Workbook JXi Pool & Spa Heater

Jandy Pro Series by ZODIAC®

JXi™ POOL & SPA HEATER

Zodiac Pool Systems Inc.
1-800-822-7933 - Regional ext. _____
www.zodiacpoolsystems.com

Instructor: _____ ext._____

Sales Representatives: _____ ext._____

_____ ext._____

_____ ext._____

Service Manager: _____ ext._____

_____ ext._____

IMPORTANT SAFETY INSTRUCTIONS

The information contained in this technical guide is intended for Zodiac trained service personnel only. Electrical installation and repairs should only be performed by a certified electrician or Zodiac trained professional, and must comply with all national electric codes (NEC, Canadian, etc.), state and local law, ordinances, codes and regulations.

If you have not received training, **do not attempt any of the electrical repairs presented in this document.** Contact Zodiac Pool Care, Inc. at 1-800-822-7933 for assistance.

Read and follow all instructions carefully.

When servicing equipment, basic safety precautions should always be followed including those listed below.

⚠ WARNING **Failure to heed the following warnings could result in property damage, permanent injury or death.**

TO REDUCE THE RISK OF ELECTRICAL SHOCK:

- Disconnect main power to pool equipment area prior to any service or repairs.
- Keep all electrical equipment at least 10 feet (3 m) from inside wall of pool or spa.
- Connect equipment only to a receptacle (cord models) or circuit (hardwired) protected by a ground fault circuit interrupter (GFCI).
- Use only copper conductors and supply wires suitable for the specific device.
- Replace damaged power cord(s) immediately and use only identical replacement parts.
- Do not bury power cord(s). Position cord(s) to minimize abuse from lawn mowers, hedge trimmers and other equipment.
- Do not install or service equipment if precipitation is present or imminent.

TO REDUCE EQUIPMENT WATER PRESSURE HAZARD:

- Always turn pump off to release pressure prior to removing or installing in-line equipment.
- To avoid equipment damage, do not exceed water pressure (psi) specifications for the device.

To reduce the risk of injury, do not permit children to operate, handle or play on equipment.

Introduction

The Jandy Pro Series JXi pool/spa heater is a blower assisted, internal combustion chamber, residential heater.

Available Model Sizes:
200, 260 & 400K BTU's

Model Numbers JXI200N, JXI200P, JXI260N, JXI260P, JXI330N, JXI330P, JXI400N, JXI400P

JXI 400 N

Model

BTU's

Gas Type N= Natural P = Propane

General

All gas fired appliances require correct installation to assure safe operation.
The requirements for this pool heater include the following:

Indoor vent adapter required for indoor installation.
Must be vented with Type B Double wall for Category 1 venting or stainless steel vent pipe for Category 3.
Water piping can be Schedule 40 PVC.
Can be wired 120VAC or 240 VAC
The JXi CAN be installed on combustable surfaces.

Field Assembly

- **Properly size gas pipe to supply gas from the meter to the heater.**
- **Gas shut-off valve (ball-cock) must be installed in-line outside of the heater jacket.**
- **Suitable gas union must be installed to connect gas line to heater outside of the heater jacket.**
- **Gas sediment trap (drip leg) in gas line between shut-off valve and heater.**
- **Supplied power 120VAC or 240VAC (as local code requires)**

Proper Gas Pipe Sizing

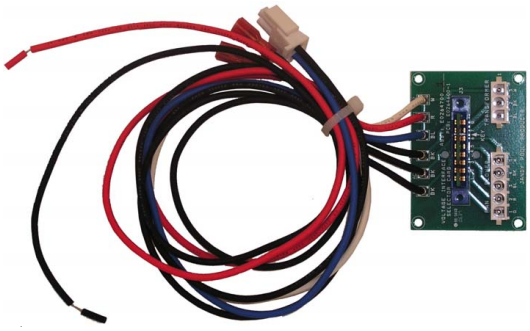
For LP gas, reduce pipe diameter by one size, but maintain a minimum 3/4 inch diameter.

Heater Size	Distance from Gas Meter					
	0-50 feet (0-15 m)		50-100 feet (15-30 m)		100-200 feet (30-60 m)	
	in.	mm	in.	mm	in.	mm
200	1	25	1-1/4	32	1-1/4	32
260	1-1/4	32	1-1/4	32	1-1/4	32
330	1-1/4	32	1-1/4	32	1-1/2	38
400	1-1/4	32	1-1/2	38	1-1/2	38

Installation Requirements (Field Assembly)

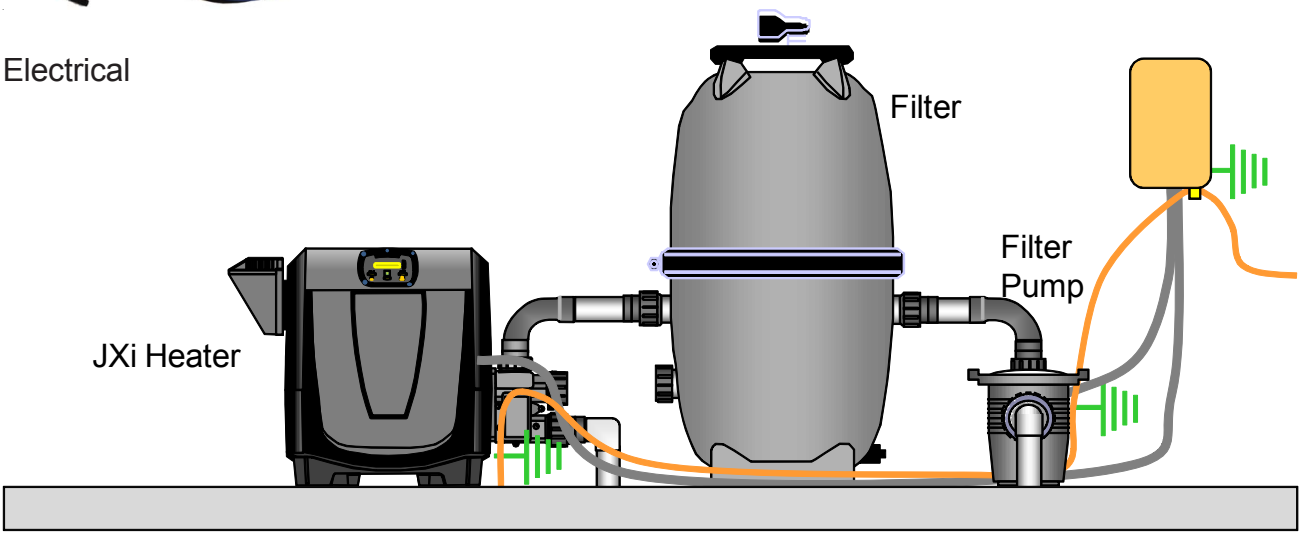
Supplied power 120VAC or 240VAC

Electrical wiring must be in accordance with the latest edition of the National Electric Code® (NEC®), ANSI®/ National Fire Protection Association® (NFPA®) 70, or in Canada, the Canadian Electrical Code (CSA® C22.1) unless local code requirements indicate otherwise.

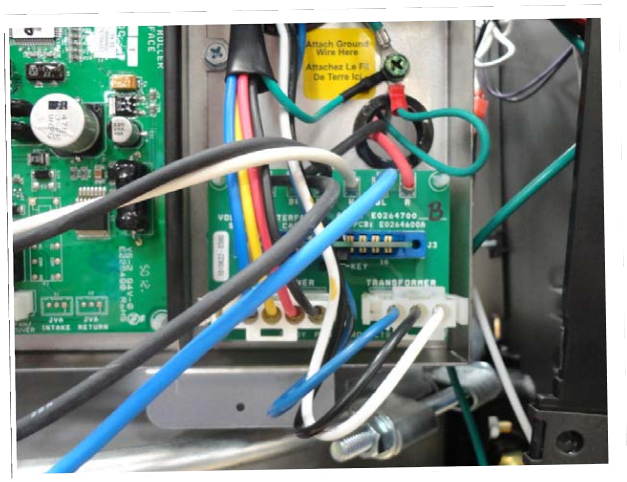


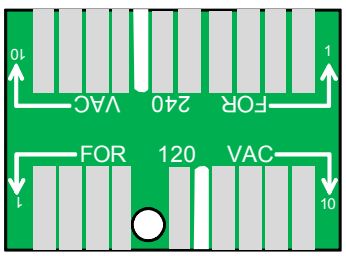
The heater comes factory-wired intended for use with 240 Vot, 60 Hz AC field electrical supply. To use 120 Vot, 60 Hz AC requires changing the position of the voltage selector board on the power distribution board. This must be done by a certi ied electrician.

Electrical



Power Distribution Board
Conversion from 240 VAC to 120 VAC

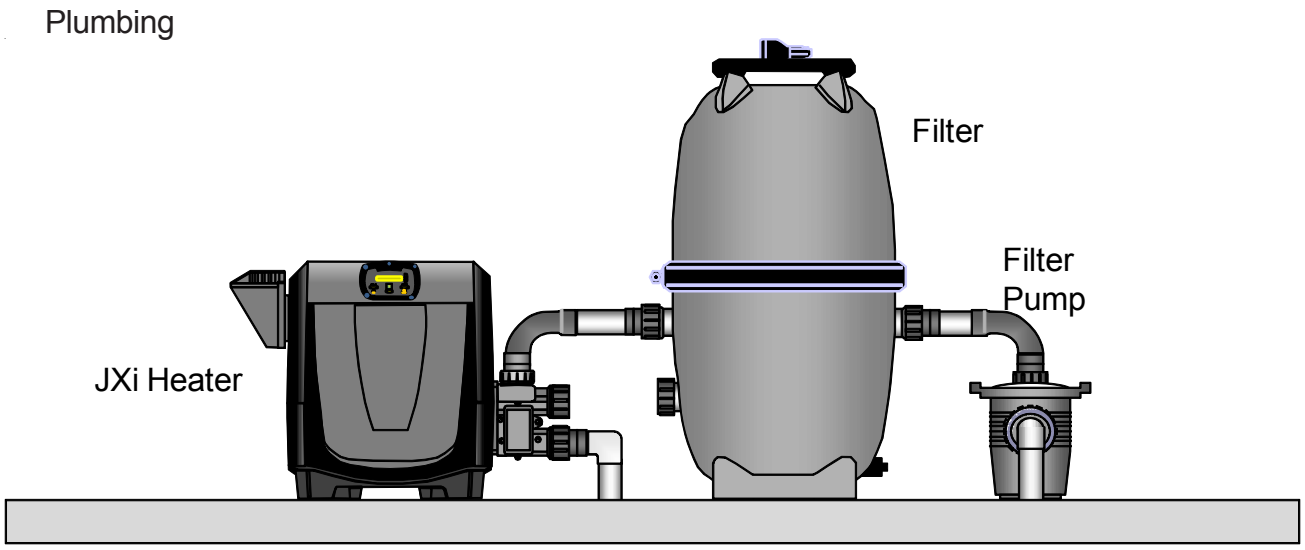




Installation Requirements

PLUMBING

Heater must be plumbed down steam of filter.
Heater must be installed so that when the filter pump is off so to is the heater.
All electrical equipment must be grounded and bonded.



The JXi heater is Versa Plumb ready.

The Versa Plumb System reduces hydraulic resistance by up to 50% versus other equipment sets in its class.

The Versa Plumb System's increased hydraulic efficiency allows for up to a 1/2 HP smaller pump to achieve the same level of flow, resulting in greater energy savings.

Faster installation with our pre-assembled plumbing kits, which enable quick and consistent equipment plumbing design to reduce installation costs.

Innovatively designed system requires less plumbing pipe and fittings, while increasing hydraulic efficiency.

Installation Requirements

Appropriate site location

Clearances/ Combustable sufaces

In both indoor installations (US) and outdoor shelter installations (Canada), the heater must be placed to provide clearances on all sides for maintenance and inspection, as well as maintain minimum distances from combustible surfaces.

The following minimum clearances must be maintained from combustible surfaces during operation.

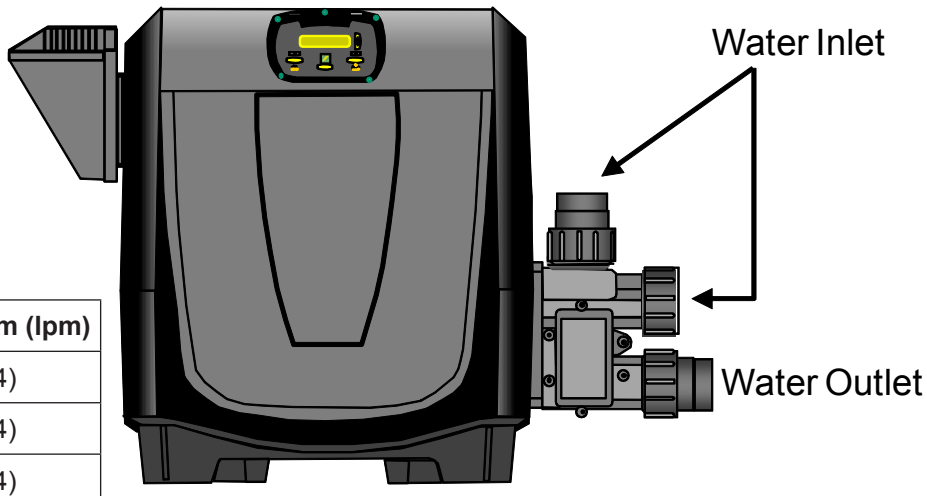
Minimum Clearances for combustible surfaces

TOP:	6 inches (15 cm)
EXHAUST SIDE:	6 inches (15 cm) from surface of the exhaust vent
HEADER SIDE:	6 inches (15 cm)
DOOR PANELS:	6 inches (15 cm)

Combustion and Ventilation requirements.

Clearances

Minimum vertical clearance = 36 inches
Minimum clearance to at least one door panel = 18 inches



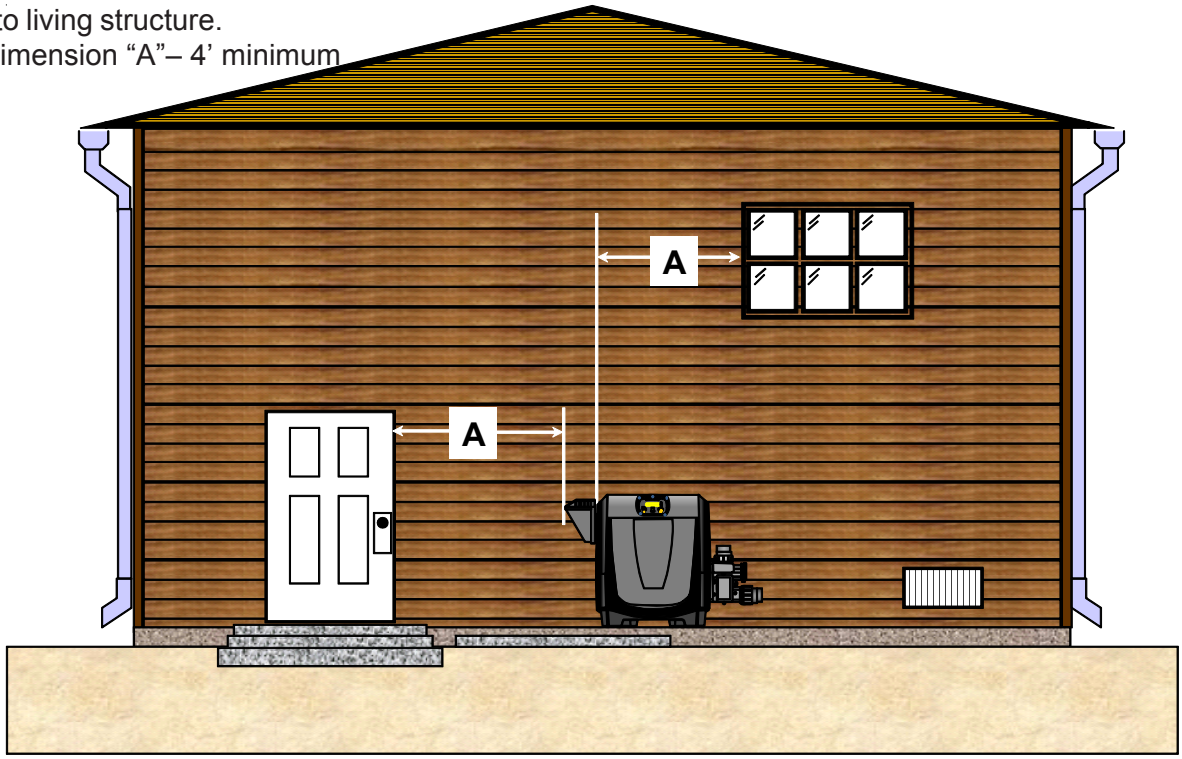
Water Flow

Model	Min gpm (lpm)	Max gpm (lpm)
200	30 (114)	120 (454)
260	30 (114)	120 (454)
330	30 (114)	120 (454)
400	30 (114)	120 (454)

Clearances to Openings

Distance from heater to door, window or other opening to living structure.

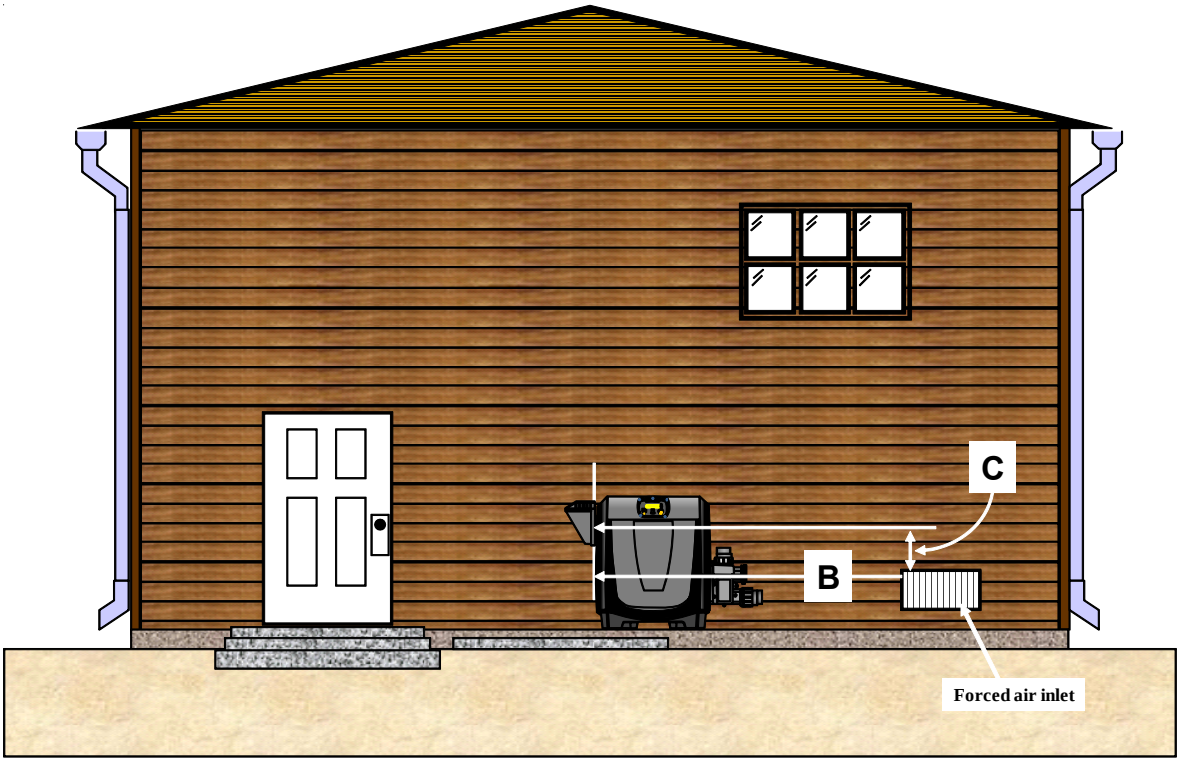
Dimension “A”– 4’ minimum



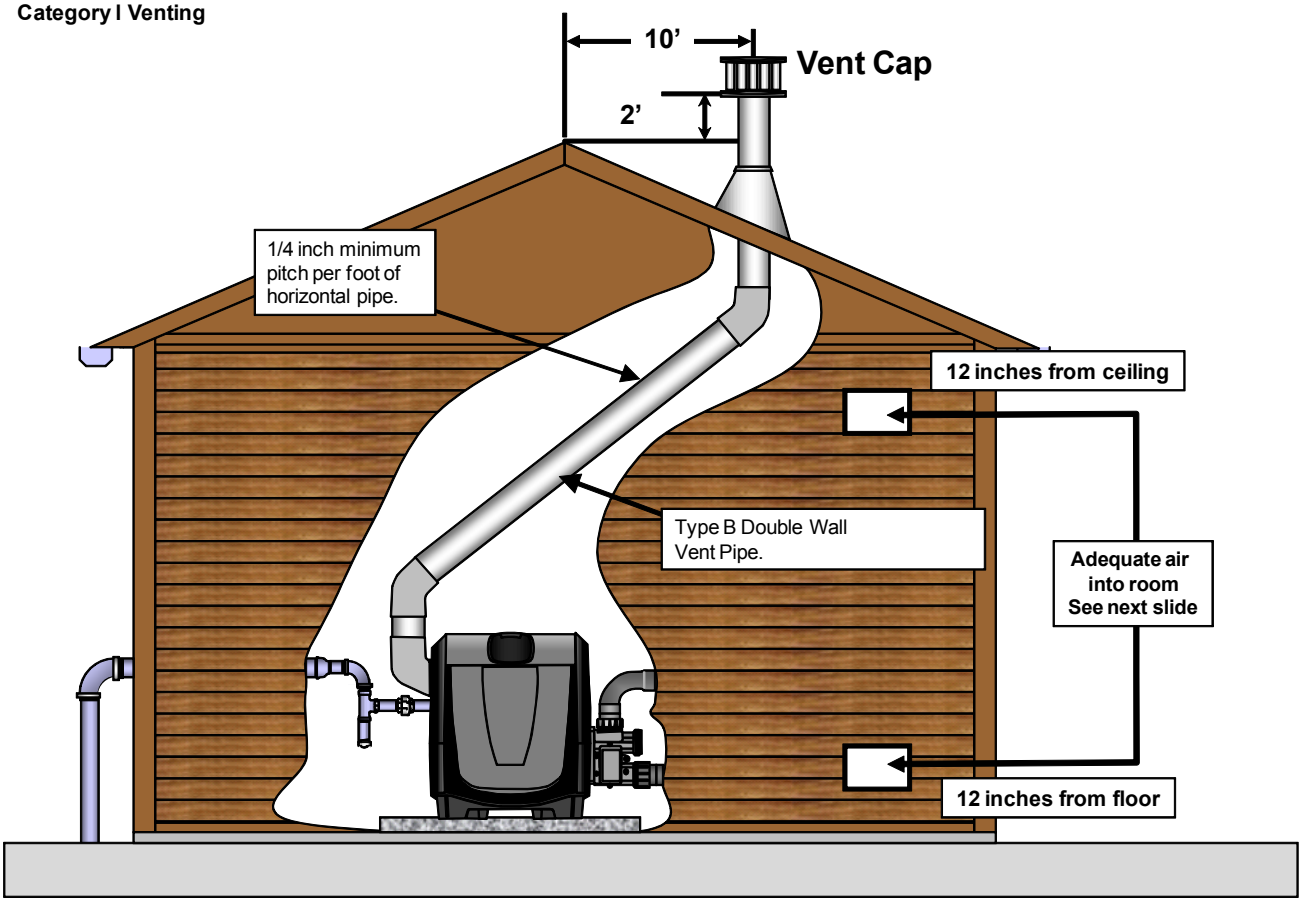
Distance from heater to forced air inlet or other vented opening.

Dimension “B” –May be any distance if dimension “C” is 3’ or more.

Dimension “B”– Must be at least 10’ if dimension “C” is less than 3’.



Category I Venting



Minimum Net Free Open Area* for Combustion Openings (square inches/centimeters)
*Area indicated is for one of two openings: one 12 inches from floor level, one 12 inches from ceiling level.

Model	Direct from outside		Duct from outside	
	in^2	cm^2	in^2	cm^2
200	50	323	100	645
260	65	419	130	839
330	83	535	165	1065
400	100	645	200	1291

Table 1. Air Openings to Outside

Heater Size	Vent Size
200	6" (15cm)
260	7" (18cm)
330	8" (20cm)
400	8" (20cm)

Table 2. Category I Vent Pipe Sizing Table

Vertical or Horizontal Venting (Category III)

When the installation requires horizontal venting in excess of what is allowed for Category I installations or calls for horizontal discharge, the JXi may be installed with a Category III venting system.

See Table 3 for recommended vent size and run lengths without elbows. For each elbow installed, reduce the run length by 12 feet (3.7m)

Heater Size	Vent Size	Special Gas Vent Length (vertical or horizontal) in feet (metres)
200	4" (10cm)	TBD (m)
260	4" (10cm)	50' (15m)
330	4" (10cm)	TBD (m)
400	4" (10cm)	50' (15m)

Table 3. Category III Vent Pipe Sizing Table

Vent Connection and Pipe Sizing

Vent Pipe or Elbow Increaser Installation (Category I and Category III)

1. Remove the exhaust body.
2. Remove the exhaust rain shield .(Figure 1)

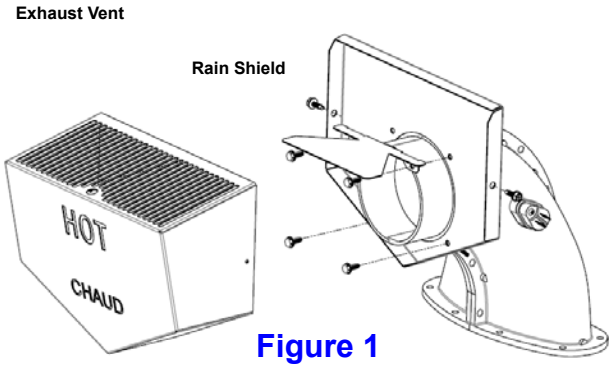


Figure 1

Figure 2. Remove Exhaust Body and Rain Shield

Category I:

3. Install a draft hood connector and an increaser to meet the vent size requirements per Table 2. (See Figure 2.)

Category III:

Install vent connector or elbow to the flue colla according to the specific i stallation instructions from the vent connector or elbow component manufacturer.

Figure 2. Remove Exhaust Body and Rain Shield

4. Wipe the socket of the vent body with rubbing alcohol using a clean cloth or paper towel, then. dry with a different clean cloth.

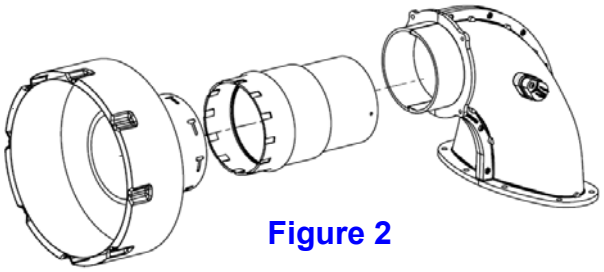


Figure 2

5. Connect the vent connector to the lue collar and fasten with three (3) sheet metal screws, as shown in Figure (3).

Figure 3. Correct positioning of screws on vent collar

6. Apply high temperature silicone RTV at the connection to seal, as shown in Figure 4.

NOTE: Use a minimum 600°F (315°C) temperature rated RTV.

Figure 4. Seal Connection with RTV

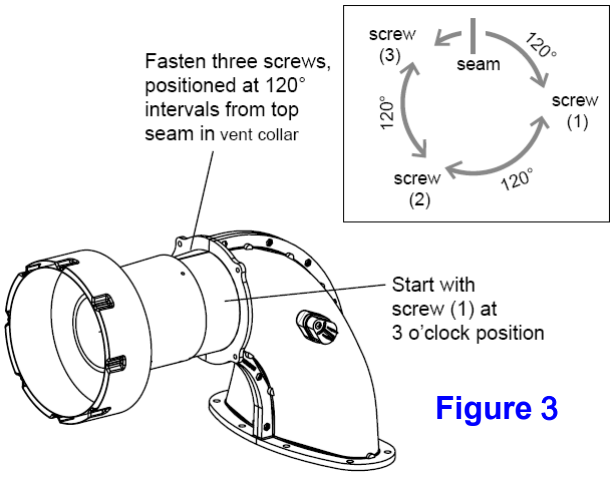


Figure 3

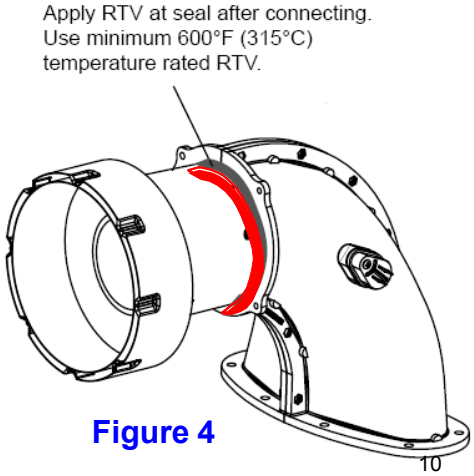


Figure 4

Connection to Controls

JXi CONNECTED TO AQUALINK RS AT RS 485 LINE

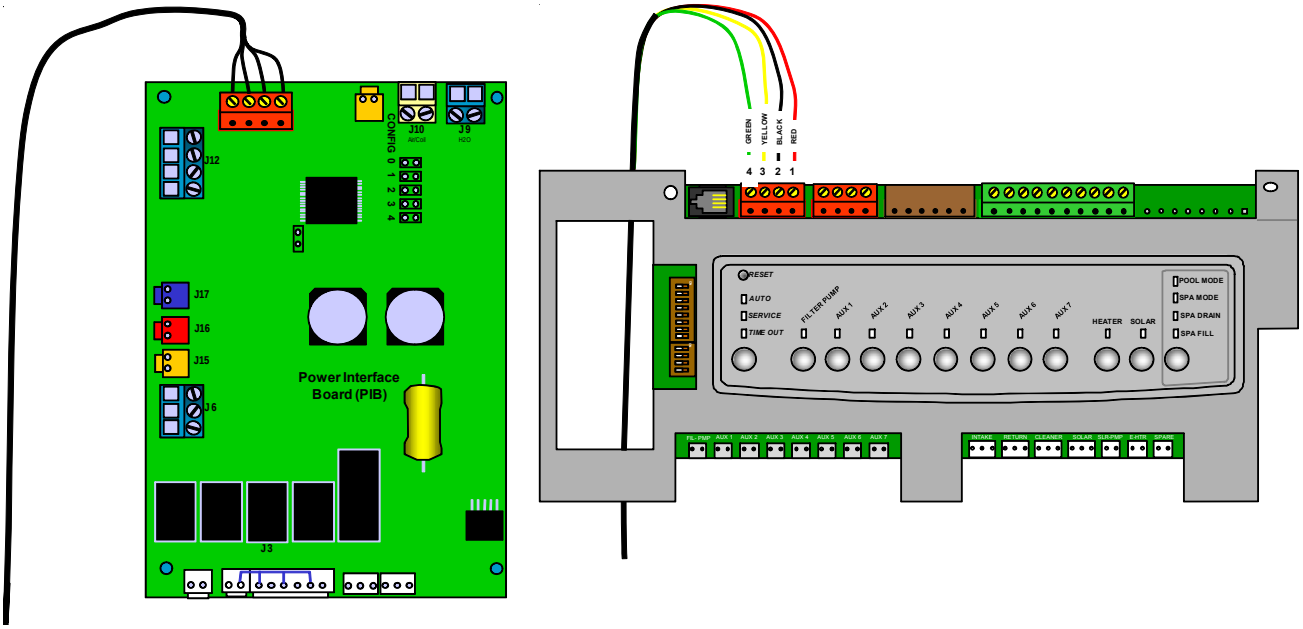
There are two ways of connecting a Jandy JXi heater to the AquaLink RS. One way is to connect at the Pool and Common terminals of the Power Interface Board. This type of connection is shown on the next page. The other way is to connect to the RS 485 line (red terminal bar) as shown here. When connected at the RS 485 line, the JXi and AquaLink RS become “smart” in that the control knows if the heater is malfunctioning. ***When connecting to the RS 485 line, the AquaLink RS firmware must be Rev N or newer.***

To establish communication between the LXi and AquaLink RS do either of the following:

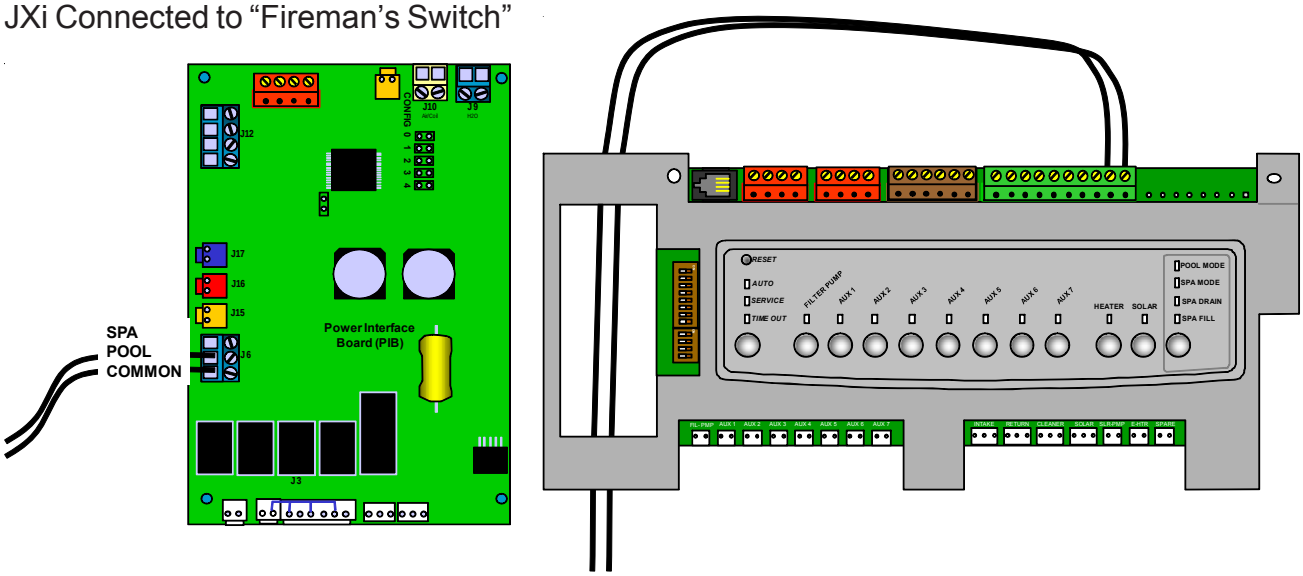
After making connection turn power off then on to the AquaLink RS.

Hold the MENU button down for 5 seconds, then simply follow the screen prompts.

Connection to Jandy Control - RS 485



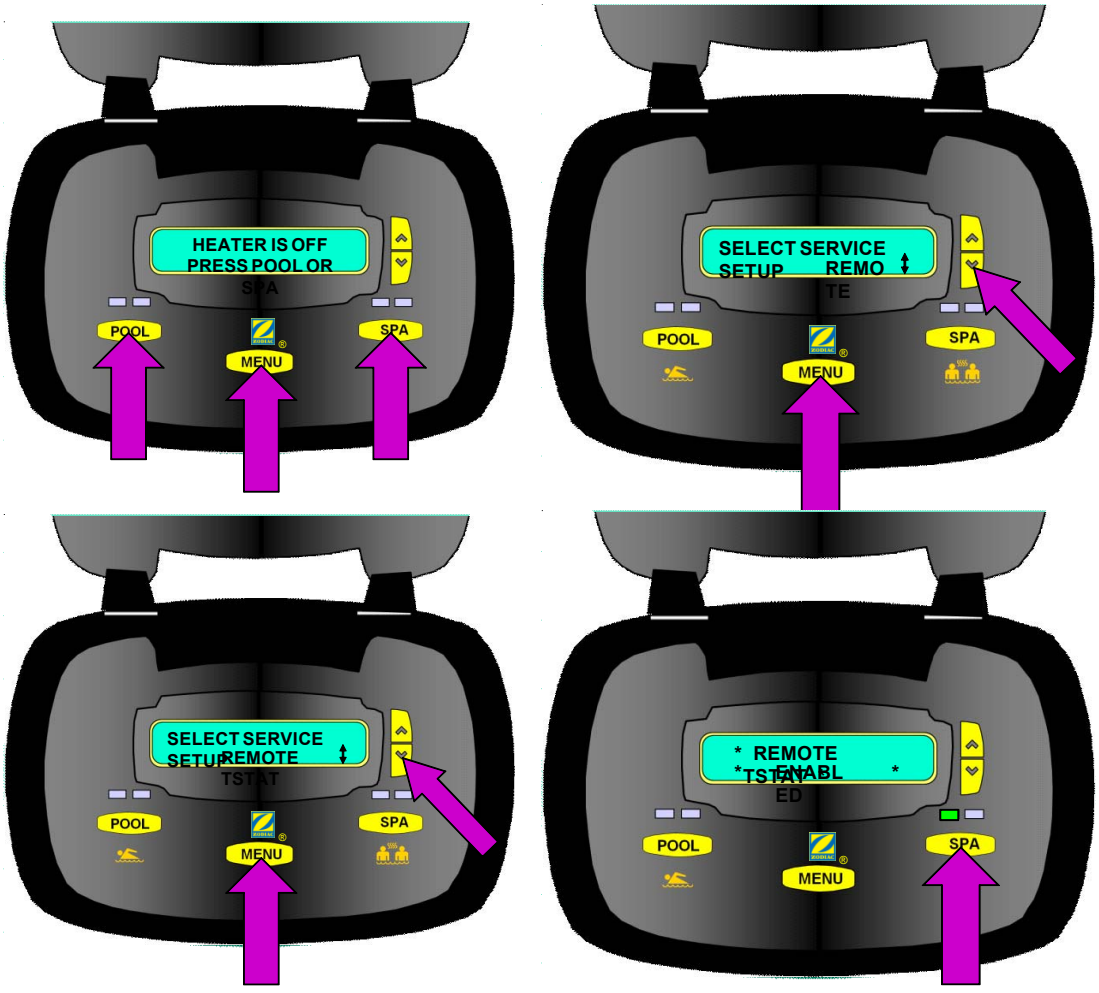
JXi Connected to “Fireman’s Switch”



JXi HEATER CONNECTION AT “FIREMAN’S SWITCH”

At the JXi Power Interface Board connect one end of two wires to terminals POOL and COMMON (J6). Connect the other end of these two wires to terminals 1 and 2 of the AquaLink RS Green terminal bar. Set pool thermostat to maximum (104 F).

Set the JXi to recognize this type of connection by holding down MENU, POOL, and SPA buttons together for 7 to 10 seconds at the JXi’s User Interface. Set REMOTE to T-Stat. Press POOL button to exit.

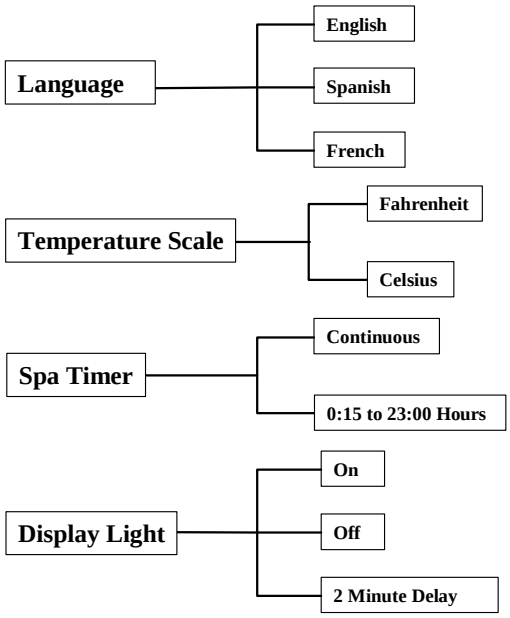


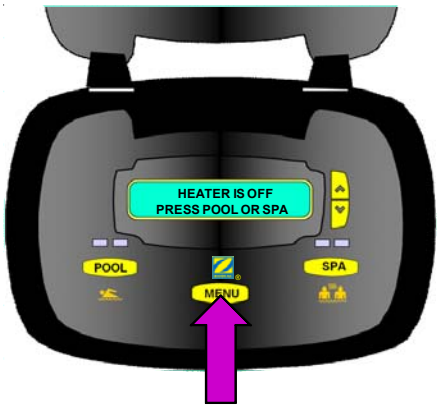
DISPLAY BEZEL w/GASKET & COVER

P/N = R0458300

End User Menu, Universal Control, JXi

Hold down the Menu Button for 5 to 10 Seconds

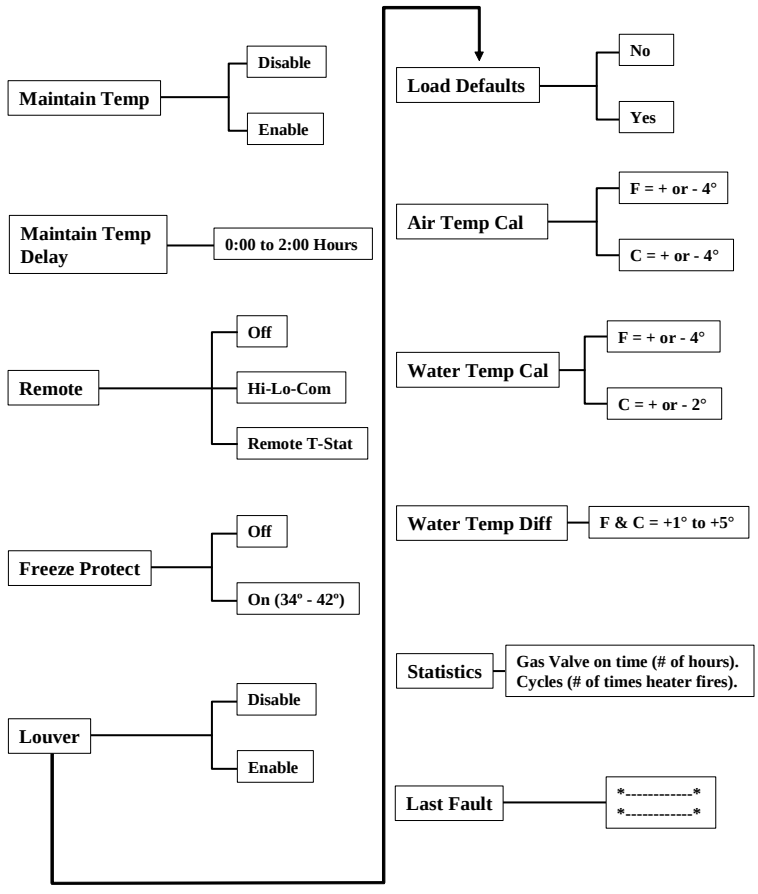


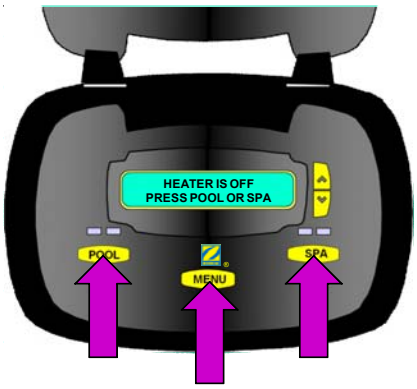


Hold down the MENU buttons for 5 to 10 seconds to enter the menu.

Installer/Technician Menu, Universal Control, JXi

Hold down the Pool, Menu, & Spa Button for 5 to 10 Seconds



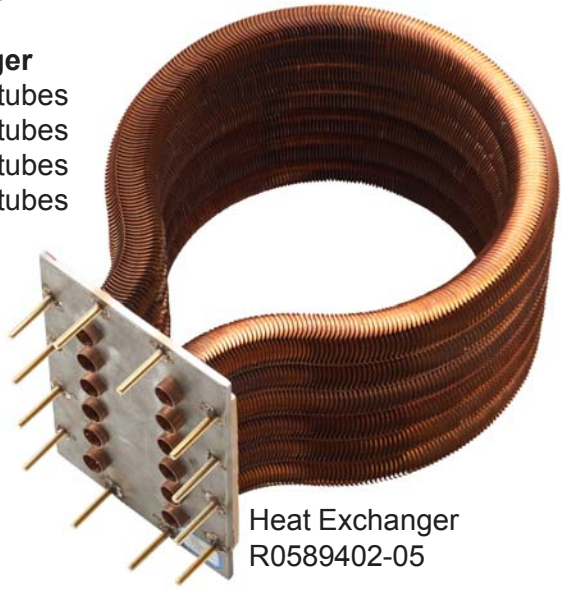


Hold down the POOL, MENU and SPA buttons for 5 to 10 seconds to enter the hidden menu.

Bypass Kit with Shaft,
C-Clip and Poppet
R0589800

Heat Exchanger
Model 200 = 3 tubes
Model 260 = 4 tubes
Model 330 = 5 tubes
Model 400 = 6 tubes

Thermal Regulator Valve (TRV)
R0589700

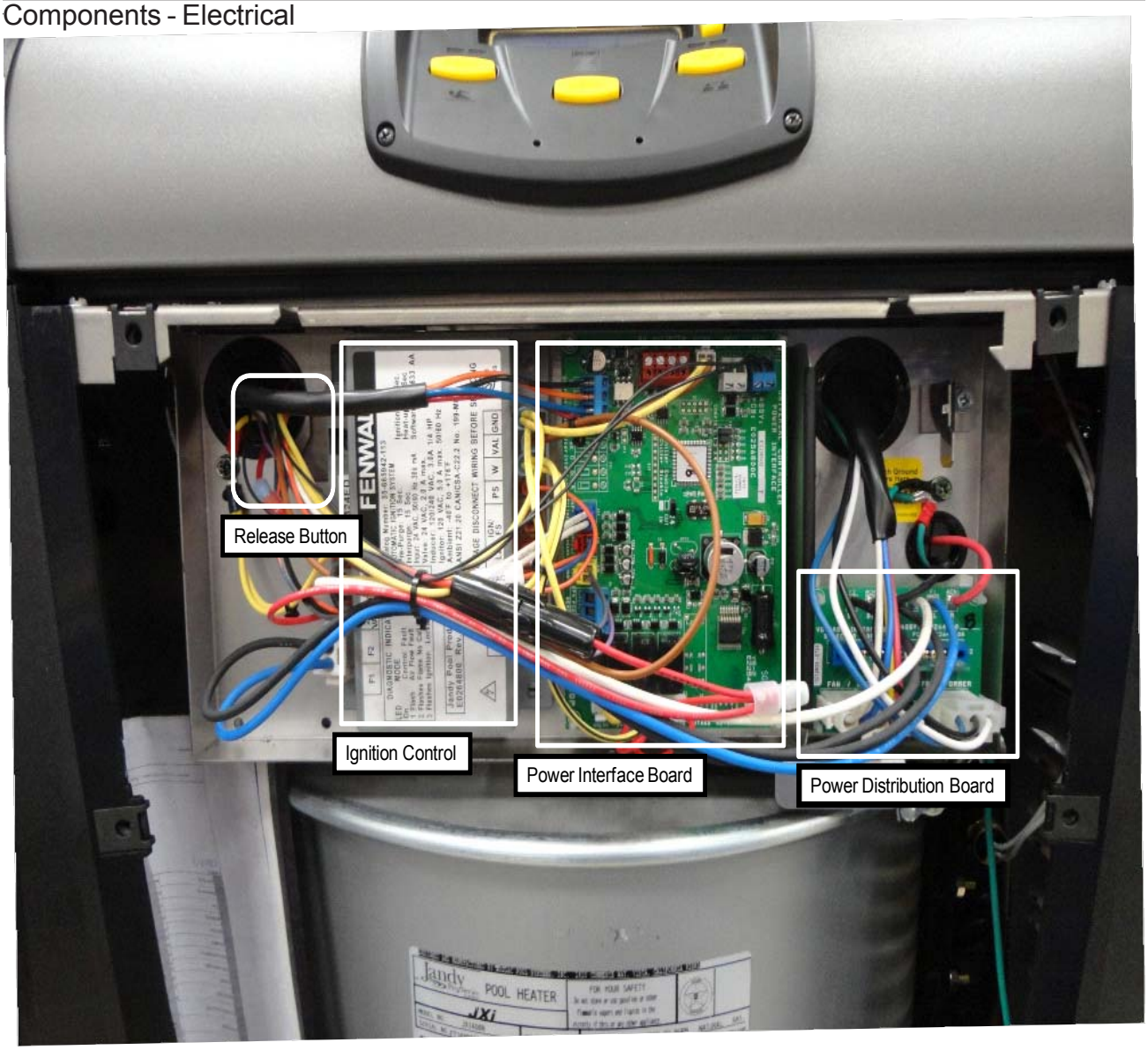


Heat Exchanger
R0589402-05

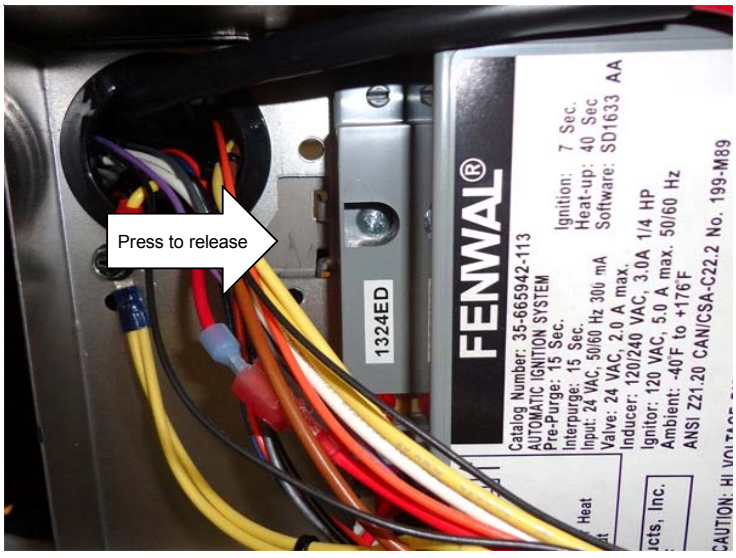
As with all pool heaters water velocity and flow through the heat exchanger are controlled by an automatic bypass. The automatic bypass consists of a disk and spring and is located between the Inlet/Outlet header.

A thermal regulator valve is also incorporated into this heater in the Inlet/Outlet header. Its purpose is to hold water in the exchanger during initial heat up to reduce the amount of condensate created at the heat exchanger.

Components - Electrical



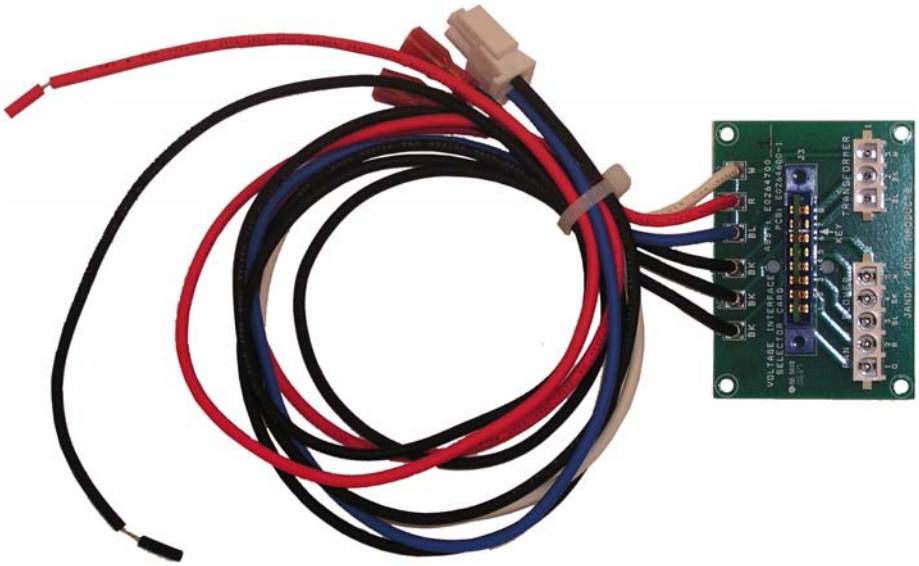
Raceway Release Button

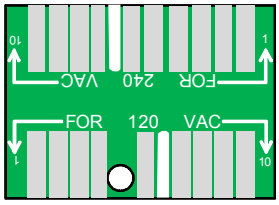


Power Distribution Circuit Board

P/N = R0458100

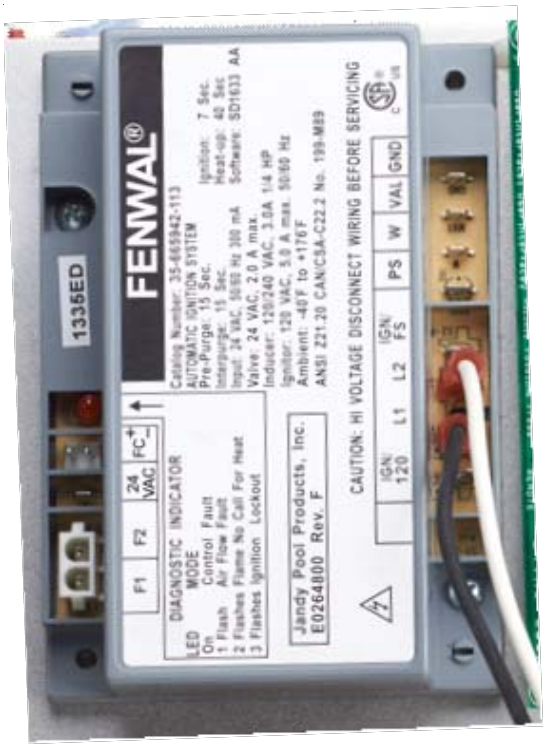
To covert from 240 VAC to 120 VAC wiring, snip the wire tie holding the conversion board in place. Remove the conversion board, flip it over and reinsert.



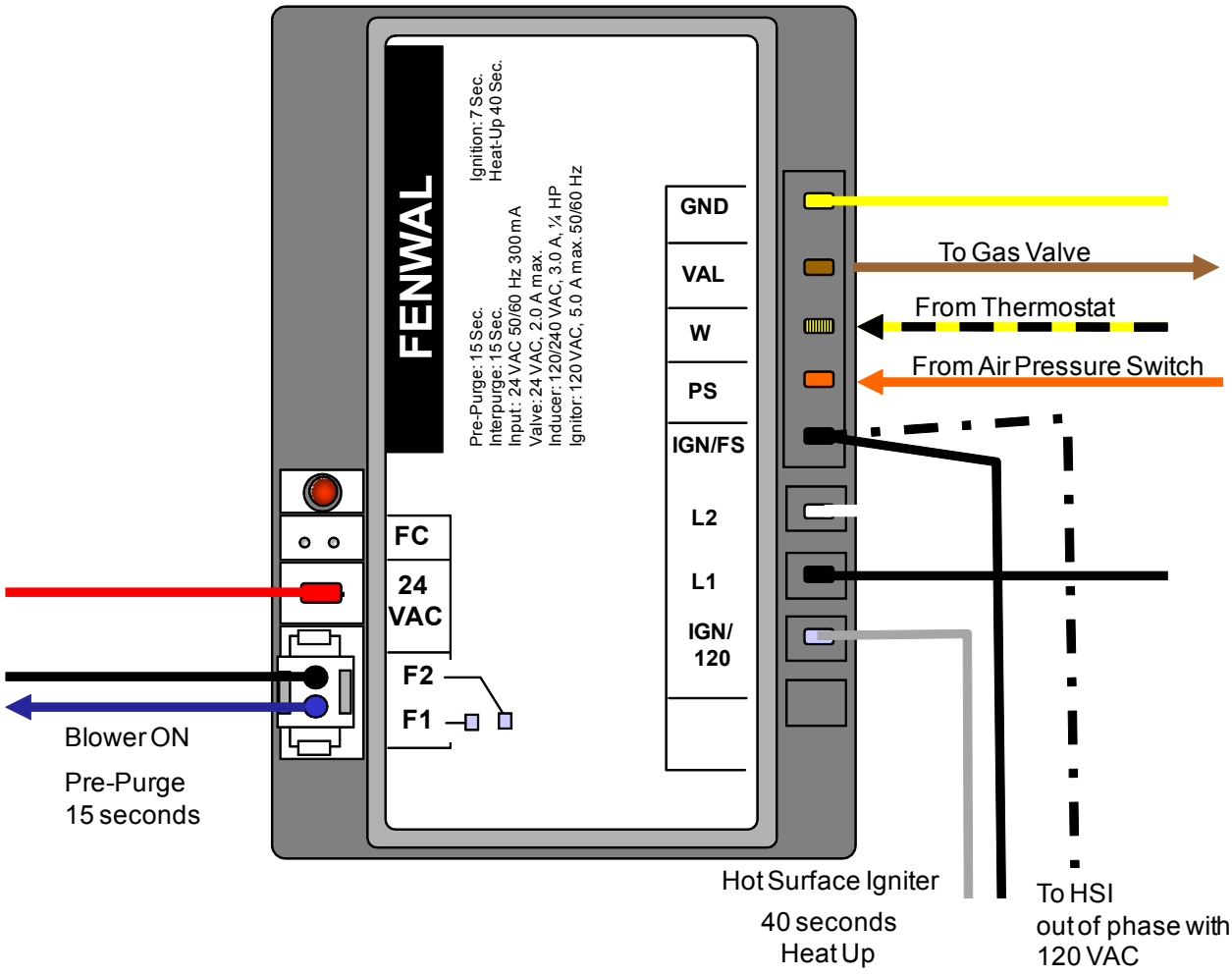


Power Interface Board (PIB)
R0458200

Ignition Control
R0456900

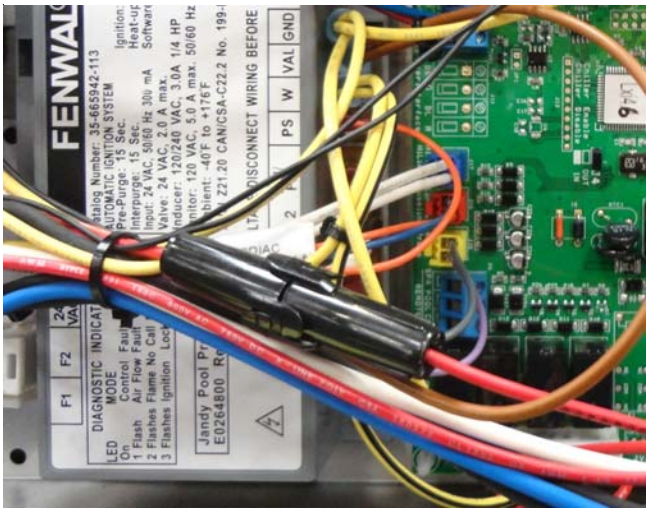


Pre-Purge: 15 Sec. Ignition: 7 Sec.
Interpurge: 15 Sec. Heat-Up: 40 Sec.
Input : 24 VAC 50/60 Hz 300 mA
Valve: 24 VAC, 2.0 A max.
Inducer: 120/240 VAC, 3.0 A, ¼ HP
Ignitor: 120 VAC, 5.0 A max. 50/60 Hz



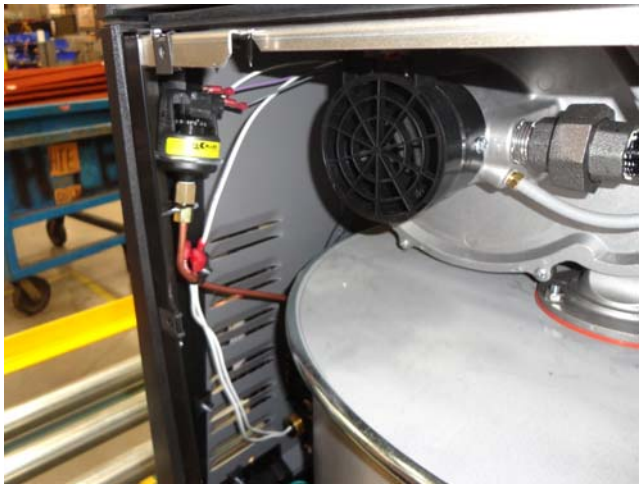
Transformer
P/N = R0456300
This transformer is a center tap primary. When connected to the Power Distribution Board, this transformer provides 120 VAC to terminals L1 and L2 of the Ignition Control, whether the incoming power is 120 or 240 VAC.
The secondary (24 VAC) of the transformer provides power to the Power Interface Board and the Ignition Control.

In-Line Fuse - 2 amp
P/N = R0337100
Fuse and Harness
P/N = R0457700



Water Temperature Sensor
R0456500
10 K Ohms thermistor

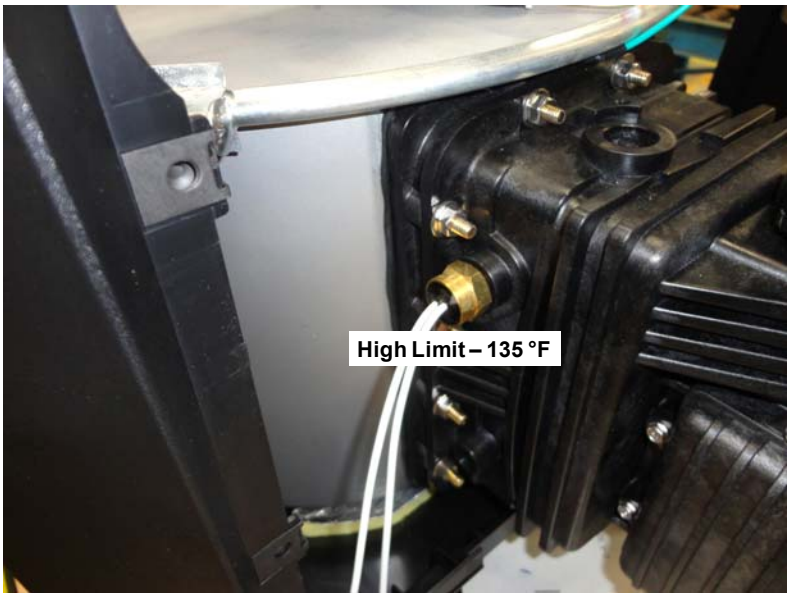
Water Pressure Switch
R0013200



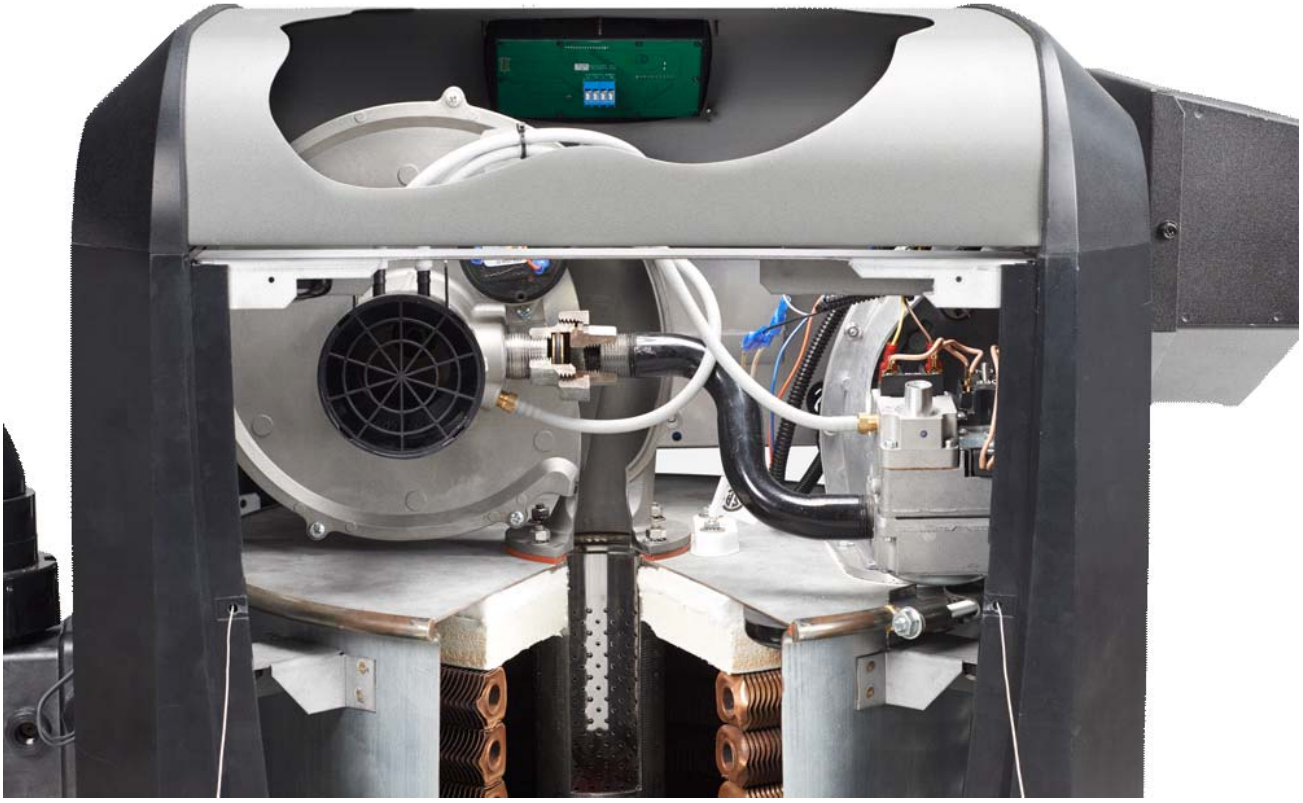
High Limit Temperature Sensors Kit R0592300

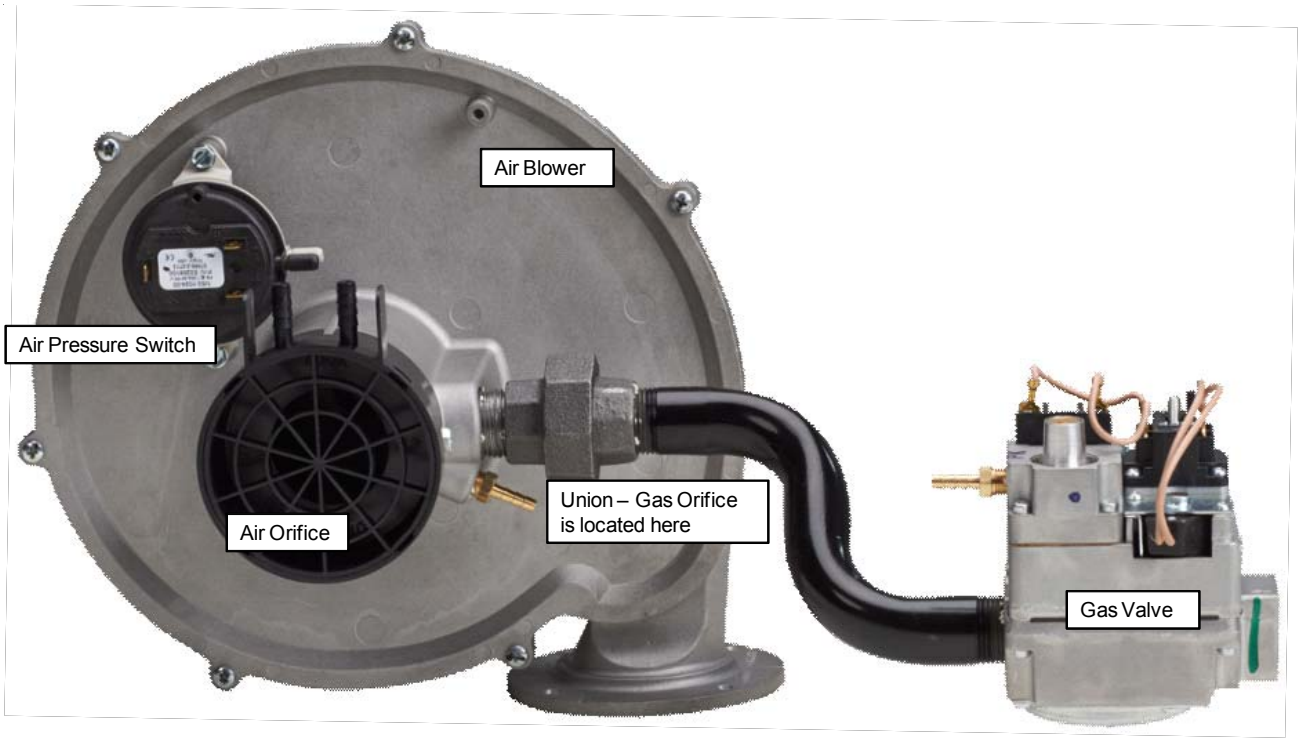
High Limit – 135 °F

High Limit – 150 °F



Fuel Components

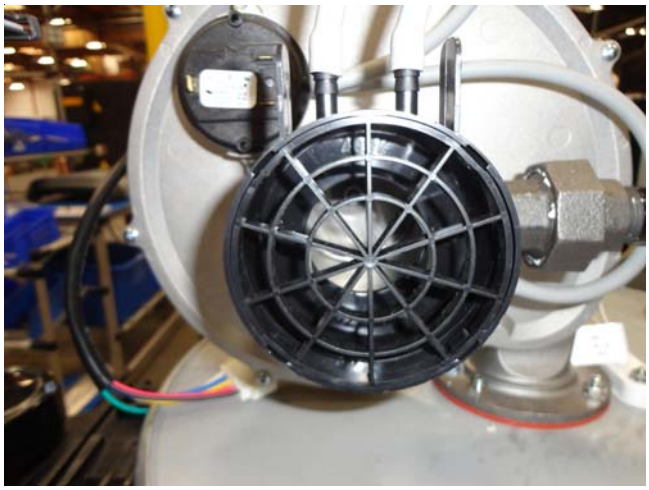




Blower Assembly
R0591100

BLOWER INTAKE ORIFACE KIT

BTU	NATURAL	LP
200	R0591302	R0591312
260	R0591303	R0591313
330	R0591304	R0591314
400	R0591305	R0591315

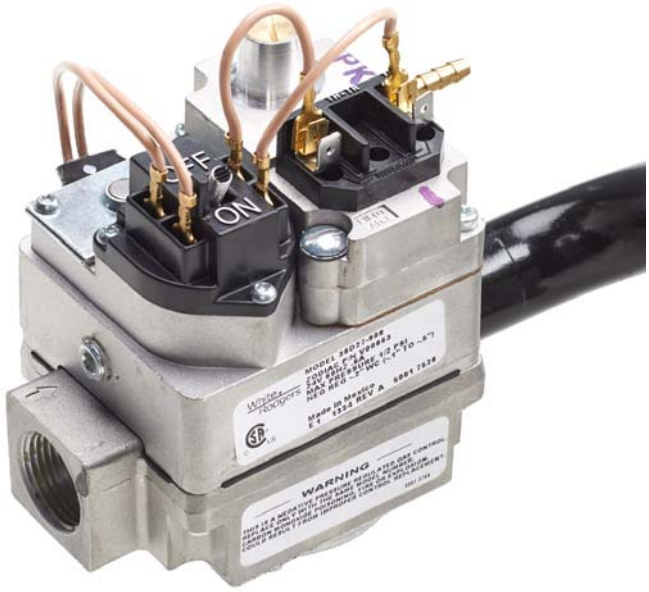


FUEL ORIFACE KIT

BTU	NATURAL	LP
200	R0591601	R0591605
260	R0591602	R0591606
330	R0591603	R0591607
400	R0591604	R0591608

Air Pressure Switch
R0456400

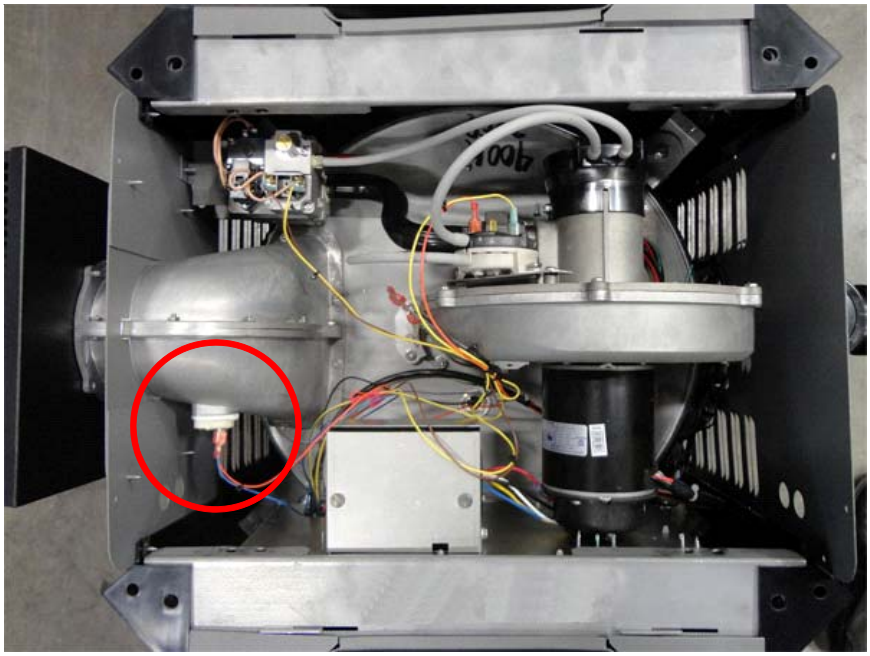
Gas Valve
R0591400



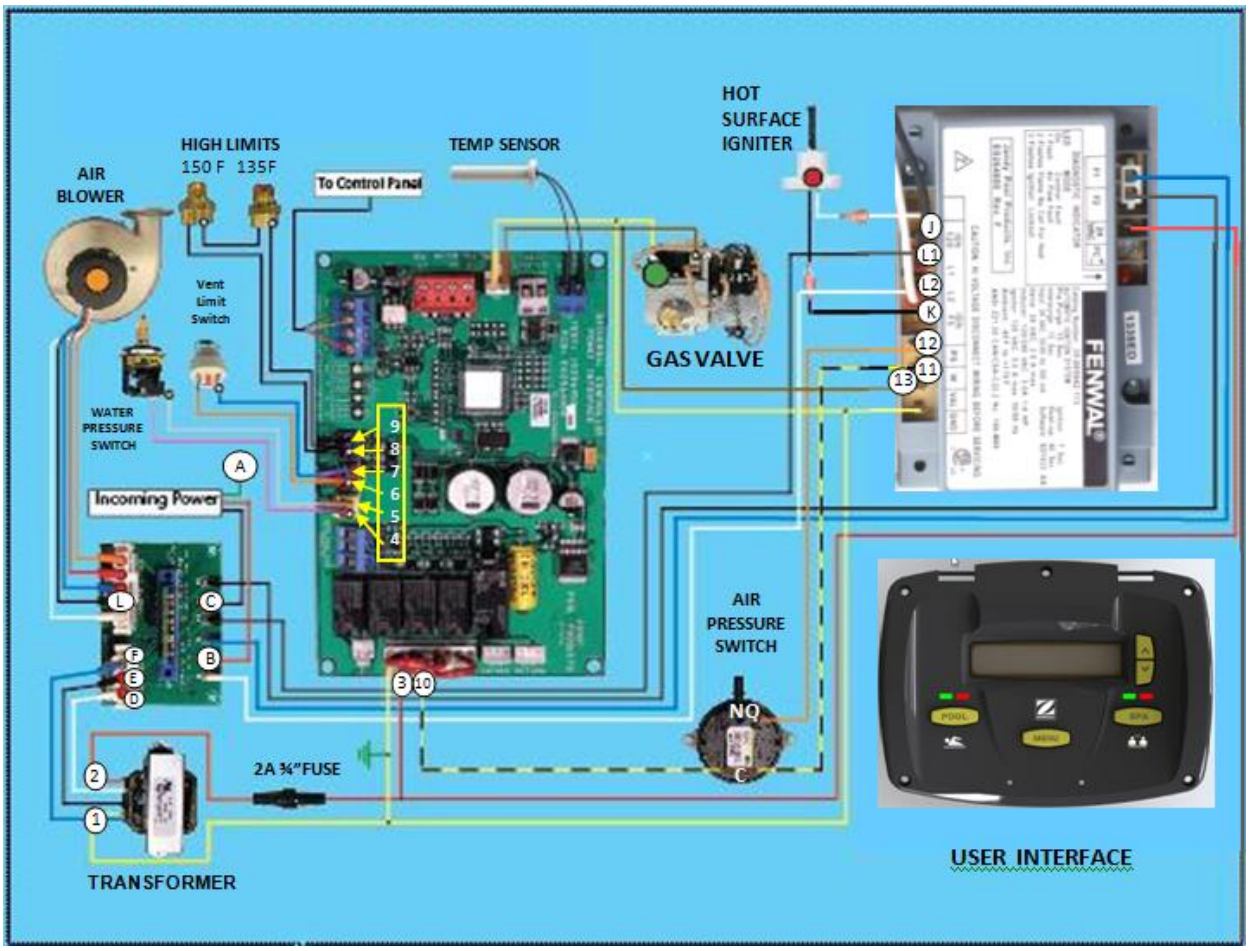
Hot Surface Igniter (HSI)
R0457500
Range 50 to 500 Ohms

Burner
R0591700

Exhaust Temperature Switch
R0524300



JXi Troubleshooting Guide



NOTE: If Blower is on Go to Step 13

STEP 1- Check Power at Dist. Brd. (make certain filter pump motor is on)

240 or 120 VAC between Black (C) wire and Red (B) wire on Power — NO → Make certain filter pump is on. Correct wiring

YES

STEP 2- Check Transformer

24 VAC between Red (2) wire and Yellow (1) wire on Transformer? — NO → If wired 240 VAC check voltage between Black (E) wire and Blue (F) wire. If wired 120 VAC check voltage between Black (E) and White (D) wires. If the correct voltage is present, replace Transformer, if not check Conversion Board position

YES

STEP 3- Check Fuse

24 VAC between Red (3) wire on PIB and Yellow (1) wire on Transformer? — NO → Locate and correct short circuit, replace Fuse.

YES

STEP 4- Check power to Water Press. Sw.

24 VAC between Purple (4) wire on PIB and Yellow (1) wire on Transformer? — NO → Recheck at Red (3) wire, if voltage is 24 VAC replace PIB.

YES

STEP 5- Check Water Pressure Switch

24 VAC between Gray (5) wire on PIB and Yellow (1) wire on Transformer? — NO → Back Pressure Test, if pressure is higher than 2 PSI, replace Water Pressure Switch, if less clean filter, baskets or repair pressure problem

YES

STEP 6- Check power to Fusible Link

24 VAC between Orange (6) wire on PIB and Yellow (1) wire on Transformer? — NO → Recheck voltage at Gray (5) wire, if voltage is 24 VAC replace PIB.

YES

STEP 7- Check Fusible Link

24 VAC between Blue (7) wire on PIB and Yellow (1) wire on Transformer? — NO → Check Vent Limit and replace failed part if necessary.

YES

STEP 8- Check Power to High Limits

24 VAC between Black (8) wire on PIB and Yellow (1) wire on Transformer? — NO → Recheck power at Blue (7) wire. If 24 VAC at Blue but not Black, replace PIB.

YES

STEP 9- Check High Limits

24 VAC between Black (9) wire on PIB and Yellow (1) wire on Transformer? — NO → Replace both High Limits. Do a Temp. Rise Test.

YES

STEP 10- Check Power to Ignition Control

24 VAC between Black/Yellow(10) wire on PIB and Yellow (1) wire on Transformer? — NO → Recheck power at Black (9) wire. If 24 VACat Black, but not Black/Yellow(10), replace PIB.

YES

STEP 11- Check Power at Ignition Control

24 VAC between Black/Yellow (11) at W terminal of Ignition Control and Yellow of Transformer? — NO → Correct problem with Black/Yellow wire or its connectors.

YES

STEP 12- Check Blower

Is Blower ON? — NO → Correct incoming power problem.

YES → Check voltage between F2 terminal of Ignition Control and ground (A0. Is voltage 105 VAC or higher? — YES → Check voltage between F1 terminal of Ignition Control and ground (A). Is voltage 105 VAC or higher? If no, replace Ignition Control, if yes check voltage between Black (L) to Blower PDB and white wire. Wired 120, voltage range is 105 to 130, when wired 240 range is 210 to 250. If voltage is correct replace Blower. If not check PDB and wires.

STEP 13- Check Air Pressure Switch

JXi Troubleshooting Guide

Blower is ON – Start on Step 13

STEP 13- Check Air Pressure Switch

24 VAC between Orange (NO) wire at the Air Pressure Switch and Yellow (1) wire on Transformer?

NO → Make certain Blower s on and combustion chamber is sealed. Check air tubes for kinks or holes. Make certain front air tube is connected to the positive (+) side and back/lower air tube is connected to negative (-) side of the Air Pressure Switch. If all are OK replace the Air Pressure Switch.

YES

STEP 14- Check Power to PSW

24 VAC between Orange (12) wire at the Ignition Control and Yellow (1) wire on Transformer?

NO → Check wire connections. Replace Orange wire.

YES

STEP 15- Check Hot Surface Igniter

After Blower comes on wait at least 15 seconds (pre-Purge). Is Igniter glowing?

NO → Check voltage between K and J of the Ignition Control. If 105 to 130 VAC, check wires and connectors to the Igniter, if OK, replace Igniter. If voltage is less than 105 VAC check incoming voltage between L1 and L2, if voltage is 105 to 130 VAC replace Ignition Control.

YES

STEP 16- Check for Ignition

After the HIS begins to glow, wait approximately 40 seconds. Did the burners ignite?

NO → Check voltage on Brown (13) wire at terminal VAL of the Ignition Control. Is there 24 VAC at VAL?

NO → Replace Ignition Control.

YES → Check supply gas pressure. If OK, replace Gas Valve.

YES

STEP 17- Check Burners operation

Do Burners stay on beyond 7 seconds?

YES

Step 18 – Verify heating

Heater is operating properly.

Heater is not recognizing the flame (flame rectification). Any of the following can prevent flame rectification:

- Low gas pressure.
- Poorly connected or missing ground wire.
- Corroded or dirty Flame Sense Rod.
- Ignition Control not sending flame sense signal.
- Or there is insufficient current when the gas valve is powered. Current loss can be caused by any of the following:
- Excessive corrosion on wire terminals.
- Frayed or over heated wires.
- Pitting contact points, usually at the Water Pressure Switch or High Limits.

To determine whether the problem is lack or rectification or loss or current, check voltage at the Black/Yellow(11) wire at Ignition Control. Keep the meter probe at this location and watch the reading. If, after the gas valve receives power, the voltage slowly drops until the gas valve shuts off, then returns to normal, the problem is due to loss of current.

Note: If the Blower runs continuously, unplug F1/F2 connector from the Ignition Control, if the Blower goes off replace the Ignition Control. Of the Blower stays on, check for shorted wires between the Ignition Control and PDB or from the PDB and the Blower.

Service Codes

Flow Rates (gpm)

BTUs	MIN	MAX
200	20	120
260	25	120
330	30	120
400	40	120

GAS PRESSURE

Inches of Water Column

	Natural	LP
Max Inlet	10.5	14
Min Inlet	4	4
Gas Offset	-0.2	-0.2

DISPLAY FUALT	CAUSE	REMEDY
Fault- Pump	1. Pump is not running	1. This is a normal display when the control is in Maintain Temp mode. NO SERVICE REQUIRED.
NO FLOW	1. Pump is not running 2. Low pump pressure. 3. Pressure switch fault	1. Check breakers and power source, recheck wiring , set time clock and current time. 2. Clean filter, clear blockages, check position of all valves in plumbing system 3. Adjust or replace pressure switch. Refer to qualified service personnel.
FAULT – HIGH LIMIT	1. Water Temperature in heater exceeds the Internal limit. 2. Limit switch fault.	1. Verify function of high limit switches. Perform temperature rise test. Identify and correct cause of overheating. 2. Identify loose connections or replace switches. Refer to qualified Service Personnel.
FAULT- FUSELINK/FIEL	1. Vent Limit fault.	1. Identify loose connections or replace Vent Limit. Refer to qualified Service Personnel.
FAULT- CHECK IGN CONTROL	1. Broken, split, pinched or disconnected fan/switch tubing. 2. Fan not operating. 3. Fan running slow or premature fan failure. 4. Air flow restricted at intake or discharge. 5. Oscillating pump pressure. 6. Low gas supply pressure. 7. No flame at burners.	1. Check tubing and replace if necessary. 2. Correct fault or replace fan. Refer to qualified service personnel. 3. Verify proper wiring for 120 or 240 VAC. Refer to qualified service personnel. 4. Check for proper clearances around heater and for adequate room ventilation if enclosed. Inspect for blockages or restriction at discharge of flue. Refer to qualified service personnel. 5. Clean filter or identify and repair cause of pump oscillation. 6. Identify and correct loose wiring connections, or problems with igniter, flame sensor, gas valve, or ignition control. Refer to qualified service personnel.
Fault- Shorted H2O Sensor Or Open Water Sensor	1.aulty wiring or connection. 2. Failed sensor.	1. Inspect sensor wiring. Ensure sensor is connected into Power Interface Board. 2. Replace temperature sensor. Refer to qualified service personnel.