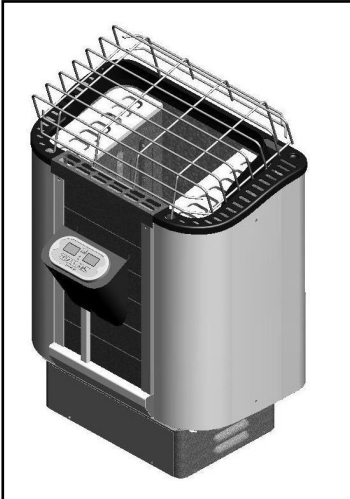


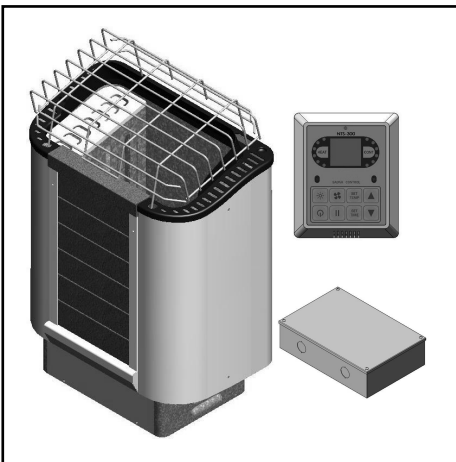
INSTALLATION AND OPERATING INSTRUCTIONS



NTSA SERIES SAUNA HEATER

MODELS: NTSA-30, NTSA-45
NTSA-60, NTSA-90

With NTS-100 on-heater digital control.



NTSC SERIES SAUNA HEATER

MODELS:
NTSC-30, NTSC-45
NTSC-60, NTSC-90

With NTS-300 wall-mounted digital control.

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

IT IS UNLAWFUL TO INSTALL THIS UNIT WITHOUT FIRST OBTAINING A PERMIT FROM THE LOCAL ELECTRICAL INSPECTION AUTHORITY.

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.

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.



SECTION 1: GENERAL INFORMATION

These heaters are ETL 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 national and local codes. See Diagram 2 for wire and room size requirements. These heaters are wall mounted.

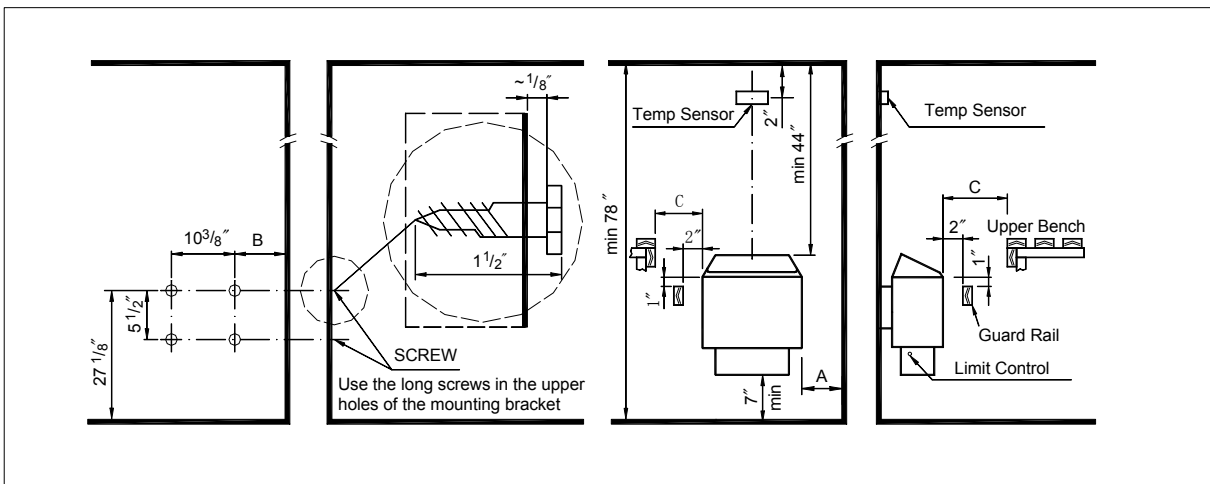
Thank for choosing NTSA and NTSC series 3~9kw sauna heater. The NTSA series sauna heater is equipped with NTS-100 on-heater digital control panel while the NTSC series sauna heater is equipped with NTS-300 wall-mounted digital control panel. Control panel NTS-300 and NTS-100 are designed for family use only.

NTSA and NTSC series sauna heaters are designed for small sauna rooms.

NTSA 30-90: 17³/₄" W × 15" D × 24³/₄" H NTSC 30-90: 17³/₄" W × 11³/₄" D × 24³/₄" H

DIAGRAM 1

MOUNTING BRACKET LOCATION AND MINIMUM DISTANCE TO COMBUSTIBLE MATERIAL



Recheck your distances from the heater to combustible materials to be sure you have the proper minimum distances.



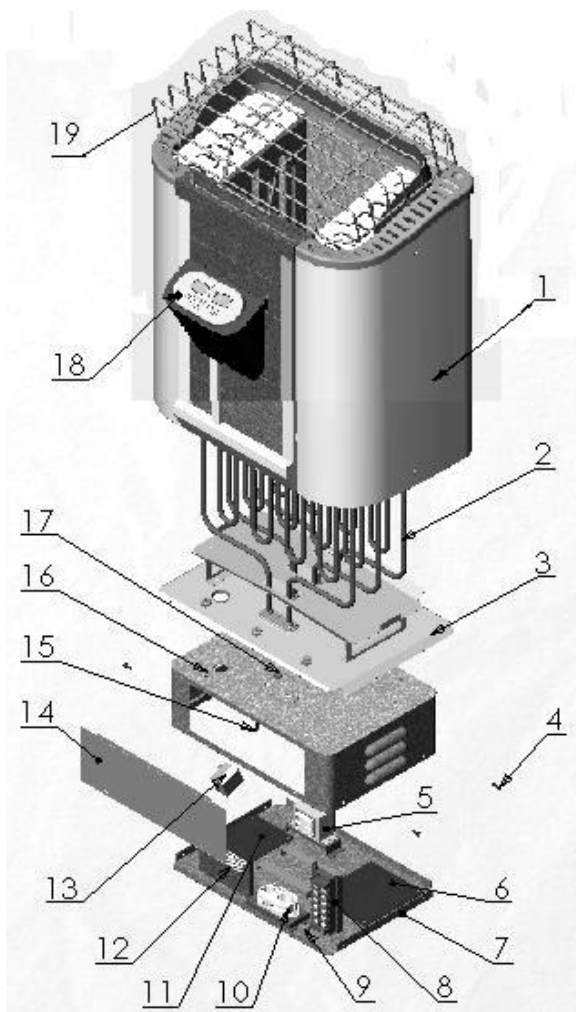
OBSERVING MINIMUM DISTANCES IS REQUIRED TO REDUCE FIRE HAZARD

SAUNA HEATER	Minimum safety distance (in.)		
	A	B	C
NTSA-30,NTSC-30	3 ¹ / ₂	7	8
NTSA-45,NTSC-45	3 ¹ / ₂	7	8
NTSA-60,NTSC-60	4	7 ¹ / ₂	9
NTSA-90,NTSC-90	6	9 ¹ / ₂	10

DIAGRAM 2

Model	Power (kW)		Sauna Room (CuFt) Height $\leq 76^{3/4}$''	240VAC60Hz		Light 120VAC60Hz	Fan 120VAC60Hz
	Max	Heating		Power wire Copper	Fuse A		
NTSA-30	3.2	3.0	70~140	4#12AGW	20	≤40W Connect to Connection terminal J9 on PCB	NO
NTSA-45	4.7	4.5	105~210	4#10AGW	25		
NTSA-60	6.2	6.0	175~320	4#8AGW	40		
NTSA-90	9.2	9.0	265~460	4#6AGW	60		≤40W Connect to Connection terminal J10 on PCB
NTSC-30	3.2	3.0	70~140	4#12AGW	20		
NTSC-45	4.7	4.5	105~210	4#10AGW	25		
NTSC-60	6.2	6.0	175~320	4#8AGW	40		
NTSC-90	9.2	9.0	265~460	4#6AGW	60		

NOTE 1 : The Neutral wire (N) is not necessary if customer do not install the bulb nor the fan.



1	Chassis
2	Heating element
3	Heating elements installation plate
4	Base plate locking screw
5	Transformer (On-heater control unit only)
6	Sub-board (On-heater control unit only)
7	Base plate
8	Connection terminal TB1
9	GND terminal (Wall-mount Digital control unit only)
10	Wire clip
11	Main-board (On-heater control unit only)
12	Connection terminal TB2, TB3, TB4 (Wall-mount Digital control unit only have TB2)
13	Manual reset thermostat KT2
14	Compartment cover
15	Wiring box locking screw
16	Wiring box
17	Heating elements locking screw
18	NTS-100 digital control panel (Build-in control unit only)
19	Heating element guard

SECTION 2: MOUNTING OF SAUNA HEATER

Refer to diagram 1, hanging the heater on the wall. Drill four 9/64” holes to fasten the heater to the wall. Install two 1/4”X1/2” hex head lag screws (supplied with the heater) into the upper two holes. Tighten these screws until their heads are about 1/8” from the wall surface. The screws must be threaded through the wall into a framing member or backing board to support the heater weight. Hang the heater on the two upper screws. Locate the two 1/4”X1” hex head lag screws(supplied with the heater) then install them into the two lower mounting holes. Tighten to lock the heater in place. See Diagram 1 for the heater location details and the necessary clearances to combustible materials.

SECTION 3: PLACING OF ROCKS (See Diagram 13)

Never operate the heater without rocks in place! Otherwise it may cause fire, only use the original sauna rocks or the rocks for use in heater. Use of any other type of rock may void the heaters warranty. Rinse the rocks with water before placing through the heater. Carefully place the rocks loosely so that the air can circulate through the heater. Packing the rocks too tightly may cause the heater high limit switch to trip. The rocks must fully cover the heating elements. Attach the guard with the screws provided.

SECTION 4: ELECTRICAL HOOK-UP

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

All the wiring connection inside the heater has been done in factory and carefully checked.

For on-heater control unit, customer only need to connect the power supply, temperature sensor cable. Remove the compartment cover from the front of the wiring box, route the feed wires through the right holes provided in the bottom of the heater, connect the power wires to the terminal TB1, route the temperature sensor cable through the left holes provided in the bottom of the heater, connect the cable to the terminal TB2,

For heater with wall-mount digital control unit, customer need to connect the power supply to the terminal block in control box. Connect the 6*12AWG+GND rubber cable wire and 2-p wire of manual reset thermostat KT2, between control box and heater. Connect the 6*12AWG+GND rubber cable wire to the terminal TB1, connect the 2-p wire to the terminal TB2.

WARNING

The use of accessory attachments not recommended by the appliance manufacturer may cause injuries

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

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

To determine the correct wire size, refer to Diagram 2. Use copper supply wire only, suitable for minimum 221°F. The heater must be grounded! See Diagram 4, 5, 6 and 7 for proper connections.

SECTION 5: TEMPERATURE SENSOR BOX

Mount sensor to finished wall 2" from the ceiling directly above the heater, see Diagram 1 ,3, 4 and 5. The temperature sensor box is equipped with 10 feet connection wire and connector. Please drill a hole with 3/4 inch diameter, then lead the connecting wire through and connect it to terminal TB2 of On-heater control unit (Diagram 6) or connector J3 on main-board in the control box of wall-mount digital control unit (Diagram 7). Then open the box cover, fix the temperature sensor on wall with screws, and put back the cover.

Sensor wire must be routed completely separate (as per low voltage electrical wiring codes) from any wiring carrying over 50 volts.

SECTION 6: CONTROL BOX

Only sauna heater with wall-mounted digital control NTS-300 is equipped with control box. The control box should be installed close to heater and outside of the sauna room. The installation spot should be well-ventilated and dry, with enough space for wire layout; the environment temperature cannot exceed 140°F; the control box can also be hanged on wall or shelf. Please refer to Diagram 7 for the control box connecting.

SECTION 7: 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 dimensions shown in Diagram 1 and 12.

DIAGRAM 3

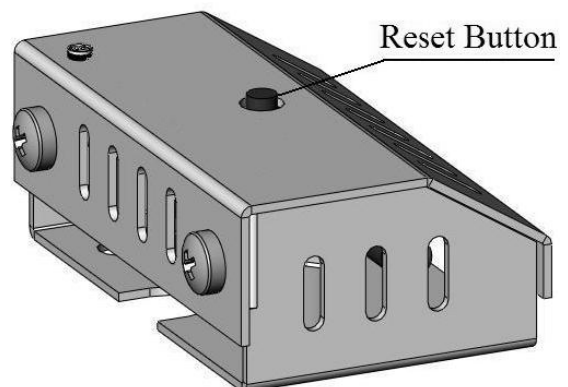
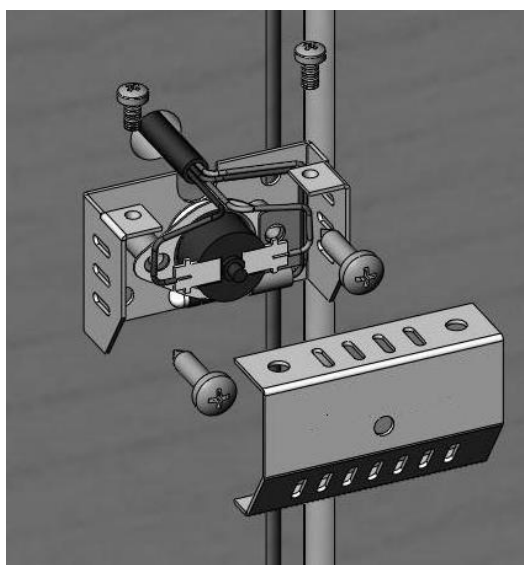


DIAGRAM 4

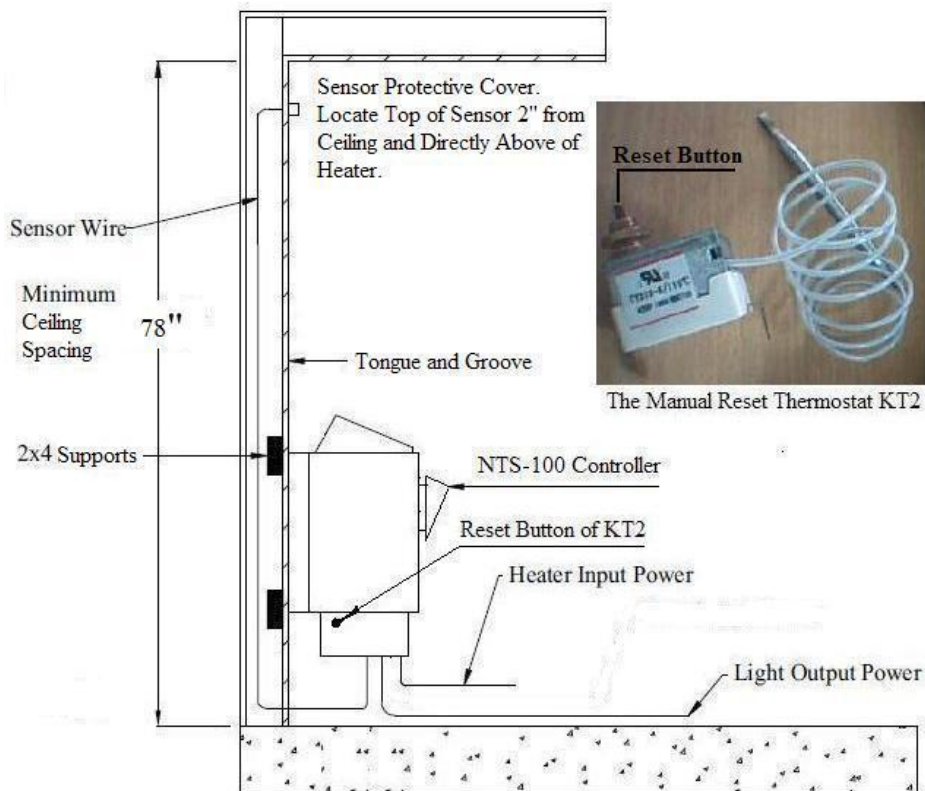


DIAGRAM 5

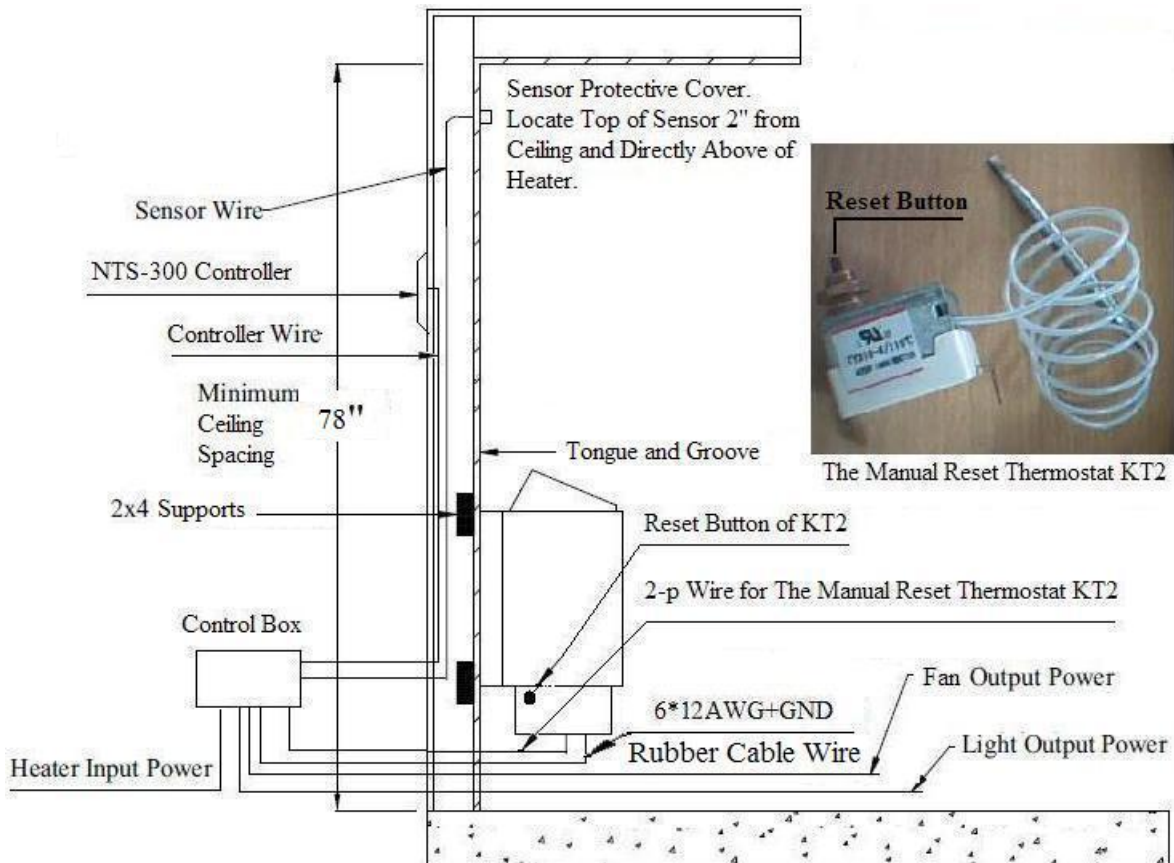


DIAGRAM 6

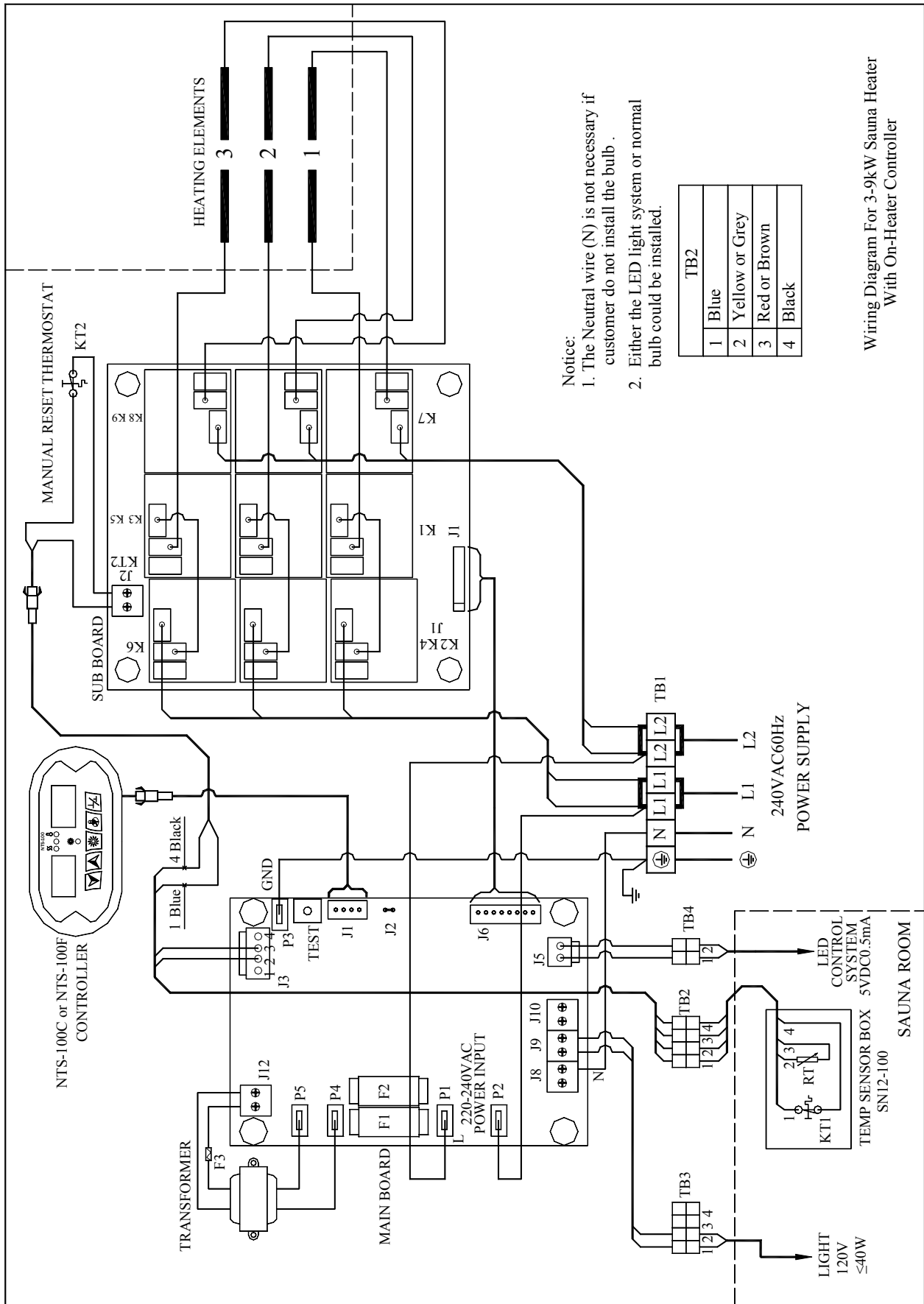
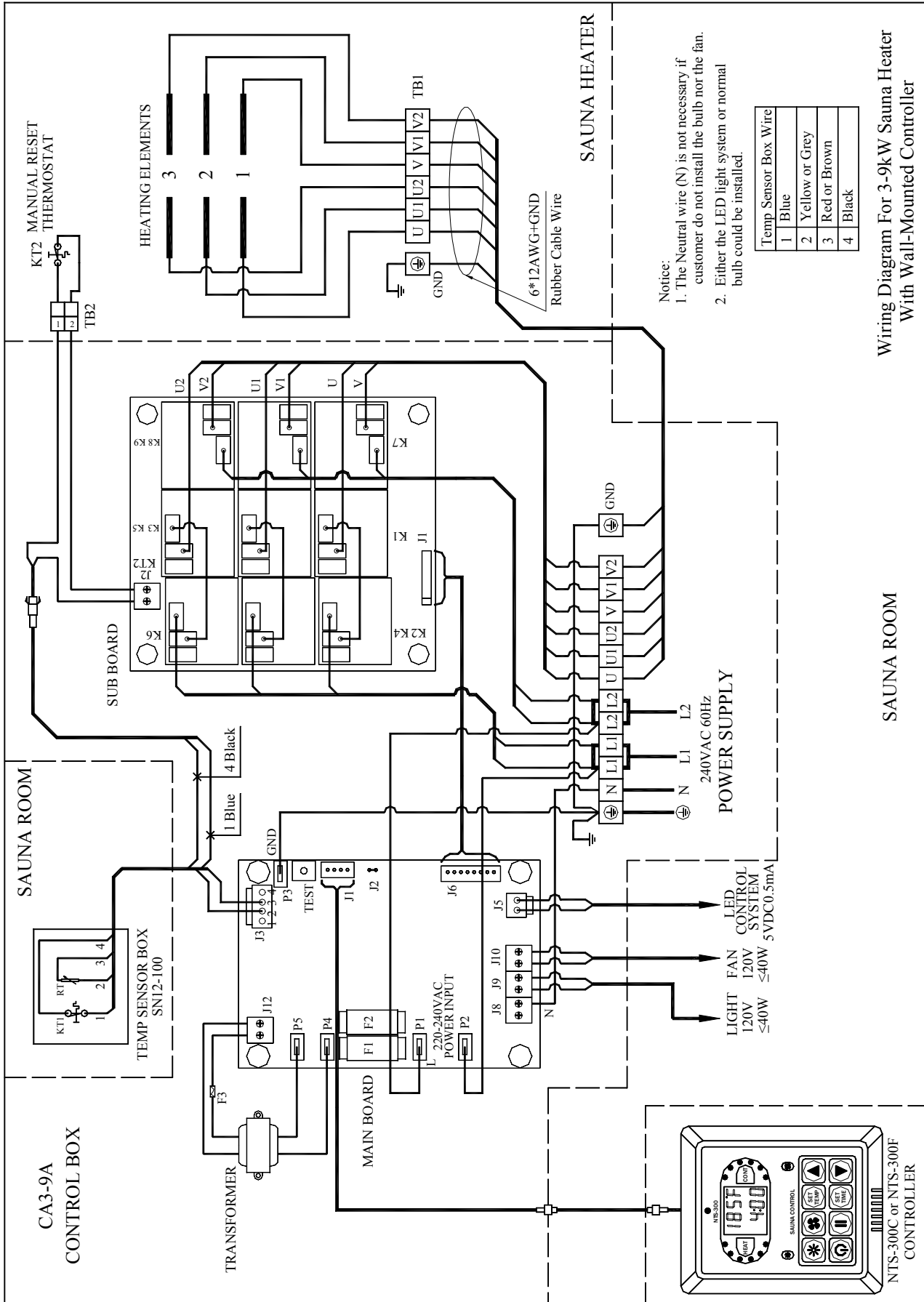


DIAGRAM 7



SECTION 8: CONTROL INSTALLATION

It is recommended that the wall-mounted digital control panel NTS-300 to be installed near the sauna door or other easy access location outside the sauna room, about 4 feet above ground. Please drill a 2" hole at the installation spot. The panel is equipped with water-proof connector and 16.5 feet control wire. Please connect one end of the control wire to the water-proof connector of the panel, and another end to the connector on the control box through the reserved wire hole. Then open the panel cover, fix the panel on the wall with screws, and put back the cover, please refer to Diagram 8.

DIAGRAM 8

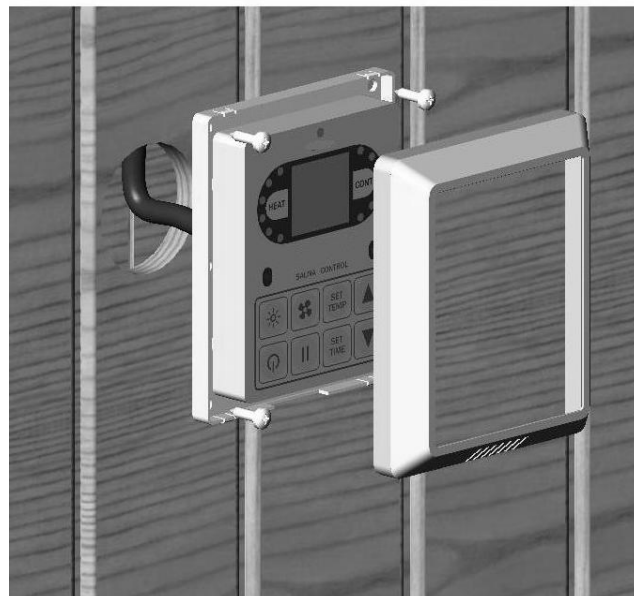
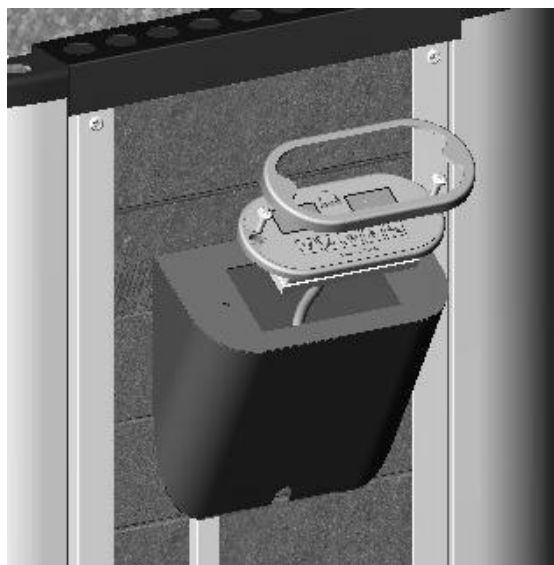
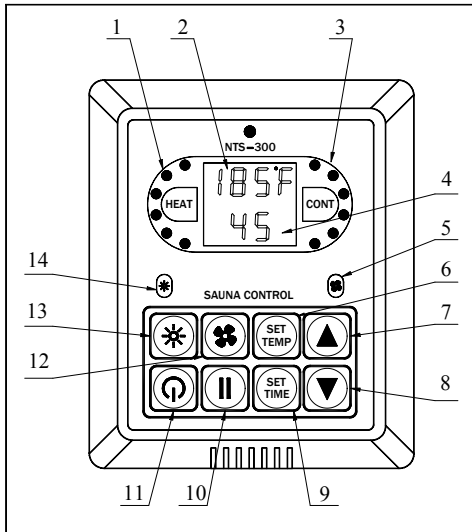


DIAGRAM 9



SECTION 9: NTS-300 CONTROL OPERATION



- 1.Heating indicator 2.Temperature display 3.Output indicator
- 4.Time display 5.Fan indicator 6.Temperature setting 7.Up
- 8.Down 9.Time setting 10.Pause/start 11.Sauna START/STOP
- 12.Fan ON/OFF 13.Light ON/OFF 14.Light indicator

1. Display

Temperature: Upper display window, display range: 43—221°F.

Setting temperature: Adjustable range 158-194°F.
Ex-factory value is 167°F.

Time: The control NTS-300, maximum preset time is 12 hours (0:00-11:59), the maximum the control will allow the heater to operate is 60 minutes(1-60). Ex-factory preset time is 0:00 while heating time is 45 minutes.

Time is displayed on the lower display window.

Heating: Indicated by left side LEDs.

Control heating: Indicated by right side LEDs.

External light: Indicated by “*”.

Fan: Indicated by “☸”.

2. Automatic heating control function

Automatic heating control function compares room temperature with user-set value, and then automatically decides groups of element to turn on. When working time is over, heater stop to heating.

3. Button and function

START/STOP: The control NTS-300, press this button to heater enters preset mode. If button pressed in preset mode or preset time is over, heater enters heating mode. If button pressed in heating mode or heating time is over, heater stop to heating.

WARNING

The control for this a thermostat to adjust the sauna temperature and a timer to control when the heater starts and stops. The maximum the timer of the heater to operate is 60 minutes. For health and fire safety, never attempt to alter or bypass the timer or thermostat.

Do not locate benches over heater. Minimum clearance of ceiling above heater 44 ”



Minimum clearance from heater to wooden surfaces (benches, side walls, heater fence etc.) 2 inches. Mounting brackets supplied. Provides proper clearance from wall behind heater.




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.

 **SET TEMP:** Press this button to change temperature setting, the upper screen blinks and displays the current setting, press “▲” or “▼” to adjust the setting, then press “” again to confirm, or the system automatically confirm the changes after 3 seconds, upper screen restore to display current room temperature.



 **SET TIME:** The control NTS-300, press this button to change preset time setting, the maximum preset time is 12 hours (0:00-11:59), press “▲” to adjust hour value, press “▼” to adjust the minute value, press “” again to confirm your setting and then enters the heating-time setting, maximum heating-time is 60 minutes, press “▲” and “▼” adjust it, press “” again to confirm your setting.





To comply with UL requirement, maximum heating time must be less than 60 minutes for family Sauna. Commercial sauna heaters must be used when service people presents. Consult your dealer if commercial model needed.

 **PAUSE:** Press this button to pause the heater from heating temporarily, and the heating indicators turn off. The pause function will not affect the status of system counting down. Press this button again to restore to original status.

 **LIGHT CONTROL:** This button is used as ON/OFF switch for ordinary sauna light (≤40W120VAC) .

 **FAN CONTROL:** Press this button to turn on/off fan for ventilation.

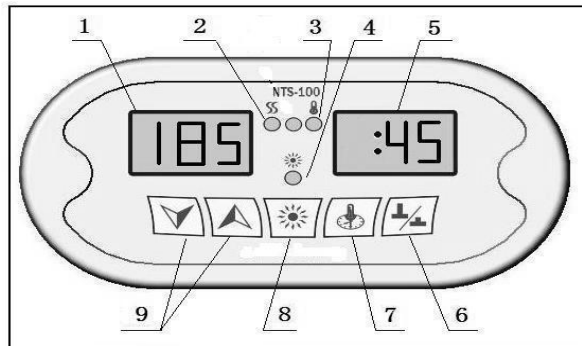
 and ▲ **TEMPERATURE UNIT SETTING:** Hold  and ▲ at the same time for over 3 seconds to switch temperature unit between °C and °F. Release the buttons when the appropriate unit appears on the display. Then temperature will be displayed in the chosen form. Ex-factory value is °F.

 and  **ILLUMINATION MODEL SETTING:** Hold  and  at the same time for over 3 seconds to switch Illumination model between filament lamp (bULb on the display) and LED system (LEd on the display), release the buttons when you need the “bULb” or “LEd” appears on the display. Ex-factory value is bULb.

▲ **ADJUSTING BUTTON.**

▼ **ADJUSTING BUTTON.**

SECTION 10: NTS-100 CONTROL OPERATION



1. Temperature display 2. Heating indicator 3. Temperature-preserving indicator 4. Light indicator 5. Time display 6. Sauna START/STOP 7. Temperature and Time setting 8. Light ON/OFF 9. Adjusting button

1. Display

Temperature: Left display window , display range: 43—221°F .

Setting temperature: Adjustable range 158—194°F , Ex-factory value is 167°F .

Time: Time is displayed on the right side display window.

The control NTS-100, maximum preset time is 10 hours(0:00-9:59), the maximum the control will allow the heater to operate is 60 minutes (1-60), Ex-factory preset time is 0:00 while heating time is 45 minutes.

Heating indicator: Indicated by .

Temperature-preserving indicator: Indicated by .

External light: Indicated by .





2. Automatic heating control function

Automatic heating control function compares room temperature with user-set value, and then automatically decides groups of element to turn on. When working time is over, heater stop to heating.


3. Button and function





START/STOP: The control NTS-100, press this button to heater enters preset mode. If button pressed in preset mode or preset time is over, heater enters heating mode, if button pressed in heating mode or heating time is over, heater stop to heating.


Temperature and Time setting: The control NTS-100, press once to adjust the temperature setting, the left side display window blinks and displays the previous setting temperature, press the or button to adjust the setting temperature, then press again to confirm your setting and entering preset time setting now, the maximum preset time is 10 hours (0:00~9:59), press to adjust hour value, press to adjust the minute value.

Press  again to confirm your setting and then enters the heating-time setting, the maximum heating-time is 60 minutes (1-60), press  or  to adjust the minute, press  again to confirm your setting.

To comply with UL requirement, maximum heating time must be less than 60 minutes for family Sauna. Commercial sauna heaters must be used when service people presents. Consult your dealer if commercial model needed.

 **Light control:** This button is used as ON/OFF switch for normal external light(≤40W120VAC).

 and  **Temperature unit setting:** Hold  and  at the same time for over 3 seconds to switch temperature unit between °C and °F. Release the buttons when the appropriate unit appears on the display. Then temperature will be displayed in the chosen form. Ex-factory value is °F.

 and  **Illumination model setting:** Hold  and  at the same time for over 3 seconds to switch Illumination model between filament lamp (bUL on the display) and LED system (LEd on the display), release the buttons when you need the “bUL” or “LEd” appears on the display. Ex-factory value is bUL.

 **Adjusting button.**

 **Adjusting button.**

SECTION 11: HIGH LIMIT CONTROL (RESET BUTTON)

The sauna heater has a built-in manual reset thermostat (KT2), when abnormal high temperature inside the sauna heater, the **heating elements** are cut off by the manual reset thermostat KT2 control equipment, sauna heater stop heating under this hazard circumstance. If the manual reset thermostat continually shuts off the heater, please check the “**VENTILATION**” section carefully. The manual reset thermostat KT2 can only be manually reset after temperature falls back to normal range and turn off power supply, then restart the sauna heater as well, see Diagram 2, 4, 5, 6 and 7.

The temperature sensor box has a built-in temperature limiting thermostat (KT1), which automatically turns off the heater by the temperature limiting thermostat (KT1) control equipment if the temperature inside in the sauna room rises to an abnormally high level. The temperature limiting thermostat KT1 can only be manually reset after temperature falls back to normal range, and please restart the heater as well. If the thermostat or heater cannot be restarted, please check temperature limiting thermostat KT1 or heating elements relays, please refer to Diagram 3, 6 and 7.

SECTION 12: 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 (1/2 cup) at a time and 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



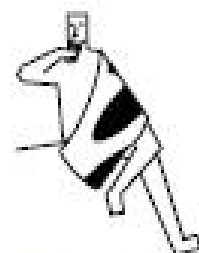
Sauna (10 - 15 min.)



Shower or swim



Rest (10 - 15 min.)



Relax with juice or water

DIAGRAM 10

TYPICAL PRE-CUT WALL CONSTRUCTION

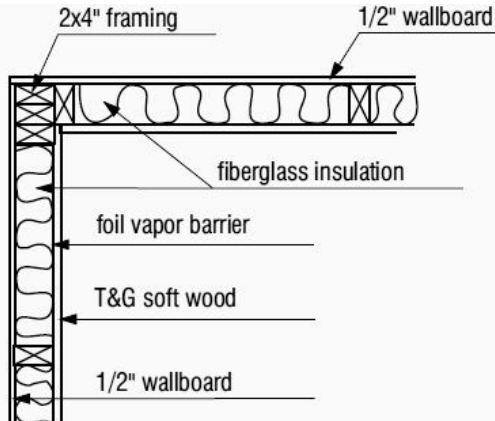
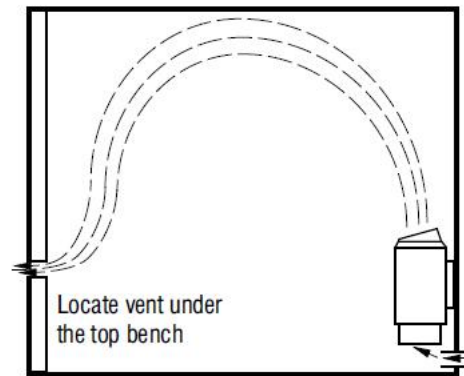


DIAGRAM 11

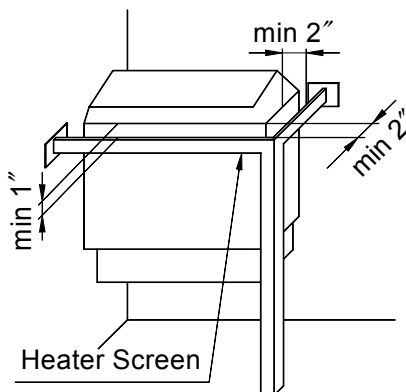
VENTILAYION



Ventilation hole needs to be drilled

Use all four long screws provided to fix the sauna heater securely on the wall. If the sauna room wall panel is less than 1/2", add extra wood frame with thickness more than 1/2" on the installation area to provide sufficient support

DIAGRAM 12



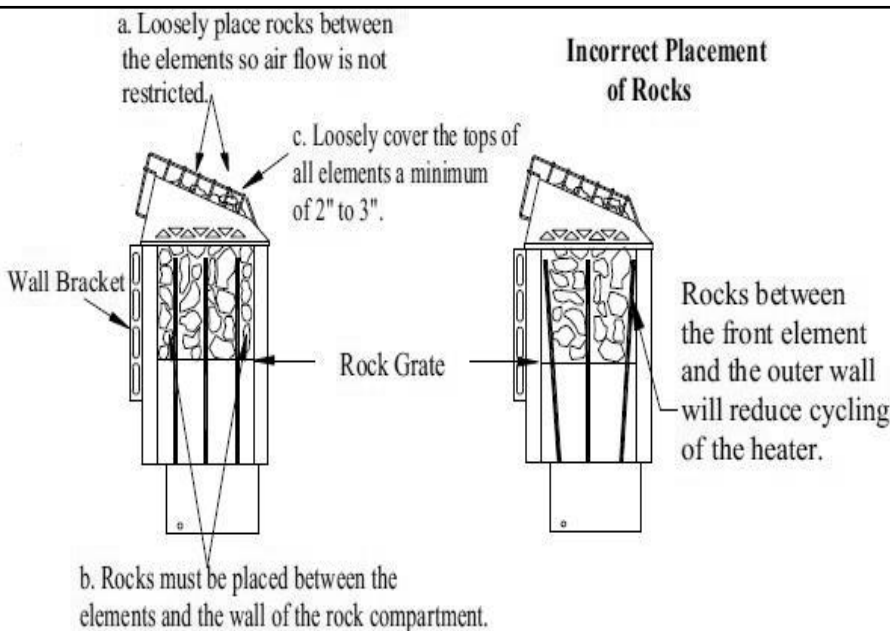
HEATER SCREEN
(GUARD RAIL)

WARNING

REDUCE THE RISK OF ELECTROCUTION AND BURNS

Do Not Operate Unless Guard Is In Place

DIAGRAM 13



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"

SECTION 13: WARNING PLACARDS

Two metal placards are included in the Installation Instruction Envelope packaged with every Sauna Heater. using the screws or nails provided in the intended location, at eye level. 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 14: ROOM CONSTRUCTION

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

- All wiring to the sauna heater and accessories shall be routed away from any direct radiation from the sauna heater.
- 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.
- No shower may be 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 13.



WARNING

REDUCE THE RISK OF OVERHEATING

1. Exit immediately if uncomfortable, dizzy, or sleepy. Staying too long in a heated area is capable of causing overheating.
2. Supervise children at all times.
3. Check with a doctor before use if pregnant, in poor health, or under medical care.
4. 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 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.

SECTION 15: VENTILATION

VENTILATION In a sauna, the air 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 went, See Diagram 11. It is recommended that ventilation openings meet the requirements of UL Specification 875. The minimum opening should be determined using one of the following formulas:

$$\text{For } R < 31, V \geq 9.3,$$

$$\text{For } R \geq 31, V \geq 0.3R$$

in which:

R = the floor area of the room in square feet and

V = the minimum vent size in square inches

For the SI system of units, the equations are:

$$\text{For } R < 2.9: V \geq 60,$$

$$\text{For } R \geq 2.9: V \geq 20.8 R,$$

in which:

R is the floor area of the room in square meters and

V is the minimum area of ventilation openings in square centimeters.

SECTION 16: MAINTENANCE

Only licensed electrician is allowed to perform the maintenance. If you need technical support, please contact your dealer.

- Power supply must be cut off before any maintenance.
- Test the heater after maintenance.
- Frequent inspection is required to prevent hazard caused by damaged wire or parts due to moisture.
- Proper ventilation is important, check possibility of over-heating after the sauna heater operating for a while.
- Make sure heater is properly grounded; all cables are properly wired and not oxidized.

Care and cleaning:

Clean the control panel surface with damp soft cloth.

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. **The units have no user serviceable parts. Any replacement shall be done by the service center:**

Changing heating elements: Turn off the sauna heater and cut off power supply. After the sauna heater completely cools down, take it off from wall and lie flat on floor. Refer to Diagram 2 (explosive view), take off the base plate(7) by unlocking screws(4), label all wires in sequence and then disconnect them from the elements, then pull the heating elements and the wiring box out of heater after unlocking the screws(15). Unlock the screws(17), and pull the heating elements out. After replacing the heating elements, reconnect everything in the reverse order.

Changing mainboard: Turn off the sauna heater and cut off power supply.

For on-heater control unit, after the sauna heater completely cools down, take it off from wall and lie flat on floor. Refer to Diagram 2 (explosive view), loose the base plate locking screw (4) and remove the base plate (7). Label all wires in sequence and then disconnect them from mainboard. After replacing the damaged mainboard, please reconnect all wires in original position, and then test the heater.

For wall-mount digital control unit, please refer to Diagram 7. Open the control box to label all wires in sequence and then disconnect them from mainboard. After replacing the damaged mainboard, please reconnect all wires in original position, and then test the heater.

Changing sub-board: Turn off the sauna heater and cut off power supply.

For on-heater control unit, after the sauna heater completely cools down, take it off from wall and lie flat on floor. Refer to Diagram 2 (explosive view), loose the base plate locking screw (4) and remove the base plate (7). Label all wires in sequence and then disconnect them from sub-board. After replacing the damaged sub-board, please reconnect all wires in original position, and then test the heater.

For wall-mount digital control unit, please refer to Diagram 7. Open the control box to label all wires in sequence and then disconnect them from sub-board After replacing the damaged sub-board, please reconnect all wires in original position, and then test the heater.

Changing control panel: Turn off the sauna heater and cut off power supply first, then take off the control panel cover and loose the control cable. Replace the broken control panel with new one, please refer to Diagram 8 and 9.

Changing temperature sensor: Turn off the sauna heater and cut off power supply, wait for the sauna heater completely cools down. For on-heater control unit, take off the compartment cover and disconnect the temperature sensor cable from terminal TB2; for wall-mount digital control unit, unplug the temperature sensor cable from connector J3 from the main-board in the control box. After that, loose the temperature sensor box and unplug the cable, then replace the broken temperature sensor with new one.

SECTION 17: TROUBLESHOOTING**Intelligent self-diagnose function**

Please check the following hint message for quick trouble shooting.

- **Room temperature is lower than 6°C (43°F):** displays “-L ”.
- **Room temperature exceeds 105°C (221°F):** Displays“- H ”. Sauna heater will not heat any more. Restore to normal state automatically after room temperature falls back to normal range.
- **Communication error:** displays“EE”. Bad connection between panel and mainboard, sauna heater will not heat any more. Error message disappears if connections restores. If the system cannot restore automatically after several minutes, please turn off sauna heater and cut off power supply, then check the control cable and connector between control panel and mainboard.
- **Temperature sensor error:** displays “SE”. The temperature sensor RT is either broken or shorted, heater stop working. Error message disappears automatically once temperature sensor is working properly. If the system cannot restore automatically after several minutes, please turn off sauna heater and cut off power supply, then check the cable and connector of the temperature sensor box, or replace sensor box.

NOTES: When abnormal high temperature inside the sauna heater or the sauna room temperature exceeds 120°C(248°F), the **heating elements** are cut off by the manual reset thermostat KT2 or the temperature limiting thermostat (KT1) control equipment, sauna heater stop heating under this hazard circumstance, please check the “**VENTILATION**” section or KT1 and heating elements relays carefully, the manual reset KT1 or KT2 can only be manually reset after temperature falls back to normal range and turn off power supply, then restart the sauna heater as well. **If the manually resettable temperature-limiting control trips frequently, a qualified serviceman should be contacted.**