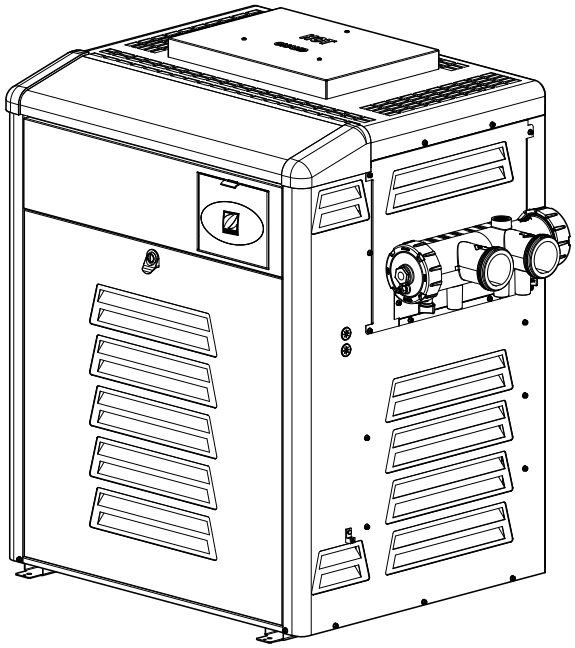
ZODIAC®

INSTALLATION AND OPERATION MANUAL

ENGLISH



Legacy™ Pool and Spa Heater

Model LRZ Electronic Natural Gas or LP Gas

CE

⚠ WARNING If these instructions are not followed exactly, a fire or explosion may result, causing property damage, personal injury, or death.

FOR YOUR SAFETY: This product must be installed and serviced by a contractor who is gas safe registered and HWB1 certified. Before installing this product, read and follow all warning notices and instructions that accompany this product. Failure to follow warning notices and instructions may result in property damage, personal injury, or death. Improper installation and/or operation can create carbon monoxide gas and flue gases which can cause serious injury, property damage, or death. For indoor installations, as an additional measure of safety, Zodiac Pool Systems, Inc. strongly recommends installation of suitable Carbon Monoxide detectors in the vicinity of this appliance and in any adjacent occupied spaces. Improper installation and/or operation will void the warranty.

⚠ WARNING Read this manual in its entirety. If these instructions are not followed exactly, a fire or explosion may result, causing property damage, personal injury, or death.

The GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1998 as amended, place statutory requirements on gas users.

This heater is certified to European requirements for use only as a swimming pool or spa heater. The heater must not be used for any other purpose and must be installed and serviced by a qualified professional. The heater must be operated strictly in accordance with the user's instructions and applicable laws.

If the heater is installed in a room, it must be separated from a living space, and adequate air supply and ventilation must be provided and maintained.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

H0316400 Rev F

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Section 1. General Information

1.1 Introduction

This manual provides installation and operation instructions for the Legacy Model LRZ electronic pool and spa heaters. Read these installation and operation instructions completely before proceeding with the installation. The installation must be conducted by a qualified professional. While the entire manual should be read by both the qualified professional installer and the user, Sections 2 through 7 of this manual are intended for the qualified professional installer. The Operating instructions for the user begin in Section 8. Consult the Zodiac factory, or local factory representative, with any questions regarding this equipment. The instructions cover two (2) types of heaters as follows:

1. Type A - Flueless for outdoor installations only.
2. Type B11 - Flue for outdoor and indoor installation, but must not be installed in a living space.

The Legacy Model LRZ electronic heater gets electrical power from an external 220-240VAC, 50 Hz source and provides a dual electronic thermostat control system for pool/spa combinations or preheat convenience.

The Legacy Model LRZ electronic heater is specifically designed for heating fresh water swimming pools and spas, and with proper installation and care, will provide years of reliable service. Do not use the heater to maintain pool or spa water temperature below 21°C (70°F). Do not use it as a heating boiler or general service water. Consult your dealer for the appropriate Zodiac products for these applications.

NOTE "Fresh water swimming pools and spas" include systems that utilize saltwater chlorine generator units, such as the Jandy AquaPure® Electronic Chlorine Generator. Please ensure that the salt content of the pool/spa *does not exceed* 4000 ppm and water flow rate is within 110-470 lpm.

1.2 Consumer Information and Safety

The Legacy Model LRZ electronic heater is designed and manufactured to provide many years of safe and reliable service when installed, operated and maintained according to the information in this manual and the installation codes referred to in later sections. Throughout the manual safety warnings and cautions are identified by the "⚠" symbol. Be sure to read and comply with all of the warnings and cautions.

1.2.1 Spa/Hot Tub Safety Rules

⚠ WARNING

Elevated water temperature can be hazardous. Consult heater operation and installation instructions for water temperature guidelines before setting temperature.

1. Spa or hot tub water temperature should never exceed 40°C (104°F). Thirty-eight degrees celsius (38°C [100°F]) is considered safe for a healthy adult. Special caution is recommended for young children.
2. The drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness, and subsequently result in drowning.
3. **Pregnant women take note!** Soaking in water above 38.5°C (102°F) can cause fetal damage during the first three (3) months of pregnancy (which could result in the birth of a brain-damaged or deformed child). If pregnant women are going to use a spa or hot tub, they should make sure the water temperature is below 38°C (100°F) maximum.
4. The water temperature should always be checked with an accurate thermometer before entering a spa or hot tub. Temperature controls may vary by as much as 1°C (1°F).
5. Persons with a medical history of heart disease, diabetes, circulatory or blood pressure problems should consult their physician before using a hot tub or spa.
6. Persons taking any medication which induces drowsiness (e.g., tranquilizers, antihistamines, or anticoagulants) should not use spas or hot tubs.
7. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
8. Prolonged immersion in hot water can induce hyperthermia.

Hyperthermia occurs when the internal body temperature reaches a level several degrees above the normal body temperature of 37°C (98.6°F). Symptoms include dizziness, fainting, drowsiness, lethargy, and an increase in the internal body temperature. The effects of hyperthermia include:

- Lack of awareness of impending hazard
- Failure to perceive heat
- Failure to recognize need to leave spa
- Physical inability to leave spa
- Fetal damage in pregnant women
- Unconsciousness resulting in a danger of drowning

1.2.2 Swimming Pool Energy Saving Tips

Zodiac Pool Systems, Inc. ("Zodiac"), offers the following recommendations to help conserve fuel and minimize the cost of operating your pool heater without sacrificing comfort.

1. The American Red Cross recommends a maximum water temperature of 25°C (78°F). Use an accurate pool thermometer. A difference of 2°C (4°F) , between 26°C and 28°C (78°F and 82°F), will use as much as 40% more gas.

2. Carefully monitor the water temperature of your pool in the summertime. You can reduce heater usage due to warmer air temperatures.

3. Find the proper setting on the pool heater temperature control and use the Set Point Lockout feature to discourage further adjustments.

4. Set the pump time clock to start the pump no earlier than 6:00 AM during the pool heating season. This is the time when nightly heat loss balances.

5. If the pool is only going to be used on weekends, reduce the heater temperature control setting by 8 or 10 degrees during the week. Reset it to the 25°C (78°F) level a day or so before you plan to use the pool.

6. During the winter or when on vacation for longer than a week, shut down the heater by following the shutdown instructions found on the inside of the heater.

7. Where possible, shelter the pool from prevailing winds with well-trimmed hedges or other landscaping, cabanas, or fencing.

8. Always use a pool cover when practical. Besides providing a valuable safety feature, a pool cover will reduce heat loss, conserve chemicals, and reduce the load on filter systems.

1.3 Warranty

The Legacy Model LRZ electronic heater is sold with a limited factory warranty. Details are specified on the back cover of this manual.

Make all warranty claims to a Zodiac representative or directly to the factory. Claims must include the heater serial number and model (this information can be found on the rating plate), installation date, and name of the installer. Shipping costs are not included in the warranty coverage.

The warranty does NOT cover damage caused by improper assembly, installation, operation or field modification. Also, damage to the heat exchanger by corrosive water is NOT covered by the warranty. See Section 9.1 for maintaining proper pool water chemistry.

NOTE Keep this manual in a safe place for future reference when inspecting or servicing the heater.

1.4 Codes and Standards

The Legacy Model LRZ electronic heater has been tested and certified by GL Industrial Services for compliance with the Gas Appliance Directive (GAD; 2009/142/EC) and the latest version of European Standard, BSEN 656. In addition, the product has also been found to be in compliance with the essential requirements of the Low Voltage Directive (LVD; 2006/95/EC), and the Electromagnetic Compatibility Directive (EMC Directive; 2004/108/EC).

All Zodiac heaters must be installed in accordance with the local building and installation codes as per the utility or authorities having jurisdiction.

Any changes to the heater, gas controls, gas orifices, wiring, draft hood, vent cap, or improper installation may void the warranty. If change is required to any of the above, consult the factory.

1.5 Technical Assistance

Consult your local Zodiac distributor with any questions or problems involving the specifications, installation, and operation of your Zodiac equipment.

1.6 Materials Installer Must Provide

1.6.1 Materials for All Applications

The following items are needed and are to be supplied by the installer for *all* Legacy Model LRZ electronic heater installations:

1. The correct size gas pipe to supply gas from the meter to the heater. See Section 4.1.

2. A manually operated gas cock to be installed in the gas line outside of the heater jacket.

3. Plumbing items needed to provide a sediment trap (drip leg) in the gas line between the manual gas cock and the heater. See Section 4.1.

4. A 220-240VAC, 50 Hz power supply. A junction box is not needed at the heater; connections are made inside of the heater jacket.

1.6.2 Materials for Special Applications

In addition to the items listed above, the following items are needed for special applications:

1. A factory authorized draft hood and any vent pipe needed for indoor installations. See Section 3.3.2. Draft hoods are available from any Zodiac distributor.
2. Primer and cement suitable for cementing PVC pipe to the Jandy CPVC unions supplied with the heater.
3. A noncombustible platform for installation on combustible surfaces. See Section 2.5.3. Noncombustible bases are available from your Zodiac distributor.
4. A factory approved vent cap for all outdoor installations where wind conditions may cause downdrafting. Approved vent caps are available from your Zodiac distributor. See Section 12.2, "Parts List", of this manual for the correct part number.

1.7 Specifications

1.7.1 General Specifications

1. Installation Location:
   Certified for use:
   Natural Gas: Indoor and Outdoor
   LPG: Outdoor Only
   Refer to Table 1.
2. Minimum Clearance From Combustible Material: See Table 4.

1.7.2 Performance Specifications

The Legacy Model LRZ electronic heater performance specifications are shown in Table 2.

1.7.3 Dimensions

See Figure 1 for a diagram showing the heater's exterior dimensions and dimensions to critical connections on the heater.

Section 2. Installation Instructions

2.1 Introduction

⚠ WARNING

This product must be installed and serviced by a contractor who is licensed and qualified in pool equipment. Improper installation or maintenance can cause nausea or asphyxiation from carbon monoxide in flue gases which could result in severe injury, or death. For indoor installations, as an additional measure of safety, Zodiac strongly recommends installation of suitable Carbon Monoxide detectors in the vicinity of this appliance and in any adjacent occupied spaces. The heater may only be installed in a room which complies with the appropriate ventilation requirements and which is separate from living areas.

Table 1. General Specifications

	LRZ				
	125	175	250	325	400
Water Capacity (L)	0,81	0,95	1,16	1,35	1,57
Minimum Water Flow (l/min)	75,7	75,7	94,6	113,6	113,6
Maximum Static Head (bar)	5,1	5,1	5,1	5,1	5,1
Maximum Outlet Temp (C)	40	40	40	40	40
Dry Weight (kg)	60	67	78	88	100
Gas Connection	3/4 in Bsp (Rc 3/4)	3/4 in Bsp (Rc 3/4)	3/4 in Bsp (Rc 3/4)	3/4 in Bsp (Rc 3/4)	3/4 in Bsp (Rc 3/4)
Water Inlet Connection	2" unthreaded PVC or CPVC	2" unthreaded PVC or CPVC	2" unthreaded PVC or CPVC	2" unthreaded PVC or CPVC	2" unthreaded PVC or CPVC
Water Outlet Connection	2" unthreaded PVC or CPVC	2" unthreaded PVC or CPVC	2" unthreaded PVC or CPVC	2" unthreaded PVC or CPVC	2" unthreaded PVC or CPVC
Electrical Supply	220-240VAC, 50 Hz, 5 Amps Max	220-240VAC, 50 Hz, 5 Amps Max	220-240VAC, 50 Hz, 5 Amps Max	220-240VAC, 50 Hz, 5 Amps Max	220-240VAC, 50 Hz, 5 Amps Max
IP Rating	IPX4				
Flue Types	Flue Type A (Flueless) for Outdoor Installations Only Flue Type B11 (with Vent Cap for High Wind Areas) For Outdoor Installation Only Flue Type B11 (with Draft Hood) for Indoor Installation Only				
Appliance Category: Natural Gas LPG	 I2h I3p				
Inlet Pressure (mbar) Natural Gas G20 LPG G31 @ 37 mbar					
Note: The LPG heat inputs apply up to an altitude of 600 m. Above this altitude, de-rate the heat input by 4% for every 300 m.					

Install the Legacy Model LRZ electronic heater, vent caps and draft hoods in accordance with the procedures in this manual, local codes and ordinances, and in accordance with the latest edition of the appropriate national code. See Section 1.4 "Codes and Standards".

All gas-fired products require correct installation to assure safe operation. The requirements for pool heaters include the following:

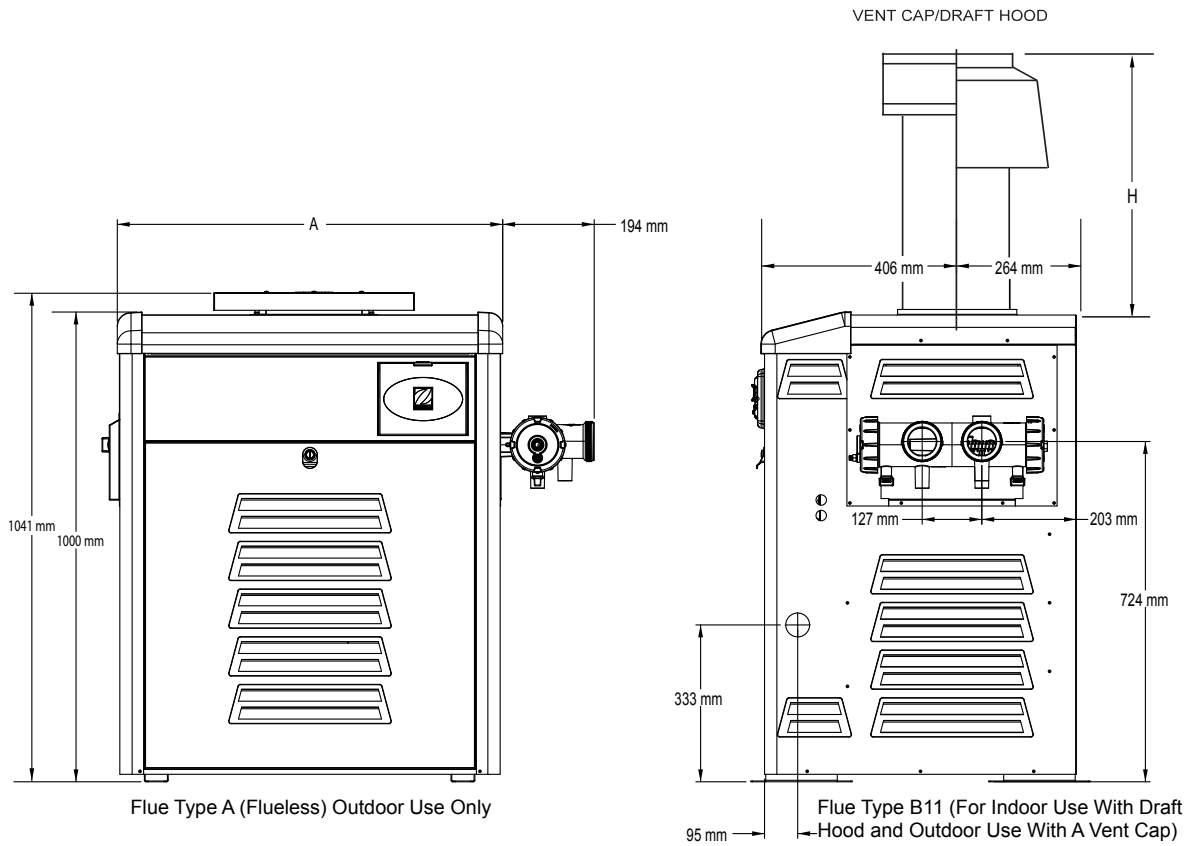
1. Field assembly (if required)
2. Appropriate site location (clearances) and flooring
3. Sufficient combustion and ventilation air
4. Properly sized gas meter and piping
5. Proper electrical wiring (if required)
6. Adequate water flow

This manual provides the information needed to meet these requirements. Review all application and installation procedures completely before continuing the installation.

2.2 Statutory Information

It is the law that all gas appliances are to be installed only by competent persons (e.g., registered members of Gas Safe) in accordance with the Gas Safety (Installation and Use) Regulations, latest published version, BS6798, BS5440 Pt. 1 and Pt. 2, BS6891, and BS5482 Pt. 2. Failure to install appliances correctly could lead to prosecution.

The Legacy heater, as supplied, has been tested and certified by Gas Appliance Directive (GAD; 2009/142/EC) and the latest version of European Standard, BSEN 656 for use with natural and LPG gases. Legacy heaters are only permitted to be installed in the open air or in a room which is separated from living rooms and provided with appropriate ventilation directly to the outside.



Model	Heater Width Dim "A"	Venting Dimensions		
		Vent Diameter	Outdoor Dimension "H"	Indoor Dimension "H"
	mm	mm	mm	mm
125	384	150	441	413
175	460	150	457	613
250	578	175	464	641
325	683	200	479	673
400	822	230	546	699

Figure 1. General Configuration

Table 2. LRZ E Performance Specifications

LRZ E Size (In BTU Input)										
	125 BTU		175 BTU		250 BTU		325 BTU		400 BTU	
	Nat. Gas	LPG	Nat. Gas	LPG	Nat. Gas	LPG	Nat. Gas	LPG	Nat. Gas	LPG
Heat Input Gross (kW)	40,7	40,7	56,9	56,9	81,5	81,5	105,9	105,9	130,3	130,3
Heat Input Net (kW)	36,7	36,7	51,3	51,3	73,4	73,4	95,4	95,4	117,4	117,4
Heat Output (kW)	28,6	28,6	41,1	41,1	58,7	58,7	76,8	76,8	95,1	95,1
Max. Burner Pressure (mbar)	9	22,4	9	22,4	9	22,4	9	22,4	9	22,4
Gas Rate (m^3/h) G20	3,5	--	4.9	--	7	--	9,1	--	11,2	--
Gas Rate (m^3/h) G30	--	1,05	--	1,48	--	2,3	--	2,99	--	3,47
Flue Gas Volume 4.5% CO2, 120C (l/sec)	32,1	--	44,9	--	64,1	--	83,9	--	102,8	--
Flue Gas Volume 4.5% CO2, 120C (l/sec) G30	--	32,3	--	45,3	--	70,3	--	91,4	--	106,4
Injector Diameter (mm and marking)	(2,26) Marked 43	(1,51) Marked 53	(2,26) Marked 43	(1,51) Marked 53	(2,26) Marked 43	(1,51) Marked 53	(2,26) Marked 43	(1,51) Marked 53	(2,26) Marked 43	(1,51) Marked 53

⚠ WARNING

The Legacy heater is certified to European requirements for use only as a swimming pool or spa heater. The Legacy heater must not be used for any other purpose and must be installed and serviced by a qualified professional. The Legacy heater must be operated strictly in accordance with the manufacturer's instructions. If the Legacy heater is installed in a room, adequate air supply and ventilation must be provided and maintained. Never store any materials within the area of the heater or ventilation openings.

It is important that no external control devices (e.g., flue dampers, economizers, etc.) be directly connected to the Legacy heater unless covered by these installation and servicing instructions or otherwise recommended in writing by Zodiac. If in doubt please ask. Any direct connection of a control device not approved by Zodiac, could invalidate the Gas Appliance Directive (GAD) certification, the normal Legacy heater warranty, and could also violate applicable gas safety regulations.

2.3 General Installation Requirements

The Legacy heater must be installed by competent persons (e.g., registered member of Gas Safe). The Legacy heater must be installed in accordance with the relevant requirements of the Gas Safety Regulations, current I.E.E. Regulations, Model Water Bylaws, local Water Authority Bylaws, and any relevant requirements of local gas region, local authority, and relevant British Standard Codes of Practice and Building Regulations.

2.4 Field Assembly

The Legacy Model LRZ electronic heater is shipped from the factory with the top assembly in the low-profile flueless Type A configuration for outdoor installation. The Legacy Model LRZ electronic heater is design certified for indoor installation when equipped with a draft hood and Type B11 flue, which must be installed without modification.

Check the rating plate on the heater or the Parts List (Section 12) of this manual for the correct Zodiac draft hood or vent cap part number. See instructions supplied with the draft hood or vent cap for installation and attachment. When the draft hood is used, locate the heater so as to be in the same atmospheric pressure zone as the combustion air inlet to the heater.

2.5 Location Requirements

2.5.1 Introduction

⚠ CAUTION

When pool equipment is located below the pool surface, a leak from any component can cause large scale water loss or flooding. Zodiac, cannot be responsible for such water loss or flooding or resulting damage.

The Legacy Model LRZ electronic heater may be installed indoors or outdoors as outlined in later sections. Location of the heater below *or above* the pool water level affects operation of its water pressure switch. See sections on water piping and heater

start-up for more information about this.

Avoid placing the heater in locations where it can cause damage by water or condensate leakage. If this is not possible, provide a suitable drain pan to catch and divert any leakage. The pan must not restrict the air flow around the heater.

All criteria given in the following sections reflect minimum clearances as stated in the national standards. However, each installation must also be evaluated, taking into account the prevailing local conditions such as wind speed and direction, proximity and height of walls that may block ventilation, and proximity to public access areas.

2.5.2 Clearances

The heater must be placed to provide clearances on all sides for maintenance and inspection. There must also be minimum distances maintained from combustible surfaces. See Table 3.

At least 457 mm access must be available in front of the heater for burner removal and access to the igniter.

If the heater is to be installed in a garage, or similar structure, all burners and burner ignition devices must have a minimum 457 mm clearance above the floor.

This heater must be installed at least 1,52 m from the inside wall of a pool unless the heater is separated from the pool by a solid fence, wall or other permanent solid barrier.

2.5.3 Flooring

The heater must be installed on a **level** surface of noncombustible construction or on fire-resistant slabs or arches. Noncombustible flooring is defined as flooring material and surface finish not capable of being ignited and burning and with no combustible materials against the underside. Acceptable materials are those consisting entirely of a combination of steel, iron, brick, tile, concrete, slate, glass or plaster. **Do not** install the heater directly on a combustible wood or carpet floor without placing a noncombustible platform between the floor and the heater.

The heater can be installed on a combustible floor if a noncombustible base assembly, available from Zodiac, is used. See the heater rating plate or the Parts List (Section 12) of this manual for the appropriate base part number. **Heaters must never be installed directly on carpeting.**

As an alternative to the Zodiac noncombustible base plate, the heater may be placed on a combustible surface when there is a platform under the heater made of hollow masonry no less than 102 mm thick, covered with sheet metal at least 24 gauge thick and extending beyond the full width and depth of the heater by at least 153 mm in all directions. The masonry must be laid with ends unsealed, and joints matched to provide free circulation of air from side to side through the masonry, see Figure 2. If the heater is installed in a carpeted alcove, the entire floor of the alcove must be covered by a noncombustible panel.

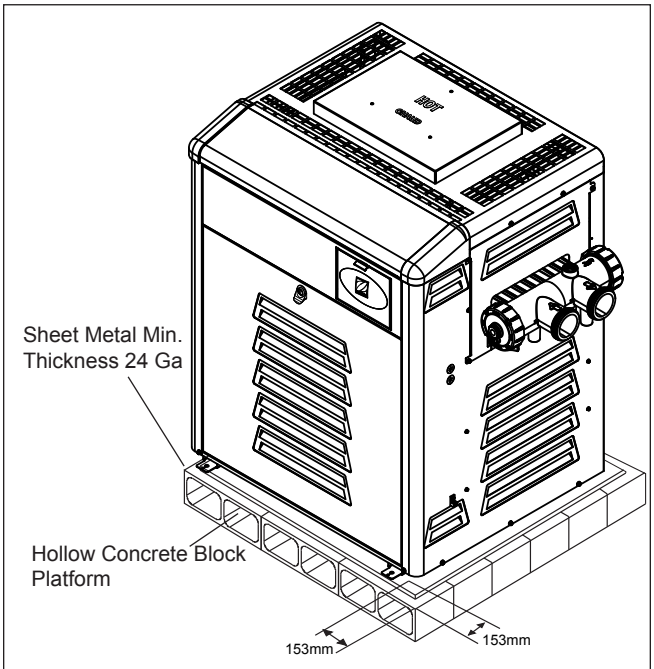
Table 3. Minimum Heater Clearances From Combustible Surfaces

SIDE OF HEATER	MINIMUM CLEARANCE
	Millimeters
BLANK	203
REAR	150
PIPING	355
TOP	1120
FRONT	457

Note: Clearances listed in Table 3 are manufacturer's tested values. These are given as minimum values. Where local codes apply, and values are different than those listed in Table 3, use the greater value to ensure safe operation.

2.5.4 Outdoor Installation

The Legacy Model LRZ electronic heater can be installed in the low-profile Type A flueless configuration as received from the factory. Alternately, the heater may be installed outdoors using a Type B11 vent cap. This vent cap is used in high wind installations. No draft hood is required for this type of



Notes:
1. Blocks must provide a solid base and be braced so they cannot slip out of place.
2. Air openings in blocks must be arranged to provide unrestricted opening through entire width or length of base.
3. Sheet metal must be at least 24 ga. and extend 153mm beyond the heater jacket on all sides.

Figure 2. Noncombustible Platform

outdoor installation.

Locate the heater in an **open, unroofed area**. Do not install the heater under a deck. Do not locate the heater below or adjacent to any doors, glass openings, louvers, grills, etc., which connect in any way with an inhabited area of a building, even though the access might be through another structure (e.g., a garage or utility room). The vent system shall terminate at least 2 m below, 2 m horizontally from, any door, operable window, or gravity inlet into any building. See Figure 3.

The top surface of the heater must be at least 0.91 m above any forced air inlet, or intake ducts located within 3 m horizontally.

If the heater is installed under an overhang, there must be a minimum clearance of 1,5 m above the top of the heater and the structure should not overhang the heater more than 0.30 m. The area under the overhang must be open on three (3) sides. This prevents combustion gases from being diverted into living areas through doors, windows, or gravity inlets.

If the heater is installed close to a structure, protect it from rain water runoff with rain gutters on the roof or other measures. Do not locate the heater near irrigation sprinkler systems that could spray water on it. Water from sprinklers may cause damage to controls and electronic components.

Avoid locations where wind deflection off nearby structures might cause downdraft conditions. Where downdraft conditions exist, locate the heater at least 0.91 m from vertical surfaces (e.g., nearby buildings and walls).

2.5.5 Indoor for Natural Gas Installation Only

The Legacy heater can be installed indoors using the draft diverter available from Zodiac, and a Type B11 flue system complying with the national and local applicable standards in addition to the Building Regulations. See Section 2.

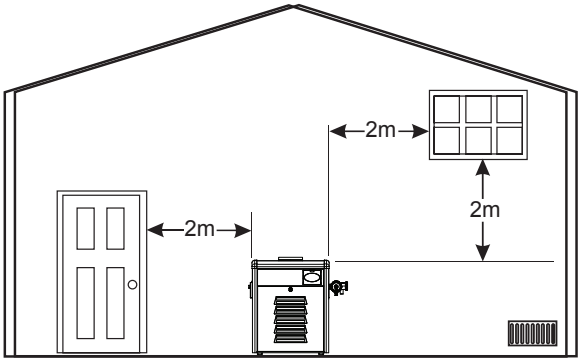


Figure 3. Outdoor Heater Installation

Section 3. Venting

The applicable codes, standards and Zodiac, require that the heater be properly vented as outlined in this manual. Proper ventilation of exhaust and combustion air are essential for the safe and efficient operation of the heater.

3.1 Combustion Air Supply

The heater location must provide sufficient air supply for proper combustion and ventilation of the surrounding area.

In general, the room in which a heater is installed should be provided with two (2) permanent air supply openings; one (1) within 305 mm of the ceiling, the other within 305 mm of the floor. All indoor installations must have uninterrupted openings to outside air for combustion, ventilation, and dilution of flue gases from inside the building, see Figure 4 and Table 4. Zodiac does not recommend indoor installations that do not provide combustion air from outside the building.

Table 4. Ventilation Requirements

Positions of Air Vents	Air Vent Areas (Air Direct From Outside)
High Level	270 cm^2 plus 2.25 cm^2 per kW in excess of 60 kW total rated input
Low Level	540 cm^2 plus 4.5 cm^2 per kW in excess of 60 kW total rated input

Exhaust Fans or Vents: Any equipment which exhausts air from the room where the heater is installed can deplete the combustion air supply or reverse the natural draft action of the venting system. This could cause flue products to accumulate in the room. Additional air must be supplied to compensate for such exhaust.

The information in Table 4 is not applicable in installations where exhaust fans or blowers of any type are used. Such installations must be designed by qualified engineers.

The heater must be completely isolated and protected from any source of corrosive chemical fumes such as those emitted by trichlorethylene, perchloroethylene, chlorine, etc.

⚠ WARNING

Do not store any chemicals, cleaners, or other corrosive material near combustion air openings or in the room. Avoid locating appliance vents in the vicinity of combustion air openings. Failure to prevent corrosive materials from mixing with combustion air can result in reduced heater life and unsafe heater operation.

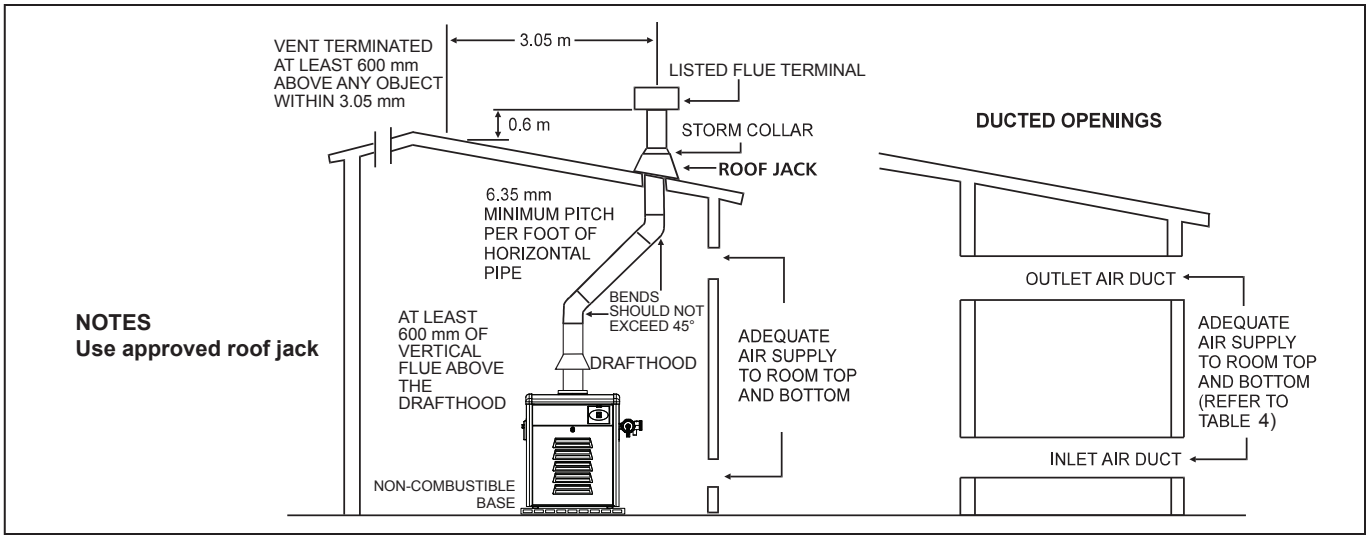


Figure 4. Indoor Installation Venting or Outdoor Shelter Venting

3.2 Flue System Type B11 (Indoor)

Connect the draft diverter to a Type B11 flue system of at least the same diameter, and end at least 0.6 meters above the highest point of the roof or other object that is within 3.05 m of the vent. Install a certified terminal which allows a full equivalent opening for flue products, see Figure 4. There must be at least 600 mm of vertical flue above the drafthood. Bends in the flue should not exceed 45° to the vertical.

To make sure the heater operates safely and satisfactorily, the flue system must be able to completely remove combustion products at all times. The number of bends and lengths of horizontal flue pipe used should be kept to a minimum in order to reduce gas flow resistance.

Compliance with all national and local applicable installation codes and regulations should be strictly observed.

The flue design should avoid the formation of excessive quantities of condensate. For this reason, it is recommended that all flues be insulated and lined. For brick or similar structures, a stainless steel rigid or flexible flue liner (Grade 304/316) may be used in conjunction with a 50 mm (minimum) thick layer or vermiculite or perlite granules between the liner and the inner skin of the chimney body.

Liners should be sealed at both top and bottom. Drainage points should be provided at the bottom of all vertical flue sections. Drain pipes should be:

1. No less than 25 mm inside diameter.
2. Made from acid condensate resistant material (e.g., stainless steel).
3. Positioned so that pipe runs and discharge points are not subject to the effects of frost and flue gases cannot leak into the boiler room.

3.3 Vent Pipe Sizing and General Installation

3.3.1 Outdoor Installations

For outdoor installations, exhaust venting considerations will determine the placement of the heater, see Section 2.5.4. If the heater cannot be placed so as to meet the requirements stated in Section 2.5.4, a Type B11 vent pipe and cap may be added to the heater to move the exhaust vent opening to a position that complies with the requirements. When the heater is installed in areas of high wind or when unavoidably installed near a vertical obstruction where downdrafting may occur, it may be desirable to add a vent cap directly to the top of the heater. In all cases, vent pipes and caps must be of the same diameter as the exhaust outlet of the heater. Approved vent caps may be obtained through your Zodiac distributor.

3.3.2 Indoor Installations (Natural Gas ONLY)

⚠ WARNING

Vent pipe diameter must be as required by applicable local gas appliance installation codes such as BS 5440. Undersized pipe can result in inadequate venting and oversize pipe can result in vent condensation. In either case the result can be release of combustion products to the indoors. This can cause serious injury or death by carbon monoxide poisoning or asphyxiation.

All indoor installations and outdoor shelter installations require a factory approved draft hood and Type B11 venting. The draft hood must be installed without modification. All vent installations must be made in accordance with all local, state or provincial codes.

Avoid long horizontal runs of the vent pipe, and 90° elbows, reductions and restrictions. Horizontal runs should have at least a 20 mm rise per meter in the direction of flow.

Avoid terminating heater vents near air conditioning or air supply fans. The fans can pick up exhaust flue products from the heater and return them inside the building, creating a possible health hazard.

Do not locate the vent terminal where flue products could strike against building materials and cause degradation.

Vent opening should be well away from trees or other obstructions that would prevent free air flow to and from vent terminal. Do not terminate the vent under decks, stairways, or car ports.

Be sure to support all venting so that connections will not separate and so that the weight of the vent pipe does not rest on the heater draft hood. All connections should be made with rustproof sheet metal screws. Do not weld or fasten the vent pipe to the heater draft hood. The draft hood and heater top must be easily removable for normal heater service and inspection.

The draft hood outlet is to be connected to an unobstructed vent pipe of the same diameter, terminating outside the building. The vent must terminate at least 0.6 m above the highest point of the roof or other object that is within 3.05 m of the vent termination. The vent pipe must have a listed vent cap which allows a full equivalent opening for flue products, see Figure 5. The top of the vent cap must be at least 1.52 m in vertical height above the draft hood outlet.

Type “B” double wall or equivalent vent pipe is recommended.

IMPORTANT NOTE: Do not use sheet metal screws at the snap lock joints.

When venting multiple appliances through one common duct, each appliance must have its own vent temperature limit switch. All vent limit switches must be wired in series so as to prevent any appliance from firing in the event of a blocked vent. Refer to national and local installation codes for more information on multiple venting.

3.3.3 Inspection and Replacement of Existing Vent System with New Components

If the Legacy Model LRZ electronic is being installed to replace an existing pool heater, it is recommended that a new appropriate venting system be installed with the new heater. However, if an existing venting system must be used, be sure to carefully inspect the venting system to ensure that it is in good condition and continues to be appropriate for the Legacy Model LRZ electronic heater. Replace any parts that are not in good and serviceable condition with new parts before completing the pool heater installation.

Section 4. Gas Connections

4.1 Gas Supply and Piping

Review the following general instructions before continuing the installation.

⚠ WARNING

The Legacy Model LRZ pool and spa heaters are designed for use with either natural gas or LPG gas. Check the rating plate on the inner panel to be sure that the heater is designed to use the type of gas being supplied. **DO NOT ATTEMPT TO CONVERT THIS HEATER FOR USE WITH ANY OTHER TYPE OF FUEL.**

⚠ CAUTION

Permanent damage to the gas valve will occur if the following procedures are not followed.

1. Gas piping installation must be in accordance with all applicable local rules and regulations such as "The Gas Safety (Installation and Use) Regulations" (Statutory Instrument 1998 No. 2451). Use rigid piping only for connection to this heater.
2. Check the gas supply to be sure that it is the same as the gas indicated on the heater's rating plate.
3. If there is any doubt regarding the capacity of any existing service pipes or the size required for new service pipes then the advice of the gas supplier should be requested. Installation pipework should be fitted and tested for gas soundness. Zodiac recommends the gas inlet pipe sizes listed in Table 5.
4. Use the figures in Table 5 to size the gas inlet piping from the gas meter to the heater. Check all local codes for compliance before installing the heater.

Table 5. Pipe Size Requirements

Heater Size	Distance from Gas Meter		
	0-15 m	15-30 m	30-60 m
	mm	mm	mm
125	20	25	25
175	25	25	32
250	25	32	32
325	32	32	40
400	32	40	40

5. Before operating the heater, test for gas soundness. Do not use a naked flame.

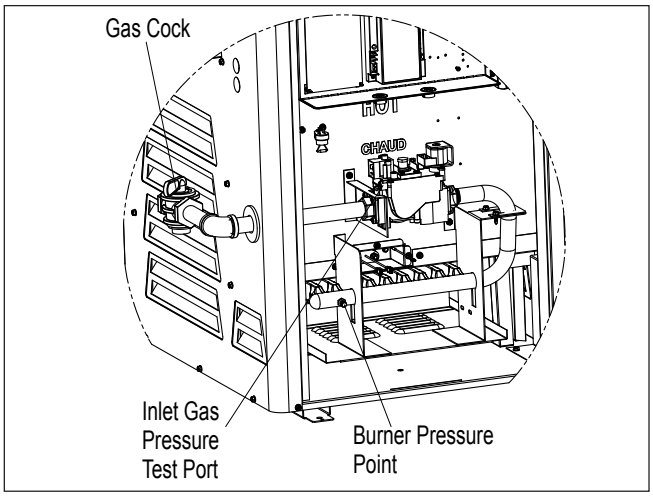


Figure 5. Fitting a Gas Service Cock

6. If the gas supply pressure is less than required, check for undersized pipe between the meter and the heater, a restrictive fitting, or an undersized gas meter. Gas supply pressures to the heater are listed in Table 2.

4.2 Burner Pressure

Confirm that gas supply pressure is correct. If the gas supply pressure is less than required, check for undersized pipe between the meter and the heater, a restrictive fitting, or an undersized gas meter. Gas inlet pressures to the heater, when it is operating, are listed in Table 2.

> **⚠ CAUTION**
> Burner gas pressure for the Legacy Model LRZ natural gas heaters should be set to the values listed in Table 2.

The burner pressure may be checked by connecting a manometer to the pressure port on the burner. Refer to Figure 5. The pressure will be zero when the heater is not running. When the heater is operating the burner gas pressure should be at the pressure listed in Table 2.

If the burner pressure indicated above is not correct, check the gas train for possible problems. Check the meter, gas line, gas fittings, and gas shut off for under sizing. Check the gas valve inlet for excess pipe dope, if all is correct, then it may be necessary to adjust the gas valve regulator. To adjust the burner gas pressure, first remove the slotted cap next to the inlet pressure port on the inlet side of the gas valve. Under the slotted cap is a slotted plastic screw which increases the burner pressure when turned clockwise and decreases the burner pressure when turned counterclockwise. After measurements and adjustments, if necessary, have been made, make sure to replace the test point plugs on the inlet and burner pressure ports, and the cap on the burner pressure adjustment screw. It is extremely important to replace these parts before leaving the installation. Failure to do so can result in damage to property or injury or death. *With the heater firing*, the pressure must be within the range shown in Table 2. Also check the pressure with the heater off.

4.3 Special Precautions for LPG

LPG is heavier than air and can therefore more readily collect or "pool" in enclosed areas if provision for proper ventilation is not made. Installation of pool heaters in enclosed areas such as pits is not recommended.

Consult any local code and fire protection authorities about specific installation restrictions in your area.

Section 5. Water Connections

5.1 Water Piping

Figure 6 illustrates typical piping for pool equipment in pool/spa combination pools.

For normal installations, do not install a shutoff valve or any kind of variable restriction in the water piping between the heater outlet and the pool/spa. In special installations where a shut-off valve, diverter valve or other variable restriction is required in the plumbing between the heater outlet and the pool, Zodiac recommends the installation of a pressure relief valve on the heater. See Section 5.7.

Arrangement of pool system components other than as illustrated in these diagrams can affect the operation of the heater's water pressure switch. Location of the heater above or below the pool water surface can also affect operation of the switch. In general, the pressure switch can be adjusted to accommodate this effect if the heater water connections are no more than 1,8 m below the pool water surface and no more than 4,5 m above it. See instructions for pressure switch adjustment (Section 7.7) in the heater start-up section of this manual for more information about this.

Note that when pool equipment is located below the pool surface a leak can result in large scale water loss or flooding. Zodiac cannot be responsible for such water loss or flooding or the damage caused by either occurrence.

For special installations such as water connections below the water level of the pool, or for other questions consult your local Zodiac dealer.

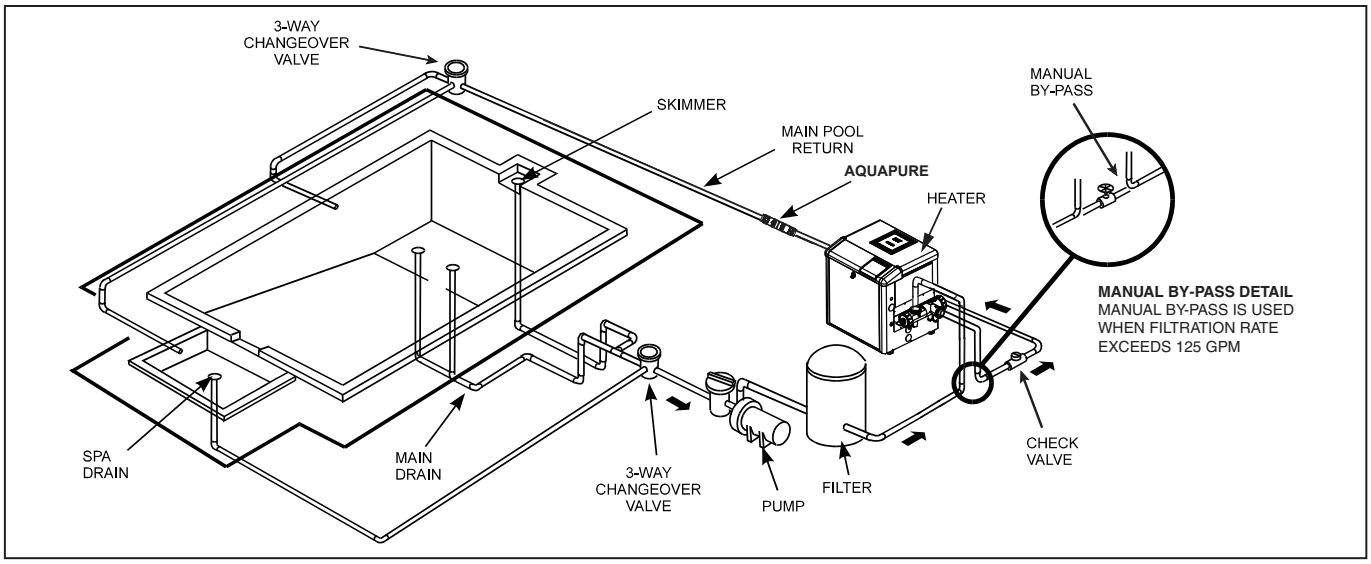


Figure 6. Typical Piping Installation

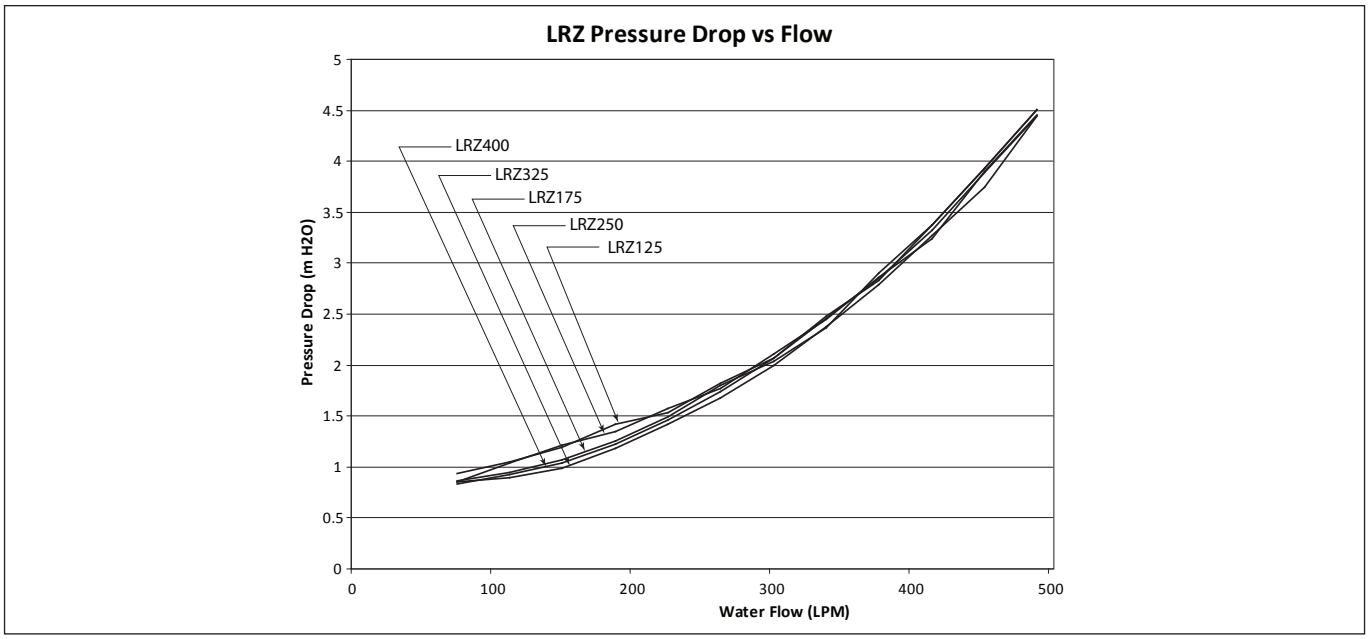


Figure 7. Hydraulic Head Loss Curve

5.2 Hydraulic Head Loss

To verify that the minimum flows required for the heater are met, a hydraulic head loss curve is shown in Figure 7. This should be checked when installing this heater into a new or existing piping system. This should also be consulted when installing a new pump.

5.3 Check Valve Installation

⚠ WARNING

A check valve can interfere with the proper operation of certain Suction Vacuum Release System (SVRS) products. To avoid possible entrapment hazard, serious injury, or death, make sure to review the operation/owners manual of your particular SVRS product before installing the check valve.

The heater must be protected from back-siphoning of water, which can result in dry starts. If there is any chance of back-siphoning, provide a check valve between the pool and the filter pump inlet.

When an automatic chemical feeder is installed in the plumbing, it must be installed downstream of the heater, see Section 5.7. A check valve must be installed between the heater and the chemical feeder to prevent back-siphoning of chemically saturated water into the heater where it will damage the components.

5.4 Automatic Flow Control Valve

The inlet/outlet header of the Legacy Model LRZ electronic heater comes equipped with an automatic flow control valve. The automatic flow control valve maintains the proper flow through the heater at rates up to approximately 475 lpm. If the filter system flow rate is higher than approximately 475 lpm, install a manual

bypass valve, see Figure 6, then perform a temperature rise test, see Section 11.6 and adjust the flow using the bypass valve until the proper temperature rise is obtained.

5.5 Reversible Water Connections

The Legacy Model LRZ electronic heater is shipped with water connections on the right side, but can be modified in the field to provide left-side water connections. This procedure involves removing the heat exchanger headers and reinstalling them on opposite ends of the tube assembly. Some of the heater wiring must be disconnected and re-routed, so this procedure must be done only by a trained service technician. Heat exchanger reversals are generally done before the installation of power and water to the heater. If you need to reverse the heat exchanger on a previously installed heater be sure that all electrical power, the gas supply and water supply have been turned off before starting the procedure. These instructions have been written to include the steps needed when reversing the water connections on an existing installation. If you are reversing the headers on a new installation, some steps will be ignored. Water connection reversal is illustrated in Figures 8 and 9. Proceed as follows:

1. For an existing installation, drain the heater by removing the two (2) drain plugs on the inlet/outlet header and the drain plug on the return header.
2. Remove the heater front panel (door).
3. Remove the I/O header side cover plates, top and bottom. See Figure 10.
4. Remove the return header side cover plates, top and bottom. See Figure 10.
5. Disconnect the blue "HiLimit" two-pin connector from the Power Interface board on the raceway. Clip any wire ties attached to the harness. Feed the "HiLimit" two-pin connector and wiring back through the way it is routed to the header so that the harness hangs free from the header, outside of the cabinet.
6. Disconnect the two (2) "WATER TEMP" temperature sensor leads from the Power Interface board on the raceway. Clip any wire ties attached to the harness. Pull the wires out of the cabinet so that they hang free from the header, outside of the cabinet.
7. Disconnect the yellow "Water Press" two-pin connector from the Power Interface board on the raceway. Clip any wire ties attached to the harness. Feed the "Water Press" two-pin connector and wiring back through the way it is routed to the water pressure switch so that the harness hangs free from the water pressure switch, outside of the cabinet.

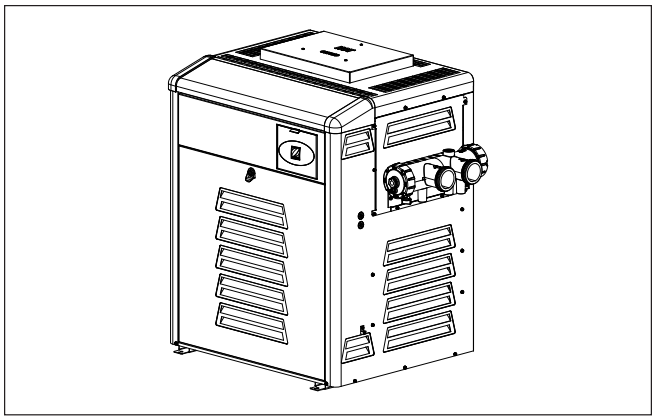


Figure 8. Water Connections as Shipped

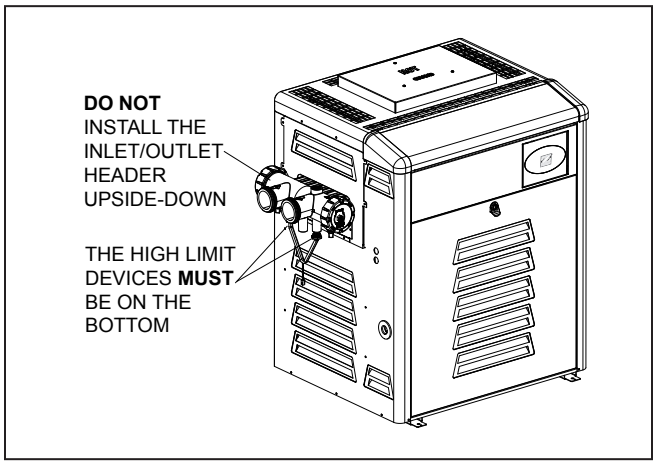


Figure 9. Water Connections Reversed

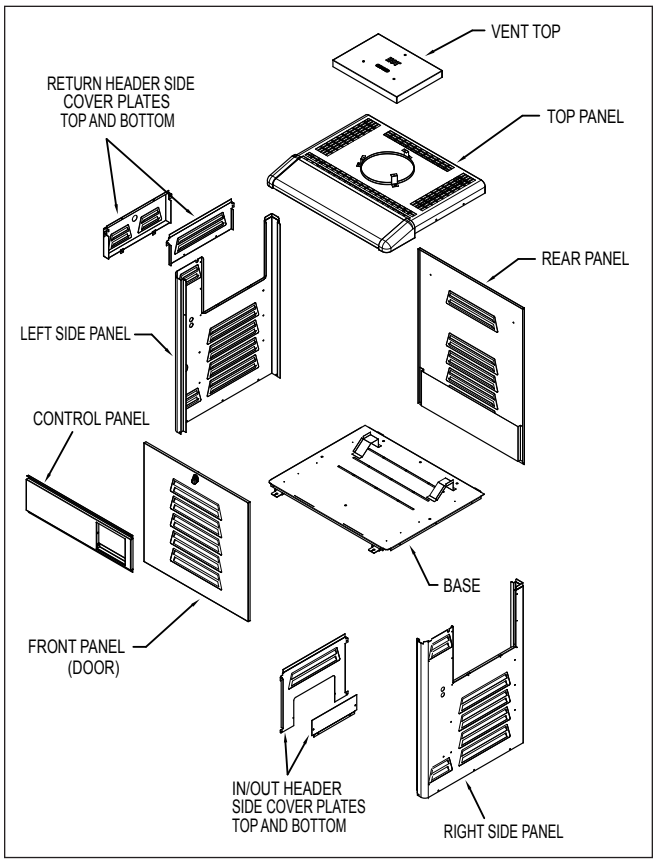


Figure 10. Legacy Model LRZ Panel Identification

⚠ CAUTION
In order to prevent property damage or injury, ensure that the wiring is handled and routed carefully so as not to cause any damage to it. Additionally, be careful not to create any kinks in the water pressure switch copper tubing when handling the header.

8. For an existing installation, remove the coupling nuts from the header and disconnect the water supply from the heater.
9. Remove the 10 bolts and washers from the inlet/outlet header and remove the header from the tube assembly.
10. Remove the 10 bolts and washers from the return header and remove the header from the tube assembly.
11. For an existing installation, remove the tube gaskets and clean the header's mating surface of any corrosion or debris. Replace the tube gaskets with new ones. Do not use any metal tools on the header surface. Scratches may compromise the seal integrity.

⚠ CAUTION
To avoid product failure which can cause property damage, serious personal injury or death, install the inlet/outlet header with the high limit devices on the bottom.

12. Place the inlet/outlet header over the bolts and gasketed tubes on the left side of the tube assembly. Make sure the high limit devices are on the bottom. Refer to Figure 9. Align the bolt and tube holes in the header with the bolts and tubes in the header bar and slide the assembly together.
13. Thread on the 10 bolts and washers and hand tighten.
14. Place the return header over the bolts and gasketed tubes on the right side of the tube assembly. Align the bolt and tube holes in the header with the bolts and tubes in the header bar and slide the assembly together.
15. Thread on the 10 bolts and washers and hand tighten. See Figure 11.
16. Use a torque wrench to tighten the bolts on each header to 4 ft-lbs. The bolts must be tightened in the sequence indicated in Figure 11.

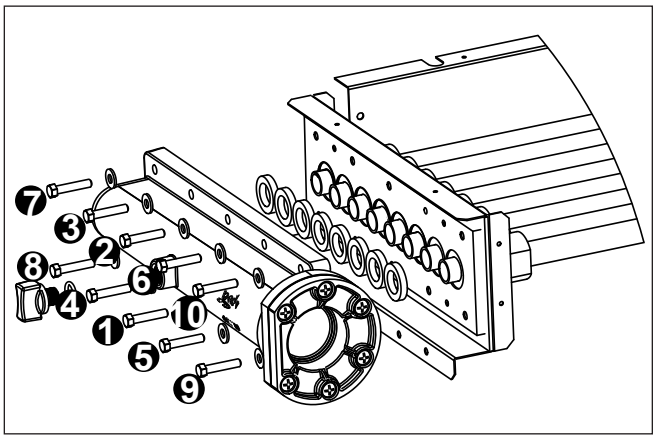


Figure 11. Header Bolt Tightening Sequence

⚠ CAUTION
Failure to tighten the header as indicated in step 16 may cause the header to leak or become permanently damaged from warping.

17. Remove the 3/4 inch button plug located in the left side panel below the inlet/outlet header and replace with the 3/4 inch wire grommet from the right side panel below the return header. The high limit leads were routed through this grommet prior to removal in step 5. Install the 3/4 inch plug in the opening where the 3/4 inch wire grommet was removed.
18. Route the blue two-pin connector attached to the high limit switches back to the Power Interface board in the raceway. Reconnect the blue "HiLimit" two-pin connector to the blue "HiLimit" connector on the Power Interface board.
19. Route the wires that attach to the temperature sensor back to the Power Interface board in the raceway. Reconnect the wires to the "WATER TEMP" terminals on the Power Interface board.
20. Route the yellow two-pin connector that connects to the water pressure switch back to the Power Interface board in the raceway. Reconnect the yellow two-pin connector to the yellow "Water Press" connector on the Power Interface board.
21. Use plastic wire ties to refasten the temperature sensor, high limit switch and water pressure switch wires to each other. Bundle the wires near the control panel and fasten them with a wire tie.

⚠ CAUTION
In order to prevent property damage or injury, be sure that none of the wires are in contact with a sharp edge or a hot surface.

22. Install the return header side cover plate on the right side of the unit.
23. Install the I/O header side cover plates, top and bottom on the left side of the unit.
24. Replace the front panel (door).

5.6 Connections at Heater

The Legacy Model LRZ electronic heater has a standard 2 inch water header and coupling design. With this feature, only nominal 2 inch PVC or CPVC may be connected to the heater. However, by installing the appropriate pipe adapters and two (2) short pieces of 2 inch plastic pipe (supplied by the installer), any size existing pipe may be fitted to the heater.

To connect a section of 2 inch PVC or CPVC pipe to the heater, first slip a coupling nut onto the pipe. Then prepare the end of the pipe with the proper PVC/CPVC primer and glue. Follow the manufacturer's instructions provided with the primer and glue for preparation procedures and curing times. Apply the slip-fit side of the coupling to the end of the pipe. Allow the glue to cure completely. Set the o-ring into the groove on the face of the coupling. Slide the coupling nut up to the coupling and tighten it to the threaded connection on the header. See Figure 12.

5.7 Pressure Relief Valve

A pressure relief valve is recommended in all installations, and is mandatory in any installation in which the water flow can be shut off between the heater outlet and the pool/spa.

A pressure relief valve is not supplied with the Legacy Model LRZ electronic heater. However, it is recommended that a pressure relief valve be installed and may even be required by local codes. Be sure to check any applicable installation codes in your area to determine whether a pressure relief valve is required. See Section 12.2 (Parts List) of this manual for the appropriate kit part number.

The pressure rating of the valve should be at or below the lowest working pressure of any component in the system. The maximum working pressure of this heater is 5.1 bar.

Follow these steps to install a pressure relief valve:

1. To protect the threads while drilling, screw the brass adapter (included with the Zodiac pressure relief valve kit) into the blind threaded hole on the top of the inlet/outlet header.
2. Using the countersink in the center of the blind hole as a guide, drill a 6,4 mm (1/4 inch) hole through the plastic. See Figure 13.

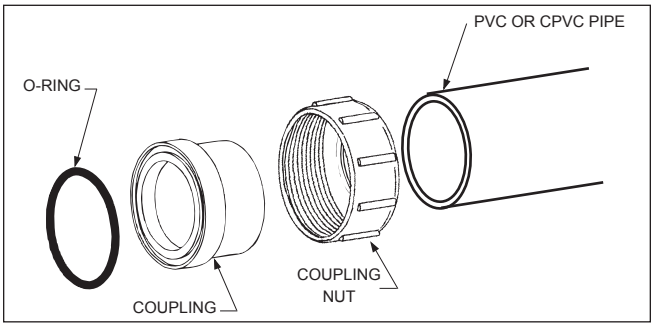


Figure 12. Piping to Heater

3. Open the hole by reaming it with a 9,5 mm (3/8 inch) drill bit.
4. Open the hole again by reaming it with a 12.7 mm (1/2 inch) drill bit.

> **⚠ CAUTION**
>
> Initially drilling a 12,7 mm (1/2 inch) hole without reaming may cause the bit to "grab" on the plastic. This may cause personal injury or damage the plastic header.

5. Remove the brass adapter and clean the cuttings out of the hole.
6. Install the rubber washer at the bottom of the hole. See Figure 14.
7. Thread the adapter into the hole and tighten so that it seals against the rubber washer.

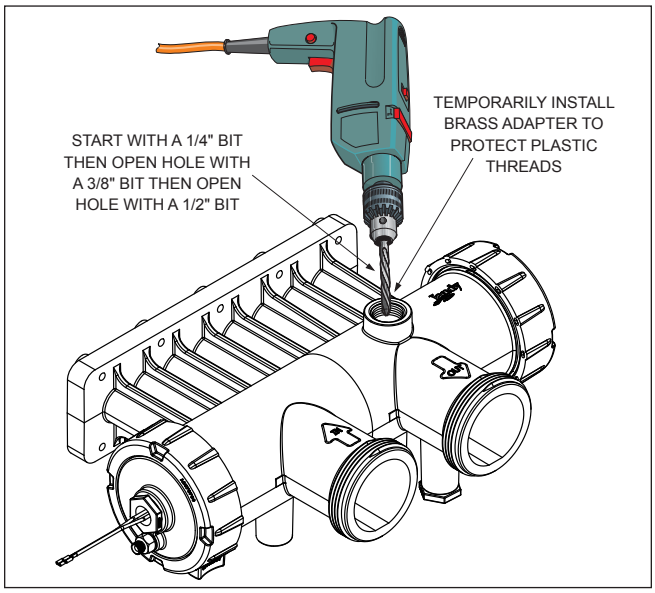


Figure 13. Drill Hole for Pressure Relief Valve

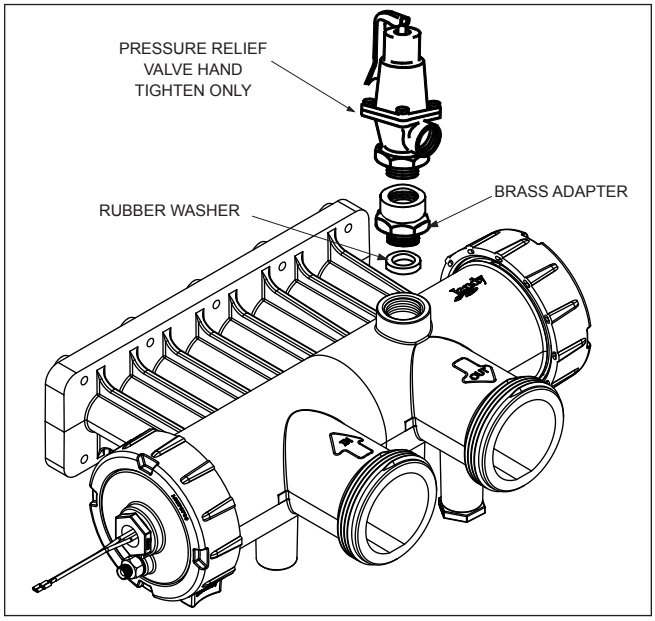


Figure 14. Pressure Relief Valve Installation

8. With a permanent marker, place a mark on the adapter so that the mark faces the same direction as the water connections on the header.
9. Remove the adapter from the hole.
10. Coat the threads of the pressure relief valve with an appropriate metal to metal thread sealant.
11. Install the adapter on the pressure relief valve and tighten using two (2) wrenches. Use the mark made earlier on the adapter to orient the press relief valve to the desired direction in relation to the water connections on the header.
12. Reinstall the adapter, with the pressure relief valve, into the plastic threaded hole and tighten it until the mark on the adapter is once again facing the same direction as the water connections on the header.

⚠ CAUTION
Do not use any pipe compound or pipe dope on the threads of the adapter or any part that comes in contact with the plastic headers. These compounds may damage the header over a period of time.

⚠ CAUTION
In order to prevent property damage, do not over-tighten. Overtightening may crack the header.

DO NOT TIGHTEN WITH A WRENCH. Overtightening may crack the header. Route the discharge piping so that discharge from the pipe does not endanger anyone near the heater. Refer to your local installation codes for more detailed information. The valve setting should be at or below the maximum working pressure of any component in the filter system. The maximum working pressure of the Legacy Model LRZ electronic heater is 5.1 bar.

5.8 Auxiliary Components, Chlorinators, Ozone Generators, and Sanitizing Chemicals

The Legacy Model LRZ electronic heater is manufactured with materials that are not compatible with high concentrations of ozone, chlorine, bromine, or other sanitizing chemicals. Heater damage caused by excessive chemicals or improper ozonization is not covered by the Zodiac warranty. Be sure to adhere to the following:

- When ozone is injected upstream of the heater, install an offgas mixing chamber, or an ozone bypass system between the heater and the ozone injector to prevent ozone and air from entering the heater.
- When chemical feeders are used, plumb the feeder downstream of the heater and install an in-line check valve between the heater and the feeder (a minimum of 46 cm is required between the heater and the check valve).
- Wire any electrical chemical feeder so that it cannot operate unless the filter pump is running. If the feeder has an independent clock control, synchronize it with the filter clock.
- Never deposit chemicals directly in the pool skimmer.

Section 6. Electrical

⚠ WARNING
This product must be installed and serviced by a contractor who is licensed and qualified in pool equipment by the jurisdiction in which the product will be installed where such state or local requirements exists. In the event no such state or local requirement exists, the installer or maintainer must be a professional with sufficient experience in pool equipment installation and maintenance so that all of the instructions in this manual can be followed exactly. Before installing this product, read and follow all warning notices and instructions that accompany this product. Failure to follow warning notices and instructions may result in property damage, personal injury, or death.

⚠ WARNING
ELECTRICAL SHOCK HAZARD. This heater contains wiring that carries high voltage. Contact with these wires may result in severe injury or death.

⚠ CAUTION
Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

6.1 General Information

Wiring connections must be made exactly as shown in the wiring diagram found on the inside of the heater door, see Figure 15. The heater must include a definite means of grounding. There is an earth bonding lug on the right side of the heater, where a bond wire must be attached.

6.2 Main Power

Electrical wiring must be in accordance with the latest edition of all applicable national and local installation codes and regulations. The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance. Connection may be via a fused pole isolator with a contact separation of at least 3 mm in all poles.

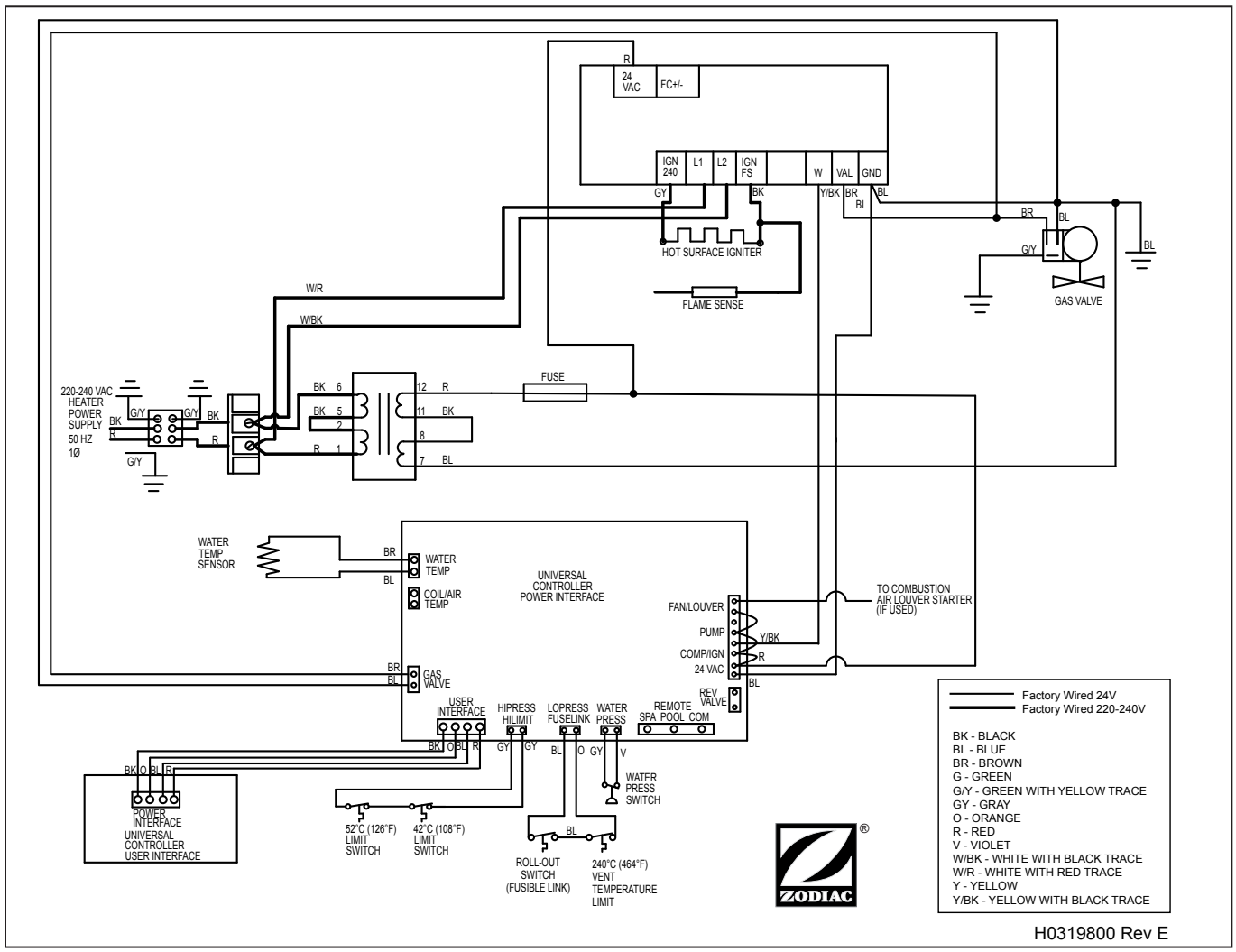


Figure 15. Legacy Model LRZ Electronic Connections/Schematic Wiring Diagram

The heater comes factory-wired intended for use with 220-240 Volt, 50 Hz AC field electrical supply. This heater is intended to be wired with an appropriate conduit.

To wire the Legacy Model LRZ electronic heater to a 220-240V /50 Hertz (Hz) electrical source:

1. Remove the door of the heater.
2. Attach conduit to one of the open holes on the heaters left or right side.
3. Run the wires from the power source through the conduit to the heater.
4. Connect the wires from the power source to terminal block on the raceway.
5. Connect a earth bonding wire (8 AWG (10 mm^2)) to the earth bonding lug on the right side of the heater.

6.3 Earth Bonding

⚠ CAUTION

To prevent premature failure of the appliance resulting from stray voltages and voltage differentials, the heater must be bonded to other equipment which is part of the pool plumbing system with a solid copper wire not smaller in diameter than 8 AWG (10 mm^2).

Zodiac requires that the appliance be connected to an "earth bonding loop" that includes all electrical equipment in the system and on the equipment pad. Earth bonding lugs must be connected with a solid copper wire not smaller than 8 AWG (10 mm^2). Failure to do so will void warranty.

Additionally, all metallic components of a pool structure, including reinforcing steel, metal fittings and above ground components be bonded together (forming an “earth bonding grid”) with a solid copper conductor not smaller than a 8 AWG (10 mm^2).

The equipment and/or appliances associated with the pool water circulating system, including, but not limited to, pump motors and heaters must also be

bonded together as part of the equipotential bonding grid. Zodiac provides a special labeled earth bonding lug on the right side of the heater to accommodate this requirement. Consult your local applicable installation codes/regulations for additional requirements that may apply.

6.4 Optional Remote Controls

⚠ WARNING
RISK OF ELECTRIC SHOCK, WHICH CAN RESULT IN SERIOUS INJURY OR DEATH. Before attempting installation or service, ensure that all power to the device is disconnected/turned off at the circuit breaker.

Electrical wiring must be in accordance with the latest editions of all applicable national and local installation codes and regulations.

6.4.1 Connection to a Remote Pool-Off-Spa Selector (3-Wire Connection)

6.4.1.1 Install the Remote Pool-Off-Spa Selector

1. Turn off the power to both the pool/spa control system and the heater unit.
2. Remove the front panel door from the front of the heater to access the raceway.
3. Run the wires from the pool/spa control system through the opening, located on the lower right or left hand side of the heater.
4. Connect the wiring from the pool/spa control system to the heater remote control terminal. See Figure 16.
5. Restore power to the heater and the pool/spa control system.

6.4.1.2 Configure the Control Panel

1. Make sure the control is in the **OFF** mode.
2. To enter the Service Setup mode, press and hold the **MENU**, **POOL**, and **SPA** buttons for 5 seconds.

NOTE The display will revert back to OFF after 1 minute since the last key press.

3. Press the Up or Down button to display **REMOTE**. Press the **MENU** button. The **SELECT REMOTE OFF** (default remote) appears. Use the Up or Down button to scroll through the Remote options. When you reach **HI-LO-COM**, press the **MENU** button to select the remote. Press **POOL** or **SPA** to exit the Service Setup mode.

6.4.2 Connection to an AquaLink® RS Control System or Remote TSTAT (2-Wire Connection)

6.4.2.1 Install the Remote TSTAT

1. Turn off the power to both the pool/spa control system and the heater unit.
2. Remove the front panel door from the front of the heater to access the raceway.
3. Run the wires from the pool/spa control system through the opening, located on the lower right or left hand side of the heater.
4. Connect the wiring from the pool/spa control system to the heater remote control terminal. See Figure 17.

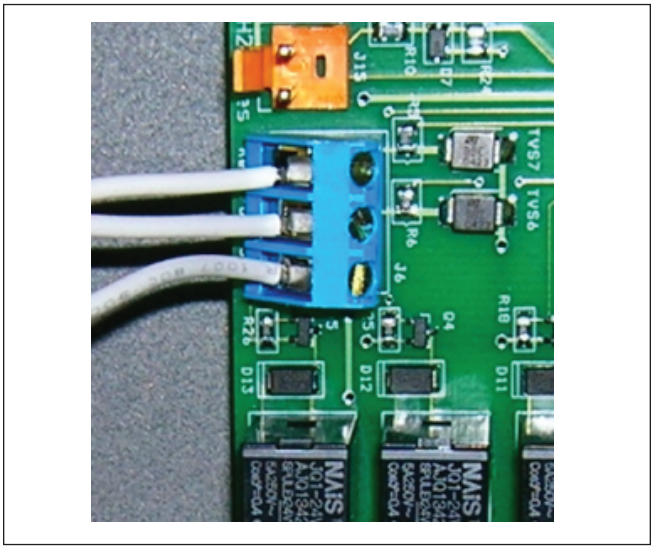


Figure 16. Remote Pool-Off-Spa Connection (3-Wire Connection)

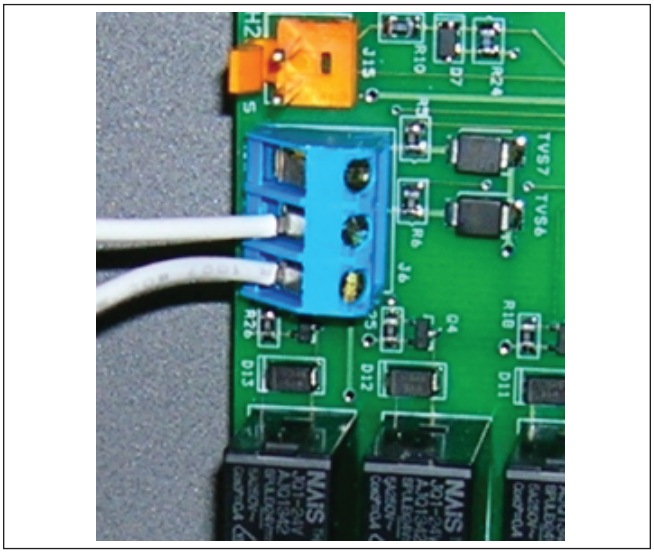


Figure 17. AquaLink RS or Remote TSTAT Connection (2-Wire Connection)

5. Restore power to the heater and the pool/spa control system.

NOTE If you install a time clock to control the filter pump operation, it is recommended that the time clock have its own low voltage (Fireman's) switch to turn off the heater before turning off the pump. The switch should shut off the heater about 15 minutes before the filter pump shuts off. This will allow for a more efficient operation by removing any residual heat contained in the heat exchanger back to the pool.

6.4.2.2 Configure the Control Panel

1. Make sure the control is in the **OFF** mode.
2. To enter the Service Setup mode, press and hold the **MENU**, **POOL**, and **SPA** buttons for 5 seconds.

NOTE The display will revert back to OFF after 1 minute since the last key press.

3. Press the Up or Down button to display **REMOTE**. The **SELECT REMOTE OFF** (default remote) appears. Use the Up or Down button to scroll through the Remote options. When you reach **REMOTE TSTAT**, press the **MENU** button to select the remote. Press **POOL** or **SPA** to exit the Service Setup mode.
4. Press **SPA**. Adjust the setpoint to the maximum setting of 40°C (104°F).

6.4.3 Connection to a Secondary User Interface

The Legacy Model LRZ electronic pool/spa heater can also be controlled remotely by installing a second wall mountable User Interface. Please order Zodiac part number R0467500. This kit contains the second User Interface, wall mounting backplate, and necessary hardware.

Section 7. Commissioning

7.1 Heater Startup

1. When the heater has lit, remove the service door and check all gas connections for soundness with leak detection fluid.
2. Check the manifold (burner) pressure setting and adjust as necessary. See Table 1.
3. Start the adjustment procedure with the heater cold, on full load, and with the temperature control set at maximum. This will ensure, as far as possible, that thermostatic shutdown does not interfere while the pressure is being checked and adjusted.
4. Remove the blanking screw in the manifold (burner) setting pressure test nipple and securely connect a suitable gas pressure gauge. See Figure 5.
5. Light the heater and allow it to operate for about 15 minutes to stabilize the burners.
6. Check the pressure and adjust it according to Table 2 for the appropriate heater size. The manifold pressure setting adjuster is found on the gas control (valve).
7. Remove the dust cover over the adjuster and, using a screwdriver, turn the screw beneath clockwise to increase or anti-clockwise to decrease the pressure. Replace the dust cover when finished.
8. Turn off the burner, disconnect the gas pressure gauge, and replace the blanking screw in the manifold setting pressure test nipple.

9 Relight and check for gas soundness.

10. For heaters installed with a draft hood, perform a spillage test in accordance with BS.5440:1 to check for spillage of combustion products from the heater draft diverter.
11. Check that the main burner responds correctly to manual ON/OFF operations of any controls fitted in the gas control circuit.
12. Check the operation of the flame failure safety device using the following steps:
    a. Extinguish the main burner by turning off the main gas inlet cock.
    b. Check that the flame failure device has actuated within 7 seconds
    c. Wait 3 minutes, then turn on the gas and re-light the pilot.
13. With the pump running, check for water leaks in the heat exchanger or water piping.

14 Adjust the water pressure switch according to the procedure in section 11.5.

15. Perform a temperature rise test according to the procedure in section 11.6.
16. Refit the service door and return all controls to the required settings.

Section 8. Operating Instructions

8.1 Normal Operation

⚠ WARNING
Improper installation or maintenance can cause nausea or asphyxiation from carbon monoxide in flue gases which could result in severe injury, or death. For indoor installations, as an additional measure of safety, Zodiac Pool Systems, Inc. strongly recommends installation of suitable Carbon Monoxide detectors in the vicinity of this appliance and in any adjacent occupied spaces.

The Legacy Model LRZ electronic ignition heater is capable of automatic operation based on a call for heat at a preset temperature. The heater has an internal safety system which allows operation in a variety of conditions and prevents operation when certain adverse conditions are encountered. The heater is capable of diagnosing problems within the safety control scheme, enabling faster service and less down time in the event of a failure.

When the heater's transformer is provided with a 220-240 VAC supply, it in turn provides a 24 VAC signal to the safety circuit. When water is flowing through the heater, and the temperature of the water entering the heater is below the temperature control setting, an operating cycle is initiated by the automatic control. The control circuit is closed, the igniter is energized. After a 40 second igniter heat-up, the gas valve is opened. Gas flows through the burners, is mixed with air in the combustion chamber, and is ignited by the hot surface igniter. Operation will continue until the temperature of the water entering the heater reaches the temperature control setting.

If ignition is unsuccessful, or if the flame fails during normal operation, the ignition control shuts off the gas valve. To reset the Legacy heater to provide three (3) additional attempts without waiting an hour, turn the control off and return it to either pool or spa. The ignition control will automatically reset itself and restart the ignition after one hour.

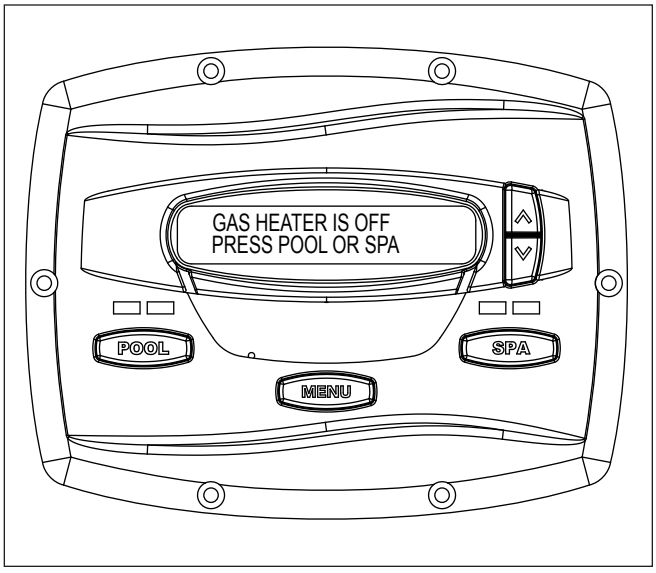


Figure 18. Main Control Panel

8.2 Start-Up

⚠ WARNING
For your safety, when starting the heater, keep your head and face well away from the burner area to prevent any risk of personal injury.

⚠ WARNING
Vent pipes, and heater tops get hot! These surfaces can cause serious burns. Do not touch these surfaces while the heater is in operation.

⚠ CAUTION
Do not use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and replace any part of the control system and any gas control which has been under water.

⚠ CAUTION
Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the heater.

⚠ CAUTION
Do not attempt repairs on the gas controls or appliance. Tampering is dangerous and voids all warranties.

⚠ CAUTION
Keep all objects off the top of the heater. Blocking air flow could damage the heater, and may void the warranty.

Be sure that there is water in the pool and that the surface level is above the skimmer or other inlet of the pool's filter system.

Confirm that pool water is flowing normally through the pool system and equipment. With any new pool or spa installation, operate the filter pump with the heater off long enough to completely clean the water. This will remove any installation residue from the water. Clean the filter at the end of this operation before starting the heater. Start the heater in accordance with the Operating Instructions section of this manual, with particular attention to the lighting and shutdown instructions and temperature control operation.

The heater may not start on the first try. Air in the gas line or other start-up situations may cause it to cycle. It will lock out if ignition is not achieved in three (3) attempts, see Section 10.2, "Service Codes". To reset the Legacy Model LRZ electronic heater to provide three (3) additional attempts, turn off the control and then put it back in either the Pool or Spa mode.

When the heater starts, immediately feel the outlet header of the heater to confirm that there is adequate water flow. The header should not be hot.

Normally, water temperature will rise only a few degrees as it passes through the heater, and a "hot" header or pipe indicates low water flow.

⚠ WARNING
When the heater is fired for the first time, the combustion chamber refractory binder material is driven out by the heat of the flame. White smoke and/or sharp odors may be emitted from the vent during this period. Do not inhale combustion product fumes at any time, and especially when these fumes are being emitted. This "burn-in" period will last only a few minutes.

When raising the temperature of a cold pool, program the time clock to turn the pump off 23 hours after the start time (e.g., If the start time is 2:00 PM, then set the stop time at 1:00 PM.). This lets the filter system and heater operate continuously until the water reaches the temperature setting on the temperature control. When that happens, the heater will automatically shut off, but the filter pump will keep running.

8.3 Operating the Controller

Your new Legacy Model LRZ electronic Pool Heater is controlled by an advanced microprocessor based controller that provides a sophisticated yet simple interface to operate your heater for maximum efficiency and enjoyment of your pool. To locate the control buttons, see Figure 18.

8.3.1 Off Mode

When the control panel is turned off, the screen displays **GAS HEATER IS OFF PRESS POOL OR SPA**.

8.3.2 Pool Mode - (Normal Heat)

To enable the pool mode, press **POOL**. The associated left green LED indicator will light and the unit will display **SET:XXX°**.

NOTE *XXX* represents the current temperature setting on the control. The default setting for pool temperature is 26°C (80°F).

You can change the temperature set point by pressing the **Up** or **Down button**. **Repeatedly press the Up or Down** button until you reach the desired temperature set point. After 5 seconds of inactivity, the new set point is stored in memory.

When the water temperature falls to 1 degree below the temperature setting, the control will start the heater and the associated right LED will light RED.

8.3.3 Spa Mode - (Normal Heat)

To enable the spa mode, press **SPA**. The associated left green LED indicator will light and the unit will display **SET:XXX°**.

NOTE *XXX* represents the current temperature setting on the control. The default setting for spa temperature is 38°C (102°F).

You can change the temperature set point by pressing the **Up** or **Down** button. Repeatedly press the **Up** or **Down** button until you reach the desired temperature set point. After 5 seconds of inactivity, the new set point is stored in memory. When the water temperature falls to 1 degree below the temperature setting, the control will start the heater and the associated right LED will light RED.

8.4 User Setup Options

The User Setup options allow the user to select specific Languages, Temperature Scale, Spa Timer, and Display Light options.

8.4.1 Language Setup

1. Make sure the control is in the **OFF** mode.
2. To enter the User Setup mode, press and hold the **MENU** button for 5 seconds.

NOTE The display will revert back to **OFF** after 1 minute since the last key press.

3. To select a language, use the **Up** or **Down** button to display **SELECT USER SETUP LANGUAGE**. Press the **MENU** button. The **SELECT LANGUAGE ENGLISH** (default language) appears, use the **Up** or **Down** button to scroll through the language options. When you reach the desired language, press the **MENU** button to select the language. Press **POOL** or **SPA** to exit the User Setup mode.

8.4.2 Temperature Scale Setup

1. Make sure the control is in the **OFF** mode.
2. To enter the User Setup mode, press and hold the **MENU** button for 5 seconds.
3. To select temperature scale, use the **Up** or **Down** button to scroll through to display **SELECT USER SETUP TEMPERATURE SCALE**. Press the **MENU** button. The **SELECT TEMP SCALE °F:** (default temperature scale) appears, use the **Up** or **Down** button to scroll to display **SELECT TEMP SCALE °C:**. When you reach the desired temp scale, press the **MENU** button to select. Press **POOL** or **SPA** to exit the User Setup mode.

8.4.3 Spa Timer Setup

1. Make sure the control is in the **OFF** mode.
2. To enter the User Setup mode, press and hold the **MENU** button for 5 seconds.
3. To select spa timer, use the **Up** or **Down** button to scroll through to display **SELECT USER SETUP SPA TIMER**. Press the **MENU** button. The **SELECT SPA TIMER CONTINUOUS:** (default spa timer setting) is displayed. To turn the spa on or off indefinitely, press the **MENU** button to select.

   To select the length of time for the spa to run, use the **Up** or **Down** button to scroll to display **SELECT SPA TIMER TIME SELECTION**. Press the **MENU** button to select. The display **SELECT SPA TIME 01:00 HRS:** (default time setting) is displayed. Use the **Up** or **Down** button to select the length of time for the spa to run (between 00:15 to 23:00 hours incremented by 00:15 minutes). Press the **MENU** button to select how long the spa will run. Press **POOL** or **SPA** to exit the User Setup mode.

8.4.4 Display Light Setup

1. Make sure the control is in the **OFF** mode.
2. To enter the User Setup mode, press and hold the **MENU** button for 5 seconds.
3. To select display light setup, use the **Up** or **Down** button to scroll through to display **SELECT USER SETUP DISPLAY LIGHT**. Press the **MENU** button. The **SELECT DISPLAY LIGHT 2 MIN TIMEOUT:** (default display light setting) is displayed. This option allows the display light to turn off after 2 minutes. Press the **MENU** button to select. Use the **Up** or **Down** button to scroll to display **SELECT DISPLAY LIGHT LIGHT OFF:**, this option allows the display light to turn off, press the **MENU** button to select. Use the **Up** or **Down** button to scroll to display **SELECT DISPLAY LIGHT LIGHT ON:**, this option allows the display light to turn on, press the **MENU** button to select. Press **POOL** or **SPA** to exit the User Setup mode.

8.5 Set Point Lockout

Make sure the control is in the **ON** mode (**POOL** or **SPA**), press and hold the **Up** and **Down** buttons for 5 seconds. The set point will be locked and the control will operate in the mode it was in when the Set Point Lockout occurred. If an attempt to change the set point is made while the control is in Set Point Lockout, the control will display **SET POINT LOCKED**. To unlock the Set Point Lockout, press and hold the **Up** and **Down** buttons for 5 seconds. The unit will display **SET POINT UNLOCKED**.

8.6 Lighting and Shutdown Procedures

⚠ WARNING
Do not attempt to light the heater with the door off. Doing so may cause severe bodily injury.

Before starting your heater, be sure that all of the functions and limits of the Legacy controller have been set according to the previous sections of this manual. Once the control is set to your preferences, follow the instructions outlined below. Read and follow all safety instructions first. A more detailed set of lighting and shutdown instructions are listed on the label located on the inside of the heater door and in Figure 19.

8.6.1 Lighting the Heater

Lighting instructions are as follows:

1. Turn off all electrical power to the heater at the main junction box.
2. Turn on the filter pump.
3. Turn on the external gas supply to the heater.
4. Turn on electrical power to the heater.
5. Set the heater control to the "SPA" mode. If the temperature of the water exceeds the thermostat setting it is necessary to increase the thermostat setting to exceed the water temperature. Adjust the thermostat setting (desired temperature) to be greater than the water temperature. The igniter lights the burner when the thermostat calls for heat.
6. Set the time clock, if one is installed.

8.6.2 Shutdown

Complete shutdown instructions are as follows:

1. Set both temperature controls to their lowest setting.
2. Turn off the control. Make sure the display shows that the heater is OFF.
3. Turn off all electrical power to the heater at the junction box.
4. Shut off the external gas supply valve to the heater.

Section 9. Maintenance

9.1 Water Chemistry

The mineral content of swimming pool water increases daily due to natural evaporation and the addition of sanitizing chemicals. If the mineral concentration in the pool gets too high, the excess minerals will deposit on the walls of the pool, in the filter system, and in the heater tubes.

The proper chemical balance in spa water is more critical than in a swimming pool heater operation. Due to the spa's size, high water temperature and heavy usage, chemical values in a spa can vary greatly. This chemical imbalance can result in unsanitary water conditions, and affect the life of the heater.

Proper chemical balances are necessary for sanitary bathing conditions as well as ensuring your heater's long life. Kits are available from your local pool supply dealer for making the various tests for mineral content. One of these kits will detect copper in the system. This is usually a warning that corrosion is taking place, possibly due to a low pH value combined with other chemistry problems. The condition can be corrected by changing the spa water and closely monitoring the pH factor and chemical properties of the water. Be sure to keep your chemical levels within the values indicated in Table 6. **Zodiac does not warrant heat exchangers damaged by corrosive chemical levels or excess dissolved solids in pool or spa water.**

For spas, it is also necessary to perform water changes in addition to chemical treatment. It is recommended to change the spa water every 60 days for light usage and every 30 days if usage is heavy.

Table 6. Optimal Water Chemistry Ranges*

Test	Recommended Level
Free Chlorine	1.0 to 3.0 ppm
Bromine	2.0 to 4.0 ppm
pH	7.4 to 7.6
Total Alkalinity (TA)	80 to 120 ppm
Calcium Hardness (CH)	175 to 400 ppm
Cyanuric Acid	10 to 50 ppm
Total Dissolved Solids (TDS)	1000 to 2000 ppm (Excluding dissolved NaCl from a Salt Chlorine Generator)
Copper	0 ppm
* Concentration levels taken from "Basic Pool and Spa Technology" published by APSP (Association of Pool and Spa Professionals).	

9.2 Seasonal Care

⚠ CAUTION

Do not operate this heater outdoors at temperatures below -7°C (20°F).

9.2.1 Spring and Fall Operation

During periods when the pool is only going to be used occasionally, set the pool and spa control temperatures to 21°C (70°F) on the Legacy, see Section 8.3.2. This prevents the pool water from becoming chilled, and minimizes the time required to raise the pool water back up to the desired temperature. If the heater is not going to be used for a long period of time, shut it down completely. Follow the instructions found on the inside of the heater, or refer to Figure 19 of this manual.

9.2.2 Winterizing

In areas where freezing temperatures occur in winter and the pool or spa will not be used, have your service technician perform the following steps:

1. Turn off the main gas valve to the heater, outside the heater jacket.
2. Remove heater door.
3. Shut down the heater following the shutdown instructions found on the inside of the heater or refer to Figure 19.
4. Remove the drain plugs from the inlet/outlet header as shown in Figure 20, and completely drain the heater before the first frost.
5. After all water has drained from the heater, check for mineral buildup in the openings.
6. Use compressed air to blow out any standing water remaining in the heat exchanger.
7. Inspect the gaskets on the drain plugs and reinstall plugs, but do not tighten.
8. Disconnect the pressure switch from the copper tubing. See Figure 21.

9.2.3 Spring Start-up

To restart the heater in the spring, have a qualified professional technician reassemble the heater as follows:

1. Attach the copper tubing to the pressure switch. See Figure 21.

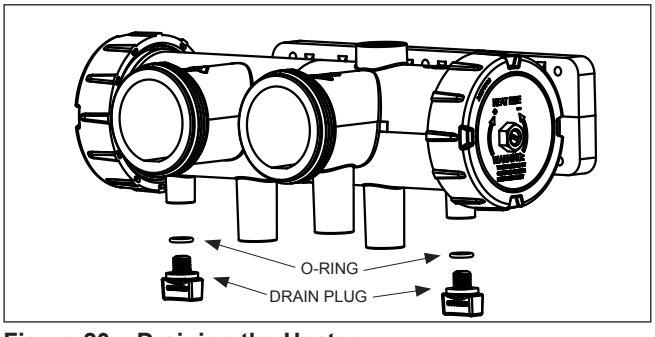


Figure 20. Draining the Heater

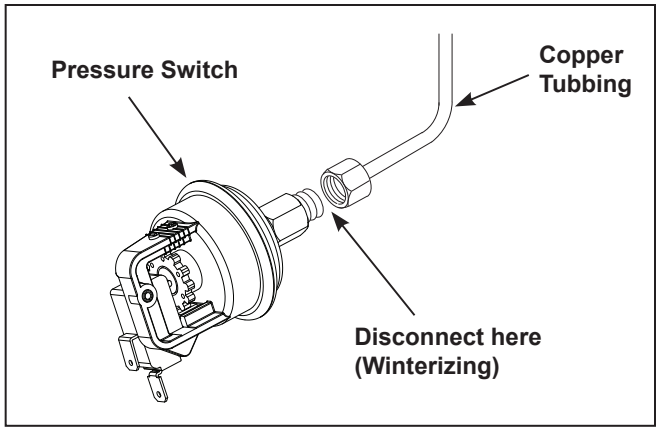


Figure 21. Pressure Switch Copper Tubing

⚠ WARNING

LP Gas Models: To avoid possible injury, fire and explosion, read and follow these precautions and all instructions on this appliance before starting the heater. LP (propane) gas is heavier than air and will remain at ground level if there is a leak. Before lighting, sniff at ground level. If you smell gas, follow these rules:

1. DO NOT light matches. DO NOT turn electric lights or switches on or off in area. DO NOT use an electric fan to remove the gas from area.
2. Shut off gas at LP tank.
3. Telephone gas company and fire department for instructions. Give your name, address and phone number.

If your LP tank runs out of fuel, turn off gas at the appliance. After the tank is refilled, the appliance must be re-started according to the instructions located on the inside of the door.

⚠ WARNING

Natural Gas Models: To avoid possible injury, fire and explosion, read and follow these precautions and all instructions on this heater before lighting the pilot. If you smell gas, follow these rules:

1. DO NOT light matches. DO NOT turn electric lights or switches on or off in area. DO NOT use an electric fan to remove the gas from area.
2. Shut off gas at gas service cock.
3. Telephone gas company and fire department for instructions. Give your name, address and phone number.

DO NOT attempt repairs on the gas control or heater. Tampering is dangerous and voids all warranties.

FOR YOUR SAFETY READ BEFORE OPERATING

⚠WARNING: If you do not follow these instructions exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.

⚠CAUTION: Keep all objects off the top of the heater, and do not obstruct louver vents or openings in the heater rear panel. Blocking ventilation airflow may damage the heater and void the warranty.

A. This appliance does not have a pilot light. It is equipped with an ignition device which automatically lights the heater. Do NOT try to light the burners by hand.

B. BEFORE OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2.* Set the thermostat for POOL and SPA to 70°F (21°C) or the lowest possible setting and switch the controller mode to OFF.
3. Turn on all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the heater. Do not try to light the burners by hand.
5. Turn on (open) external gas supply valve to the heater.
6. Turn on the filter pump.
7.* Set thermostat to desired settings for "Pool and Spa" and switch the controller mode from OFF to either POOL or SPA.
8. If the appliance will not operate, check that the filter pump is on, the filter is clean and water is flowing to the pool. Otherwise, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

TO TURN OFF GAS TO APPLIANCE

1.* Set the thermostat for POOL and SPA to 70°F (21°C) or the lowest possible setting and switch the controller mode to OFF.
2. Turn off all electric power to the appliance if service is to be performed.
3. Shut off the external gas supply valve to the heater.

*See manual for details of operation of thermostat control.

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Figure 19. Lighting and Shutdown Instructions

2. Tighten the drain plug.

3. Make sure that power is supplied to the pump. Turn on the filter pump and circulate water through the heater for five (5) minutes. Check for leaks while circulating.

4. Turn on the main gas supply to the heater at the gas cock outside the heater jacket.

5. Turn on the heater following the lighting instructions found on the inside of the heater, or refer to Figure 19 of this manual.

9.3 Inspection and Service

Zodiac designs and constructs the heater to provide long performance life when installed and operated properly under normal conditions. Periodic inspections, especially at spring start-up, are important to keep your heater running safely and efficiently through the years.

⚠ WARNING
Improper installation or maintenance can cause nausea or asphyxiation from carbon monoxide in flue gases which could result in severe injury, or death.

9.3.1 Owner Inspection

Zodiac recommends that you inspect the heater on a continual basis and especially after abnormal weather conditions. The following basic guidelines are suggested for your inspection:

1. Keep the top and surrounding area of the heater clear of all debris.

2. Keep the area around and beneath the heater clean and free of all combustible materials such as paper, leaves, etc.

⚠ CAUTION
Do not store or use gasoline or other flammable vapors, liquids or chemicals in the vicinity of this or any other appliance.

⚠ WARNING
Do not use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and replace any part of the control system and any gas control which has been under water.

3. If the heater is equipped with a pressure relief valve, check for corrosion in and around the valve. Twice a year, with the filter pump on, lift the release lever on the top of the valve to make sure that water runs freely through it. If corrosion is found, replace the pressure relief valve. When replacing the valve, be sure that the pump is off. Install the valve so that the discharge is directed away from any area that may be damaged by water.

4. Be sure all combustion air and ventilation openings are not blocked. Check for spider webs and other debris inside the heater, in the vents on all sides of the heater jacket and in the exhaust outlet– especially after a long period of nonuse.

9.3.2 Professional Inspection

Inspections performed at least once a year by a qualified technician are required to maintain your heater's safe and efficient operation. The following basic safety checks must be performed:

1. Inspect the venting system for blockage, leakage, and corrosion.

2. Check for spider webs or other obstructions in the main burner orifices – especially at spring start-up. Clean with wire brush if necessary.

3. Check for loose or broken wires and terminal connections.

4. Inspect the electrical controls, specifically the following:
   a. High limit controls.
   b. Water pressure switch.
   c. Power interface/Temperature control.
   d. Ignition control.
   e. Automatic gas valve.
   f. Roll-out switch (Fusible link).
   g. Control circuit fuse.
   h. Vent temperature limit.

5. Inspect the external surfaces of the heat exchanger tubes for black carbon soot buildup by placing a mirror between and under the burners when the heater is firing. Remove any soot that has collected on the tubes, and correct the cause.

NOTE After installation and first start-up, check the heat exchanger for black carbon soot buildup after the following periods of operation: 24 hours, 7 days, 30 days, 90 days, and once every 6 months thereafter.

6. Make sure that the pressure switch operates properly by shutting the filter pump off and on a few times. The burner should go off immediately after the pump stops. An ignition sequence should start shortly after the pump is turned back on.

7. Conduct a normal operating cycle and observe that the sequence proceeds as intended.

> **⚠ CAUTION**
> For your safety, when starting the heater, keep your head and face away from the burner area opening to prevent any risk of personal injury.

8. Make a visual check of the main burner flame. The flame can be seen in a mirror arrangement held beneath the burners. The flame should be:

   a. Blue in color.

   b. 25 mm to 100 mm above burner surface. See Figure 22.

9. Perform a temperature rise test in accordance with Section 11.6.

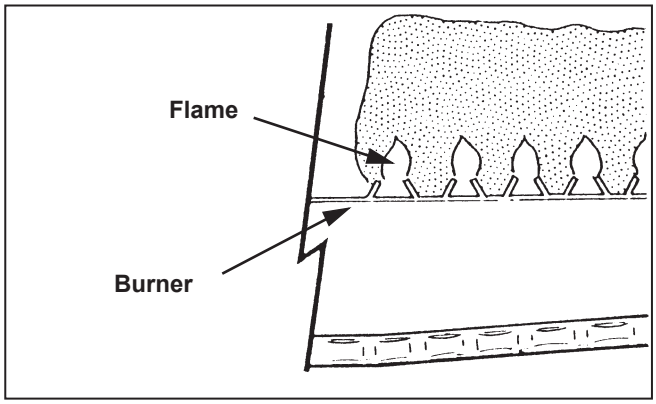


Figure 22. Main Burner Flame

Section 10. Troubleshooting

10.1 General Heater Troubleshooting

Table 7 lists some of the more common problems, causes and solutions encountered when running the heater. Most problems occur when the heater is being started for the first time after installation or at spring start-up. Careful installation and maintenance will help ensure years of trouble free use from your Legacy heater.

10.2 Service Codes

The Legacy Model LRZ electronic controller monitors several functions of the heater. In the event of a malfunction, the Legacy controller will display a FAULT message. Table 8 lists the Legacy Model LRZ electronic Heater Service Codes along with potential causes and remedies.

Table 7. Legacy Model LRZ electronic Troubleshooting Guide

#	Symptom	Cause	Remedy
1.	No Water Flow	A. No power. B. Pump defective. C. Incorrectly wired. D. Pump relay defective. E. Time clock settings not synchronized with actual time. F. Controller Defective.	A. Check circuit breakers and power source. B. Replace.* C. Recheck wiring.* D. Replace pump relay.* E. Check time clock setting and current time. F. Replace controller.*
2.	Flame roll-out on start-up	A. Blocked flue on start-up. B. Igniter out of position (delayed ignition). C. Blocked heat exchanger. D. Refractory blanket out of place. E. Altered draft hood. F. Downdraft conditions. G. Low gas pressure.	A. Remove blockage.* B. Correct igniter position.* C. Clean and correct as necessary.* D. Correct or replace blanket as necessary.* E. Install factory-provided draft hood.* F. Install vent cap.* G. Adjust burner or supply pressure.*
3.	Spillage at vent cap	A. Cold chimney. B. Vent pipe pitches down to chimney. C. Blocked chimney. D. Draft hood altered. E. Prefabricated chimney with incorrect cap	A. Allow heater to operate five (5) minutes to create draft action.* B. Reinstall vent pipe to pitch up from heater to chimney. C. Remove blockage.* D. Install factory-provided draft hood.* E. Install a Zodiac approved vent cap.*
4.	Flame has lazy yellow tip	A. Low primary air. B. Incorrect burner pressure.	A. Check for internal burner obstructions.* B. Adjust burner pressure according to rating plate. Clean burner ports if dirty.*
5.	Not enough heat	A. Inadequate gas supply. B. Low burner gas pressure. C. Heater size inadequate. D. Temperature rise set incorrectly.	A. Gas meter too small. Gas line from meter to heater too small.* B. Gas burner pressure should be adjusted to the value listed in Table 2.* C. Replace with heater of higher input.* D. Adjust temperature rise according to Section 11.6 of this manual.*
6.	Heater pounding or knocking	A. Low water flow through heater.	A. Check temperature rise between inlet and outlet heater piping. See Section 11.6 for recommended range of temperature rise. If temperature rise is above the maximum recommended, adjust the bypass. Check for closed valve in system.*
7.	Heater condensing	A. Low water temperature. B. Heater plumbed backwards.	A. Flue product moisture will condense at the start-up until the pool water temperature reaches the normal operating conditions.* B. Correct Plumbing.*
8.	Igniter lights but main burners will not come on	A. Gas valve not at “on” position. B. Air in gas line. C. Gas valve failed.	A. Turn knob to “on” position. B. Cycle ignition sequence until air is out of the gas line.* C. Replace gas valve.*

* Must be performed by a qualified professional pool technician.

Table 8. Legacy Model LRZ Electronic Heater Service Diagnostic Guide

Display Fault	Cause	Remedy
Display shows **NO FLOW**	1. Pump is not running. 2. Low pump pressure. 3. Pressure switch fault.	1. This is a normal display when the pump is **OFF**. **No Service Required**. 2. Clean filter or clear blockage, check position of valve 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. Refer to qualified service personnel. 2. Identify and correct loose connections or replace switches. Refer to qualified service personnel.
FAULT- **FUSELINK/FIELD**	1. Roll-out switch (fusible link) fault. 2. Vent temperature limit fault.	1. Identify and correct loose connections or replace roll-out switch (fusible link). Check for and correct any downdraft condition. Refer to qualified service personnel. 2. Identify and correct loose connections or replace vent temperature limit. Refer to qualified service personnel.
FAULT- **CHECK IGN CONTROL**	1. Air flow restricted at intake or discharge. 2. Oscillating pump pressure. 3. Low gas supply pressure. 4. No flame at burners.	1. Check for proper clearances around heater and for adequate room ventilation if enclosed. Inspect for blockage or restriction at discharge of flue. Refer to qualified service personnel. 2. Clean filter or identify and repair cause of pump oscillation. 3. Identify and repair incorrect supply pipe size or pipe line blockage. 4. 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 **FAULT-** **OPEN WATER SENSOR**	1. Faulty 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.

Section 11. Professional Maintenance and Service

⚠ WARNING

SERVICING SAFETY

Some of the servicing procedures for the Legacy Model LRZ electronic heater are hazardous because they involve fuel gas, electricity, moving parts and procedures which require testing or temporary bypass of safety controls. For this reason, the heater must be serviced only by a qualified professional service technician.

IMPROPER SERVICE HAZARD

The Legacy Model LRZ electronic heater incorporates unique design features. Incorrect service of this heater can result in property damage, serious personal injury or death. To avoid such hazards, the heater must be serviced only by a qualified professional service technician.

11.1 General Information

A qualified professional technician must service the Legacy Model LRZ electronic pool heater using Zodiac's service procedures. Before calling for service, however, the owner should check for obvious problems. The other components in the pool system, including pump, filters and strainers, water valves, gas supply, electrical power and time clocks, have an affect on heater operation.

Confirm that the heater control is set to either **POOL** or **SPA** and that the corresponding temperature set point is set high enough to make the heater operate. Make sure the pump is operating, that the filter and strainers are not clogged, that there are no mispositioned water valves, that the gas or electric power supplies are not shut off and that time clocks are properly adjusted. Also be sure that there is no blockage of the exhaust vent grill or rear louvers, which supply combustion air to the burners.

11.2 Natural-Draft Combustion System

The Legacy Model LRZ electronic pool and spa heater has an atmospheric combustion system. This system is illustrated in Figure 23.

As the heated exhaust gases rise out of the combustion chamber, flow is created through the system and fresh combustion air is drawn into the heater through the louvers cut into the front and sides of the heater. Gas is forced through an orifice into the open end of a burner. When the gas flows into the burner, a “negative” pressure is created at the opening of the burner. This negative pressure pulls air into the burner with the gas and mixes the two together. As the gas/air mixture flow through the burner ports it is ignited in the combustion chamber. Hot combustion products then rise through a highly efficient heat exchanger. Combustion products then enter a flue collector and are directed to the outdoors through the top of the heater or a vent pipe and cap.

11.3 Heater Components and Their Operation

1. **Gas Valve / Regulator** - The gas valve controls gas flow into the manifold and burners. It provides flow only when the temperature control requires heat and only if all safety controls enable operation. It is also a positive pressure regulator. It regulates the gas pressure in the burner to specifications addressed earlier in this manual. This is necessary for proper operation of the burner system.

2. **Temperature Control** - The Legacy Models are equipped with an electronic control which senses water temperature by means of a thermistor and controls heater operation to bring the water to the temperature selected. It has an option for two (2) separate thermostat settings which are typically used to set pool and spa temperatures.

3. **Ignition Control** - The ignition control provides energy for ignition of the air/gas mixture, monitors the flame and controls the gas valve. Then it applies electrical power to a "hot surface" igniter. When the igniter is hot enough, the ignition control opens the gas valve. It has sophisticated means to sense ignition and flame condition so that unburned gas will not escape. Once the ignition control has sensed flame, it de-energizes the igniter. After the burner is shut off, the ignition control provides a post-purge period.

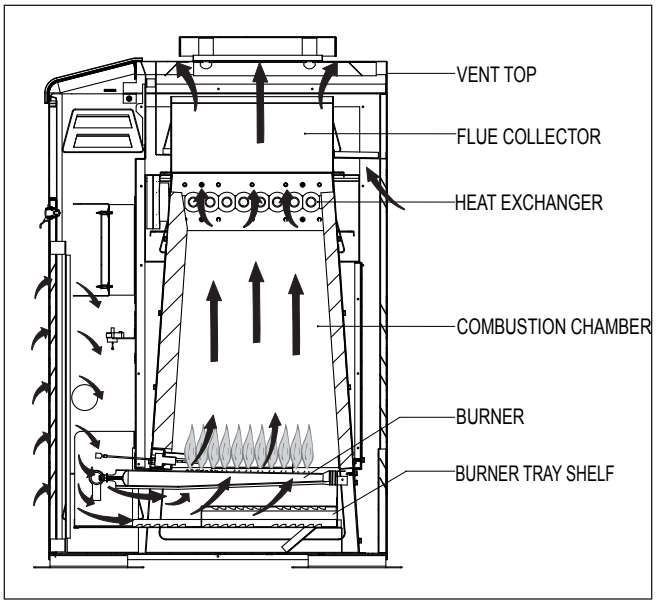


Figure 23. Atmospheric Combustion System

4. **Igniter -** The hot surface igniter is a ceramic element which becomes very hot when electrical power is applied to it. The hot surface igniter directly ignites the air/gas mixture in the combustion chamber.

5. **Flame Sensor -** The flame sensor is the electrode through which the ignition control detects "rectification" of current passed through the flame. Inadequate rectification indicates an unsatisfactory flame condition. The rectification signal can be measured by attaching the leads of a DC ammeter to the two (2) pins on the connector of the ignition control labeled "FC". A wire harness, available from Zodiac, makes it easier to attach the voltmeter leads. The flame current should not be less than 1.5 micro-amps. If the flame signal is less than 1.5 micro-amps, verify correct gas supply and burner pressures.

6. **Limit Switches -** Two (2) limit switches prevent excessive water temperature - one (1) at the heater and one (1) at the heater inlet. If either senses excessive temperature, burner operation is interrupted.

7. **Water Pressure Switch** - This control senses whether or not water is available to the heater by measuring back pressure inside of the heat exchanger. If the pool water pump fails or the water filter is blocked, the pressure switch prevents operation of the burner.

8. **Roll-Out Switch (Fusible Link) -** This is a single-use switch which detects abnormal temperature in the component compartment of the heater. The roll-out switch (fusible link) is held to the combustion chamber just above the burner tray by a sheet metal bracket. Excessive temperature in the component compartment, possibly due to a blocked flue or flame roll-out, will cause the switch to fail. This opens the safety circuit which shuts off the gas valve and shuts the heater down.

9. **Vent Temperature Limit** - This is a single-use switch which detects abnormal temperature in the vent system. It is mounted to the flue collector assembly. Excessive temperatures will cause the switch to open. Excessive temperatures can be caused by inadequate water flow or a damaged heat exchanger. The vent temperature limit will open the safety circuit which shuts off the gas valve and shuts down the heater.

11.4 Electrical Troubleshooting

This section describes procedures for checking the electrical power and control components of the heater one at a time and in the order they appear in the control circuit. It is important to follow the sequence of this troubleshooting guide because the safety circuit is connected in series.

NOTE Pump must be running during the troubleshooting procedure.

These procedures require a Volt-Ohm meter with a minimum 0-250VAC voltage range, and 1-1000 Ohm resistance range. Figure 25 shows the power and control circuits and where to take measurements. Location numbers in circles have been added, and will be referenced in the following sections.

Where test points are shown at circuit board connectors, the probe of the meter can be carefully pushed into the connector along side of the wire at the connection to be measured.

The electrical power supply can be checked with the heater not set to fire. All other procedures need to be checked with power correctly supplied to the heater, all external devices set so that the heater is allowed to fire and the heater's thermostat set so that there is a call for heat.

As stated at the beginning of the manual, some of these procedures are hazardous. Only a qualified service technician should service the heater.

11.4.1 Electrical Power Supply

The electrical components of the Legacy Model LRZ electronic pool heaters are designed to operate with supply voltage ranging from 204V to 264V at 50 Hz if connected to a nominal 220-240 Volt power supply. Measure supply voltage at the power supply leads where they enter the heater to verify that the correct voltage is supplied to the heater.

If no voltage is present, correct this external power supply problem to the heater. Circuit breakers, time clock settings or similar devices may be the problem. Voltage outside of the above ranges may be due to poor wiring, poor connections, other loads such as air conditioning compressors or an electric utility company problem. Arrange for correction of the voltage as appropriate.

11.4.2 Controller

The controller must be operational in order to check the control circuits of the heater.

11.4.3 Control Circuit Troubleshooting

The heater controls are arranged in several 24V 50Hz circuits with some operating and safety controls arranged in series circuits.

Troubleshooting is done by probing for voltage between the common and various points in the circuit to determine which component is preventing operation. Check points are indicated on Figure 26.

The black lead of the meter should be attached to the common tap on the secondary side of the

transformer and may be left there throughout most of the procedure.

The recommended procedure steps through each circuit in a sequential way, and each section assumes that components from all previous sections have been tested and are operational. However, verifying voltage at any of the numbered points in that circuit confirms that all prior components of the circuit are operational.

11.4.3.1 Transformer

Attach the black lead of the voltmeter to the terminal on the secondary side of the transformer of the transformer with a yellow wire attached to it (common). This is test point 1 on Figure 26. Touch the free red lead of the voltmeter to the terminal on the secondary side of the transformer with a red wire attached to it (24V tap), test point 2. The voltmeter should read between 20-28 Volts AC. If the voltage does not fall within the limits mentioned above, replace the transformer.

11.4.3.2 Fuse

Leave the black voltmeter lead in place at test point 1. Touch the free lead of the voltmeter to test point 3, which is on the Power Interface Board where the red wire from the transformer enters the end of the connector. You will need to push the voltmeter lead into the back of the connector along side of the wire pin. The meter should read 20-28 Volts AC. If there is no voltage, the fuse has failed. Inspect the rest of the wiring, especially the safety circuit, to be sure that there is no "short" such as contact of a terminal with the heater chassis or another terminal which may have caused the fuse to fail. Correct any such condition and replace the fuse. Use only a 2 amp, 1 1/4" long x 1/4" diameter, quick acting, glass tube type fuse.

11.4.3.3 Water Pressure Switch

Start by checking the voltage at the two (2) legs of this circuit on the controller, see test points 4 and 5 in Figure 26. Check the voltage at test point 4, where the violet wire from the pressure switch enters the two-pin connector on the controller. If there is not 20-28 Volts AC nominal at this point, either the controller or the two-pin wire harness is faulty and must be replaced. If 20-28 Volts AC nominal is detected at test point 4, then move the red lead of the meter to test point 5 where the gray wire from the Pressure Switch enters the two-pin connector. If 20-28 Volts AC nominal is detected at this point, the devices in this circuit are closed and the circuit is working properly.

If there is no voltage the pressure switch contacts are open. This is almost always due to a water flow deficiency, the most common one being a blocked water filter or defective pump. However, sometimes it is due to blockage of the copper siphon loop tube or mis-adjustment of the switch. Investigate thoroughly, referring to Section 11.5 on "Adjusting the Water Pressure Switch". If there is no problem with the pool system or pressure switch adjustment, replace the pressure switch.

11.4.3.4 Roll-Out Switch (Fusible Link)

To check the roll-out switch (fusible link)/air louver/field interlock circuit, place the red lead at test point 6. If there is not 20-28 Volts AC nominal, either the controller or the two-pin wire harness is faulty, or the water pressure switch is open. If 20-28 Volts AC nominal is detected at test point 6, then move the red lead of the meter to test point 7. If 28 Volts AC nominal is detected, the circuit is closed and working correctly. If the proper voltage is not detected, the roll-out switch (fusible link) or vent temperature limit has opened, or the wire harness is faulty.

If no voltage is detected at test point 7, the roll-out switch (fusible link) has failed. This indicates higher than normal temperatures in the component compartment (vestibule). Normal component compartment temperature is well below 148.9°C (300°F). The roll-out switch (fusible link) is designed to fail at temperatures above 151.7°C (305°F). Excessive temperature might be due to a blocked flue or heat exchanger. Clean the heat exchanger and clear the flue and vent of any restrictions. Sometimes the roll-out switch (fusible link) fails due to flame roll-out. Flame roll-out may be caused by delayed ignition or downdrafting in windy areas. Thoroughly investigate the causes for flame roll-out and correct the problem when replacing the roll-out switch (fusible link).

The vent temperature limit will fail due to abnormal temperatures in the vent system. Excessive temperatures will cause the switch to open. The vent temperature limit is designed to fail at temperatures above 464°F (240°C). Excessive temperatures can be caused by inadequate water flow or a damaged heat exchanger. Thoroughly investigate the causes for roll-out switch (fusible link) failure and correct the problem when replacing the vent temperature limit.

11.4.3.5 Temperature Limit Switches Circuit

Since the limit switches are not easily accessible, the voltage can be checked at the two (2) legs of the circuit at the controller. See test points 8 and 9 in Figure 26.

Check the voltage at test point 8. If there is not 20-28 Volts AC nominal at this point, either the controller or the two-pin wire harness is faulty, or one (1) of the two (2) safeties (water pressure and fuselink) before it are open. If 20-28 Volts AC nominal is detected at this point, then move the red lead of the meter to test point 9 where the black wire from the 52°C (126°F) limit enters the two-pin connector. If 20-28 Volts AC nominal is detected at this point, the devices in this circuit are closed and the circuit is working properly.

If there is no voltage, one (1) of the limit switches is open. This is normally due to excessive water temperature, which should be thoroughly investigated before replacement of limit switches. Excessive water temperature may be caused by low water flow. Water flow deficiency may be due to obvious problems such as a defective pump or blocked water filter. Alternatively, excessive water temperature may be due to over-firing, or to a problem with the water piping or the heater's internal bypass control. Over-firing might be a result of an incorrect gas orifice or supply of propane gas to a heater intended for natural gas.

If there are no such fundamental problems, identify which of the switches is open. Limit switch access is through the limit switch plugs on the side of the heater to which water pipes are connected. Remove the limit switch plugs from the bottom of the header and gently remove the switches from the wells.

Note that the limit switches have different trip points, and it is important that replacements are correct. The 42°C (108°F) switch has a red dot on the top of the switch, and is installed on the inlet side of the in/out header. The 52°C (126°F) switch has no dot, and is farthest from the heater jacket, must be installed in the upper well in the outlet of the header.

Move the red meter lead to the terminal connection on the 42°C (108°F) switch that is connected back to the controller. The voltmeter should read 20-28 Volts AC nominal. No voltage here means that the two-pin wire harness is bad and should be replaced. If voltage is detected at this point move the lead to the other terminal of the switch. If the voltmeter does not show voltage then the 42°C (108°F) limit is bad and should be replaced. If the meter reads 20-28 Volts AC nominal, move the lead to the terminal of the 52°C (126°F) limit that is connected to the wire that jumps between the two limit switches. No voltage here means that the wire assembly is bad and needs to be replaced. 20-28 Volts AC nominal shows that the wire between the two (2) limits is making a good connection. Now move the lead to the other connection terminal on the 52°C (126°F) limit. No voltage means a failed switch. Replace the switch. If there is still no voltage at test point 9 then the wire harness is faulty and needs replacement.

11.4.3.6 Gas Valve Voltage

The gas valve will operate only when there is a call for heat, all safety circuits have been satisfied and the hot surface igniter has had power for approximately 35 seconds. If the gas valve does not operate under these conditions, check the voltage going to the gas valve. Place one (1) voltmeter lead on the connector on the ignition control where the brown wire is connected (test point 15). Touch the free lead of the meter to the gas valve terminal where the blue wire is attached at the gas valve. This test point will have voltage present only during a trial for ignition or during normal operation. The meter should read 20-28 Volts AC. If there is no voltage, then there is a bad connection between the gas valve and the ignition control. Replace the wire harness.

Listen closely to the gas valve when it is first energized (24V first appears at test point 14 during the trial for ignition). There should an audible "click" when the valve opens.

If there is voltage at the gas valve terminal where the brown wire is attached, but the gas valve does not open, replace the valve.

11.4.3.7 Igniter/Ignition Control Circuit

> **⚠ WARNING**
> The igniter, power supply circuit board and some terminals of the ignition control utilize 220-240V power and require appropriate servicing precautions. Note that wires and terminals of these components may be “hot” even when the component is not operating.

With the igniter energized, there will be voltage of 105-130 VAC supplied by the ignition control, test point 13 and test point 12, with the igniter energized. This voltage will be applied only during igniter heat up or trial for ignition. Even if voltage has been confirmed at the end of the safety circuit, the “trial for ignition” sequence is imposed by the ignition control. This sequence consists of a 15 second period of pre-purge, a 40 second period for heat-up of the igniter and a 7 second trial for ignition. During this last 47 seconds there is voltage between test point 11 and test point 10, or between test point 12 and test point 13. If satisfactory ignition is not achieved, the igniter is turned off and the system waits for a 15 second inter-purge period. The system may go through this cycle as many as three (3) times, but thereafter it is “locked out” by the ignition control for a one (1) hour period. Additional attempts will be made only if the call for heat is interrupted by turning off electrical power or setting the control to “Off” and then back to "Pool" or "Spa" or after the one (1) hour delay.

To trouble shoot the ignition control's igniter circuit, connect the voltmeter leads at test points 10 and 11, and set the control to call for heat. Observe that the normal ignition sequence takes place. After the 15 second pre-purge, note the voltage between test points 10 and 11, or test points 13 and 12. Then look for the glow of the igniter by looking upwards through the burner tray opening. If the correct voltage is detected between points 10 and 11, or points 13 and 12 during the trial for ignition but the igniter does not glow, check igniter as follows:

Check the igniter with the ohmmeter. Disconnect the igniter terminals from the igniter at test points 10 and 11. Place one (1) lead of the meter on each wire to

the igniter. The resistance should read between 40 and 75 Ohms at ambient air temperature. If the meter reads outside of this range or shows an open or short circuit, replace the igniter. If a short circuit is indicated, it is necessary to investigate further to find if the short is from the igniter or the flame sense circuit.

If voltage does not appear between points 12 and 13, or points 10 and 11 during the trial for ignition, there may be a bad connection, faulty transformer, or a short on the ignition control. Check all connections, the transformer, and the ignition control for loose or corroded connections or failure and replace as necessary.

11.5 Adjusting the Water Pressure Switch

⚠ CAUTION

The water pressure switch should be adjusted to turn the heater off when the pump is off. Setting the switch too close at too low of a flow can damage the appliance. Adjust the switch to turn the heater off, not on.

The pressure switch is preset at the factory for activation at 14 kPa. Do not adjust the pressure switch if the heater is installed more than 4,57 m below the pool surface. Consult your local Zodiac representative for recommendations.

On some installations, the piping from the heater to the pool is very short. The back pressure could be too low to trigger the pressure switch. If this happens, it may be necessary to install a directional fitting or elbows where the return line enters the pool. This will increase back pressure enough for the heater to operate properly.

Make sure the pool filter is clean before making any pressure switch adjustment. A dirty filter will restrict the water flow and the pressure switch cannot be adjusted properly.

To adjust the pressure switch, see Figure 24 and proceed as follows:

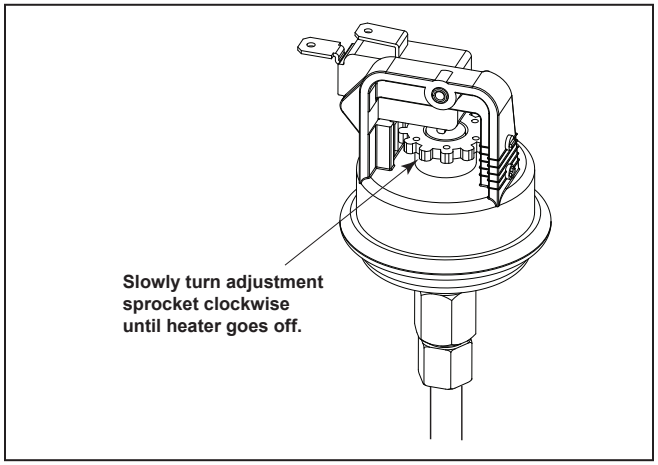


Figure 24. Adjustment of Pressure Switch

1. Set the heater control to the "OFF" mode.
2. Remove the front door to access the water pressure switch.
3. Start the filter pump and confirm by means of a voltmeter that the pressure switch closes (if the switch fails to close, replace it with a switch that has a lower minimum setting).
4. Set the heater control to either "POOL" or "SPA". Heater should start.
5. With your fingers, turn the adjustment sprocket very slowly clockwise until the heater goes off.
6. Slowly turn the pressure switch adjustment sprocket **counterclockwise** one-quarter turn. The heater should come back on.
7. Check the adjustment by turning the filter pump OFF. The burners should shut off immediately. If they do not, restart the filter pump and repeat Steps 5 and 6. Check the adjustment again.
8. Return the pool temperature control to the desired temperature.

It may be necessary to repeat these steps to get a proper setting. The switch must be set so that the heater will not fire unless the pump is running. If a proper setting cannot be reached, contact the factory service department.

11.6 Temperature Rise

The Legacy pool and spa heaters have an internal bypass which accommodates a wide range of water flow. The bypass is easily adjustable to change the temperature rise for optimum performance and length of heater life. The bypass assures constant heat exchanger flow even though flow through the filter system will vary depending on how dirty the filter is.

For most installations, an external bypass valve is not needed in the heater water piping. This is due to the large size of the heater's internal bypass valve. If the pump flow rate is known to exceed 470 lpm, an external bypass may be needed to assure proper heater operation. Water flow should be confirmed upon start-up of the heater and in most servicing situations. If the flow is not normal, corrections must be made to the pool system. Flow is evaluated by determining the water temperature rise through the heat exchanger.

Before checking the temperature rise, make sure that the pool filter is clean and that gas supply and burner pressures are correct. If necessary, clean all components of the filter system. Temperature rise is measured in the return header of the Legacy. To measure the temperature rise, turn off the filter pump and remove the plastic plug protruding through the cabinet on the return header side of the heater. See Figure 25.

With the plug removed, install the special thread adapter and Pete's Plug® fitting and insert a pocket thermometer. A temperature rise measurement kit is available through your Zodiac distributor. See Section 12 of this manual for the correct kit number.

The internal bypass can be adjusted by means of a screw on the right-hand side of the header. To adjust the temperature rise to within the ranges specified in Table 5, proceed as follows:

1. If the piping system has an external bypass valve, close it.
2. Set the heater's control panel to the "OFF" position.
3. Start the filter pump.
4. After three (3) minutes, note and record the thermometer reading. This is the pool water temperature.
5. Start the heater by setting the control panel to either "POOL" or "SPA". Allow the heater to operate for five (5) minutes or more. Note and record the thermometer reading. Subtract pool water temperature from this reading. This difference is the temperature rise. Refer to Table 9. If your measured temperature rise is within the range designated for your heater, skip steps 6 through 8.
6. Locate the bypass adjustment screw on the right-hand side of the header, see Figure 25. Loosen the nut so that the screw can be adjusted. A slight water leak past the nut may be expected. Turn the screw counterclockwise to decrease the temperature rise, and clockwise to increase the temperature rise as needed to achieve the ranges in Table 5. After the adjustment, tighten the nut so that no leaks occur.
7. If the temperature rise is too low and cannot be raised by means of the adjustment screw, the flow is in excess of 7.9 lpm. An external bypass will need to be installed, or if one already exists, open the external bypass valve gradually until the temperature range in Table 9 is achieved.
8. If it was necessary to adjust the external bypass as outlined in step 6, scribe a line on the bypass shaft and case to mark the correct adjustment position. Wire or remove the valve handle to prevent tampering.

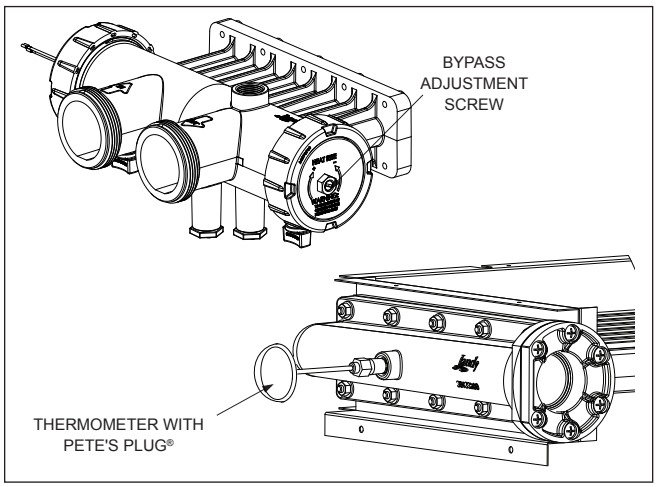


Figure 25. Temperature Rise Measurement

Table 9. Water Temperature Rise and Flow Rates (Measured at Return Header)

Model	Minimum Temp Rise, °C (°F)	Maximum Temp Rise, °C (°F)	Minimum System Flow lps (GPM)
125	4 (7)	5 (10)	1.9 (30)
175	6 (10)	7 (13)	1.9 (30)
250	9 (16)	11 (20)	1.9 (30)
325	11 (20)	14 (26)	1.9 (30)
400	13 (23)	16 (29)	1.9 (30)

In a system without external bypass, it may be necessary to make changes. If temperature rise is too low, a manual bypass must be installed. If temperature rise is too high, there is inadequate flow, possibly requiring a change to the piping system or a larger pump. Before proceeding with either remedy, verify proper heater operation. Low gas input results in low temperature rise and vice-versa. A problem with the heater internal bypass assembly also affects measured temperature rise.

Section 12. Replacement Parts

12.1 Ordering Information

To order or purchase parts for the Legacy Model LRZ electronic pool and spa heater, contact your nearest Zodiac dealer or distributor. See the Zodiac web site at www.Zodiac.com for the nearest service center. If they cannot supply you with what you need, contact Technical Support at Zodiac, Telephone (800) 822-7933.

NOTE To supply the correct part it is important that you state the model number, serial number and type of gas when applicable. This information is on the rating plate inside the heater.

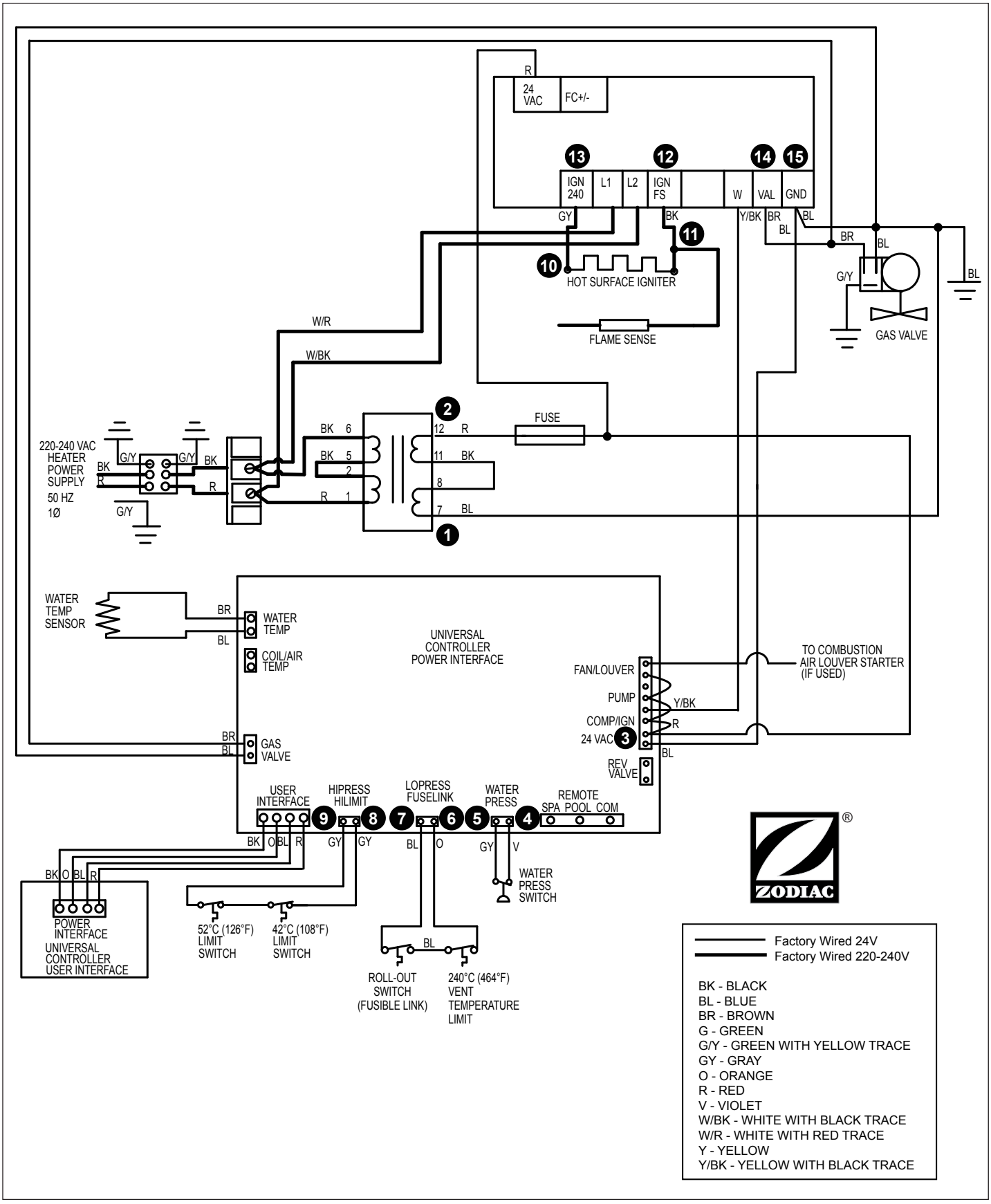


Figure 26. Test Point Identification Diagram

12.2 Parts List

Key No.	Description	Model No.	Order Part No.
	Main Gas Assembly		
1	Burner Tray Assy, Natural	125-400	R0484901-05
1	Burner Tray Assy, LPG	125-400	R0485001-05
2	Burner Tray, Shelf Only	125-400	R0469101-05
3	Gas Valve	All	R0486500
4	Anti-Rotation Bracket	All	R0469700
5	Hot Surface Igniter	All	R0457501
6	Flame Sensor Rod	All	R0458601
7	Burner, Main	All	R0469800
8	Burner Manifold	125-400	R0485801-05
9	Manifold Assy, Natural Gas	125-400	R0485906-10
9	Manifold Assy, LPG	125-400	R0486006-10
	Electrical System		
10	Universal Control User Interface	All	R3008800
11	Universal Control W/Bezel	All	R0496701
12	Universal Control Power Interface	All	R0470200
13	Transformer	All	R0486100
14	Temperature Sensor	All	R0456500
15	Gasket, Temperature Sensor	All	R0456600
16	Nut, Sensor Retainer	All	R0523900
17	Pressure Switch Assembly (2 PSI)	All	R0455400
18	Pressure Switch, 2 PSI	All	R0013200
19 *	Pressure Switch, 1 PSI	All	R0011300
20 *	Pressure Switch, 1-10 PSI	All	R0015500
21	Water Pressure Switch Tubing	All	R0483600
22	High-Limit Switch Assembly	All	R0514000
23	High-Limit Switch, 42°C (108°F)	All	R0514200
24	High-Limit Switch, 52°C (126°F)	All	R0514300
25	Ignition Control	All	R0486200
26	Roll-Out (Fusible Link) Assembly	All	R0012200
27	Roll -Out (Fusible Link) Bracket	All	R0337200
28 *	Wire Harnesses, Set	All	R0486300
	Vent System		
29	Top Enclosure	125-400	R0470301-05
30	Vent Cover	125-400	R0470401-05
31	Rainshield (Partition)	125-400	R0478201-05
32	Flue Collector Assembly	125-400	R0470501-05
33	Outdoor Vent Cap	125-175	R0491606
33	Outdoor Vent Cap	250-400	R0491603-05
34	Indoor Drafthood	125-175	R0499606
34	Indoor Drafthood	250-400	R0499603-05
35	Adapter Plate	125-400	R0478301-05
36 *	Clip	All	R0500200
37	Vent Temp Limit Assembly	All	R0543100
38	Vent Temp Limit Switch, 240°C (464°F)	All	R0524300
	Water System		
39	Inlet/Outlet Header Assy, Polymer	125-400	R0470800
40	Return Header Assy, Polymer	All	R0454201
41	Header Hardware Set, Polymer	All	R0454500
42	Heat Exchanger Assembly, Complete	125-400	R0485701-05
43	Heat Exchanger Drain Plugs, Polymer	All	R0446000
44	3" Coupling Nut Kit w/ O-ring	All	R0454000
45	Bypass Assembly, Polymer	125-400	R0453701
46	Bypass Spring, Adjustable, Polymer	All	R0453901
47	Tailpiece w/ Union Nut (Set of 2), 50mm	All	R0472800

Key No.	Description	Model No.	Order Part No.
	Water System (Continued)		
48	Header Gasket Assembly (Set of 18)	All	R0454300
49 *	Bypass Hardware, Gaskets	All	R0453800
50	Heat Exchanger Tube Assy, Copper	125-400	R0490101-05
51	Plug, Sensor	All	R0456800
	Firebox Components		
52	Combustion Chamber Panels	125-400	R0494901-05
53	Igniter Box	125-400	R0484000
	Jacket Components		
54	Door with Latch	125-400	R0470901-05
55	Latch Assembly	All	R0334900
56	Grommet, Sealing, 2"	All	R0460300
57	Grommet, 7/8"	All	R0492800
58	Rear Panel Assy	125-400	R0482301-05
59	Side Panel, Right	All	R0482400
60	In/Out Cover Panel, Top	All	R0482500
61	In/Out Cover Panel, Bottom	All	R0482600
62	Side Panel, Left	All	R0482700
63	Return Side Cover, Top	All	R0482800
64	Return Side Cover, Bottom	All	R0482900
65	Heat Shield	125-400	R0483101-05
66	Heat Deflector Guard, Front	125-400	R0483201-05
67	Rear Partition	125-400	R0483401-05
68	Heat Deflector Guard, Rear	125-400	R0483501-05
69	Controller Mounting Panel	125-400	R0483901-05
70	Weather Stripping	All	R0491000
71	Button, Plug, 7/8"	All	R0491100
	Optional Components		
72 *	Noncombustible Base	125-400	R0471001-05
73 *	Press Relief Valve Kit, 75 PSI, Polymer	All	R0336100
74 *	Temp Rise Measurement Kit	All	R0336000

NOTES:

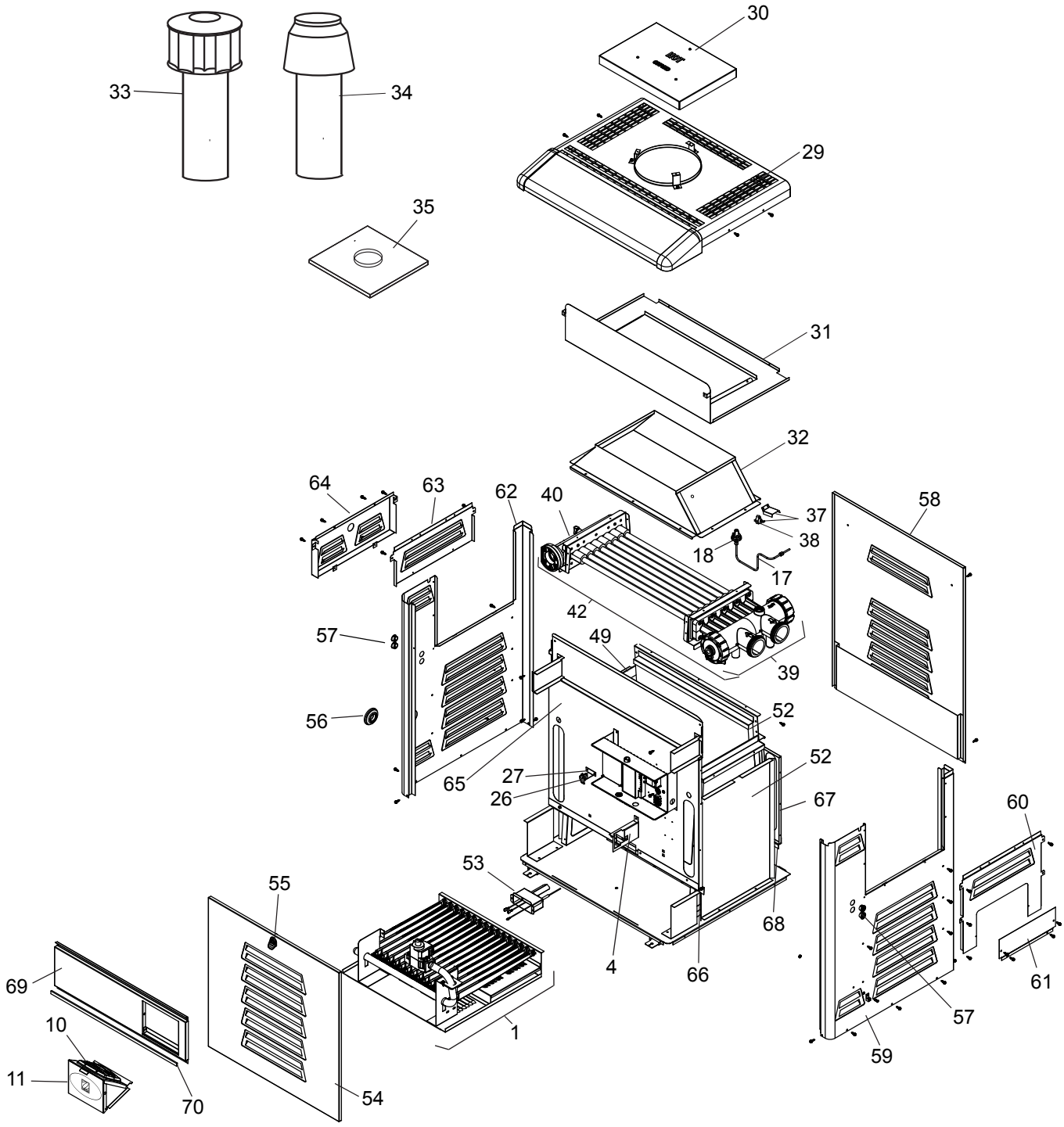
1. All hardware sets contain all pieces necessary for assembly, including gaskets.

2. Gaskets and hardware are included in all kits that involve the removal of a gasket as part of the procedure to replace a part.

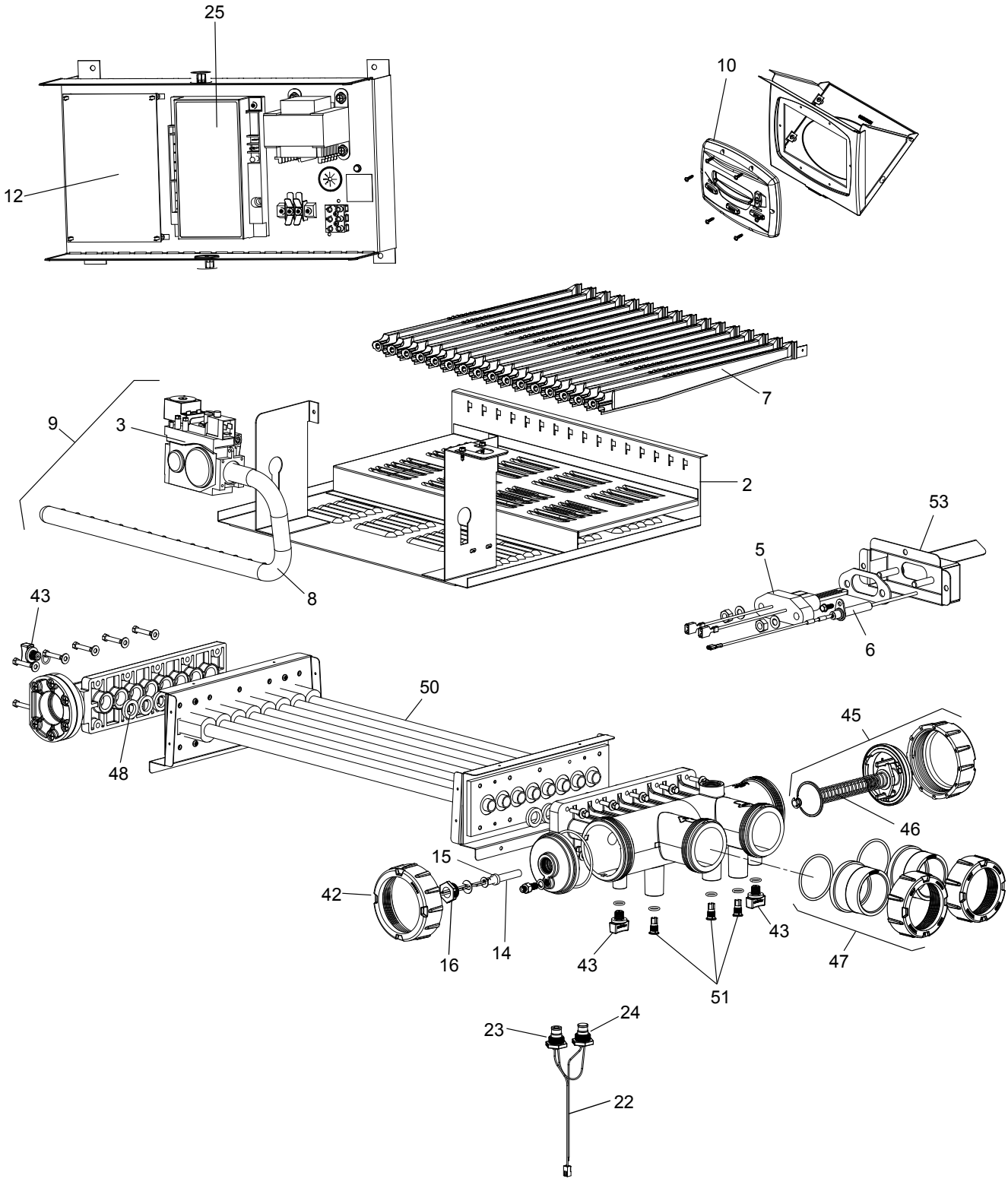
* PARTS NOT SHOWN ON KEY VIEW

** MANIFOLD KIT INCLUDES INSTALLED ORIFICES BUT DOES NOT INCLUDE GAS VALVE

12.3 General Exploded View



12.4 Detailed Exploded View



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