided in the bottom of the heater and connect the wires to the terminal block. To determine the correct wire size, refer to Diagram 4. Use copper supply wire only, suitable for minimum 90 degrees C. The heater must be grounded! See Diagram 5 for proper connections.

## SECTION 5: HEATER SCREEN (GUARD RAIL)

Install a wooden heater guard to prevent the sauna bather from accidentally touching the sauna heater. Install the heater guard rail with the height clearances and dimensions shown in Diagram 7.

## SECTION 6: OPERATION

All controls for this heater have a thermostat to adjust the sauna temperature and a timer to control when the heater starts and stops. Each control will have its own operation information. For health and fire safety, never attempt to alter or bypass the timer or thermostat. If the sauna is used without a timer provided, an attendant must be present at all times.

## WARNING

***Do not locate benches over heater. Minimum clearance of ceiling above heater 45".***

***For minimum clearance from heater to wooden surfaces refer to Diagram 1 for distances. The mounting brackets supplied provide the proper clearance from the heater to the wall.***

***Use only copper wire of the size and type indicated in the Heater Specification Chart and the temperature rating indicated on the heater junction box.***

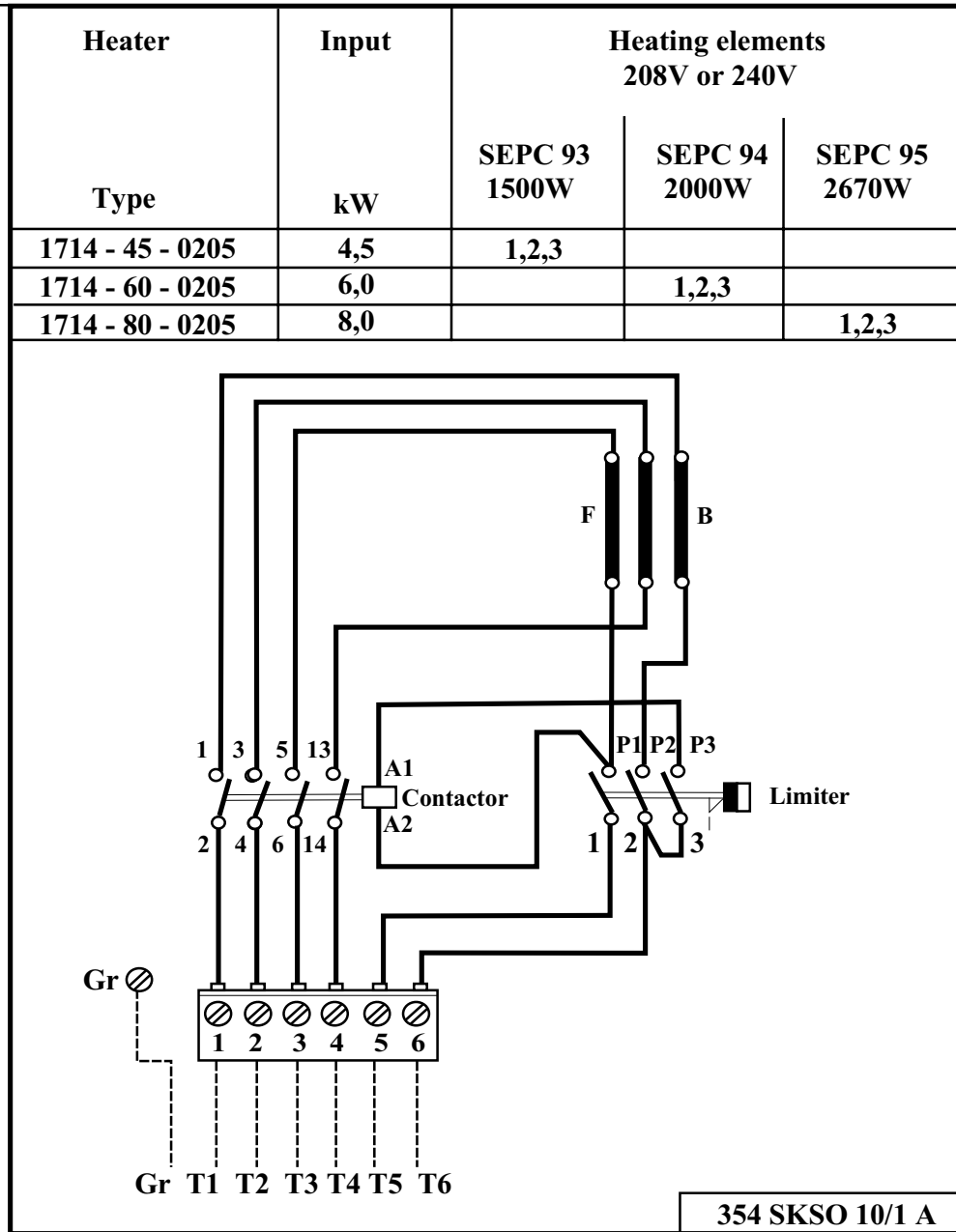
***All heaters and controls must be grounded per NEC to prevent electrical shock in case of unit failure.***

***Electrical outlets or receptacle must not be installed in a sauna room.***

***A guardrail or fence is required around the heater to prevent burns from accidental contact.***

# "Maxi" Series Heater Installation & Operation Instructions

DIAGRAM 5



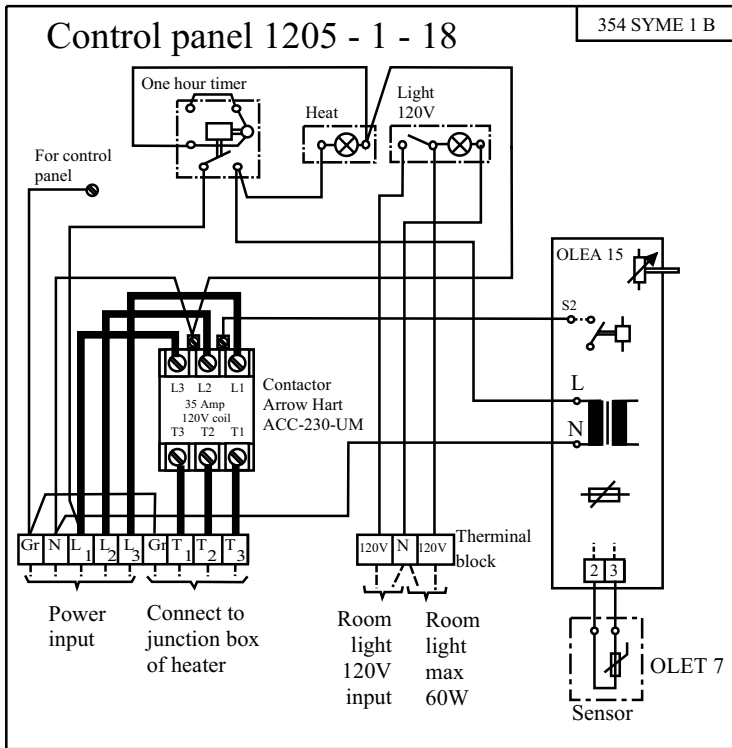
Refer to Table 8-1 on Page 8 for wiring size and number of conductors.

**IMPORTANT:** A neutral wire is required to operate the control. The electrical installation must be made by a licensed electrician in accordance with local regulations.

**CAUTION-USE SUPPLY WIRES SUITABLE FOR AT LEAST 90°C (194°F) USE COPPER WIRE ONLY.**

# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 6: OPERATION, CONTINUED - ADDITIONAL WIRING DIAGRAMS



### Control Panel 1205-1-18 (FACS-82)

**Note:** A temperature sensor (OLET 7) is required from the sauna room to the 1205-1-18 control panel. The 9' sensor wire is supplied, be sure to run this wire in addition to the wires listed in Table 8-1 on page 8. See the wiring diagram on page 2 for locating the sensor.

*A neutral wire is required to the control.*

*A Separate 120 volt circuit is required to operate the room light.*

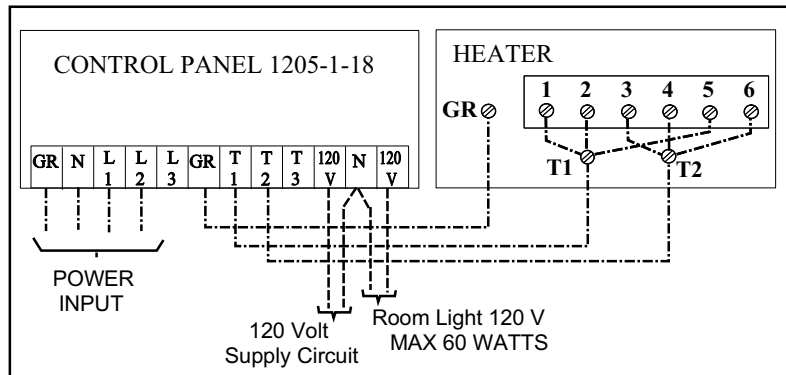
### Control to Heater Connections

Diagrams below show the wiring connections between the 1205-1-18 control and the sauna heater. Connections for both 1 phase and 3 phase are shown.

### 1 phase

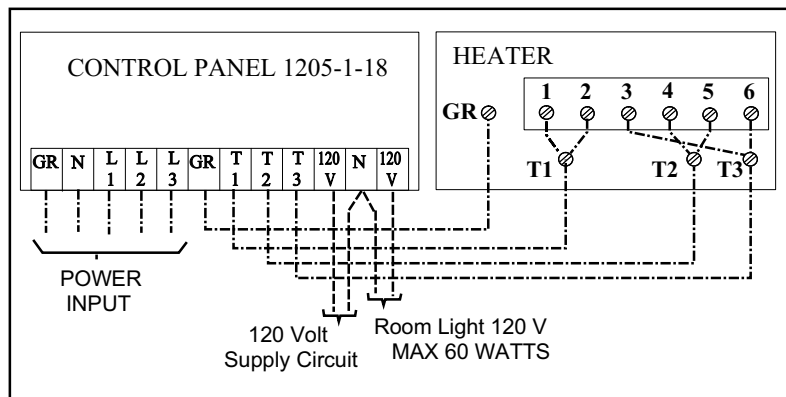
*A neutral wire is required to the control.*

*L3 and T3 are not required for 1 phase*



### 3 phase

*A neutral wire is required to the control.*



# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 6: OPERATION, CONTINUED - ADDITIONAL WIRING DIAGRAMS

### Wiring Information

Wire sizes and number of conductors is given in the table below. Select the heater size, phase, and voltage and read across for wire size and number of conductors.

Heater	kW	V	208-240V AC 1 ph. 60 hz		V	208-240V AC 3 ph. 60 hz	
			To Control	To Heater		To Control	To Heater
1714-45-0205	4.5	240 V	2#10awg+N+Gr	2#10awg+Gr	240 V	3#12awg+N+Gr	3#12awg+Gr
1714-60-0205	6.0		2#10awg+N+Gr	2#10awg+Gr		3#12awg+N+Gr	3#12awg+Gr
1714-80-0205	8.0		2#8awg+N+Gr	2#8awg+Gr		3#10awg+N+Gr	3#10awg+Gr
1714-45-0205	4.5	208 V	2#10awg+N+Gr	2#10awg+Gr	208 V	3#12awg+N+Gr	3#12awg+Gr
1714-60-0205	6.0		2#8awg+N+Gr	2#8awg+Gr		3#12awg+N+Gr	3#12awg+Gr
1714-80-0205	8.0		N/A	N/A		3#10awg+N+Gr	3#10awg+Gr

**Note:** Do not use the 1205-1-18 control with 8 kW, 208 volt, 1 phase, heaters.

## OPERATING INSTRUCTIONS: 1205-1-18 (FACS-82)

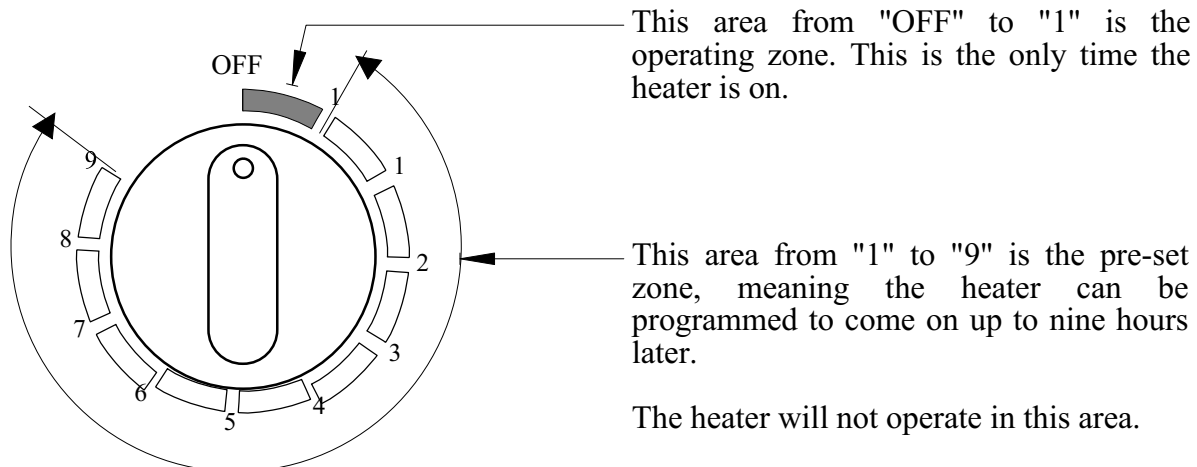
### SETTING THE TEMPERATURE

Turn thermostat knob to adjust sauna temperature. To raise the temperature, turn the knob clockwise; and to lower the temperature, turn the knob counter-clockwise.

### SETTING THE TIME

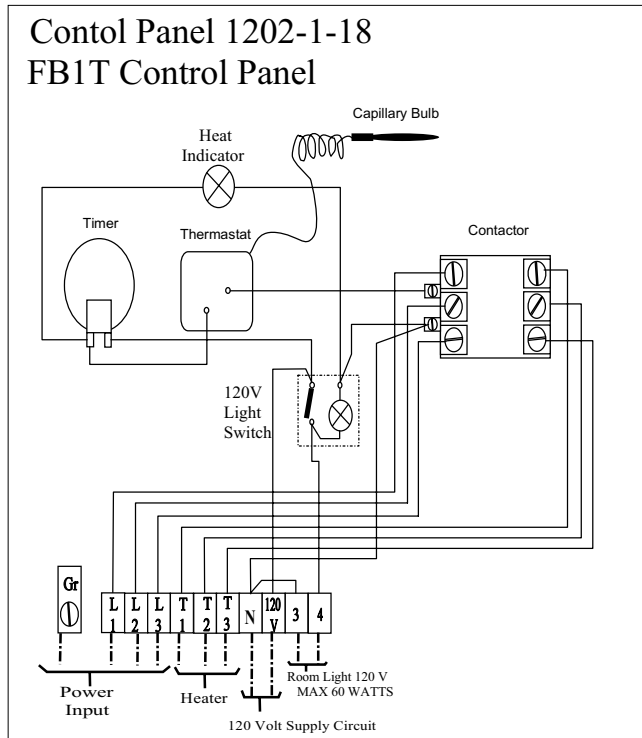
If you want the heater to start heating immediately, turn the dial clockwise past the first marked section "off to 1", then turn the dial back (counterclockwise) until it "clicks" into the one hour operational zone.

The heater has a "9 plus 1" timer, meaning you can pre-program the heater to come on up to 9 hours later.



# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 6: OPERATION, CONTINUED - ADDITIONAL WIRING DIAGRAMS



### OPERATIONS OF FB1T CONTROL PANEL

#### SETTING THE TEMPERATURE

Turn thermostat knob to adjust sauna temperature. To raise the temperature, turn the knob clockwise; to lower the temperature, turn the knob counter-clockwise

#### SETTING THE TIME

Turn the timer clockwise to the chosen amount of time. The range is from 0 to 60 minutes. The heater will start immediately after setting time.

**Note:** The capillary bulb needs to be placed horizontally in the sauna room 5 inches down from ceiling above the heater. Be sure **NOT** to bend tube in a smaller radius than 5/8 of an inch or the size of a quarter.

The thermostat should be turned off to stop the heater, do not turn timer counterclockwise to remove time.

### 1 phase

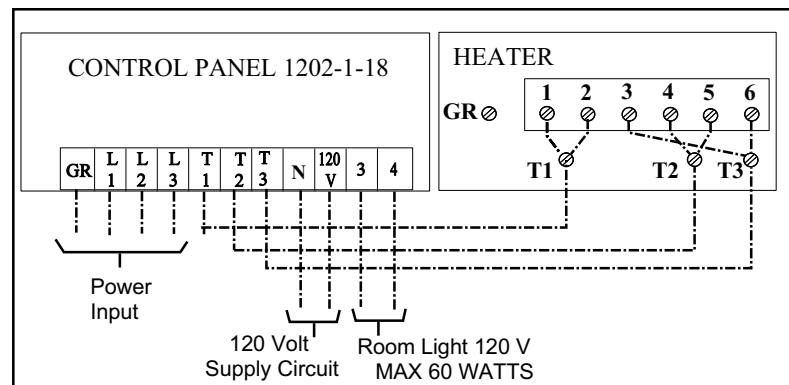
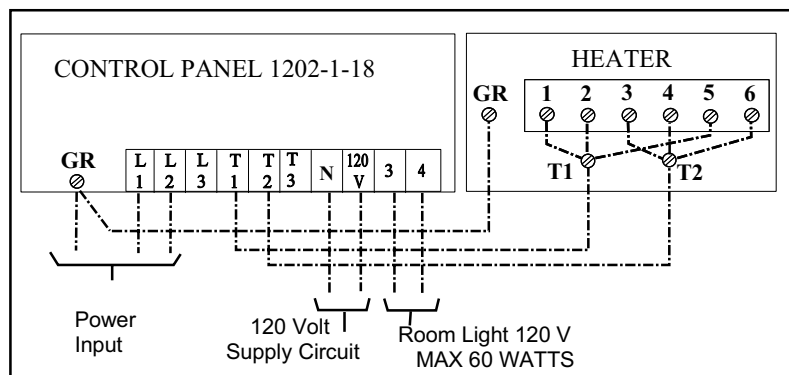
**L3 and T3 are not required for 1 phase.**

#### Control to Heater Connections

Diagrams show the wiring connections between the 1202-1-18 control and the sauna heater. Connections for both 1 phase and 3 phase are shown.

**1 and 3 phase controls require a separate 120 volt circuit. This voltage also supplies the light circuit.**

### 3 phase



# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 6: OPERATION, CONTINUED - ADDITIONAL WIRING DIAGRAMS

### Control Panel SS2000 and Contactor Box CB2000

**Note:** A sensor is required from the sauna room to the CB2000 contactor box. This sensor will plug directly into the circuit board in the contactor box. Be sure to run the sensor wire in addition to the wires listed in Table 10-1 at the bottom of this page.

SS 2000 Touch Pad and the CB2000 Contactor Box must be located outside the sauna room.

**A separate 120 volt circuit is required to operate the room light.**

#### Control to Heater Connections

Diagrams below show the wiring connections between the contactor box and the sauna heater. Connections for both 1 phase and 3 phase are shown.

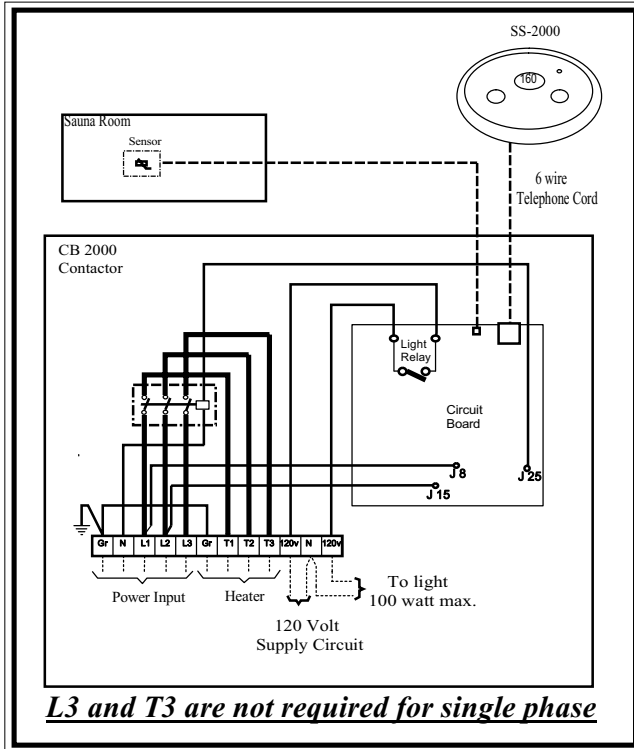
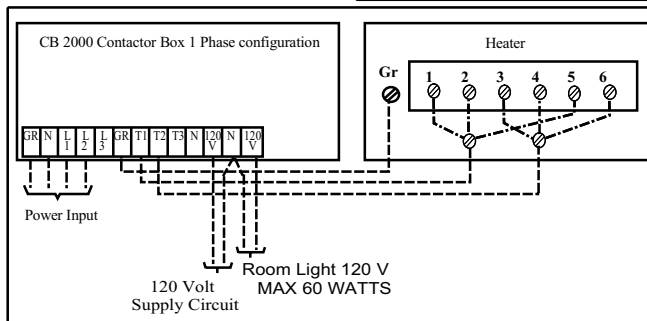


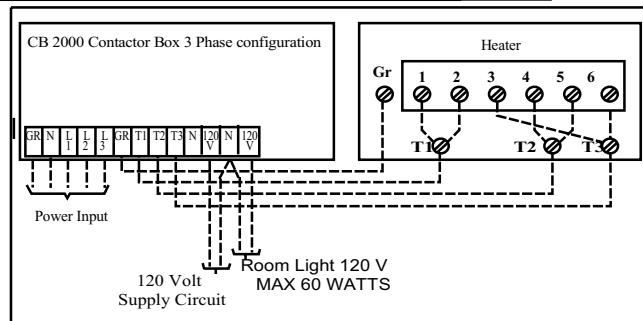
Table 10-1

HEATER	PH.	VOLTS	AMPS	WIRE TO CB-2000	WIRE TO HEATER
1714-45-0205	1	120/240	18.8	2 #10awg+N+Gr	2 #10awg+Gr
	1	120/208	21.6	2 #10awg+N+Gr	2 #10awg+Gr
	3	120/240	10.8	3 #12awg+N+Gr	3 #12awg+Gr
	3	120/208	12.5	3 #12awg+N+Gr	3 #12awg+Gr
1714-60-0205	1	120/240	25	2 #10awg+N+Gr	2 #10awg+Gr
	1	120/208	28.8	2 #8 awg+N+Gr	2 #8 awg+Gr
	3	120/240	14.4	3 #12awg+N+Gr	3 #12awg+Gr
	3	120/208	16.7	3 #10awg+N+Gr	3 #10awg+Gr
1714-80-0205	1	120/240	33.3	2 #8 awg+N+Gr	2 #8 awg+Gr
	1	120/208	<i>Not for use with 208 volt, 1 phase, 8kW</i>		
	3	120/240	22.2	3 #10awg+N+Gr	3 #10awg+Gr
	3	120/208	19.2	3 #10awg+N+Gr	3 #10awg+Gr



#### **Single Phase**

**L3 and T3 are not required for 1 phase**



#### **Three Phase**

# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 6: OPERATION, CONTINUED - USERS MANUAL FOR ELECTRONIC CONTROLS

### SS-2000 Operating Instructions

#### Setting the Temperature

1. Be sure the digital display is on and the LED indicator is off. The digital display indicates the current temperature in the sauna room.

2. Press the Time/Temp Set button. The last stored temperature-setting flashes on the digital display.

3. With the digital display flashing, press the Time/Temp Set button to decrease the temperature one degree.

**Note: The display will not scroll; each time you press the button, the temperature will decrease one degree.**

4. To increase the temperature, wait four seconds until the display stops flashing, repeat Steps 2 and 3 above.

**Note: The display will not scroll; each time you press the button, the temperature will increase one degree, to a maximum of 194°F.**

5. Be sure the digital display is on and the LED indicator is off. The digital display indicates the current temperature in the steam room. Press the Time/Temp Set button. The last stored temperature-setting flashes on the digital display.

6. With the digital display flashing, press the On\Off button. The last stored time-setting flashes on the digital display.

7. With the digital display flashing, press the Time\Temp Set button to decrease the time 5 minutes.

**Note: The display will not scroll; each time you press the button, the time will decrease five minutes.**

8. To increase the time, wait four seconds until the display stops flashing, and repeat steps 6-8 above.

**Note: The display will not scroll; each time you press the button the time will increase in five minute increments, to a maximum of 60 minutes.**

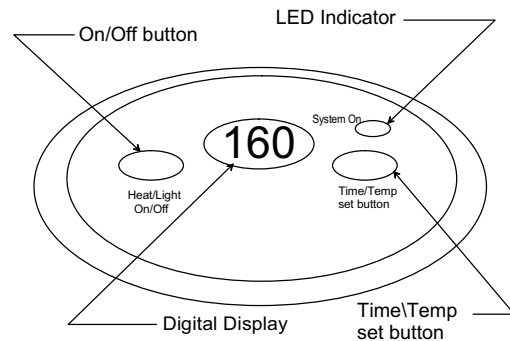
#### Turning on the sauna heater and room light

Pushing the "Heat/Light" button once turns the sauna heater on, light is off.

Pushing the "Heat/Light" button the second time turns the light on, sauna heater stays on.

Pushing the "Heat/Light" button the third time turns the sauna heater off, light stays on.

Pushing the "Heat/Light" button the fourth time turns the light off, heater stays off.



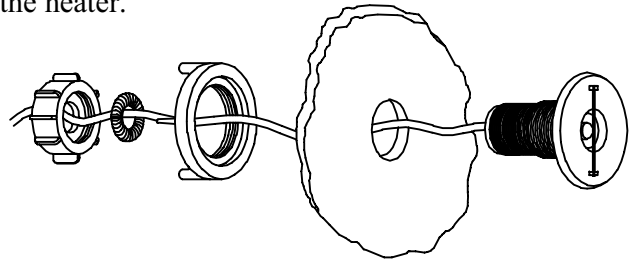
# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 6: OPERATION, CONTINUED - USERS MANUAL FOR ELECTRONIC CONTROLS

Installing the sensor for the SS 2000 Control

Mount the sensor 5" below the ceiling, above the heater.

1. Cut a 1" round hole in the wall of the sauna room.
2. Insert the sensor holder in the hole until the flange seats tightly against the wall.
3. Secure the sensor holder to the wall using the mounting nut. The mounting nut has left-hand threads.



- Note: If using the mounting nut is not possible, squeeze a small bead of silicon around the base of the sensor holder before seating it against the wall.*
4. Insert the O-ring into the groove on the end nut, and attach the end nut to the end of the sensor holder.
  5. Feed the sensor wire through the sensor holder, and carefully press the sensor into place in the holder. Push the o-ring tight to the sensor holder, and thread the end nut on the sensor holder to lock the sensor in place.
  6. Route the sensor wire to the CB-2000 control panel, and plug the end into the receptacle on the circuit board. Use a knockout and stress relief fitting to protect the wire where it enters the box. Plug the end into the 2-pin receptacle located on the circuit board within the control panel.

# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 7: HIGH LIMIT CONTROL (RESET BUTTON)

The sauna heater has a built-in high limit control, which automatically turns off the heater if the temperature inside in the sauna room rises to an abnormally high level.

To restart the heater, let the heater cool and turn the timer down to off, then push the reset button on the bottom of the heater, See the last drawing on Diagram 9 on page 14. If the high limit continually shuts off the heater, refer to Section about Troubleshooting.

## SECTION 8: HOW TO TAKE A SAUNA

- When taking a sauna, allow time to relax completely.
- Remove clothing and jewelry...if required, wear a towel loosely.
- After 10 minutes or when perspiration begins, leave sauna and relax in dressing area...follow with a cool shower.
- Cooling time should equal time spent in sauna. Enter sauna room again and stay 5 or 10 minutes.
- Repeat the cycle 2 or 3 times; end with a brisk shower...rinse in cool water.
- Dress when completely dry and perspiration has stopped.
- Some sauna bathers enjoy the soothing effect of steam by splashing water on the heated sauna rocks. Use only one dipper full (approx. ½ cup) at a time and take care to keep clear of the steam as it rises off the rocks.
- Do not smoke, exercise or drink alcoholic beverages in the sauna room.
- Do not pour chlorinated pool or spa water on the heater or corrosion damage may result.



Shower



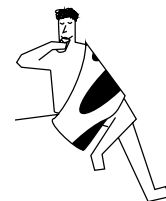
Sauna (10 - 15 min.)



Shower or swim



Rest (10 - 15 min.)



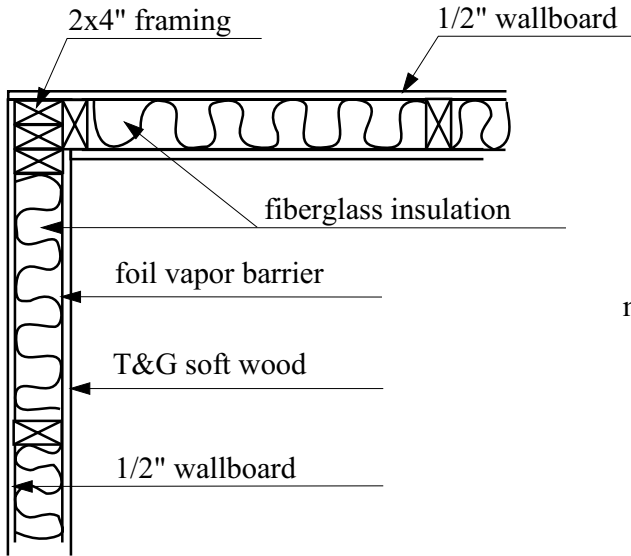
Relax with juice or water

Like it?  
Do it again and  
feel great.

# "Maxi" Series Heater Installation & Operation Instructions

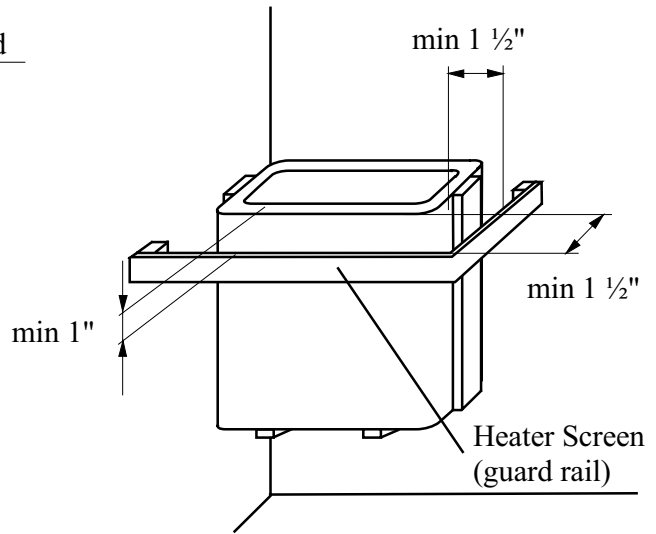
**DIAGRAM 6**

**TYPICAL PRE-CUT WALL CONSTRUCTION**



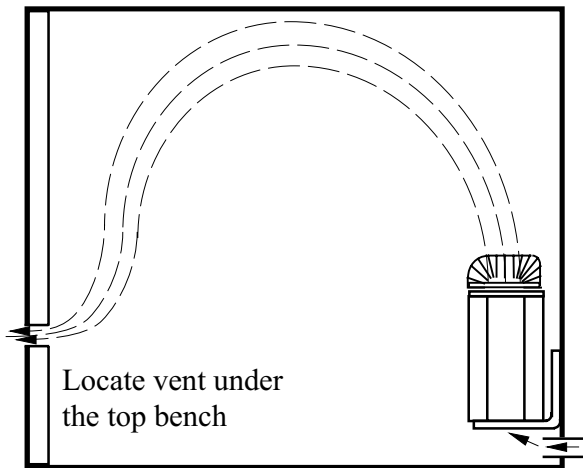
**DIAGRAM 7**

**HEATER SCREEN (GUARD RAIL)**



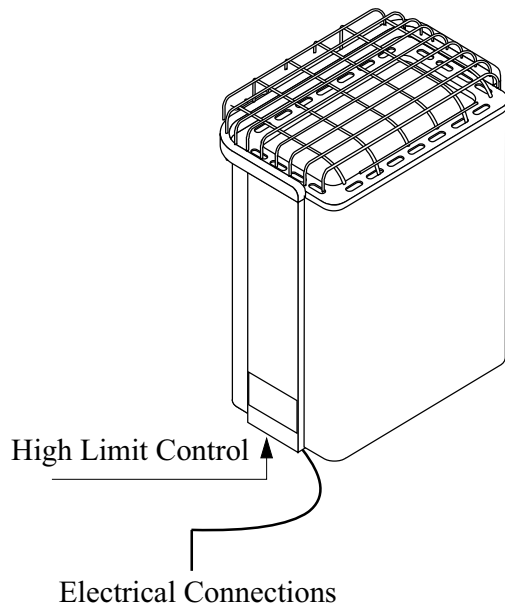
**DIAGRAM 8**

**VENTILATION**



**DIAGRAM 9**

**RESETTING HIGH LIMIT SWITCH**



# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 9: WARNING PLACARDS

Two metal placards are included in the Installation Instruction Envelope packaged with every Sauna Heater. The CAUTION placard must be attached to the interior wall of the sauna room directly above the heater where it is visible to the bather. The WARNING placard must be attached to the door of the sauna room.

## SECTION 10: ROOM CONSTRUCTION

For safety and reliability, the following rules must be addressed.

- No permanent locking or latch system is to be used on the sauna door.
- Acceptable door fittings are: magnetic catches, friction catches, spring or gravity loaded closures. The door must always open outwards.
- The warranty is void if a shower is installed in a sauna room.
- No electrical receptacle shall be installed inside the sauna room.
- The enclosed WARNING: Reduce the risk of overheating ... warning plate must be mounted on or alongside the door outside the sauna room at about eye level.
- The enclosed CAUTION: Reduce the risk of fire ... caution plate must be mounted on the interior wall above the heater.
- The heater should not be operated without its container properly filled with rocks and the rock guard in place.
- If an intercom speaker is installed, it should be away from the heater and as close to the floor as possible.
- If a room light is installed, it should be a surface mounted bracket type. Wall mounted lights should be about 70" above the floor. Ceiling mounted lights should be of an approved type with a junction box that is remote to the fixture itself. Use only a fixture that uses A.F. or fixture type internal wiring. A 60 watt bulb should provide sufficient lighting.
- Fire sprinkler systems installed inside any sauna room should be properly rated for sauna room temperatures.
- Always mount the heater according to these installation instructions.

## WARNING

***The "CAUTION" and "WARNING" placards must be mounted in accordance with Section 9.***

### WARNING

REDUCE THE RISK OF OVERHEATING

- \* Exit immediately if uncomfortable, dizzy, or sleepy. Staying too long in a sauna is capable of causing overheating.
- \* Supervise children at all times.
- \* Check with a doctor before use if pregnant, in poor health, or under medical care.
- \* Breathing heated air in conjunction with consumption of alcohol, drugs, or medication is capable of causing unconsciousness.

### CAUTION

REDUCE THE RISK OF FIRE

Do Not Place Combustible Material On The Heater At Any Time.

***For safety purpose sauna door must open out and not lock.***

***Never use a wood stain, seal or preservative on the inside of your sauna room.***

***Light fixtures get very hot during operation. Locate light fixture where it will not be a burn hazard.***

# "Maxi" Series Heater Installation & Operation Instructions

## SECTION 11: VENTILATION

VENTILATION should be changed about 6 times an hour. This can be achieved by making a vent opening (fresh air inlet) in the sauna wall directly below the heater. The air outlet must be lower than the upper benches, as far as possible from the heater and about two feet higher than the fresh air inlet vent, See Diagram 8.

The minimum opening should be determined using one of the following formulas:

For  $R < 31$ ,  $V \geq 9.3$

For  $R \geq 31$ ,  $V \geq 0.3R$

where  $R$  = the floor area of the room in square feet and  
 $V$  = the minimum vent size in square inches

## SECTION 12: MAINTENANCE

The sauna, like a bathroom, should be kept clean and odor free.

Towels or mats should always be used on benches and floor as perspiration otherwise penetrates the soft wood.

Air out the sauna often by keeping the door and vents open when the sauna is not in use. Saunas that are in daily use should be washed down at least once a week to keep them clean and the air fresh. Duckboard should be removed from the sauna, the sauna floor mopped and dried in a conventional manner, and the duckboard thoroughly scrubbed and dried before returning to the sauna room. The sauna heater should be wiped down occasionally with a damp cloth to remove lint and dust. The rocks should be removed once a year for cleaning and small or crumbled rocks replaced.

To clean and remove perspiration stains, use soap or detergent in warm water, best applied with a scrub brush. Badly soiled surfaces may require sanding. Sand paper wrapped around a wooden block works well.

Benches and supporting structure must be inspected annually for potential deterioration due to age, dry rot or abuse. Any boards with signs of deteriorations should be replaced immediately to avoid possible injury.

## SECTION 13: TROUBLESHOOTING

For troubleshooting or service questions call 1-800-346-6536 and ask to speak with service.

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