Designer B Electric Sauna Heater Troubleshooting

Please watch this video for reasons why the high limit trips!

CLICK HERE TO WATCH

1. **Confirm the Model# & Serial Number of the Heater.**
2. Confirm the Timer is understood right, there is a time delay for up to 9 hours.
3. Confirm that a GFCI Breaker is **NOT** used.
4. Confirm the location of the Reset Button and if this has been pressed.
5. Confirm if they have the vent kit installed for air intake under the heater.
6. Confirm if the stones are loosely placed between the elements so there is still air flow.
7. Confirm if the Heating Elements turn orange at all when the heater is turned on.
8. Heater not turning on in extreme cold temperatures?

If all these tips have been tested, please Call Sauna 360 directly with your heater model number and serial number and they will assist further.

If you have your electrician on site, please have him contact Sauna 360 directly to troubleshoot;

888-780-4427

us_techsupport@sauna360.com

Dundalk LeisureCraft Inc.
318448 8th Line, Melancthon, Ontario Canada L9V 2K3
Ph: 519-923-9813 | Fax: 866-458-7583 | Web: www.leisurecraft.com

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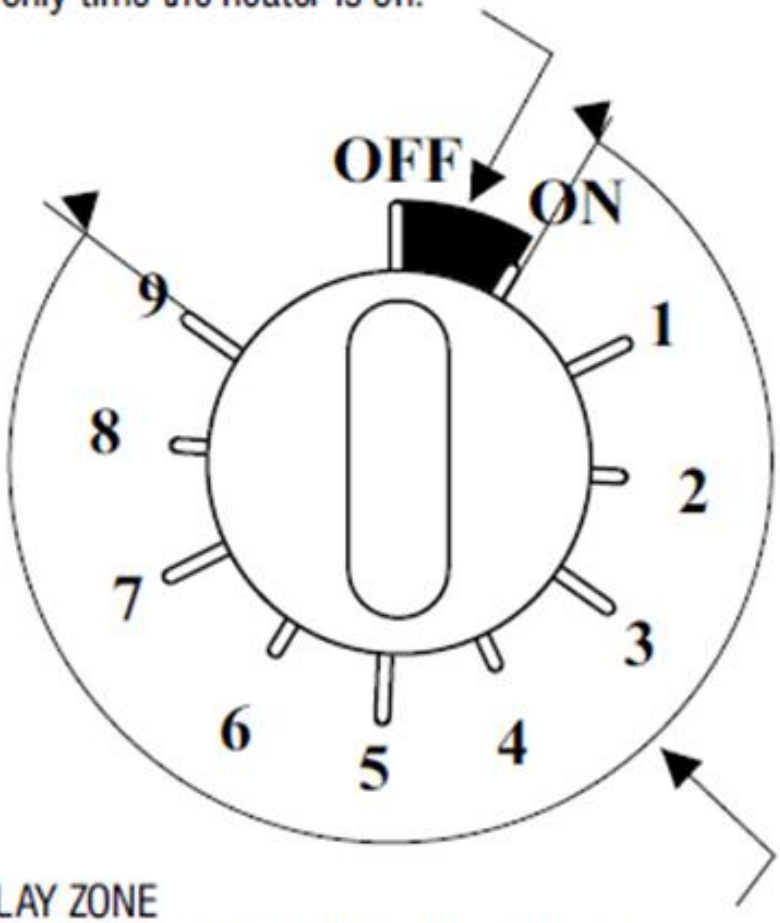
2. Understanding the Timer

ONE HOUR OPERATING ZONE FOR 9 HOUR DELAY TIMER
This area from "OFF" to "ON" is the operating zone. This is the only time the heater is on.



DELAY ZONE
This area from "9" to "ON" is the delay zone, meaning the heater can be programmed to come on up to nine hours later. The heater will not operate in this area.

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3. GFCI Breaker Not Required

TYLOHELO

December 23, 2020

From: TyloHelo Inc.
575 Cokato St. East
Cokato, MN 55321

To: Whom It May Concern

Subject: TyloHelo Sauna Heaters Do Not Require GFCI Protection

TyloHelo (Finnleo, Helo, Tylo, Polar, and Saaku Brand) heaters do not require GFCI protection. A sauna is not a "spa or hot tub" and a GFCI is not required in the NEC. The NEC does not specifically reference sauna in the standard.

Provided the heater is connected to the appropriate grounded circuit, there is absolutely no risk to the end user. If a GFCI protected breaker is installed, it will nuisance trip.

If there are further questions, please reach me at the below phone number.

Sincerely,

R&D/Quality Manager, TyloHelo Inc.

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4. Thermostat 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 zero (off), then push the reset button on the bottom of the heater, See Item 3 on Diagram 2. If the high limit continually shuts off the heater, contact a service representative.

[Where to find your high Limit Reset]

[Reasons why the high limit trips]

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5. Vent Kit for Air Intake and Proper Air Flow

The purpose of sauna ventilation is to move the air from the heater to the seating area and to ensure the heater has adequate airflow to keep it from overheating.

The sauna should have cross ventilation with the inlet vent low below the heater and an outlet vent high in the opposite corner from the heater.

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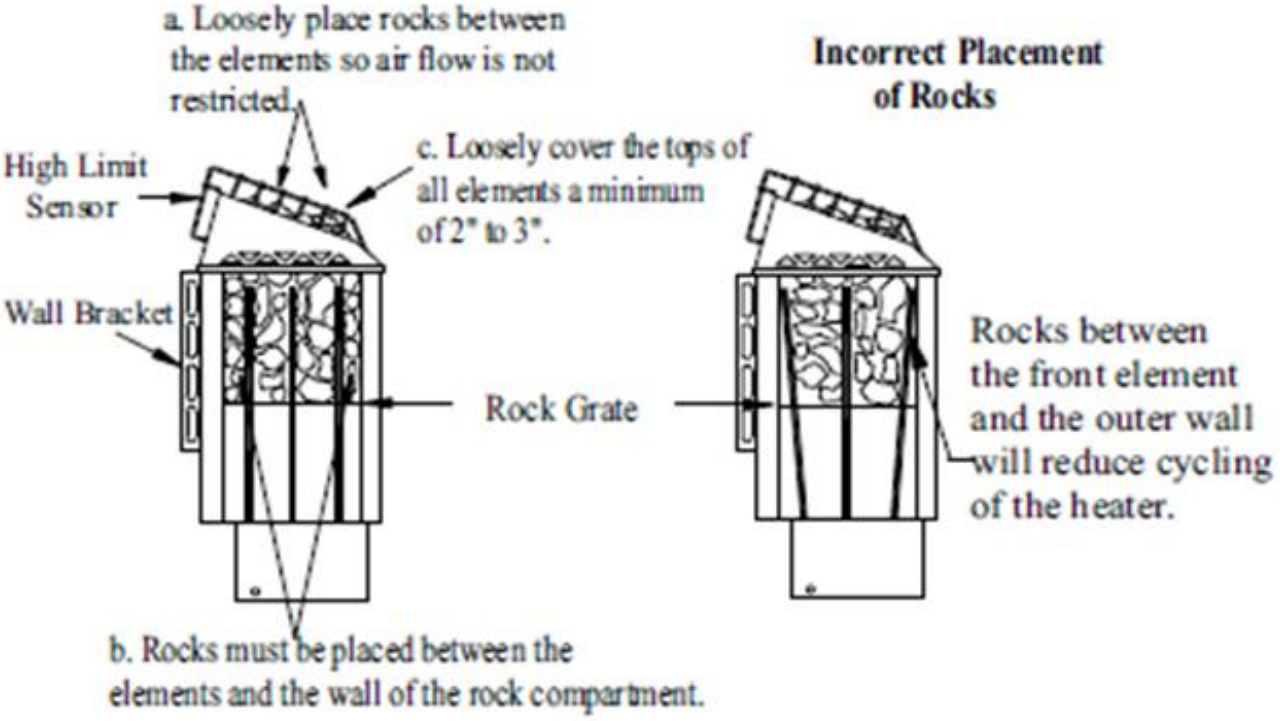
6. Placement of the Rocks

DIAGRAM 10



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".

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6. Heating Elements still turning Red.

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8. Heater not turning on in extreme cold temperatures?

Designer B heaters have a safety feature that will shut off the heater in the following.

If the oil in capillary bulb gets too hot it expands the pressure in the bulb shutting down the heater.

Solution: Let the internal temperature of the heater to decrease allowing the hi limit reset button to be pressed to enable the heater to be turned on again.

(See page 4 for more information on the High limit Reset)

If the temperature inside the sauna is too cold, the oil pressure in the capillary bulb gets to low and will trip the high limit switch and will not allow the heater to reset in temperatures below 0°C (32°F).

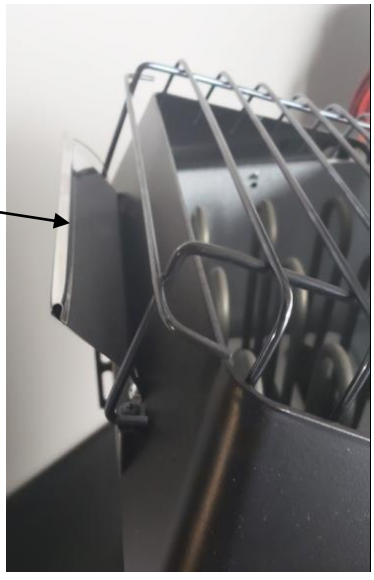
Solution: The safety feature will allow the hi limit to be reset around 20°C (68°F)

You will need to get the inside temperature of the sauna to this temperature to allow the oil pressure to return to normal and be able to reset the high limit.

You can do this by trying any of the following.

- placing a small heater in sauna
- Using a blow-dryer or something similar to warm up the capillary bulb. (see pic)
- You may also be able to just use your hands to warm up the area of the capillary bulb enough to be able to reset the high limit.

The Capillary Bulb Housing is located at the top back of the heater.



HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17

Symptoms	Probable Causes	Action To Be Taken
Room not reaching Temp	Heater not Sized Properly. Room Ambient Temperature Thermometer Location Sauna Room Insulated Rock Placement Ventilation Thermostat not set properly	Measure Room, L x W x H = __cu. ft. Outside Saunas take longer to heat. Thermometer should be mounted in a neutral area, away from door and heater 1 foot down from the ceiling. Verify that the rocks have been properly placed in the heater. Verify per owner's manual. Make sure thermostat is set fully clockwise.
No Heat	Timer In Delay Zone High Limit Tripped. Breaker Off or Tripped. No Voltage Contactor Will Not Energize	Turn the timer to 3, then slowly turn back counter clockwise until a click is heard. ***See Section A,*** Timer Reset the high limit button underneath the heater. ***See Section C***, High Limit Turn breaker on or reset if tripped. Verify voltage at the terminal block. ***See Section F***, wiring diagram. ***See Section D***, Contactor
Not All Elements Turning On	Thermostat not set properly. Contactor Elements Thermostat	Make sure thermostat is set fully clockwise. ***See Section D***, Contactor ***See Section B***, Elements ***See Section E***, Thermostat
Heater won't run for one hour	Timer	Turn timer clockwise to number 3, then turn back counter clockwise until a "**click"** is heard, then stop turning the knob. Start timing. ***See Section A***, Timer.

For assistance, call Saunatec Inc 1-888-780-4427. Please have the Model and Type number available.

Electric Shock Hazard: High voltage exists within this equipment. There is 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.

HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17

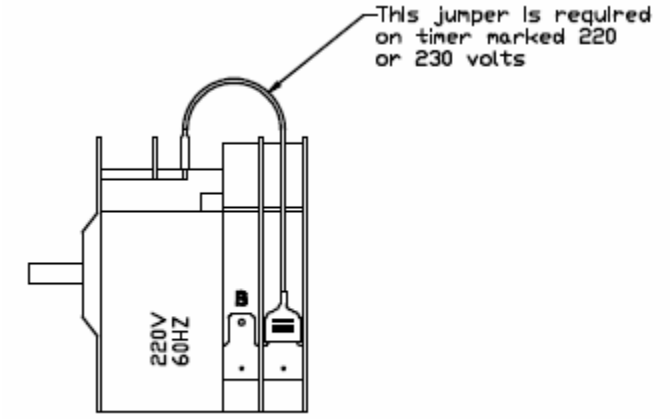
Timer (Section A)

Part Number: 3140-504

Note: This heater is equipped with a 9+1 timer, be sure you understand how to operate this timer.

. The 240-volt timer will have a jumper in place of the resistor ***(See Figure T2)***.

Note: All replacement timers will have 220 V or 230 V marking on the side, and are used with 240-volt (208 volt) heaters.



T2

Troubleshooting with the power on:

Check for power between terminals "A1" & "A1" on the top of the timer. You should have 240 or 208 volts at this point ***(See Figure T3)***.

1. Turn timer to the preset zone.

There will be 240 or 208 volts between terminals "A1" and "A1", but no voltage between terminals "B0" and "B0" ***(See Figure T3)***. Clamp the amprobe to one of the incoming wires (a wire from the circuit breaker). If the timer is working properly, it will draw a small amount of current (.005-.03 amp). You may be able to feel the slight vibration of the timer as it runs by placing your hand on the front of the timer.

HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17

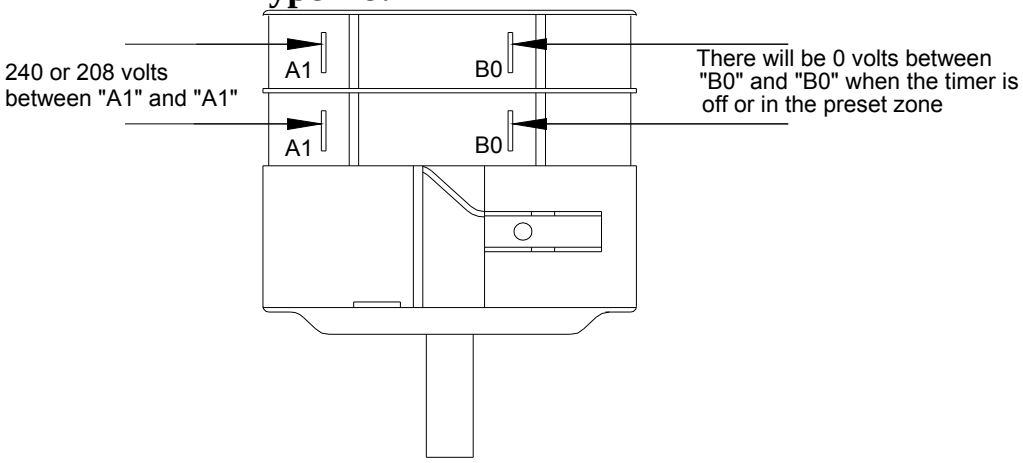


figure T3

2. Turn timer knob to the operating zone.

Check for voltage between terminals "B0" and "B0". There should be 240 or 208 volts at these terminals. If not, the timer is bad.

Troubleshooting with the circuit breaker off

1. Remove the timer from the heater. (NOTE: Mark wires before removing)

2. Check continuity between terminals. Make sure no leads are attached when checking continuity.

There are two "A1", two "B0" and two "B" terminals on each timer. To avoid confusion, the terminals closest to the front of the heater will be called "A1" front, "B0" front, and "B" front; and the terminals closest to the back of the heater will be called "A1" back, "B0" back and "B" back. ***(See Figure T4)***

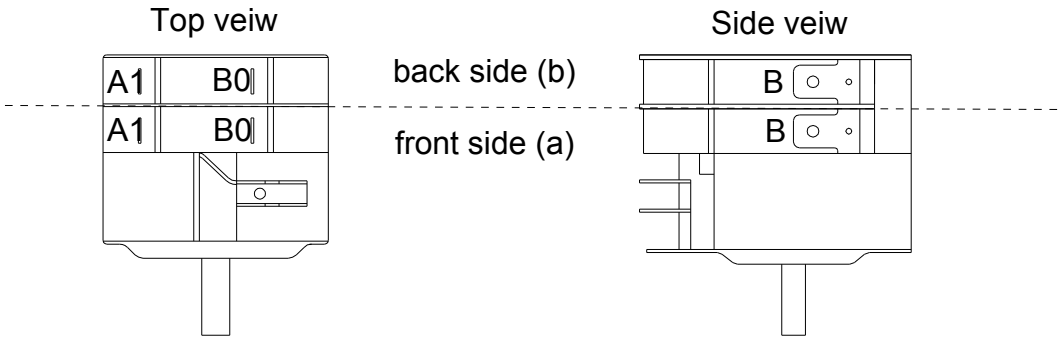


figure T4

With the timer in the off position, there is no continuity between the "A1" and the "B0" terminal and no continuity between the "A1" and the "B" terminal.

Preset zone
Turn the timer to the preset zone. In the preset zone, there will be continuity between "A1" front and the "B" terminal front, and between terminal "A1" back and terminal "B" back. There is no continuity between the "A1" and the "B0" terminals.

Operating zone
Turn the timer to the operating zone. In the operating zone there ***will be*** continuity between "A1" and the "B" terminals and between "A1" and the "B0" terminals.

If there is no continuity between points described above, the timer needs to be replaced.

3. Checking the timer motor

Reading resistance of the motor. Place one lead of ohmmeter on terminal "A", (that has the small black or blue wire attached) place other lead on the group of four copper terminals on top with the second small black or blue wire attached. If the timer is good, the following resistance will be read.

240 volt timer-- 6.4 to 7.0 K ohms

The resistance reading may vary somewhat, but generally when the timer motor is bad, the circuit opens so resistance will be infinite.

Elements (Section B)

Part Numbers: See Table Below

Checking Total Current Draw of Heater Elements:
With an amprobe clamped to one of the supply conductors, turn heater on. Read the current draw and reference the table below showing correct current draw.

208 Volt 1 & 3 Phase Heaters

Model	Per Element	1 Phase	3 Phase
1714-45-17	7.2 Amps	21.6 Amps	12.5 Amps
1714-60-17	9.6 Amps	28.8 Amps	16.7 Amps
1714-80-17	12.8 Amps	38.5 Amps	22.2 Amps

240 Volt 1 & 3 Phase Heaters

Model	Per Element	1 Phase	3 Phase
1714-45-17	6.3 Amps	18.8 Amps	10.7 Amps
1714-60-17	8.3 Amps	25.0 Amps	14.5 Amps
1714-80-17	11.1 Amps	33.3 Amps	19.2 Amps

A. If there is current through an element, it is working. If there is no current through an element check for voltage.
B. If there is voltage to an element and no current, element is bad and needs to be replaced.
C. If there is no voltage, check the high limit, ***See Section C***.

HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17

With power off, remove one wire to each element and ohm out. The resistance reading should be equal on all three. If not the element that does not read equal is bad. ***See table below***.

Type	KW	Volts	Ohms
1714-45-17	4.5	208	28.3
1714-60-17	6.0	208	22.2
1714-80-17	8.0	208	16.6
1714-45-17	4.5	240	38.1
1714-60-17	6.0	240	27.9
1714-80-17	8.0	240	21.4

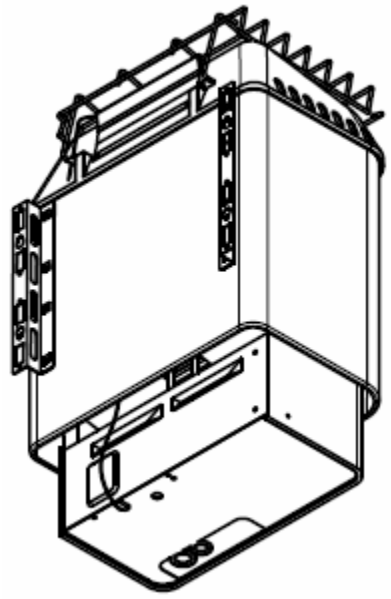
Type	Part No:	Description	Qty
1714-45-17	3001-723	Element: SEPC 93, 208V/1500W (1 & 3 Phase)	1
1714-60-17	3001-725	Element: SEPC 94, 208V/2000W (1 & 3 Phase)	1
1714-80-17	3001-728	Element: SEPC 95, 208V/2670W (1 & 3 Phase)	1
1714-45-17	***3001-724***	***Element: SEPC 93, 240V/1500W (1 & 3 Phase)***	***1***
1714-60-17	***3001-726***	***Element: SEPC 94, 240V/2000W (1 & 3 Phase)***	***1***
1714-80-17	***3001-729***	***Element: SEPC 95, 240V/2670W (1 & 3 Phase)***	***1***

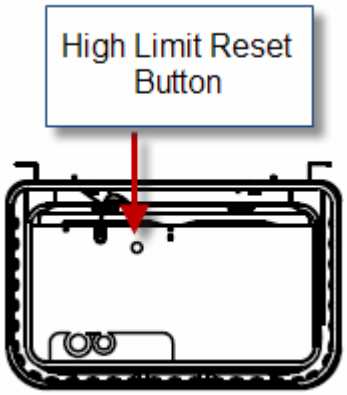
High Limit (Section C)

Part Number: 3119-510

The high limit has a reset button that can be pressed to restore power if tripped. Button located to the left, underneath where the electrical wires are incoming. If button is springy, high limit is not tripped. If not, high limit is tripped. Push up hard to reset. If the high limit is open or if it opens during normal use, be sure that the capillary bulb is in the bracket. ***Figure L1*** shows where the capillary bulb and high limit is located.

High Limit Capillary Bulb





HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17

Figure L1

Troubleshooting with the power on: ***See Figure L2***
Power into the high limit is 240 or 208 volts between terminals "P1" & "P2" and "P2 & P3". Power out will be 240 or 208 volts between terminals "1" & "2" and "2" & "3". If there is power on the "**in**" side and no power on the "**out**" side, the high limit is open. If the high limit can't be reset, it will have to be replaced.

If there is no power on the "**in**" side of the high limit, go back and check the timer, ***See Section A.***

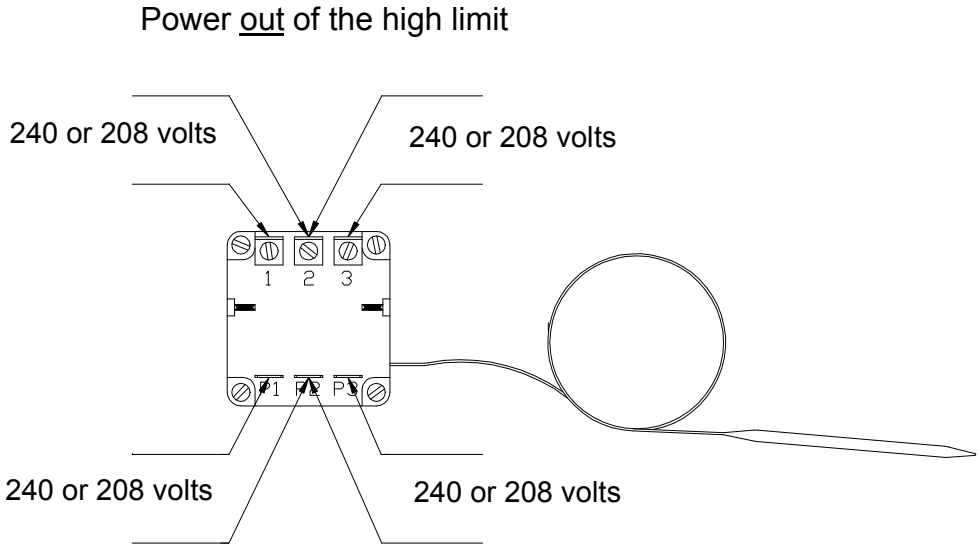


Figure L2

Troubleshooting with the circuit breaker off:

Mark and remove all three wires from one side of the high limit, (from "1", "2" and "3" or from "P1", "P2" and "P3" terminals). Check for continuity through each set of contacts; "1" and "P1", "2" and "P2", "3" and "P3". Each set of contacts should be closed, and the resistance should be zero. If any one of the contacts is open and can't be reset by pressing the reset button, the high limit control should be replaced.

HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17

Contactor (Section D)

Part Number: 3131-517

Part Number: 3131-517, shown on the left in Figure C1.

Troubleshooting with the power on:

When the heater is turned on, the bar in the center of the contactor moves in; and when the heater is turned off, it will move out again. When the heater is turned on, the tab on the contactor will move from the O to the I position, and back to O when power is turned off. ***(See Figure C1).***

If the contactor bar or tab moves in and out as the heater is turned on and off, the coil has voltage at terminal A1 and A2 and is operating normally.

If this bar or tab fails to move, check for power at terminal “A1” and “A2” when the heater is on. If there is 240V or 208V power at “A1” and “A2” the contactor is bad and must be replaced. If there is no voltage on terminal "A1" and "A2", the problem is either the timer, high limit or an improper wire connection to the contactor, ***(check the wiring diagram in Section F)***.

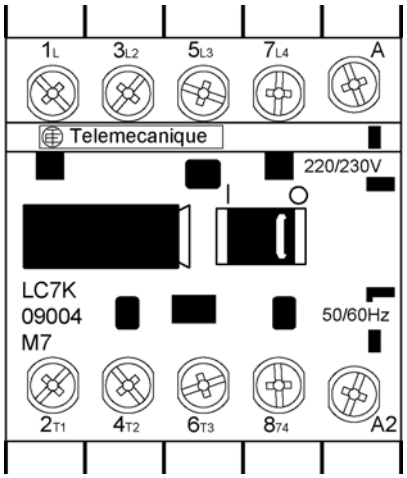


Figure C1

If the contactor is closing normally, the contacts must be checked. The following table lists what the voltage should be at each point on the contractor. ***(See figure C1 for the location of the terminals).***

HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17

1 Phase Heaters 208 / 240 volts at terminal #'s	3 Phase Heaters 208 / 240 volts at terminal #'s	1 & 3 Phase Heaters 0 volts at terminal #'s
3131-517	**3131-517**	**3131-517**
2 & 6	2 & 6	1 & 2
2 & 8	2 & 8	3 & 4
4 & 6	4 & 6	5 & 6
4 & 8	4 & 8	7 & 8
1 & 5	1 & 5	
1 & 7	1 & 7	
3 & 5	3 & 5	
3 & 7	3 & 7	

If you are reading full voltage between all of the terminals listed in one of the first two columns, the problem is in another part of the heater.

If not reading full voltage across terminals listed and something other than 0 (or very close to 0) across the terminals in the third column, the contactor needs to be replaced.

If reading full voltage between terminals in one of the first two columns and 0 volts across the terminals in the third column, the contactor is good.

Troubleshooting the contactor when removed from the heater:

To remove the *Telemecanique* 3131-517 contactor, pull contactor down and lift up from the bottom.

Apply 208-240 volts to the coil of the contactor, terminals "A1" & "A2,"***(See figure C1).*** The contactor should close. You should now have continuity, (no resistance) through each of the four poles of the contactor. If the contactor doesn't close, or no continuity through any of the poles; the contactor needs to be replaced.

HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17
Thermostat (Section E)
Part Number: 3155-622

Operation

The thermostat is a three-stage thermostat. Under normal operation, it will shut off the back element first, then the center element, and then the front element.

The thermostat is very difficult to check when the heater is operating since it is not very accessible. The easiest way is to turn off power and remove the thermostat from heater.

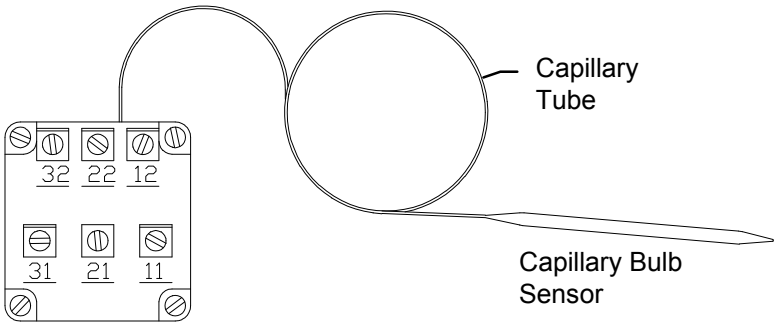
Troubleshooting

There must be continuity (no resistance) between the following points marked on the thermostat at room temperature. Thermostat must be turned to maximum, ***fully clockwise***.

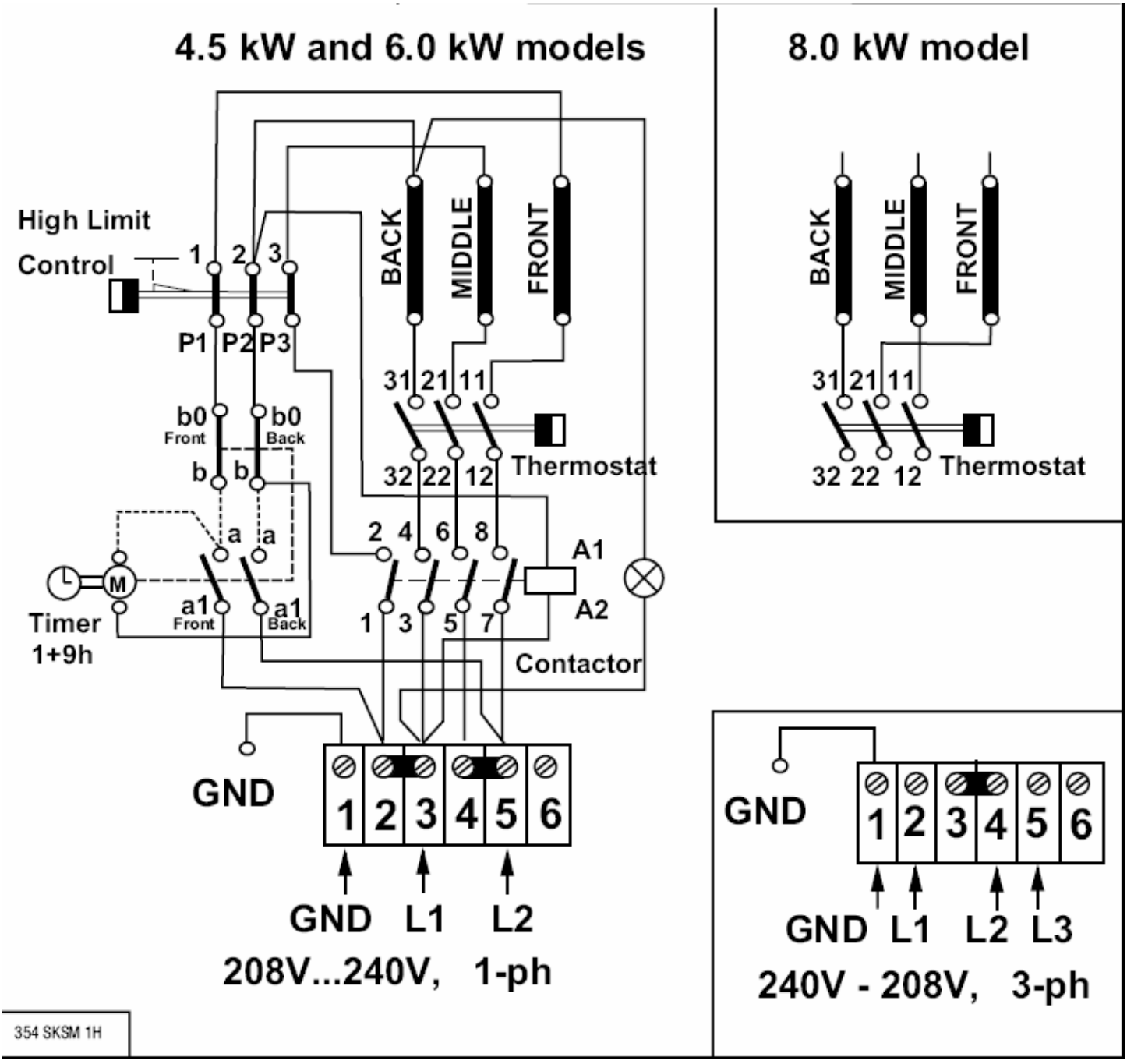
31 and 32
21 and 22
11 and 12

As the thermostat is slowly turned back (counterclockwise), three soft but, distinct clicks can be heard as each pole as the thermostat opens. (This depends on the temperature of the room, if the room is cool, all poles may stay closed.) The first pole to open will be terminals 11 and 12, second to open will be terminals 21 and 22, and last to open will be terminals 31 and 32. These can be checked with the continuity tester ***(See Figure TH 1)***.

If the poles are opening and closing normally, the thermostat is good. If any of the poles are stuck in the open or closed position, the thermostat needs to be replaced. Be sure the capillary tube is not kinked (not a radius smaller than a nickel) or cut ***(See Figure TH1)***.

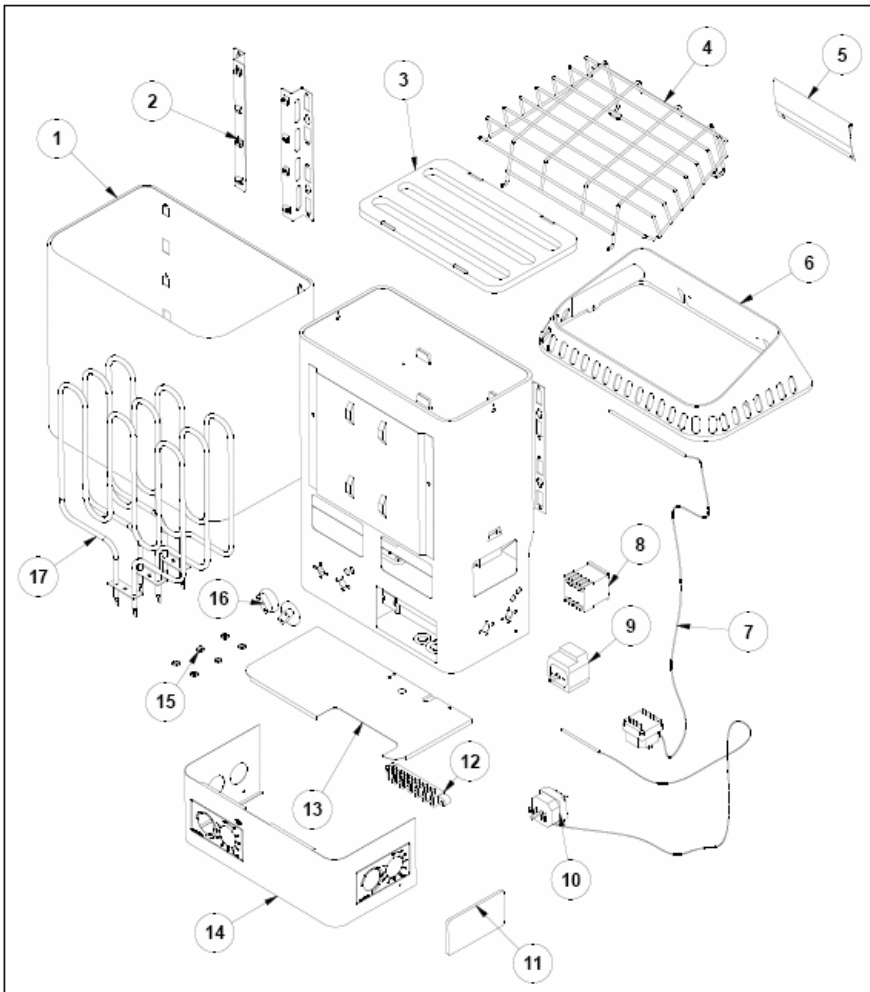


HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17
Wiring Diagram **(Section F)**

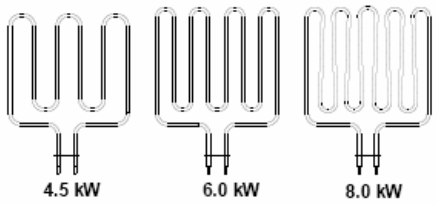


HEATER TROUBLE SHOOTING GUIDE
Type No: 1712-XX-17
Parts List

Type Number 1712-xx-17



Designer B Parts List		
#	Description	Part #
1	Designer Heater Shourd	8012-506
2	Heater Supports 4.5 & 6.0 kW	8250-060
2	Heater Supports 8.0 kW	8250-080
3	Rock Grate	8019-209
4	Rock Cage	8019-500
5	Capilary Holder	N/A
6	Heater Cap	8012-450
7	High Limit Switch	3119-510
8	Contactor	3131-517
9	Timer	3140-504
10	Thermostat Control	3155-622
11	Control Hole - Cover	N/A
12	Terminal Block	2100-550
13	Lower Heater Cap	8012-445
14	Electrical Enclosure Cover	N/A
15	Element Seals	8855-10
16	Control Knobs	2140-500
17	Elements	See Chart



Element Chart			
kW	Part #	Description	Qty
4.5	3001-701	Element: SEPC 63, 240 V	3
4.5	3001-702	Element: SEPC 63, 208 v	3
6.0	3001-703	Element: SEPC 64, 240 V	3
6.0	3001-704	Element: SEPC 64, 208 V	3
8.0	3001-705	Element: SEPC 65, 240 V	3
8.0	3001-706	Element: SEPC 65 208 V	3