PENTAIR

MASTERTEMP® POOL AND SPA HEATER
INSTALLATION AND USER'S GUIDE

⚠WARNING

FOR YOUR SAFETY - READ BEFORE OPERATING

If you do not follow these instructions exactly, a fire or explosion may result, causing property damage, personal injury or loss of life. For additional free copies of this manual; call (800) 831-7133.

FOR YOUR SAFETY - This product must be installed and serviced by authorized personnel, qualified inpool/spa heater installation. 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, Pentair Aquatic Systems 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.

120/240 VAC NATURAL GAS/LP GAS		
Models	**Natural**	**Propane**
175K BTU/HR	460792	460793
200K BTU/HR **(ASME)**	461000	461001
200K BTU/HR	460730	460731
200K BTU/HR **(HD ASME)**	461032	–
250K BTU/HR	460732	460733
250K BTU/HR **(HD)**	460806	–
250K BTU/HR **(ASME)**	460771	460772
250K BTU/HR **(HD ASME)**	461020	–
300K BTU/HR	460734	460735
400K BTU/HR	460736	460737
400K BTU/HR **(HD)**	460805	–
400K BTU/HR **(ASME)**	460775	460776
400K BTU/HR **(HD ASME)**	461021	–

OWNER: Retain For Future Reference

⚠WARNING Improper installation, adjustment, alteration, service or maintenance can cause propertydamage, personal injury or death. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

FOR YOUR SAFETY

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical 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.

DO NOT store or use gasoline or other flammable vapors and liquids in the vicinity of this or other appliances.

Pentair Water Pool and Spa, Inc.
1620 Hawkins Ave., Sanford, NC 27330 • (800) 831-7133 or (919) 566-8000
10951 W. Los Angeles Ave., Moorpark, CA 93021 • (800) 831-7133 or (805) 553-5000

Customer Service and Tecnincal Support

If you have questions about ordering Pentair Aquatic Systems replacement parts, and pool products, please call:

Phone: (800) 831-7133

Fax: (800) 284-4151

(8 A.M. to 4:30 PM Eastern Time/Pacific Time)
Web sites: www.pentairpool.com - www.staritepool.com

P/N 472592 Rev. L 8/14

Contents

Section 1: Heater Identification Information

To identify the heater, see rating plate on the inner front panel of the heater. There are two designators for each heater, one is the Model Number and the other is the Heater Identification Number (HIN).

a. Heater Identification Number (HIN)

The following *example* simplifies the identification system:

1) **MT** : MasterTemp
2) **Model Size** : (**175, 200, 250, 300** or **400**) : Input rating (Btu/hr) X 1000
3) **Fuel Type** : (**LP** = Propane gas or **NA** = Natural gas)
4) **Construction** : (**STD** = Standard Model)
(**HD** = Heavy Duty Model)
(**ASME** = ASME Certified Model)
(**HD ASME** = Heavy Duty ASME Model)

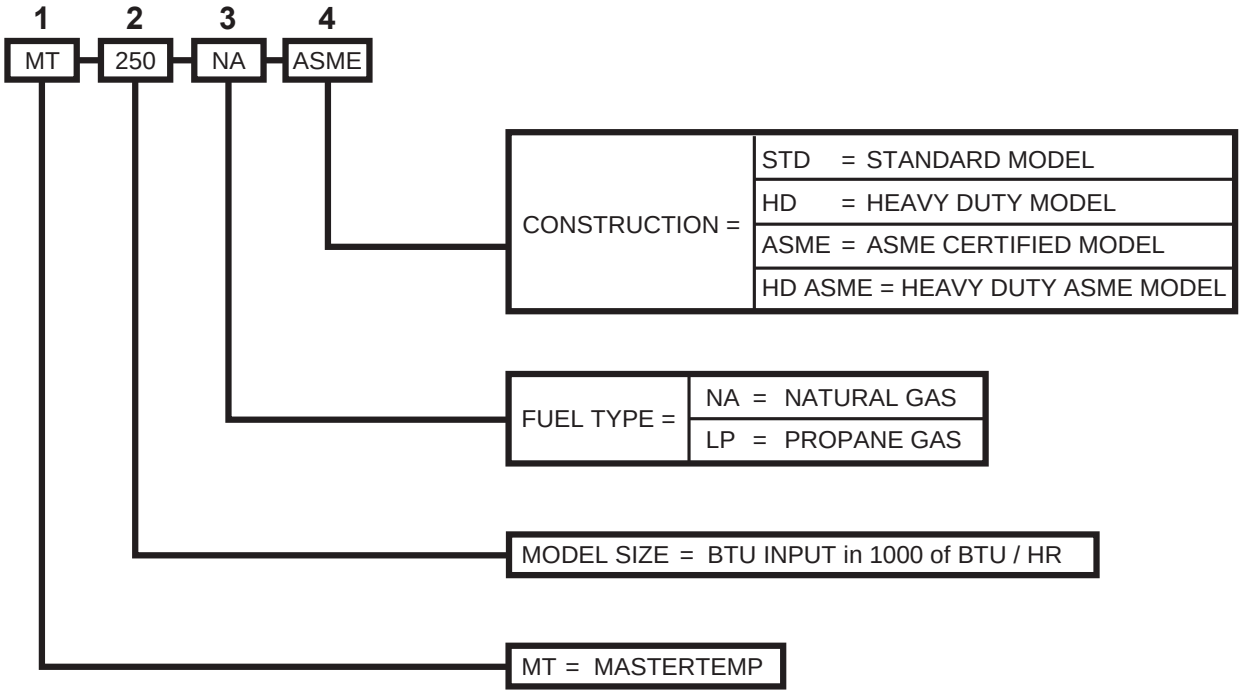
HEATER IDENTIFICATION INFORMATION — (HIN)

H. I. N.

HEATER IDENTIFICATION NUMBER

ID DESIGNATOR FOR PENTAIR AQUATIC SYSTEMS MASTERTEMP® HEATERS

Example:



Section 2: Warning and Safety Instructions

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

MASTERTEMP®
Pool and Spa Heater

Congratulations on your purchase of the MasterTemp Pool and Spa Heater. Proper installation and service of your new heating system and correct chemical maintenance of the water will ensure years of enjoyment. The MasterTemp heater is a compact, lightweight, efficient, induced-draft, gas fired high performance pool and spa heater that can be directly connected to schedule 40 PVC pipe. The MasterTemp heater also comes equipped with the Pentair multifunction temperature controller which shows, at a glance, the proper functioning of the heater. All MasterTemp heaters are designed with a direct ignition device, HSI (hot-surface ignition), which eliminates the need for a standing pilot. The MasterTemp heater requires an external power source (120/240 VAC 60 Hz) to operate.

SPECIAL INSTRUCTIONS TO OWNER: Retain this manual for future reference. This instruction manual provides operating instructions, installation and service information for the MasterTemp high performance heater. The information in this manual applies to all MasterTemp heater models. **READ AND REVIEW THIS MANUAL COMPLETELY,** it is very important that the owner/installer read and understand the section covering installation instructions, and recognize the local and state codes before installing the MasterTemp heater. Its use will reduce service calls and chance of injury and will lengthen product life. History and experience has shown that most heater damage is caused by improper installation practices.

IMPORTANT NOTICES

For the installer and operator of the MasterTemp heater: The manufacturer's warranty may be void if, for any reason, the heater is improperly installed and/or operated. Be sure to follow the instructions set forth in this manual. If you need any more information, or if you have any questions regarding to this pool heater, please contact Pentair Aquatic Systems at (800) 831-7133.

WARRANTY INFORMATION

The MasterTemp pool and spa heater is sold with a limited factory warranty. ***Specific details are described on the warranty registration card which is included with the product.*** Return the warranty registration card after filling in the serial number from the rating plate inside the heater.

Pentair Aquatic Systems high standards of excellence include a policy of continuous product improvement resulting in your state-of-the-art heater. We reserve the right to make improvements which change the specifications of the heater without incurring an obligation to update the current heater equipment.

These heaters are designed for the heating of chlorine, bromine or salt system swimming pools and spas or in non-stationary installations, and should never be employed for use as space heating boilers or general purpose water heaters. The manufacturer's warranty may be void if, for any reason, the heater is improperly installed and/or operated. Be sure to follow the instructions set forth in this manual.

⚠CAUTION

OPERATING THIS HEATER CONTINUOUSLY AT WATER TEMPERATURE BELOW 68° F. WILL CAUSE HARMFUL CONDENSATION AND WILL DAMAGE THE HEATER AND VOID THE WARRANTY. Do not use the heater to protect pools or spas from freezing if the final maintenance temperature desired is below 68° F., as this will cause condensation related problems.

CODE REQUIREMENTS

Installation must be in accordance with all local codes and/or the latest edition of the National Fuel Gas Code, ANSI Z223.1 and the latest edition of the National Electrical Code, NFPA 70 (US).

Installation in Canada must be in accordance with the latest CAN/CGA-B149.1 or .2 and CSA C22.1 Canadian Electric Code, part 1.

The heater, when installed, must be electrically grounded and bonded in accordance with local codes, or, in absence of local codes, with the National Electrical Code, ANSI/NFPA70 (US) or in Canada in accordance with the Canadian Electric Code, part 1.as applicable.

⚠DANGER

CARBON MONOXIDE GAS IS DEADLY – Exhaust from this pool heater contains toxic levels of carbon monoxide, a dangerous, poisonous gas you cannot see or smell.

CONSUMER INFORMATION AND SAFETY

⚠WARNING

The U.S. Consumer Product Safety Commission warns that elevated water temperature can be hazardous. See below for water temperature guidelines before setting temperature.

1. Spa or hot tub water temperatures should never exceed 104° F (40° C). A temperature of 100° F (38° C) is considered safe for a healthy adult. Special caution is suggested for young children.
2. 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 beware! Soaking in water above 102° F (39° C) can cause fetal damage during the first three months of pregnancy (resulting in the birth of a brain-damaged or deformed child). Pregnant women should stick to the 100° F (38° C) maximum rule.
4. Before entering the spa or hot tub, the user should check the water temperature with an accurate thermometer. Spa or hot tub thermostats may err in regulating water temperatures by as much as 4° F (2.2° C).
5. Persons with a medical history of heart disease, circulatory problems, diabetes or blood pressure problems should obtain their physician's advice before using spas or hot tubs.
6. Persons taking medication which induce drowsiness, such as tranquilizers, antihistamines or anticoagulants should not use spas or hot tubs.

⚠WARNING

Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the heater. Do not use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and to replace any part of control system and gas control which has been under water.

SAFETY INFORMATION

The MasterTemp® pool heaters are designed and manufactured to provide many years of safe and reliable service when installed, operated and maintained according to the information in this manual. 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.

⚠ DANGER — CARBON MONOXIDE GAS IS DEADLY

READ OWNERS MANUAL COMPLETELY BEFORE OPERATING

THIS PRODUCT MUST BE INSTALLED AND SERVICED BY A PROFESSIONAL SERVICE TECHNICIAN, QUALIFIED IN POOL HEATER INSTALLATION. Some jurisdictions require that installers be licensed. Check with your local building authority about contractor licensing requirements. Improper installation and/or operation could create carbon monoxide gas and flue gases which could cause serious injury or death. Improper installation and/or operation will void the warranty.

Exhaust from this pool heater contains toxic levels of carbon monoxide, a dangerous, poisonous gas you cannot see or smell. Symptoms of carbon monoxide exposure or poisoning include dizziness, headache, nausea, weakness, sleepiness, muscular twitching, vomiting and inability to think clearly. IF YOU EXPERIENCE ANY OF THE ABOVE SYMPTOMS, IMMEDIATELY TURN OFF THE POOL HEATER, LEAVE THE VICINITY OF THE POOL OR SPA AND GET INTO FRESH AIR IMMEDIATELY. THE POOL HEATER MUST BE THOROUGHLY TESTED BY A GAS PROFESSIONAL BEFORE RESUMING OPERATION.

EXCESSIVE CARBON MONOXIDE EXPOSURE CAN CAUSE BRAIN DAMAGE OR DEATH.

NEVER use this pool heater indoors without specified ventilation system (and properly installed vent pipe).

NEVER use this pool heater in the home or in partly enclosed areas (such as garages), unless the specified ventilation system is used. If used outdoors, install far from open windows, doors, vents and other openings.

Pentair strongly recommends that all vents, pipes and exhaust systems be initially and periodically tested for proper operation. This testing can be accomplished by using a hand-held carbon monoxide meter and/or by consulting with a gas professional.

Pool heaters must be used in conjunction with carbon monoxide detectors installed near the pool heater. The carbon monoxide detectors must be periodically inspected for proper operation so as to insure continued safety. Broken or malfunctioning carbon monoxide detectors must be replaced immediately.

⚠ WARNING — FOR YOUR SAFETY

This product must be installed and serviced by a professional service technician, qualified in pool heater installation. Some jurisdictions require that installers be licensed. Check with your local building authority about contractor licensing requirements. Improper installation and/or operation could create carbon monoxide gas and flue gases which could cause serious injury or death. Improper installation and/or operation will void the warranty.

⚠ WARNING — **This heater is equipped with an unconventional gas control valve that is factory set with a manifold pressure of -.2 inches wc.** Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation or service must be performed by a qualified installer, service agency or the gas supplier. If this control is replaced, it must be replaced with an identical control.

Do not attempt to adjust the gas flow by adjusting the regulator setting.

SAFETY INFORMATION, (cont'd.)

⚠ WARNING — Risk of fire or explosion from incorrect fuel use or faulty fuel conversion. Do not try to run a heater set up for natural gas on propane gas or vice versa. Only qualified service technicians should attempt to convert heater from one fuel to the other. Do not attempt to alter the rated input or type of gas by changing the orifice. If it is necessary to convert to a different type of gas, consult your Pentair dealer. Serious malfunction of the burner can occur which may result in loss of life. Any additions, changes, or conversions required in order for the appliance to satisfactorily meet the application needs must be made by a Pentair dealer or other qualified agency using factory specified and approved parts. The heater is available for use with natural gas or LP (propane) gas only. It is not designed to operate with any other fuels. Refer to the nameplate for the type of gas the heater is equipped to use.

- Use heater only with the fuel for which it is designed.
- If a fuel conversion is necessary, refer this work to a qualified service technician or gas supplier before putting the heater into operation.

⚠ WARNING — Risk of fire or explosion from flammable vapors. Do not store gasoline, cleaning fluids, varnishes, paints, or other volatile flammable liquids near heater or in the same room with heater.

⚠ WARNING — Risk of explosion if unit is installed near propane gas storage. Propane (LP) gas is heavier than air. Consult local codes and fire protection authorities about specific installation requirements and restrictions. Locate the heater away from propane gas storage and filling equipment as specified by the Standard for the Storage and Handling of Liquefied Petroleum Gases, CAN/CSA B149.2 (latest edition) or ANSI/NFPA 58 (latest edition).

⚠ WARNING — Risk of fire, carbon monoxide poisoning, or asphyxiation if exhaust venting system leaks. Only qualified service technicians should attempt to service the heater, as leakage of exhaust products or flammable gas may result from incorrect servicing.

⚠ WARNING — Risk of asphyxiation if exhaust is not correctly vented. Follow venting instructions exactly when installing heater. Do not use a drafthood with this heater, as the exhaust is under pressure from the burner blower and a draft hood will allow exhaust fumes to blow into the room housing the heater. The heater is supplied with an integral venting system for outdoor installation. A vent conversion kit (See Page 24 for Part Numbers for Conversion Kits) is available for installations in enclosures (Canada) or indoors (U.S.). Use the specified venting, and only the specified venting, when heater is installed in an enclosure or indoors. In Canada, this pool heater can only be installed outdoors or in an enclosure that is not normally occupied and has no openings directly into occupied areas. See Page 19 for enclosure venting requirements.

⚠ CAUTION — Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Wiring errors can also destroy the control board.

- Connect heater to **120** or **240** Volt, 60 Hz., Single Phase power only.
- Verify proper operation after servicing.
- Do not allow children to play on or around heater or associated equipment.
- Never allow children to use the pool or spa without adult supervision.
- Read and follow other safety information contained in this manual prior to operating this pool heater.

CONSUMER INFORMATION AND SAFETY

⚠WARNING

The U.S. Consumer Product Safety Commission warns that carbon monoxide is an "invisible killer". Carbon monoxide is a colorless and odorless gas.

1. Carbon monoxide is produced by burning fuel, including natural gas and propane.
2. Proper installation, operation and maintenance of fuel-burning appliances in the home is the most important factor in reducing carbon monoxide poisoning.
3. Be sure that fuel burning appliances such as heaters are installed by professionals according to manufacturer's instructions and codes.
4. Always follow the manufacturer's directions for safe operation.
5. Have the heating system (including vents) inspected and serviced annually by a trained service technician.
6. Examine vents regularly for improper connections, visible cracks, rust or stains.
7. Install battery-operated carbon monoxide alarms. The alarms should be certified to the requirements of the most recent UL, IAS, CSA and IAPMO standard for carbon monoxide alarms. Test carbon monoxide alarms regularly and replace dead batteries.

GENERAL SPECIFICATIONS

NOTICE:

- Combustion air contaminated by corrosive chemical fumes can damage the heater and will void the warranty.
- The Combination Gas Control Valve on this heater differs from most appliance gas controls. If it must be replaced, for safety reasons replace it only with an identical gas control.
- The access door panels must be in place to provide proper ventilation. Do not operate the heater for more than five (5) minutes with the access door panels removed.
- This heater is design certified by CSA International as complying with the Standard for Gas Fired Pool Heaters, ANSI Z21.56/CSA 4.7, and is intended for use in heating fresh water swimming pools or spas.
- The heater is designed for the heating of chlorine, bromine or salt system swimming pools and spas. It should **NOT** be used as a space heating boiler, or general purpose water heater.
- The heater is design certified by CSA International for installation on combustible flooring. Specified minimum clearances must be maintained to combustible surfaces (see “Heater Clearances”, page 18).
- The heater should be located in an area where leakage of the heater or connections will not result in damage to the area adjacent to the heater or to the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the heater. The pan must not restrict air flow.
- The heater may not be installed within 5 ft. (1.5M) of the inside surface of a pool or spa unless it is separated by a solid fence, wall or other permanent barrier.

Section 3: Installation Instructions

HEATER DESCRIPTION

Figure 1 is a diagram of the heater showing how it operates. Precisely matched orifice plates meter the air and gas into the mixer. The blower draws the air and gas through the mixer and forces it into the burner's flame holder. A sealed heat exchanger surrounds the flame holder, discharging exhaust gases out the flue.

Two inch PVC water piping connects directly to the manifold/header on the heat exchanger using 2" PVC slip unions provided with the heater. The outer manifold remains cool; no heat sinks are required. A thermal regulator and an internal bypass regulate the water flow through the heat exchanger to maintain the correct outlet temperature. The heater operator control panel board assembly is located on top of the heater.

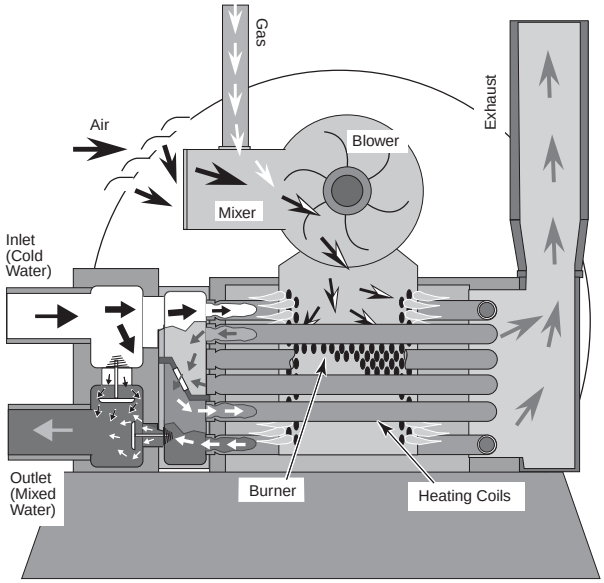


Figure 1.

SEQUENCE OF OPERATION

An electronic temperature sensing **thermistor** in the manifold adapter inlet controls the heater operation. When the inlet water temperature drops below the temperature set on the **operating control**, the **burner controller** supplies power to the combustion **air blower** through a series of **safety interlocks**. The interlocks consist of:

- the **pressure switch** (**PS**), which senses that the pump is running,
- the **high limit switch** (**HLS**), which opens if the heat exchanger outlet temperature goes above 135° F (57° C), and
- the **air flow switch** (**AFS**), which senses the pressure drop across the air metering orifice,
- the **automatic gas shut-off** (**AGS**) switch, which opens if the heat exchanger outlet temperature goes above 140° F (60° C).
- the **stack flue sensor** (**SFS**), which shuts down the heater if the flue gas temperature reaches 480° F (249° C).

The air flow switch (AFS) senses the pressure drop across the air metering orifice. As soon as there is sufficient air flow, the AFS closes, closing the circuit to the **hot surface igniter** (**HSI**), which ignites the fuel mixture. On a call for heat, the blower and HSI are energized. In about 20 seconds, the gas valve opens and ignition occurs. The HSI then switches to a sensing mode and monitors the flame.

The heater is equipped with a digital operating control that enables the user to pre-set the desired pool and spa water temperatures. The control enables the user to select between pool and spa heating, and features a digital display that indicates the water temperature.

PUTTING THE HEATER INTO SERVICE

If the heater is installed below the level of the pool, or more than two feet above pool level, the pressure switch setting should be adjusted. See WATER PRESSURE SWITCH, in the SAFETY CONTROLS Section.

Before putting the heater into service for the first time, follow the instructions under "BEFORE START-UP" (page 33) in the front of this manual. Check for proper operation of the heater by following the steps under "OPERATION INSTRUCTIONS."

Damage to equipment caused by improper installation or repair will void the warranty.

SPECIFICATIONS

These installation instructions are designed for use by qualified personnel only, trained especially for installation of this type of heating equipment and related components. Some states require installation and repair by licensed personnel. If this applies in your state, be sure your contractor bears the appropriate license. See Figure 2 for Outdoor and Indoor Installations.

DIMENSIONS IN INCHES

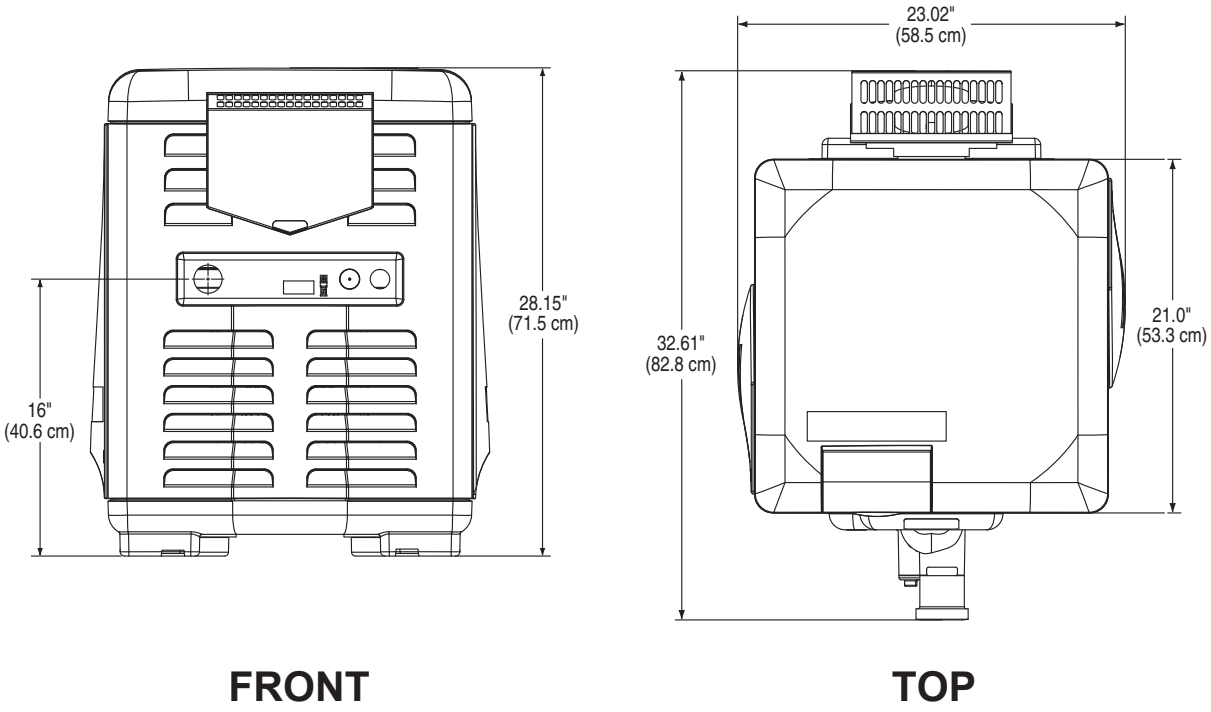


Figure 2.

PLUMBING CONNECTIONS

The MasterTemp heater has the unique capability of direct schedule 40 PVC plumbing connections. A set of bulkhead fittings is included with the MasterTemp heater to insure conformity with Pentair's recommended PVC plumbing procedure. Other plumbing connections can be used. See Figure 3 for plumbing connections.

⚠CAUTION

Before operating the heater on a new installation, turn on the circulation pump and bleed all the air from the filter using the air relief valve on top of the filter. Water should flow freely through the heater. Do not operate the heater unless water in the pool/spa is at the proper level. If a manual by-pass is installed, temporarily close it to insure that all air is purged from the heater.

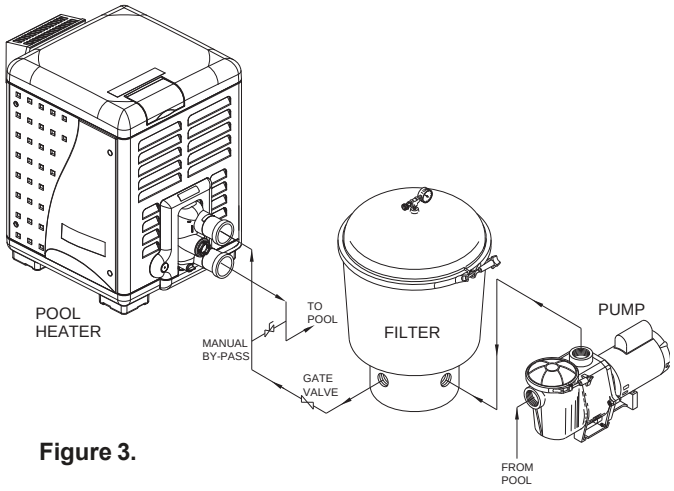


Figure 3.

WATER CONNECTIONS

The heater requires proper water flow and pressure for its operation. See Figure 5 for the recommended installation. The filter pump discharges to the filter, the filter discharges to the heater, and the heater discharges directly to the pool or spa.

A manual bypass valve should be installed across the heater when the pump flow exceeds 120 GPM (454 LPM). See "WATER FLOW RATE" on page 13- Table 1 for setting of the manual by-pass valve.

Make sure that the outlet plumbing from the heater contains no shut-off valves or other flow restrictions that could prevent flow through the heater (except for pool installations as noted below, or winterizing valves where needed). To switch flow between the pool and spa, use a diverter valve. Do not use any valve that can shut off the flow.

Install the chemical feeder downstream of the heater. Install a chemical resistant one-way check valve between the heater and the chemical feeder to prevent back-siphoning through the heater when the pump is off.

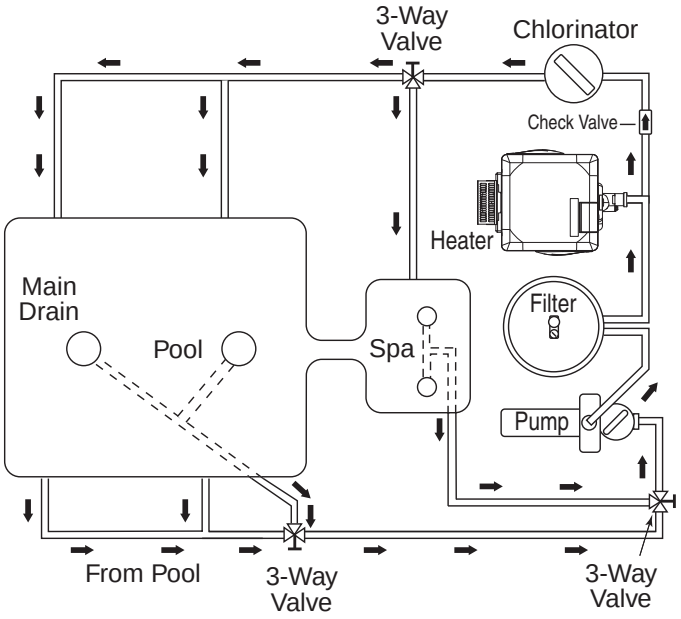


Figure 5.

NOTICE: If the heater is plumbed in backwards, it will cycle continuously. Make sure piping from filter is not reversed when installing heater.

Connect the heater directly to 2" PVC pipe, using the integral unions provided. Heat sinks are not required. The low thermal mass of the heater will prevent overheating of the piping connected to the pump even if the heater shuts down unexpectedly.

Occasionally a two-speed pump will not develop enough pressure on the low speed to operate the heater. In this case, run the pump at high speed only to operate the heater. If this does not solve the problem, do not try to run the heater. Instead, correct the installation.

Do not operate the heater while an automatic pool cleaner is also operating. If the circulation pump suction is plugged (for example by leaves), there may not be adequate flow to the heater. Do not rely on the pressure switch in this case.

VALVES

When any equipment is located below the surface of the pool or spa, valves should be placed in the circulation piping system to isolate the equipment from the pool or spa. Check valves are recommended to prevent back-siphoning. Back-siphoning is most likely to occur when the pump stops, creating a pressure-suction differential. Do **NOT** sanitize the pool by putting chlorine tablets or sticks into the skimmer(s). When the pump is off, this will cause a high concentration of chlorine to enter the heater, which could cause corrosion damage to the heat exchanger.

⚠CAUTION

Exercise care when installing chemical feeders so as to not allow back siphoning of chemical into the heater, filters or pump. When chemical feeders are installed in the circulation of the piping system, make sure the feeder outlet line is down stream of the heater, and is equipped with a positive seal noncorrosive "Check Valve", (P/N R172288), between the feeder and heater.

MANUAL BY-PASS

Where the water flow rate exceeds the maximum 120 GPM, a manual bypass should be installed and adjusted. After installing the valve, adjust the valve to bring the flow rate within the acceptable range. Then remove the valve handle or lock it in place to avoid tampering. See Figure 4.

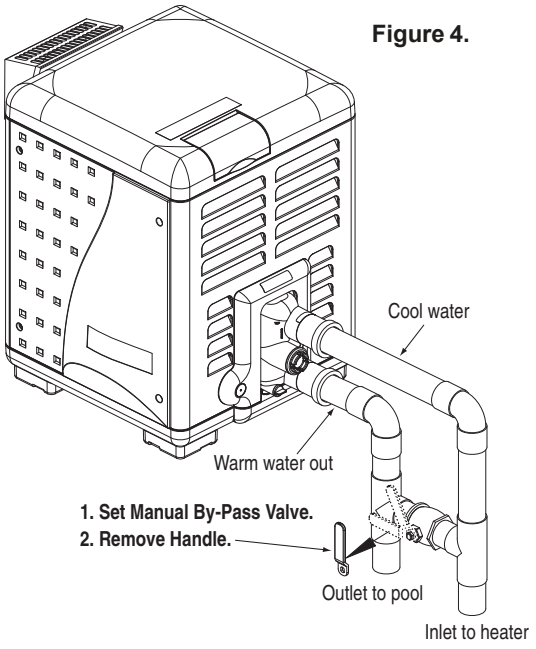
Table 1.

Model	Min. (GPM) (LPM)	Max. (GPM) (LPM) *
175	20 (76)	120 (454)
200	20 (76)	120 (454)
250	25 (95)	120 (454)
300	30 (114)	120 (454)
400	40 (152)	120 (454)

*** Do not exceed the maximum recommended flow rate for the connecting piping.**

*** Pumps 2 HP or larger can produce water pressure flow in excess of 120 GPM. For these pumps, a BY-PASS VALVE is recommended.**

Figure 4.



See page 46 for Pressure Relief Valve Installations.

BELOW POOL LEVEL INSTALLATION

If the heater is below water level, the pressure switch must be adjusted. This adjustment must be done by a qualified service technician. See following **CAUTION** before installation.

⚠CAUTION

BELOW OR ABOVE POOL INSTALLATION

The water pressure switch is set in the factory at 3.00 PSI (± 0.75 PSI). This setting is for a heater installed at pool level. If the heater is to be installed more than 1' above or below, the water pressure switch must be adjusted by a qualified service technician. See page 35, Figure 29.

FLOW SWITCH

If the heater is installed more than 5' above the pool or more than 4' below the pool level, you will be beyond the limits of the pressure switch and a flow switch must be installed. Locate and install the flow switch externally on the outlet piping from the heater, as close as possible to the heater. Connect the flow switch wires in place of the water pressure switch wires.

GAS CONNECTIONS

GAS LINE INSTALLATIONS

Before installing the gas line, be sure to check which gas the heater has been designed to burn. This is important because different types of gas require different gas pipe sizes. The rating plate on the heater will indicate which gas the heater is designed to burn. The Table 2, shown on page 15, show which size pipe is required for the distance from the gas meter to the heater. The table is for natural gas at a specific gravity of .65 and propane at a specific gravity of 1.55.

When sizing gas lines, calculate three (3) additional feet of straight pipe for every elbow used. When installing the gas line, avoid getting dirt, grease or other foreign material in the pipe as this may cause damage to the gas valve, which may result in heater failure.

The gas meter should be checked to make sure that it will supply enough gas to the heater and any other appliances that may be used on the same meter. The gas line from the meter will usually be of a larger size than the gas valve supplied with the heater. Therefore a reduction of the connecting gas pipe will be necessary. Make this reduction as close to the heater as possible.

The heater requires a gas supply of not less than 4" (10.2 cm) wc and not more than 14" (35.6 cm) wc. Gas supply pressures outside of this range may result in improper burner operation. A minimum flowing or dynamic inlet pressure (while the heater is running) of 4" (10.2cm) wc is required to maintain input rating with no more than a 2" pressure drop between static and dynamic. The gas supply must be installed in accordance with the *National Fuel Gas Code*, *ANSIZ223.1*, or standard *CSA B149.1*, *Natural Gas and Propane Installation Codes*, as applicable and all applicable local codes. Install a manual shut-off valve and a sediment trap and union located outside the heater panels, see Figure 6. Do not use a restrictive gas cock. The following minimum gas pipe sizes are recommended for natural gas supply piping, see Table 2 on page 15. For low pressure LP gas, pipe size may be reduced by 1/4", with a minimum pipe size of 1/2". Check for compliance with local codes.

The heater and any other gas appliances must be disconnected from the gas supply piping system during any pressure testing on that system, (greater than ½ PSI). The heater and its gas connection must be leak tested before placing the heater in operation. **Do not use flame to test the gas line.** Use soapy water or another nonflammable method.

NOTE

A manual main shut-off valve must be installed externally to the heater.

⚠WARNING

DO NOT INSTALL THE GAS LINE UNION INSIDE THE HEATER CABINET. THIS WILL VOID YOUR WARRANTY.

SEDIMENT TRAPS

Install a sediment trap and union located outside the heater panels in accordance with National code requirements. Do not use a restrictive gas cock. The sediment trap shall be either a tee fitting with a capped nipple in the bottom outlet which can be removed for cleaning, as illustrated in Figure 6, or an other device recognized as an effective sediment trap. All gas piping should be tested after installation in accordance with local codes.

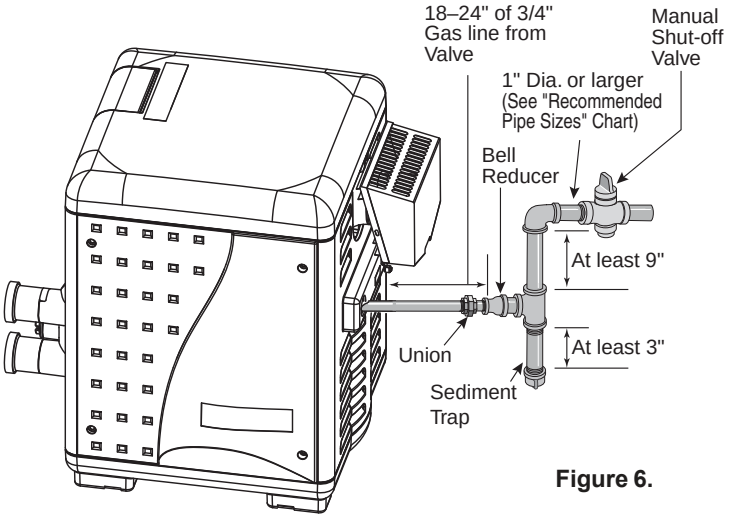


Figure 6.

GAS PIPE SIZING

STAGE TWO "LOW PRESSURE" GAS PIPE SIZING

Table 2.

PIPE SIZING FOR GAS LINE CONNECTIONS														
MAXIMUM EQUIVALENT PIPE LENGTH (Ft.)														
Natural Gas at 1000 B.T.U. per Cubic Foot														
Propane Gas at 2500 B.T.U. per Cubic Foot														
	1/2"		3/4"		1"		1-1/4"		1-1/2"		2"		2-1/2"	
MODEL	NAT	PRO	NAT	PRO	NAT	PRO	NAT	PRO	NAT	PRO	NAT	PRO	NAT	PRO
175	-	20'	30'	80'	125'	250'	450'	600'	-	-	-	-	-	-
200	-	20'	30'	80'	125'	250'	450'	600'	-	-	-	-	-	-
250	-	10'	20'	50'	70'	150'	250'	500'	600'	-	-	-	-	-
300	-	-	10'	30'	50'	100'	200'	350'	400'	600'	-	-	-	-
400	-	-	-	10'	20'	60'	100'	150'	200'	450'	400'	-	-	-

TESTING GAS PRESSURE

Before operating the heater, the heater and its gas connections must be leak tested. **Do NOT use an open flame to test for leaks.** Test all gas connections for leaks with soapy water or another non-flammable method (see page 14).

The heater and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa).

The heater must be isolated from the gas supply system by closing its individual manual shut-off valve during any pressure testing of the gas supply at test pressures equal to or less than 1/2 psig (3.5 kPa).

CHECKING THE GAS PRESSURE THROUGH THE COMBINATION GAS CONTROL VALVE

⚠WARNING

Risk of fire and explosion. Improper installation, incorrect adjustment, alteration, service, or maintenance of the Combination Gas Control Valve can lead to fire or explosion, causing loss of life, personal injury, and/or property damage. If it is necessary to adjust the gas valve, this must be done by only by a qualified service agency. **These instructions are for the use of qualified service technicians only!**

This appliance is equipped with an unconventional gas control valve that is factory set with a manifold pressure of –.2" (–0.5cm) wc. Installation or service must be performed by a qualified installer, service agency, or the gas supplier. If this control valve is replaced, it must be replaced with an identical control.

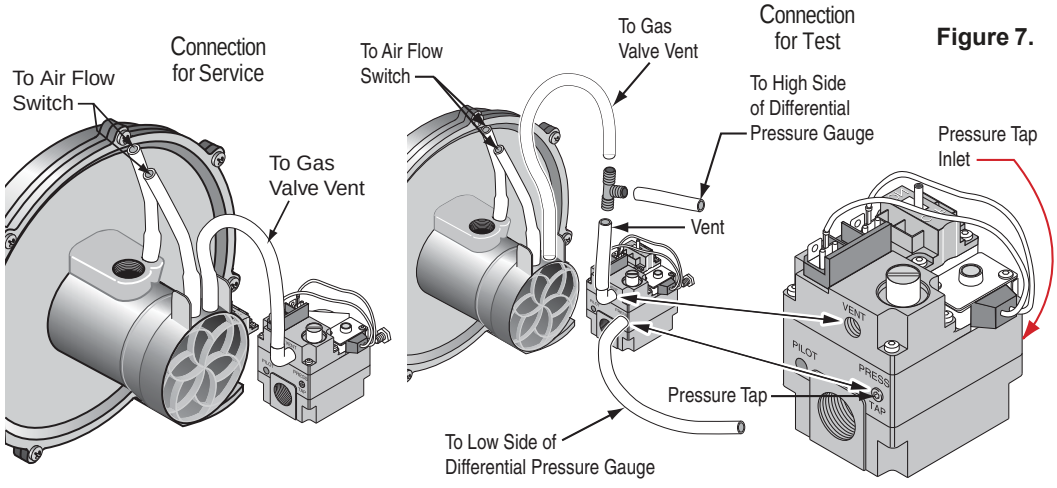


Figure 7.

The combination gas valve incorporates dual shut-off valves and a negative-pressure regulator. For proper operation, the regulated pressure at the outlet manifold of the valve must be –0.2" (–0.5cm) wc below the reference pressure at the blower mixer inlet, and the gas valve 'VENT' tap must be connected to the end cap air orifice as shown in Figure 7.

Do not attempt to adjust the gas input by adjusting the regulator setting. The correct gas regulator setting is required to maintain proper combustion and must NOT be altered.

⚠CAUTION

The use of Flexible Connectors (FLEX) is NOT recommended unless they are properly sized according to the supplier recommendations for the heater rating.

GAS PRESSURE REQUIREMENTS

Gas Pressure	Model	Natural	Propane
		Inches W.C.	
Maximum Inlet	MT	14	14
Minimum Inlet	MT	4	4
Manifold	MT	-0.2 ± 0.1	-0.2 ± 0.1
NOTE: All readings must be taken while heater is operating. Any adjustments or readings made while heater is off will result in performance problems.			

Table 3.

OUTDOOR INSTALLATION (U.S. and Canada)

For heaters located outdoors, using the built-in stackless venting system.

⚠WARNING

Risk of explosion if a unit burning propane gas is installed in a pit or other low spot. Propane is heavier than air. Do not install the heater using propane in pits or other locations where gas might collect. Consult your local building code officials to determine installation requirements and specific installation restrictions of the heater relative to propane storage tanks and filling equipment. Installation must meet the requirements for the Standard for the Storage and Handling of Liquid Petroleum Gases, ANSI/NFPA 58 (latest edition) in the U.S., or CAN/CSA B149.2 (latest edition) in Canada. Consult local codes and fire protection authorities about specific installation restrictions.

Locate the heater on a level surface in an open area that is protected from drainage or run-off. Install the heater in an area where leaves or other debris will not collect on or around the heater.

To avoid damage to the electronic components in the heater, take care to prevent prolonged exposure to driving sources of water (such as lawn sprinklers, heavy roof runoff, hoses, etc.). Avoid operation in persistent, extreme, moist or salty environments. In extreme weather, shut down the heater and disconnect the power to it until the weather has moderated. In areas subject to hurricanes or very high winds, purchase the Bolt Down Bracket Kit, P/N 460738.

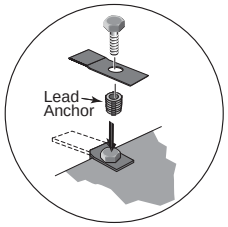
HEATER CLEARANCES – OUTDOOR

IMPORTANT!

- **In an outdoor installation it is important to ensure water is diverted from overhanging eves with a proper gutter/drainage system. The heater must be set on a level foundation for proper drainage.**
- **This unit shall not be operated outdoors at temperatures below -20° F.**

If the heater is located under a roof overhang, there must be at least three (3) feet (1m) of clearance between the bottom of the overhang and the top of the heater exhaust vent, see Figure 8. If the heater is under a roof overhang, the space around the heater must be open on three sides. **DO NOT, under any circumstances, install the heater under ANY deck.**

For Heater mounting bolts and clamps, purchase separately Bolt Down Bracket Kit, Part No. 460738.



For minimum exhaust vent clearances for all building openings, including but not limited to vented eaves, doors, windows, gravity air inlet, see Figure 9, show below.

In Canada, the heater must be installed with the top of the vent at least 10 feet (3m) below, or to either side of, any opening into a building.

Orient the heater for convenient access to the water connections and the gas and electrical connections.

Note: Check local building codes for installing the heater from any property line set back requirements (see the installation diagram below).

⚠CAUTION

If installing the heater next to or near an air conditioning unit or a heat pump, allow a minimum of 36 in. (91.4 cm) between the air conditioning unit and the heater.

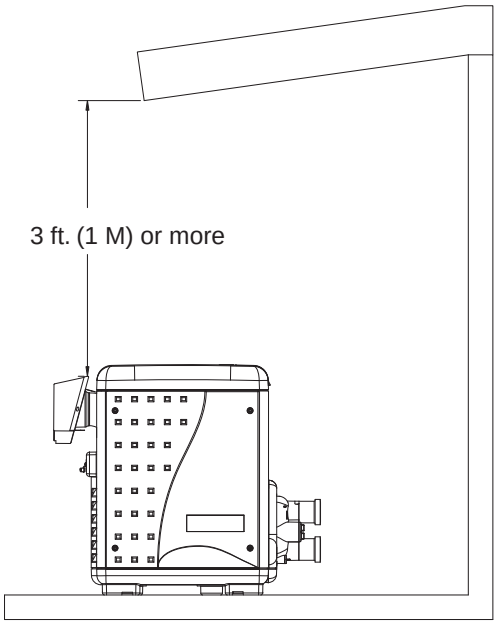


Figure 8.

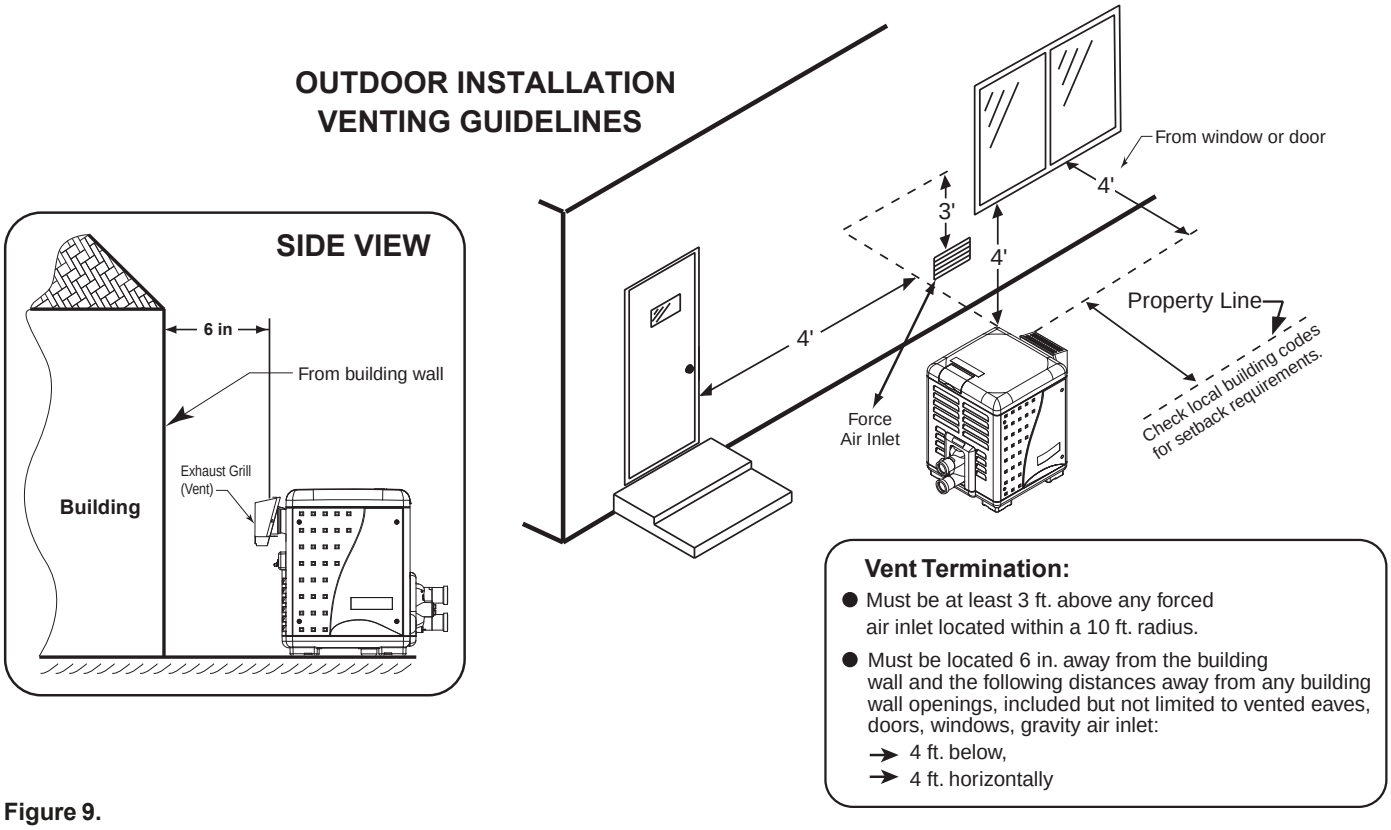


Figure 9.

INDOOR VENTING — General Requirements

The heater may be installed as a Category I or Category III appliance.

Vented Appliance (Category I) – **Vertical only**

An appliance that operates with a *nonpositive* vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent, see pages 20-23.

Vented Appliance (Category III) – **Vertical or Horizontal**

An appliance that operates with a *positive* vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent, see pages 24-26.

If you are considering connecting this heater to a pre-existing vent system, make sure that the vent system meets the appropriate venting requirements as given in this manual on pages 18-28. If not, replace the vent system. **DO NOT** use a draft hood with this heater.

The MasterTemp heaters are capable of a 270-degree discharge rotation and operate with a positive vent static pressure and with a vent gas temperature less than 400° F (204° C). The total length of the horizontal run must not exceed the length that is listed in Table 11 on page 21-22.

HEATER CLEARANCES — General Requirements

INDOOR INSTALLATION (U.S.) OR OUTDOOR SHELTER (CANADA)

The following clearances must be maintained from combustible surfaces:

TOP .....6 in. (15 cm)
EXHAUST SIDE .....6 in. (15 cm)
HEADER SIDE .....6 in. (15 cm)
DOOR PANELS† .....6 in. (15 cm)

Note (†) For service access it is advisable to allow for sufficient clearance on at least one door panel. The heater is design certified by CSA International for installation on combustible flooring. For installation on carpeting, the heater must be mounted on a metal or wood panel that extends at least three inches (10cm) beyond the base of the heater. If the heater is installed in a closet or alcove, the entire floor shall be covered by the panel. On an outdoor shelter installation, the exhaust discharges into a vent pipe. Orient the heater so that the vent pipe does not interfere with adjustment of the operating controls. The control panel located on the top panel can be rotated to any of the three sides of the heater for easy access. However, the control panel must not be located on the side where the vent is located.

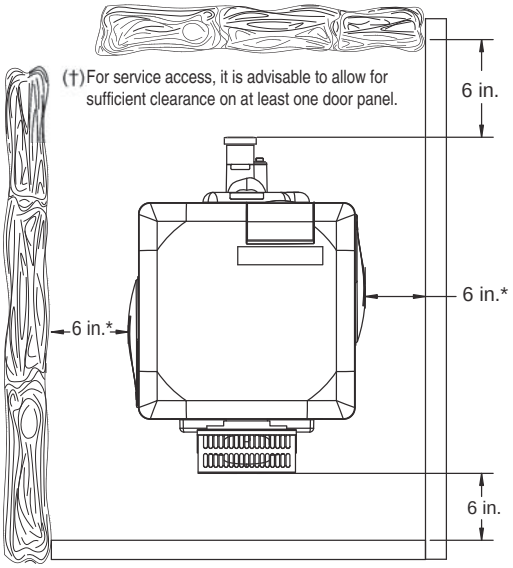


Figure 10.

OUTSIDE VENT COVER REMOVAL

The heater is supplied from the factory with a built-in stackless outside vent for outdoor installation. Remove the outside vent cover for outdoor shelter installation.

COMBUSTION AIR SUPPLY

For indoor installation, the heater location must provide sufficient air supply for proper combustion and ventilation of the surrounding area.

The minimum requirements for the air supply specify that the room in which a heater is installed should be provided with two permanent air supply openings; one within 12 inches (30cm) of the ceiling, the other within 12 inches (30cm) of the floor for combustion air, in accordance with the latest edition of ANSI Z223.1, or the National Fuel Gas code, the CSA B149.1, Natural Gas and Propane Installation Codes, as applicable, and any local codes that may apply. These openings shall directly, or through duct, connect to outdoor air.

Note: For indoor installations where combustion air might be insufficient, see "Direct Air Intake Duct with 3-inch PVC Pipe (Indoor Installation)" below.

Air Supply Requirements Guide

for MasterTemp Heaters

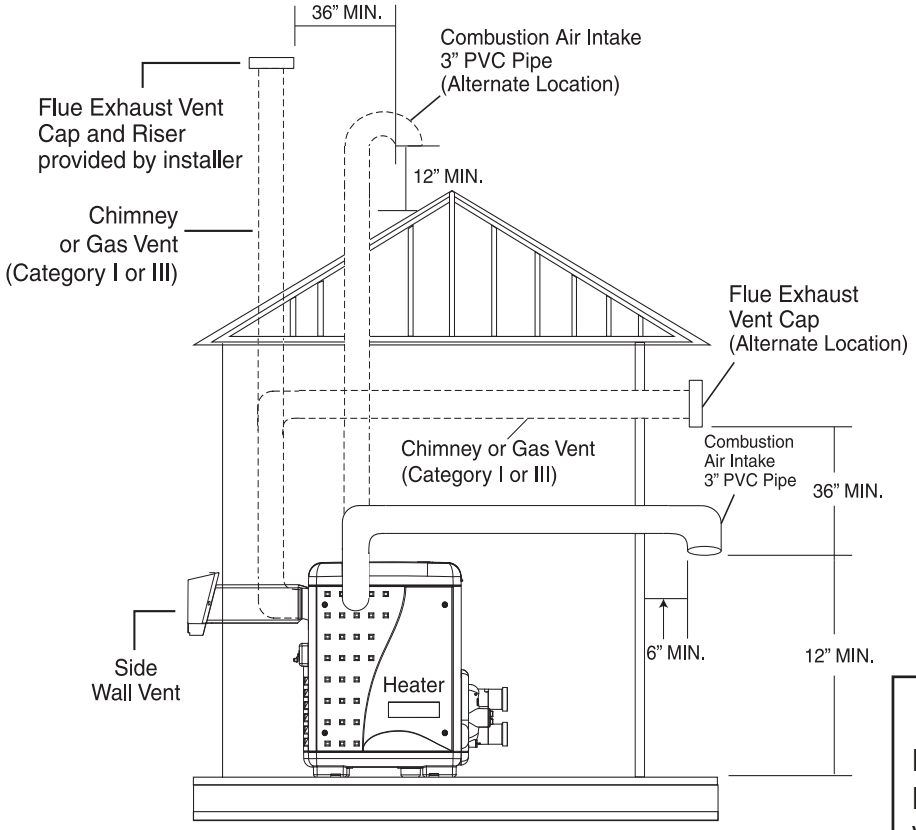
Minimum Net Free Open Area for Each Opening* (Square Inches/Centimeters)				
Model	All Air From Inside Building		All Air From Outside Building	
	Combustion	Vent	Combustion	Vent
175	200 sq. in. 1290 sq. cm.	200 sq. in. 1290 sq. cm.	50 sq. in. 323 sq. cm.	50 sq. in. 323 sq. cm.
200	200 sq. in. 1290 sq. cm.	200 sq. in. 1290 sq. cm.	50 sq. in. 323 sq. cm.	50 sq. in. 323 sq. cm.
250	250 sq. in. 1613 sq. cm.	250 sq. in. 1613 sq. cm.	63 sq. in. 406 sq. cm.	63 sq. in. 406 sq. cm.
300	300 sq. in. 1935 sq. cm.	300 sq. in. 1935 sq. cm.	75 sq. in. 484 sq. cm.	75 sq. in. 484 sq. cm.
400	400 sq. in. 2580 sq. cm.	400 sq. in. 2580 sq. cm.	100 sq. in. 645 sq. cm.	100 sq. in. 645 sq. cm.
* Area indicated is for one of two openings; one at floor level and one at the ceiling.				

Table 4.

Direct Air Intake Duct with 3-inch PVC Pipe (Indoor Installation)

For indoor heater installations where combustion air supply might be insufficient, the MasterTemp® Heater is certified for a direct air intake duct using 3-inch PVC pipe. If outside air is drawn through 3" PVC duct directly into the heater, PVC pipe can be installed in accordance with the following requirements:

The air intake opening MUST be installed at least 1 ft. above the roof line or normal snow levels for free air flow. The Category I or III exhaust vent termination cap must have at least 3 ft. minimum vertical clearance from air intake duct. (See diagram on page 20).



Combustion 3 in. PVC Pipe Inlet Air Intake Duct Requirements*

Combustion Air Intake 3 in. Pipe (Vertical or Horizontal)	
No. of 90° Elbows	Maximum Length in Feet (M)
0	70 ft. (21.3 M)
1	58 ft. (17.7 M)
2	46 ft. (14.0 M)
3	34 ft. (10.4 M)
4	22 ft. (6.7 M)

Table 5.

⚠WARNING!

DO NOT USE PVC PIPE FOR FLUE EXHAUST VENT. FLUE EXHAUST VENT TEMPERATURES CAN BE IN EXCESS OF 400° F. FLUE EXHAUST VENT **MUST BE** CATEGORY I or CATEGORY III METAL VENT.

Note (*): Combustion Air Intake Duct Connection Kit (Part Number 461031) for all MasterTemp heater models can be purchased separately. See page 52 for parts list.

NOTE

Each 90-degree elbow reduces the maximum horizontal PVC air intake duct run by 12 feet and each 45-degree elbow in the PVC air intake duct run reduces the maximum run by 6 feet. See the Table 5 above for the maximum lengths using 90-degree elbows.

Corrosive Vapors and Possible Causes

Area	Likely Contaminants
Chlorinated swimming pools and spas	Pool or spa cleaning chemicals. Acids, such as hydrochloric or muriatic acid.
New construction and remodeling areas	Glues and cements, construction adhesives, paints, varnishes, and paint and varnish strippers. Waxes and cleaners containing calcium or sodium chloride.
Beauty parlors	Permanent wave solutions, bleaches, aerosol cans containing chlorocarbons or fluorocarbons.
Refrigeration plants or various industrial finishing and processing plants	Refrigerants, acids, glues and cements, construction adhesives.
Dry cleaning and laundry areas	Bleaches, detergents, or laundry soaps containing chlorine. Waxes and cleaners containing chlorine, calcium or sodium chloride.

Table 6.

⚠CAUTION

Chemicals should not be stored near the heater installation. Combustion air can be contaminated by corrosive chemical fumes which can void the warranty.

VENT INSTALLATION – INDOOR INSTALLATION (U.S.) OR OUTDOOR SHELTER (CANADA)

(Category I)

Always vent the heater to the outdoors, see Note*.

• Vent it vertically using Type "B" double wall vent connector pipe.

NOTE *: Vent must be at least eight (8) feet away from nearest vertical surface. Vents extending five (5) feet or more above the roof must be braced or guyed. Consult your local code officials for detailed information.

Locate the heater so as to minimize the length of horizontal venting and the number of vent elbows required. Horizontal vent runs must slope up 1/4" per foot (2cm/M) from the heater to allow exhaust condensate to drain and it is recommended to have a condensate drain as described in the venting installation instructions.

VERTICAL VENTING - NEGATIVE PRESSURE

(See Figures 11, 12 and 13)

Vent the heater vertically in a negative pressure (positive draft) system in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or CSA B149.1, Natural Gas and Propane Installation Codes, and local codes. Type "B" Double-wall vent connector is recommended; however single-wall pipe is allowed by the National Fuel Gas Code in some circumstances. Consult your local code official for detailed information. **Do not** use a draft hood with this heater.

To connect a negative pressure metal gas vent to the heater, order the appropriate Metal Flue Collar from the chart below:

Metal Flue Collar	Part No.
4 x 6"	77707-0076
4 x 8"	77707-0077

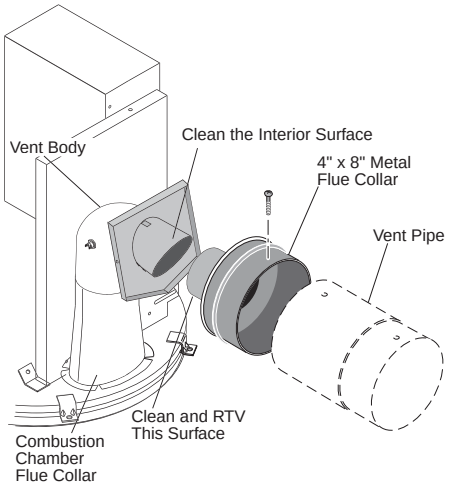


Figure 11.

1. See Table 7, to determine allowable vent sizes for your heater.

NOTICE: Table 7 is for installations in which the total lateral vent length (that is, the horizontal distance from the flue collar to the main vertical portion of the vent) is less than 1/2 the total vent height (the vertical distance from the flue collar to the vent termination) and which have three or less elbows in the system. For venting systems which do not meet these conditions, consult the National Fuel Gas Code, ANSI Z223.1 (U.S.), or the standards CSA B149.1 and B149.2 (Canada).

Read "VERTICAL VENTING – NEGATIVE PRESSURE" before using this table.

Table 7. **– Permitted Minimum and Maximum Vent Heights By Size and Heater Model**

Type "B" Double-Wall Vent with Type "B" Double-Wall Connector in Feet (Meters)					
Vent Size	**Model 175 Height min./max.**	**Model 200 Height min./max.**	**Model 250 Height min./max.**	**Model 300 Height min./max.**	**Model 400 Height min./max.**
6 in.	6 ft. (1.8)/100 ft. (30.5)	6 ft. (1.8)/100 ft. (30.5)	18 ft. (5.5)/100 ft. (30.5)	30 ft. (9)/100 ft. (30.5)	Not Rec.
7 in.	6 ft. (1.8)/100 ft. (30.5)	6 ft. (1.8)/100 ft. (30.5)	8 ft. (2.4)/100 ft. (30.5)	10 ft. (3)/100 ft. (30.5)	15 ft. (4.6)/100 ft. (30.5)
8 in.	6 ft. (1.8)/100 ft. (30.5)	6 ft. (1.8)/100 ft. (30.5)	6 ft. (1.8)/100 ft. (30.5)	6 ft. (1.8)/100 ft. (30.5)	8 ft. (2.4)/100 ft. (30.5)
9 and 10 in.	6 ft. (1.8)/50 ft. (15.3)	6 ft. (1.8)/50 ft. (15.3)	6 ft. (1.8)/50 ft. (15.3)	6 ft. (1.8)/100 ft. (30.5)	6 ft. (1.8)/100 ft. (30.5)
Type "B" Double-Wall Vent with Single-Wall Connector in Feet (Meters)					
Vent Size	**Model 175 Height min./max.**	**Model 200 Height min./max.**	**Model 250 Height min./max.**	**Model 300 Height min./max.**	**Model 400 Height min./max.**
6 in.	6 ft. (1.8)/15 ft. (4.6)	6 ft. (1.8)/15 ft. (4.6)	6 ft. (1.8)/15 ft. (4.6)	Not Rec.	Not Rec.
7 in.	6 ft. (1.8)/8 ft. (2.4)	6 ft. (1.8)/8 ft. (2.4)	6 ft. (1.8)/8 ft. (2.4)	10 ft. (3)/20 ft. (6)	15 ft. (4.6)/50 ft. (15.3)
8 in.	Not Rec.	Not Rec.	Not Rec.	6 ft. (1.8)/20 ft. (6)	8 ft. (2.4)/20 ft. (6)
9 in.	Not Rec.	Not Rec.	Not Rec.	Not Rec.	6 ft. (1.8)/6 ft. (1.8)
10 in.	Not Rec.	Not Rec.	Not Rec.	Not Rec.	Not Rec.

NOTE

The allowable vent runs for each vent pipe diameter are different and can not be exceeded.

Each 90-degree elbow reduces the maximum horizontal vent run by 12 feet and each 45-degree elbow in the vent run reduces the maximum vent run by 6 feet. See Table 7 on page 21 for the maximum vent lengths using 90-degree and 45-degree elbows.

2. Install the metal Flue Collar in the Vent Body of the heater (located under the outside vent cover). Fasten the metal Flue Collar to the Vent Body with two #10 sheet metal screws. Use high temperature silicone RTV to seal the Flue Collar to the Vent Body. Before connecting the metal Flue Collar to the Vent Body, wet a clean cloth or paper towel with isopropyl alcohol (rubbing alcohol) and vigorously wipe the socket of the Vent Body. Immediately wipe the cleaned surfaces dry with a clean cloth or paper towel. Repeat for the exterior of the 4" end of the metal Flue Collar. Attach the metal Flue Collar to the Vent Body using the RTV supplied with the kit, following the vent manufacturer's instructions (included with kit).
3. Attach the vent pipe to the metal Flue Collar with sheet-metal screws.

⚠WARNING

Risk of fire or asphyxiation if vent is not assembled according to manufacturer's instructions or if vent parts from different manufacturers are mixed. Vent parts from different manufacturers ARE NOT interchangeable. Mixing parts from more than one manufacturer may cause leaks or damage to vent. When assembling a vent, pick one manufacturer and be sure that all vent parts come from that manufacturer and are specified by the manufacturer for your system. Follow manufacturer's instructions, local code requirements, National Fuel Gas Code requirements (U.S.) or standards CSA B149.1 and B149.2 (Canada) carefully during assembly and installation.

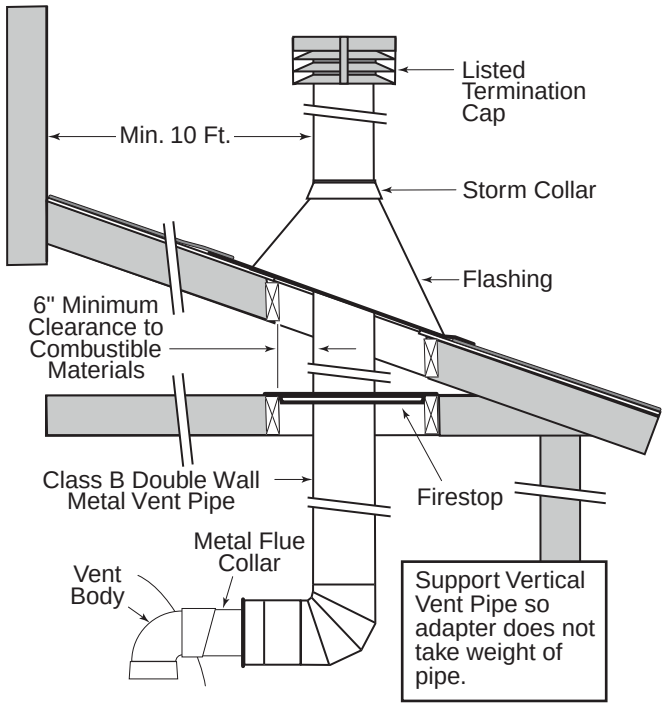


Figure 12. – Typical Metal Vent Pipe Installation - U.S. (Vertical – Negative Pressure)

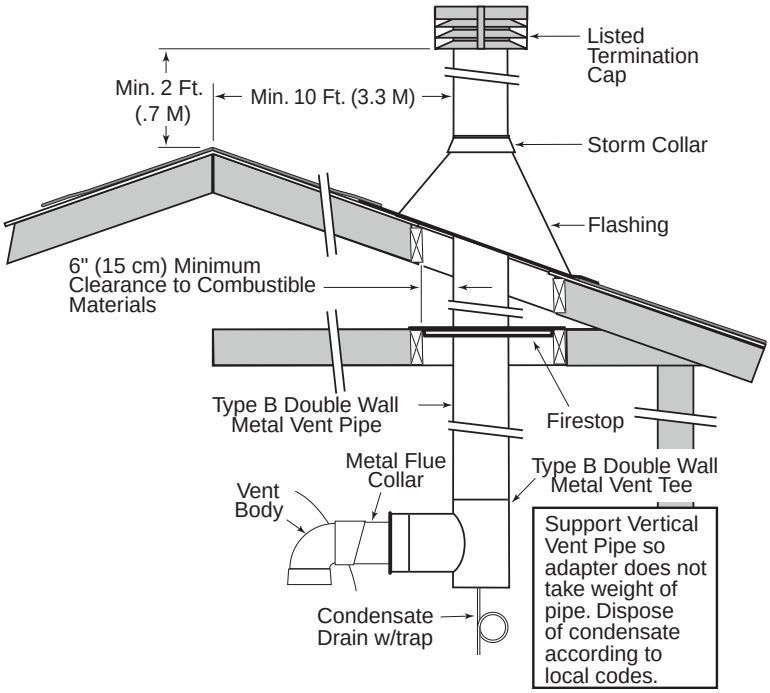


Figure 13. – Typical Metal Vent Pipe Installation - Canada (Vertical – Negative Pressure)

4. Install vent pipe so that it can expand and contract freely as the temperature changes. Support the vent pipe according to applicable codes and the vent manufacturer's instructions. Pipe support must allow the vent pipe free movement out and back, from side to side, or up and down as necessary, without putting a strain on the heater or vent body. Slope horizontal pipe runs up from the heater at least 1/4" per foot (2cm per meter). Install Listed condensate drains at low points where condensate might collect. Plumb condensate drains to a drain through hard piping or high temperature tubing such as silicone rubber or EPDM rubber – do not use vinyl or other low temperature tubing. Follow drain manufacturer's installation instructions.

5. Use Listed fire stop for floor and ceiling penetrations. Use Listed thimble for wall penetrations. Use a Listed roof flashing, roof jack, or roof thimble for all roof penetrations. Do not fill the space around the vent (that is, the clear air space in the thimble or fire stop) with insulation. The roof opening must be located so that the vent is vertical.

6. **Do not run the heater vent into a common vent with any other appliance.**

⚠WARNING

Fire Hazard. Do not vent the heater directly into a masonry chimney. Installation into a masonry chimney must use a chimney liner and must meet the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or CSA B149.1, Natural Gas and Propane Installation Codes requirements and all local code requirements.

⚠WARNING

Risk of fire, carbon monoxide poisoning, or asphyxiation. It is recommended to use a CO Monitor and Fire Alarm in rooms that contain gas fired appliances.

HORIZONTAL OR VERTICAL VENTING - POSITIVE PRESSURE (See Figures 14, 15, and 16)

(Category III)

Vent the heater either horizontally or vertically using an optional vent adapter of the 4-inch special gas approved Category III vent pipes. Install the vent pipe in accordance with local codes and the provisions of the National Fuel Gas Code, ANSI Z223.1 (U.S.), or the standards CSA B149.1, Natural Gas and Propane Installation Codes (Canada), and the vent manufacturer's instructions. Do not use a draft hood with this heater. Install the vent according to the vent manufacturer's detailed instructions. **Note:** Maintain clearance between the vent pipe and combustible surfaces according to the vent manufacturer's instructions and code requirements. Do not place any insulating materials around the vent or inside the required clear air space surrounding the vent. See Table 11 for maximum permissible vent lengths.

NOTE

The allowable vent runs for each vent pipe diameter are different and can not be exceeded. Each 90° elbow reduces the maximum horizontal vent run by 12 feet and each 45-degree elbow in the vent run reduces the maximum vent run by 6 ft. See the Table 8 below for the maximum vent lengths using 90° elbows.

The MasterTemp heater is a "Category III" appliance **(which requires a four (4) inch special gas approved "Category III" vent pipe)** and is a forced-draft pool and spa heater which uses positive pressure to push flue gases through the vent pipe to the outside. ***Flue gases under positive pressure may escape into the dwelling with any cracks or loose joints in the vent pipe, or improper vent installation.*** The vent pipe must be of a sealed-seam construction, such as those listed for use with "Category III Appliances", and for operating temperatures less than 400°F (204°C). Vent pipe construction will be of UL 1738 approved non-corrosive material, such as stainless steel. A condensate trap may be needed. The use of "Approved" thimbles, roof jacks and/or side vent terminals are required; and the proper clearances to combustible materials must be maintained in accordance with type of vent pipe employed—in the absence of a clearance recommendation by the vent pipe manufacturer, the requirements of the Uniform Mechanical Code should be met. ***See page 19, for heater ventilation air requirements.*** It is recommended that vent runs over 18 feet may need to be insulated to reduce condensation related problems and/or the use of a condensate trap in the vent run close to the heater may be necessary in certain installations such as cold climates. Horizontal vents 3' (1M) or less in length do not require a condensate tee. The MasterTemp heater is suitable for through-the-wall venting.

Table 8.

4 in. Special Gas Vent (Vertical or Horizontal)*	
No. of 90° Elbows	**Maximum Length in Feet (M)**
0	70 ft. (21.3M)
1	58 ft. (17.7M)
2	46 ft. (14.0M)
3	34 ft. (10.4M)
4	22 ft. (6.7M)

*Minimum vent length is one foot (.34M), or in accordance with vent manufacturer's instruction, and local and national codes. Horizontal vents 3'(1M) or less in length do not require a condensate tee, but must slope down toward the outlet at 1/4" to the foot (2cm/M) to allow condensate to drain.

⚠CAUTION

Do **NOT** combine exhaust vent pipes to a common exhaust vent in multiple unit installations. Run separate vent pipes.

CONNECTING SPECIAL METALIC GAS VENT TO THE HEATER

1. Order an optional appliance adapter kit, *(Pentair offers optional appliance adapter kits, call Customer Service at (800) 831-7133 for more information):* Part No. 77707-0086 for Saf-T Vent® or Saf-T Vent® CI. Part No. 77707-0087 for Z-Vent.
2. Remove the outside vent cover.
3. Install the Appliance Adapter in the Vent Body of the heater (located under the outside Vent Cover). Before connecting the Appliance Adapter to the Vent Body, wet a clean cloth or paper towel with isopropyl alcohol (rubbing alcohol) and vigorously wipe the socket of the Vent Body. Immediately wipe the cleaned surfaces dry with a clean cloth or paper towel. Repeat for the exterior of the heater end of the Appliance Adapter. Attach the appliance adapter to the vent body using the adhesive specified by the vent manufacturer, following the vent manufacturer's instructions.

⚠WARNING

Risk of carbon monoxide poisoning if adapter is improperly attached. Mechanical connections (such as screws) can cause cracking and leaks in the adapter. Do **NOT** drill holes or use screws to connect the appliance adapter to the heater vent body. Attach with manufacturer's specified adhesive.

⚠WARNING

Risk of fire or asphyxiation if vent is not assembled according to manufacturer's instructions or if vent parts from different manufacturers are mixed. Vent parts from different manufacturers ARE NOT interchangeable. Mixing parts from more than one manufacturer may cause leaks or damage to vent. When installing a vent, pick one manufacturer and be sure that all vent parts come from that manufacturer and are specified by the manufacturer for your system. Follow manufacturer's instructions and local and National Fuel Gas Code (U.S.) or CSA B149.1, Natural Gas and Propane Installation Codes (Canada) requirements carefully during assembly and installation.

4. Install vent pipe so that it can expand and contract freely as the temperature changes. Support the vent pipe according to applicable codes and vent manufacturer's instructions. Pipe support must allow the vent pipe free movement out and back, from side to side, or up and down as necessary, without putting a strain on the heater or vent body. It is recommended to slope the horizontal pipe runs up from the heater at least 1/4" per foot (2cm/M). Install "Approved" condensate drains at low points where condensate might collect. Plumb condensate drains to a drain through hard piping or high-temperature tubing such as silicone rubber or EPDM rubber – do not use vinyl or other low temperature tubing. Follow drain manufacturer's installation instructions.
5. Use an "Approved" firestop for floor and ceiling penetrations. Use an "Approved" thimble for wall penetrations. Use an "Approved" roof flashing, roof jack, or roof thimble for all roof penetrations. Do not fill the space around the vent (that is, the clear air space in the thimble or firestop) with insulation. The roof opening must be located so that the vent is vertical.
6. **Vent Termination – Vertical** (See Figures 14 and 15), for height of vent termination above the roof. Use an "Approved" vent terminal specified by local and national codes and your manufacturer's instructions. A roof termination must be vertical. In Canada, the Vent Cap location shall have a minimum clearance of 4 feet (1.2M) horizontally from electric meters, gas meters, regulators, and relief openings.
7. Make sure entire installation is sealed according to approved standard.

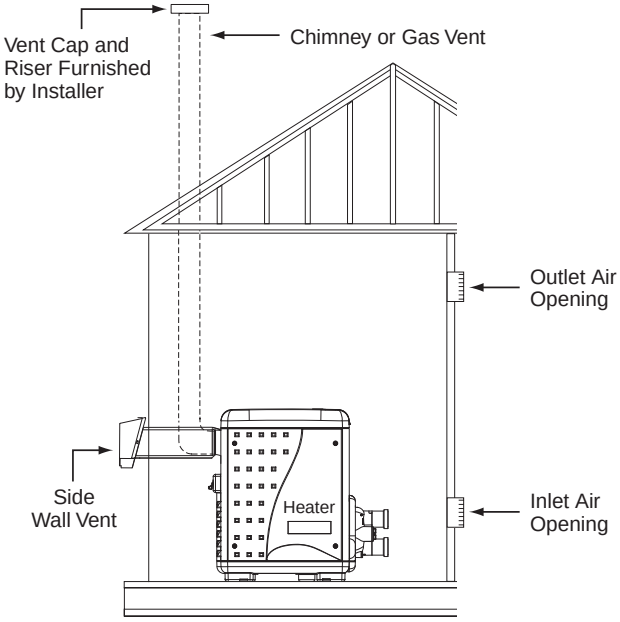


Figure 14.

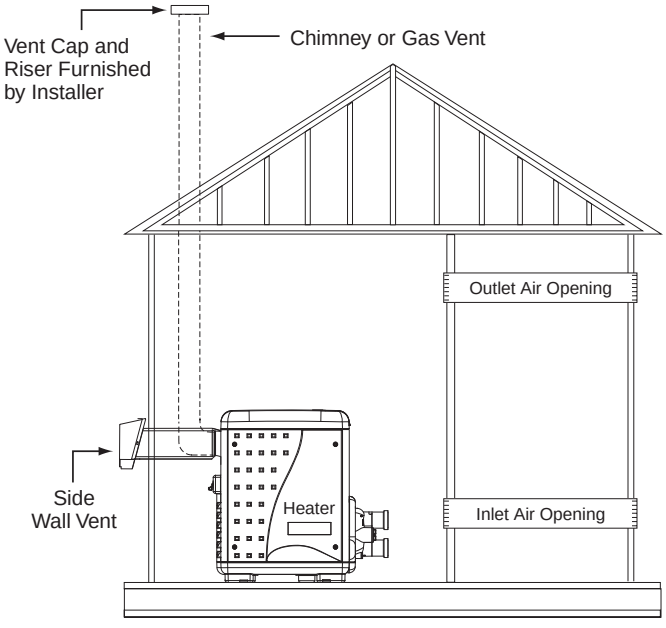


Figure 15.

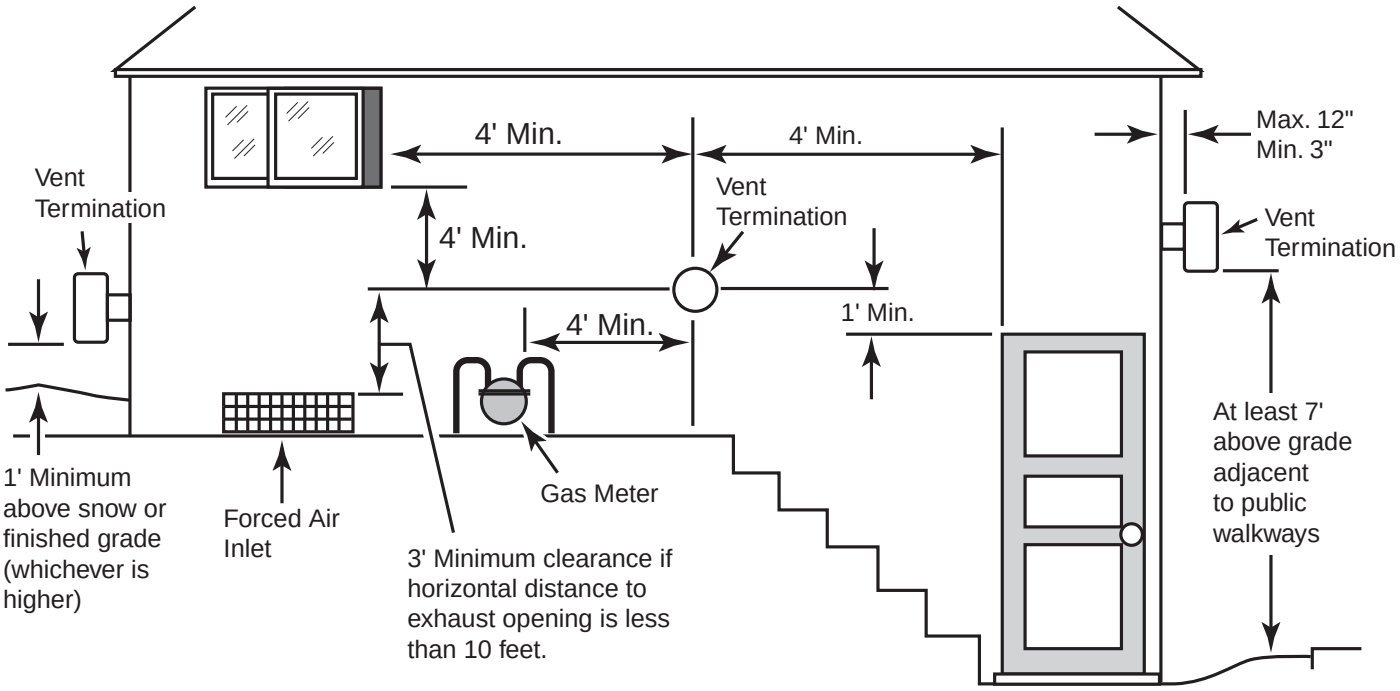


Figure 16.

8. **Vent Termination – Horizontal**

The terminal must be located (U.S. – See Figure 16):

- at least 3" and at most 12" out from the wall (see Figure 17), following the vent manufacturer's instructions
- at least 12" above finished grade or the normally expected snow accumulation level, whichever is higher
- at least 4 feet below or horizontally from, or 1 foot above, any doors or windows or gravity air inlet to a building
- at least 3 feet above any forced air inlet located within 10 feet
- at least 4 feet horizontally from electric meters, gas meters, regulators and relief equipment
- at least 7 feet above grade adjacent to walkways or similar traffic areas

The terminal must be located (Canada – See Figure 16):

- at least 10 feet (3.3M) from any opening into a building
- at least 12" (.3M) above finished grade or the normally expected snow accumulation level, whichever is higher
- at least 4 feet (1.2M) horizontally from electric meters, gas meters, regulators and relief equipment
- at least 7 feet (2.1M) above grade adjacent to walkways or similar traffic areas

Allow at least three feet (1M) vertical clearance over vent termination when terminating under an overhang.

Avoid corners or alcoves where snow or wind could have an effect. Exhaust may affect shrubbery and some building materials. Keep shrubbery away from termination. To prevent staining or deterioration, sealing or shielding exposed surfaces may be required.

⚠WARNING

Fire Hazard. Do not run the heater vent into a common vent with any other appliance. Do not run the Special Gas Vent into, through, or within any active vent such as a factory built or masonry chimney.

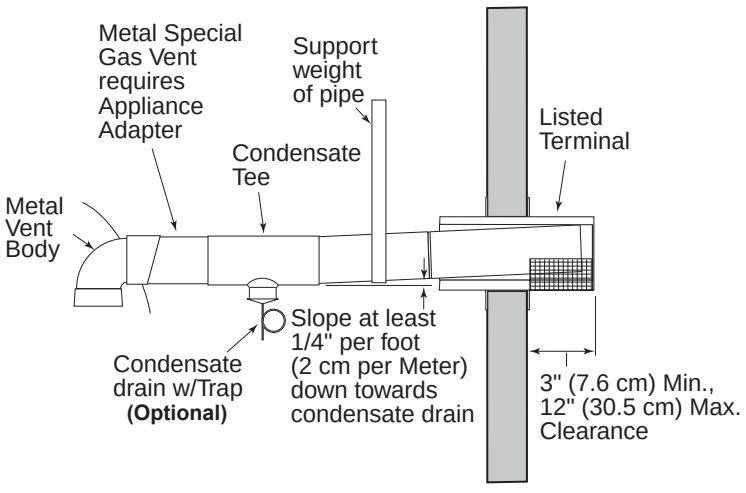


Figure 17.

OUTDOOR SHELTER INSTALLATION

In Canada, this pool heater can only be installed outdoors or in an enclosure that is not normally occupied and has no direct openings into occupied areas.

⚠WARNING

Risk of asphyxiation if exhaust is not correctly vented. Follow venting instructions exactly when installing heater. Do not use a draft hood with this heater, as the exhaust is under pressure from the burner blower and a draft hood will allow exhaust fumes to blow into the room housing the heater. Exhaust venting to the outdoors is required for all outdoor shelter installations.

⚠WARNING

Risk of explosion if a unit burning propane gas is installed in a pit or other low spot. Propane is heavier than air. Do not install the heater using propane in pits or other locations where gas might collect. Consult your local building code officials to determine installation requirements and specific installation restrictions of the heater relative to propane storage tanks and filling equipment. Installation must meet the requirements for the Standard for the Storage and Handling of Liquefied Petroleum Gases, CAN/CSA B149.2 (latest edition) or ANSI/NFPA 58 (latest edition). Consult local codes and fire protection authorities about specific installation restrictions.

The heater is design certified by CSA International for installation on combustible flooring; in alcoves; basements; in closet or utility rooms (in the U.S.).

GARAGE OR UTILITY ROOM INSTALLATION

In Canada, the heater must be installed in a room that is not normally occupied and has no openings directly to occupied areas.

⚠WARNING

Risk of fire and explosion if installed at floor level in an automotive garage or near gasoline or flammable liquid storage. Gasoline fumes are heavier than air and will settle to floor level in closed spaces. Gasoline fumes and spilled gasoline or other volatile liquids (such as some paints and varnishes) will travel across the floor and can be ignited by a gas appliance.

In any utility room or residential garage installation, install the heater with the base at least 18 inches (.5M) above the floor, see Figure 18. In a garage, install a rail or wall to protect the heater from physical damage by a moving vehicle.

Provide an adequate ventilation air supply (See Table 4, page 19)**.**
Choose a location that will avoid contamination by chemical fumes.

⚠CAUTION

A Propane (LPG) fired heater must not be installed in a garage in Massachusetts, by order of the Massachusetts State Fire Marshal. For more information, call the Massachusetts State Fire Marshal's office.

NOTICE: Combustion air contaminated by corrosive chemical fumes can damage the heater and will void the warranty (See Table 6, page 20).

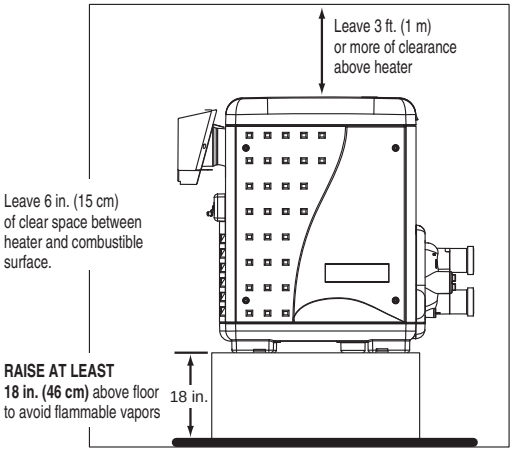


Figure 18.

CONTROL PANEL INDEXING

On an outdoor shelter installation, the exhaust discharges into a vent pipe. Orient the heater so that the vent pipe does not interfere with adjustment of the operating controls. The control panel located on the top panel can be rotated to any of the three sides of the heater for easy access, see Figure 19.

1. Remove the bolts from the door panels. Remove both door access panels.
2. Remove the four corner wing nuts that secure the top panel. Lift the top panel upward to remove the top panel.
3. Rotate the top panel to the desired position located at 90° angles. *Note that the control panel must **NOT** be located on the side where the vent is located.*
4. Replace the top panel down onto the side panels. Be sure that there are no wires caught under the panel.
5. Secure the top panel using the four corner wing nuts.
6. Reattach the door access panels.

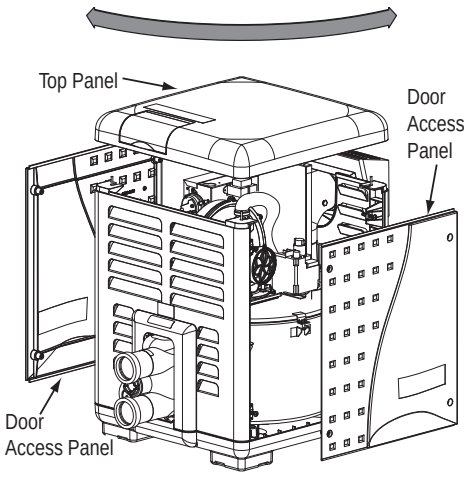


Figure 19.

FINAL INSTALLATION CHECK

Check that horizontal vent pipe runs slope uniformly at least 1/4" per foot (2cm per meter) to condensate drain(s). No sags, no dips, no high or low spots.

Check that vent is supported at elbows, tees, and horizontal and vertical runs according to manufacturer's instructions and code requirements.

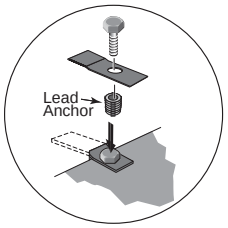
Check that vent supports and wall and ceiling penetrations allow free movements up, down, and sideways without putting any strains on the heater or vent body.

Check for at least six inch (15cm) free air clearance between the heater vent pipe and combustible materials.

Check that all joints are completely together and sealed.

In Florida, building codes require that the heater be anchored to the equipment pad or platform to withstand high wind pressures created during hurricanes. A Bolt Down Bracket Kit, P/N 460738, is available with anchor clamps designed to hold the unit to the equipment pad in high wind conditions. Installation of the anchor clamps are recommended in all installations and are required in Florida, (See Florida Building Code 301.13).

For Heater mounting bolts and clamps, purchase separately Bolt Down Bracket Kit, Part No. 460738.



ELECTRICAL CONNECTIONS

Electrical Rating: 60 Hz 120 / 240 Volts AC, single phase

Enclose the incoming AC power line to the heater, in an approved flexible conduit connected directly to the junction box on the inside of the access door panel. Line voltage field wiring should be 14 gauge, with a circuit capacity of 15 Amps.

⚠CAUTION

This heater is designed to operate at 120 or 240 VAC. It is not recommended to be connected to OR operate on a 208 VAC.

NOTE

- Before making any electrical connections to the power supply, remove the access door panels, open the control box and plug in the correct plug (120 VAC or 240 VAC). See plugs below.

⚠CAUTION

The heater ships from the Factory with the 240 VAC plug installed. Installing the 120V plug and then connecting the heater to 240V line current will immediately destroy the transformer, control board and ignition control module, and will void warranty. If you install the 240V plug and connect the heater to 120 VAC line current, the heater will not operate.

- If any of the original wiring supplied with this heater must be replaced, installer must supply (No. 18 AWG, 600V, 105° C. U.L. approved AWM low energy stranded) copper wire or it's equivalent.

Please read the boxes headed **"IMPORTANT! READ ME FIRST!"** on pages 38 and 42 before proceeding.

1. All wiring must be in accordance with all applicable codes.
2. The heater, when installed, must be electrically grounded and bonded in accordance with local codes or, in the absence of local codes, with the National Electrical Code or the Canadian Electrical Code (as applicable). A bonding lug is provided on the outside of the panel under the vent for this purpose.
3. Electrical power circuits to the pool heater must follow local codes and National Electrical Code or Canadian Electrical Code (as applicable).
4. All wiring between the heater and devices not attached to it, or between separate devices which are installed in the field, must be "Type T" wire rated for 35°C rise.
5. All line voltage wiring shall be enclosed in approved flexible conduit, and shall be securely attached to the field wiring box located inside the access door panel. The conduit or cable connector at the field wiring box should contain an insulating bushing or its equivalent to prevent abrasion of the wires as they enter the box.
6. **The filter pump should run continuously when the heater is on, and for at least 5 minutes after the heater turns off.** Any switches in the pump circuit (including circuit breakers) that can disconnect the pump must also disconnect the heater.
7. Do not wire single-pole switches, including protective devices, into a grounded line. The heater is not sensitive to polarity.

Connect the **L1** of the power supply to the **black** wire, the **L2** or neutral lead to the **red** wire, and the **ground** wire to the **green** wire. A time clock controlling the filter pump should have a low-voltage Fireman's Switch that switches off the heater at least 15 minutes before shutting off the pump.

Always use crimp type connectors when connecting two wires.

AC VOLTAGE SELECT PLUGS: (120 VAC or 240 VAC)

Figure 20.

CONNECTION OF FIREMAN'S SWITCH OR REMOTE CONTACT

⚠CAUTION

If, while there is line voltage connected to the heater, you touch either line voltage terminal with any 24VAC wire that is connected to the control board (including the Fireman's Switch jumper), you will immediately destroy the control board and void the warranty.

REMOTE CONTROL CONNECTIONS

1. Switch off power to heater at main circuit breaker panel.
2. Unbolt and remove the access door panels.
3. Open control box cover (see Figure 21).

4a. *To connect a 2-Wire Control* (such as Pentair's IntelliTouch® or EasyTouch® Control Systems) *or a timer:*

- Remove the factory installed jumper from the Fireman's Switch terminals.
- Connect wires between the Fireman's Switch terminals on the heater and the relay. Connect wires from the controller or timer to the Fireman's Switch. Controller, timer or relay should be sized to handle 24VAC at 0.5 Amp (because it will be completing the 24VAC control board circuit on the heater as shown in Figure 22). DO NOT apply line voltage to the Fireman's Switch terminals. Use 18 gauge wire with a minimum 3/64" (1.2mm) thick insulation rated for a temperature rise of at least 105°C.
- Knock-outs are provided to route the wires through the bottom of the control box and past the junction box.

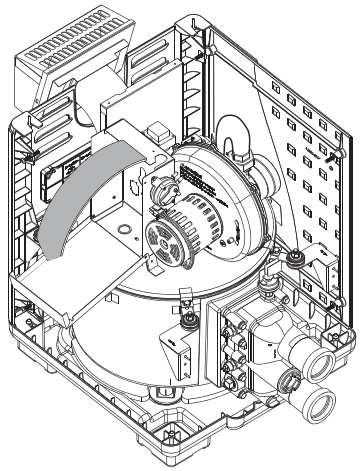


Figure 21.

4b. *To connect a 3-Wire Control:*

- Connect wires between the control board terminals on the heater and the external relays, as shown in Figure 23. Use at least 2 relays per heater, to allow for an "OFF setting" on each heater mode. Select relays that can handle logic level switching. DO NOT apply line voltage to control board terminals.
- Move jumper (as shown on Figure 23) to enable external control and to disable the heater membrane pad's "Pool ON" and "Spa ON" buttons (the "OFF" key on the membrane pad remains functional).
- Knock-outs are provided to route the wires through the bottom and the top of the control box and past the junction box.

5. Close control box cover.
6. Re-install the access door panels.

To control heaters that are operated in parallel, connect wiring at same locations on heater as 2-Wire or 3-Wire Control. It is imperative that each control circuit is isolated from the other control circuits, to avoid that current will flow from one heater to another through the control circuits.

NOTICE: The fuse for the Fireman's Switch is a 1.25 Amp 1¼ x ¼" fast blow fuse, which is commonly available.

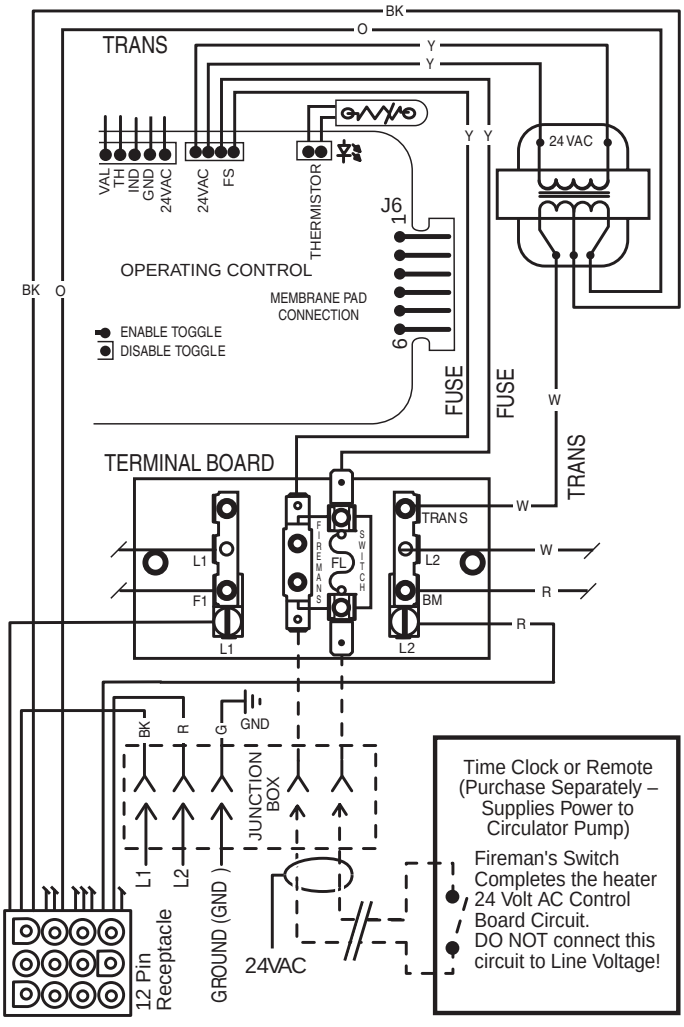


Figure 22.

MASTERTEMP HEATER WIRING DIAGRAM

(3-WIRE SYSTEM)

CONNECTION DIAGRAM

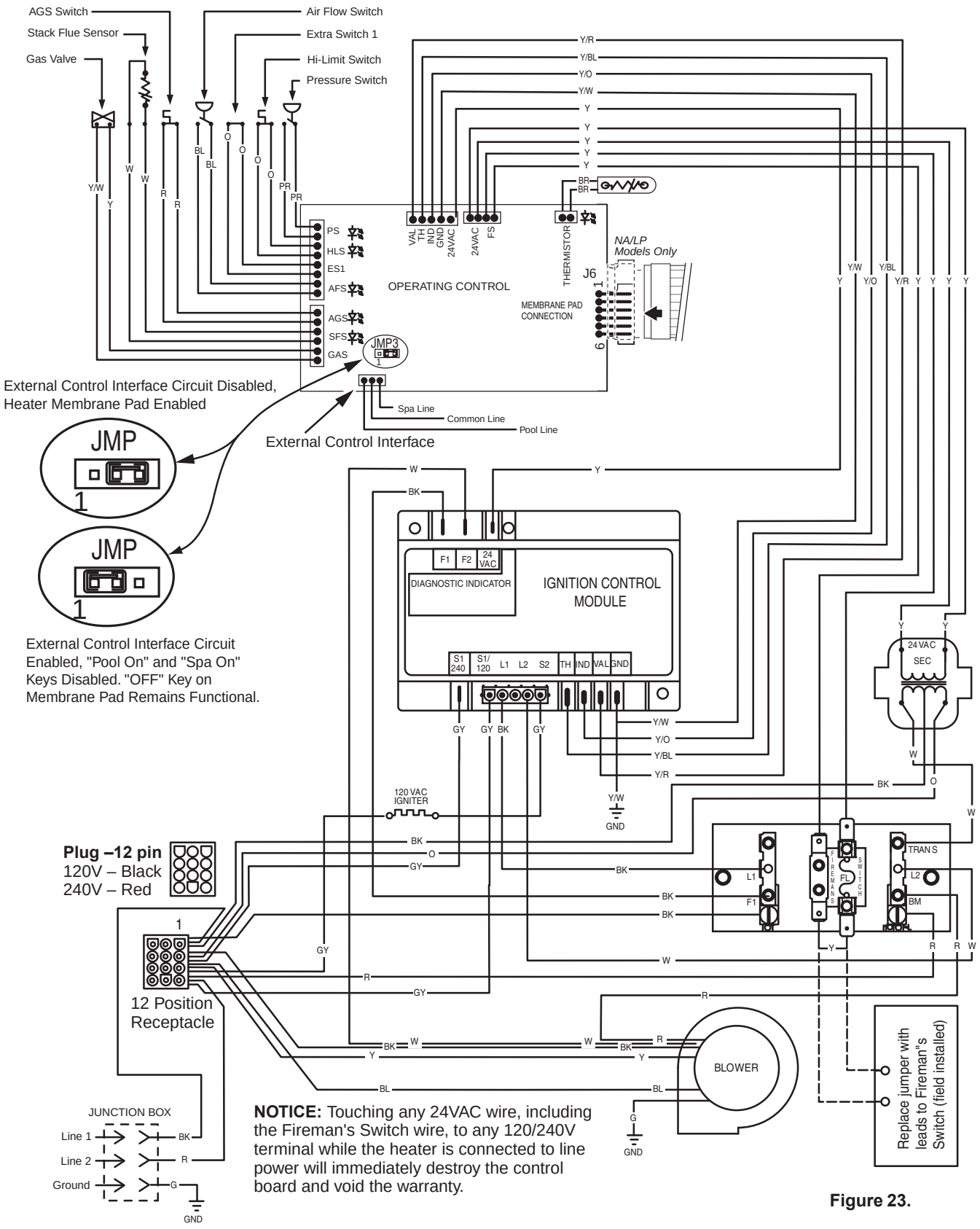
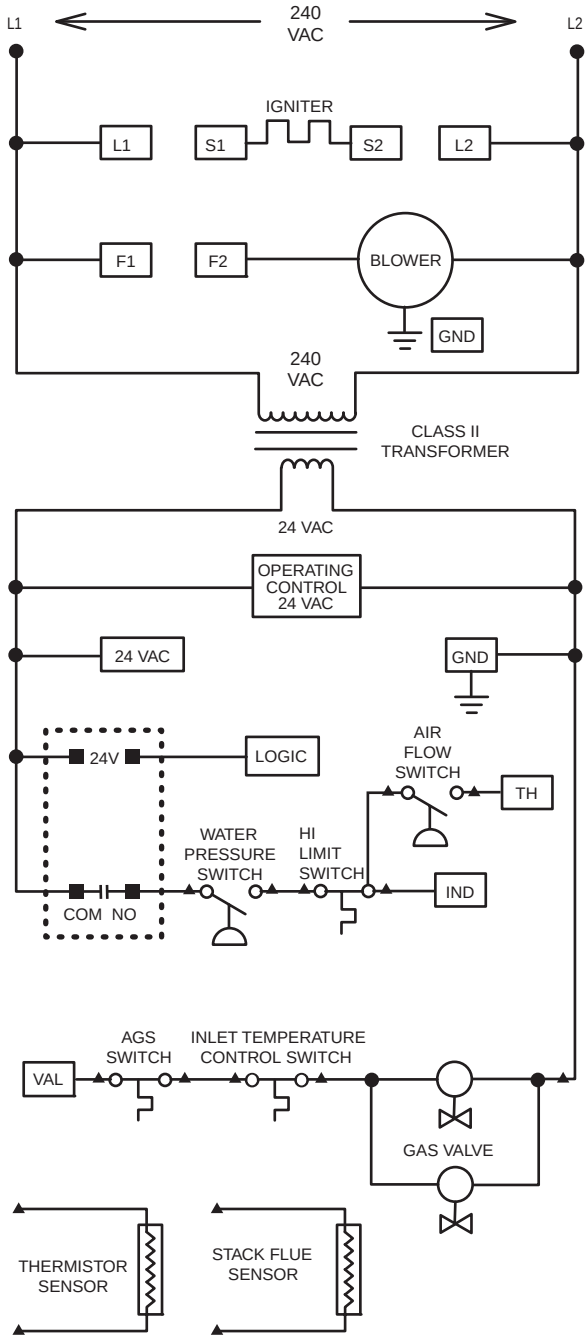


Figure 23.

MASTERTEMP HEATER ELECTRICAL SCHEMATIC LADDER DIAGRAM

LADDER DIAGRAM



NOTES:

1.) L1 L2 F1 F2 S1 24 VAC S2 GND IND VAL AND TH

ARE CONNECTED ON THE IGNITION MODULE.

2.) ▲ PIN AND SOCKET CONNECTOR.

3.) IF ANY OF THE ORIGINAL WIRES AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, THEY MUST BE REPLACED WITH TYPE 105° C OR ITS EQUIVALENT.

Figure 24.

Operation Instructions

BASIC SYSTEM OPERATION

Start pump, make sure the pump is running and is primed, to close the water pressure switch and supply power to heater. Be sure the pool and/or spa is properly filled with water. Follow the Lighting/Operating instructions below.

MASTERTEMP HEATER HSI ELECTRONIC IGNITION LIGHTING/OPERATION

FOR YOUR SAFETY: READ BEFORE LIGHTING

⚠WARNING	
	If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.
	Do not attempt to light the heater if you suspect a gas leak. Lighting the heater can result in a fire or explosion which can cause personal injury, death, and property damage.

START-UP AND OPERATION

START-UP AND SHUTDOWN INSTRUCTIONS ARE ON THE LABEL ATTACHED TO THE COVER OF THE APPLIANCE CONTROL BOX.

BEFORE START-UP

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burners. 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 electrical 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. Use only your hand to turn the gas control on or off. Never use tools. If you cannot change the ON/OFF setting by hand, don't try to repair it, call a qualified service technician. Forced or attempted repair may result in a fire or explosion.

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

E. Do not operate the pool heater unless the pool or spa is properly filled with water.

F. Before operating the appliance for the first time or after it has been off for an extended time, perform the following checklist:

1. Remove debris or other articles from inside the heater and the area around the heater and its exhaust vent. Make sure the ventilation openings are clear of debris or obstruction. For installations in an enclosed space, make sure openings for combustion and ventilation air are unobstructed.
2. Keep heater area clear and free from combustibles, flammable liquids and chemicals.
3. Check that all water connections are tight.
4. Water must be flowing through the heater during operation. Make sure that pool/spa is filled with water and have pump operating. Check that water flow is unobstructed from the appliance. When operating for the first time or after an extended shut-down, run filter pump for several minutes to clear all air from the system.

OPERATING INSTRUCTIONS

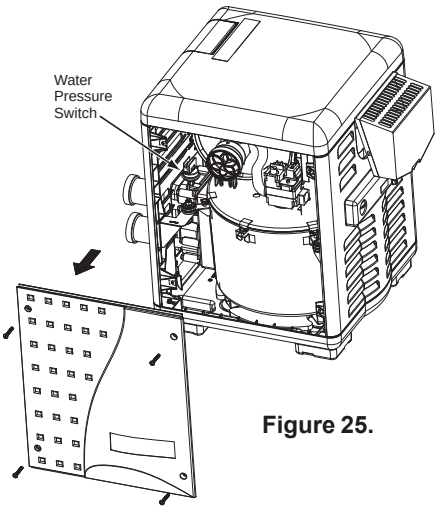


Figure 25.

1. **STOP!** Read the safety information on (page 33).
2. Set both pool and spa thermostats to the lowest settings.
3. Turn off all electric power to the appliance.
4. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Remove the access door panels by unfastening the four screws located on each door, then lift up and out from the bottom of the panel to remove. If necessary, the screws may be used as handles, see Figure 25.
6. **Toggle-Style Valve:** Pull toggle toward you to turn gas off , see Figure 26.
7. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "B" in the "Before Start-up" instructions (page 33). If you don't smell gas, go to the next step.
8. Push the toggle switch away from you to switch the gas on.
9. Replace the Door Access Panels. All panels must be in place when operating the heater.
10. Set 3-way valves on inlet and outlet to pool or spa, as appropriate.
11. Turn on all electric power to the appliance.
12. Press either the POOL ON or SPA ON button switch on the operating control.
13. Set the thermostat to desired setting (***NOTICE:*** Setpoint must be above actual water temperature or burner will not fire). See "OPERATING the CONTROL PANEL".
14. The blower should come on immediately, and after about 20 seconds, the burner should fire. When operating for the first time, the burner may not fire on the first try because of air in the gas line. If it does not fire at first, push the OFF switch, wait five minutes, and again push the POOL or SPA ON switch. The burner should fire after about 20 seconds. You may have to repeat this until all of the air has cleared the gas line.

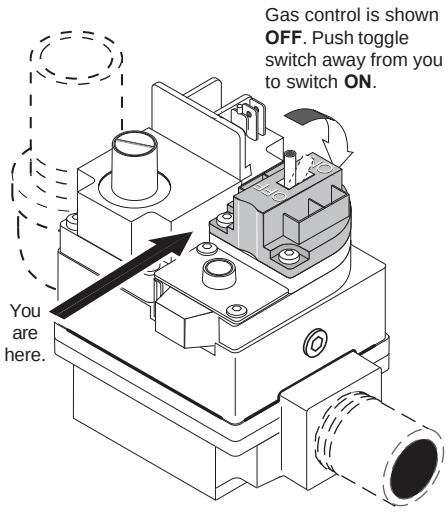


Figure 26.

15. The burner should fire until the pool/spa temperature reaches the desired temperature set on the thermostat. The blower will continue to run for about 45 seconds after the burner shuts off. If any of the safety interlocks should open during burner operation, the burner shuts off immediately, but the blower continues to run for about 45 seconds. Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the appliance.
16. If the appliance will not operate, follow the instructions below "TO TURN OFF GAS TO THE APPLIANCE", and call your service technician or gas supplier.

TO TURN OFF GAS TO APPLIANCE

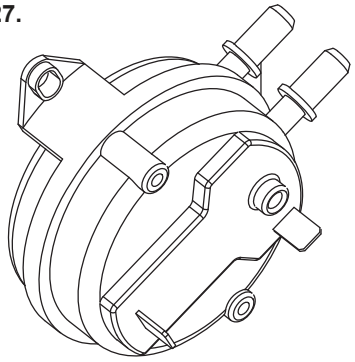
1. Press the OFF button on operating control.
2. Switch off all electric power to the unit.
3. Remove the access door panels, see Figure 25.
4. **Toggle-Style Valve:** Pull toggle toward you to turn gas off, see Figure 26.
5. Replace the Access Door Panels.

SAFETY CONTROLS

AIR FLOW SWITCH (AFS)

The air flow switch, (see Figure 27), is a safety device used to insure that the combustion air blower (fan) is operating and has been designed to monitor the vacuum (negative) pressure within the blower housing. The air flow switch is factory set and is connected upstream of the ignition module. The ignition module does not operate unless the air pressure switch and all safety switches are closed.

Figure 27.



Air Flow Switch

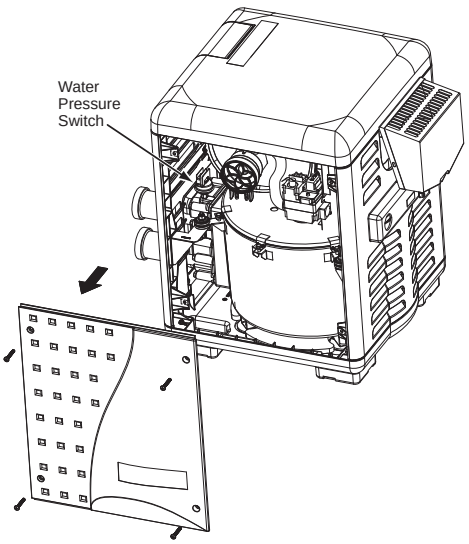
WATER PRESSURE SWITCH

⚠WARNING

Hazardous pressure. Do not bypass the Water Pressure Switch or render it inoperable.

The water pressure switch, (see Figure 28). If the water flow is restricted, the water pressure switch may prevent the burner from firing and cause the "Service System" light to go on. If the light remains on after the filter has been serviced, have a qualified service technician check the system.

Figure 28.



For deck-level heater installations, the Water Pressure Switch is factory set at 3.00 psi (20.6 kPa). ***NOTE:*** *See, Below Pool Level Installation Instructions on page 13*. If the pressure switch is one feet (.3M) below or above the pool water level, reset the switch so that it is open when the pump is off and closed when the pump is running. Turn the star-wheel on the switch clockwise (↷) to raise setting (heater below the pool) and counterclockwise (↶) to lower the setting (heater above the pool – see Figure 29. Test the switch after resetting.

NOTICE: When the heater is mounted more than five feet (1.5M) above or four feet (1.2M) below the deck level, a Pressure Switch is no longer adequate. A Flow Switch must be installed instead.

NOTICE: Heater operation with incorrect Pressure Switch setting may cause operation with no water flow. Operation of the heater without sufficient water flow may severely damage it.

HIGH LIMITS

A "High Limit", is a safety device that opens the electrical circuit and shuts off the heater based on a water temperature set point within the "High Limit Device". The MasterTemp heater series of heaters contains two (2) high limit devices which are located on the main inlet / outlet header.

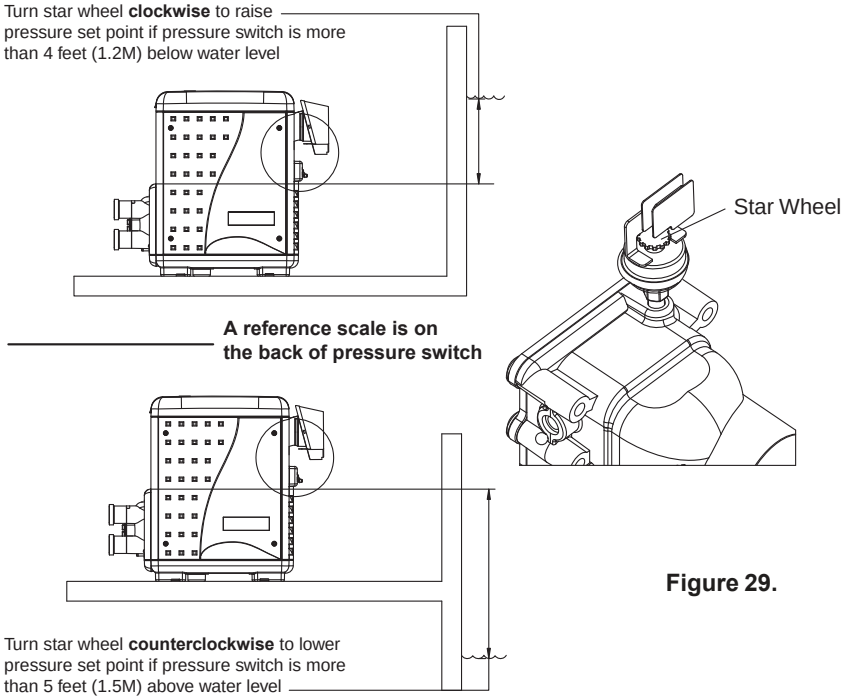


Figure 29.

SAFETY CONTROLS, (cont'd.)

OPERATION OF IGNITION MODULE

The Ignition Module, (see Figure 30), is microprocessor based and operates on 24VAC supplied by the transformer. The control utilizes a microprocessor to continually and safely monitor, analyze, and control the proper operation of the gas flame holder. The module with the presence of the flame sensor, using flame rectification, allows the heater to operate.

Figure 30.

OPERATING THE CONTROL PANEL

The five operating switches are:

POOL ON	Press this button to govern heater operation by the pool temperature setting.
SPA ON	Press this button to govern heater operation by the spa temperature setting.
HEATER OFF	Press this button to switch off the heater.
▲ TEMP	Press this button to raise the temperature setting.
▼ TEMP	Press this button to lower the temperature setting.

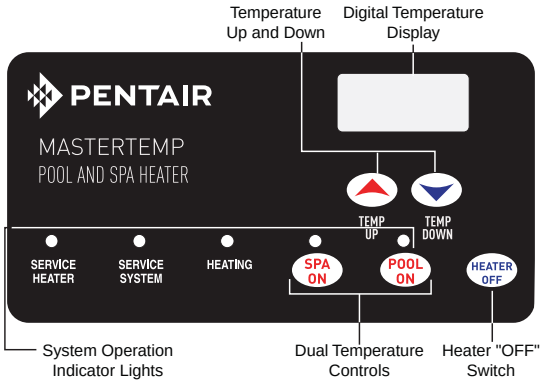


Figure 31.

To toggle the display between degrees Centigrade (°C) and degrees Fahrenheit (°F):

1. Turn the Operating Control OFF.
2. Press **▲TEMP** or **▼ TEMP** for 5 seconds. The display will flash once and change modes (°C to °F or vice versa).
3. Turn the Operating Control ON.

When either the **▲TEMP** or **▼ TEMP** buttons are depressed, the digital display will indicate the temperature setting. After five seconds, the display will return to the actual pool/spa temperature.

In addition to the digital temperature display, there are five indicator lights:

The **POOL ON** light indicates that the pool water temperature is governing operation of the heater.

The **SPA ON** light indicates that the spa water temperature is governing operation of the heater.

The **HEATING** light comes on and stays on when the burner is firing. This light should be on whenever the burner is on. It blinks when the heater is calling for heat but not firing. If this light is on but the burner fails to come on, one of the "service" lights should come on, indicating a fault in the system.

The **SERVICE SYSTEM** light indicates that there is insufficient water flow to the heater. If the pump is operating, this usually indicates that the filter and/or skimmers should be cleaned (some filters may require back-washing). If the light remains on after the filter/skimmers have been serviced, the system should be checked by a qualified service technician.

The **SERVICE HEATER** light indicates a fault in the heater or its controls. If this light comes on, shut down the heater (See "TO TURN OFF GAS TO THE APPLIANCE" on page 34), and have a qualified service technician check the system.

⚠WARNING

Risk of explosion or fire causing burns or death if safety interlocks are disabled. DO NOT attempt to operate heater when SERVICE HEATER light is on or if blower or burner will not start. Instead, follow instructions under "To Switch Off Gas to the Appliance," and call a qualified service technician to repair unit.

TEMPERATURE SETTING

The heater comes factory set at 78° F. for the pool mode and 100° F. for the spa mode. Using the up and down arrows, you can set the thermostats to a minimum temperature of 65° F., or a maximum of 104° F. If you desire to heat only one body of water, the thermostat is capable of an off mode. As an example, if you only wish to heat the spa and not the pool, simply depress and hold the pool down arrow, and the thermostat will lower its setting to 65° F. then go to an off mode.

MAXIMUM TEMPERATURE SET POINT

1. Unbolt and remove the door panels (see Figure 32).
2. Access the control panel board on the underside of the top cover. Locate the yellow button on the corner of the control board.
3. Push the **Max. Temp. Set Point** button on the back of the control board (see Figure 33).

The following sequence should happen:

A. The unit will come on and the **POOL ON** light will come on.

B. Press the ▲**TEMP** or ▼ **TEMP** pad (on TOP of the panel) to set maximum pool temperature.

C. Wait up to 30 seconds; the **POOL ON** light will go off and the **SPA ON** light will come on. To override the time delay, push the **Max. Temp. Set Point** button again.

D. Press the ▲**TEMP** or ▼ **TEMP** button on the control panel and set maximum spa temperature to 104°F (40°C) or less.

E. Wait up to 30 seconds; the **SPA ON** light will go off and the unit will shut down. To override the time delay, push the **Max. Temp. Set Point** button again.

4. Reinstall the access door panels.

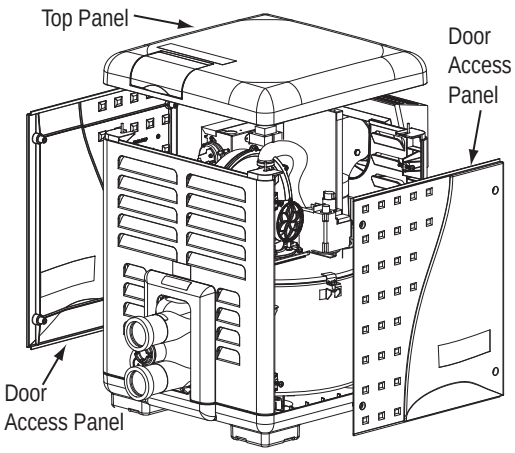


Figure 32.

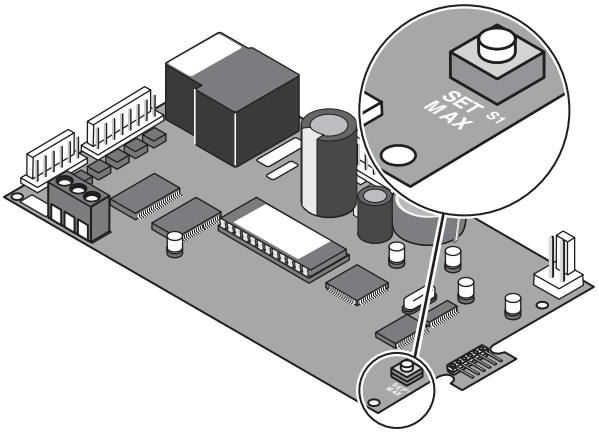


Figure 33.

Troubleshooting Instruction

Initial Troubleshooting

Only qualified, trained service technicians with appropriate test equipment should service the heater. Remember that all parts of the system affect heater operation. Before starting this troubleshooting procedure, make sure that the pump is running correctly, that there are no blockages in the system, that the valves are correctly set and that the time clock is correctly set and is running.

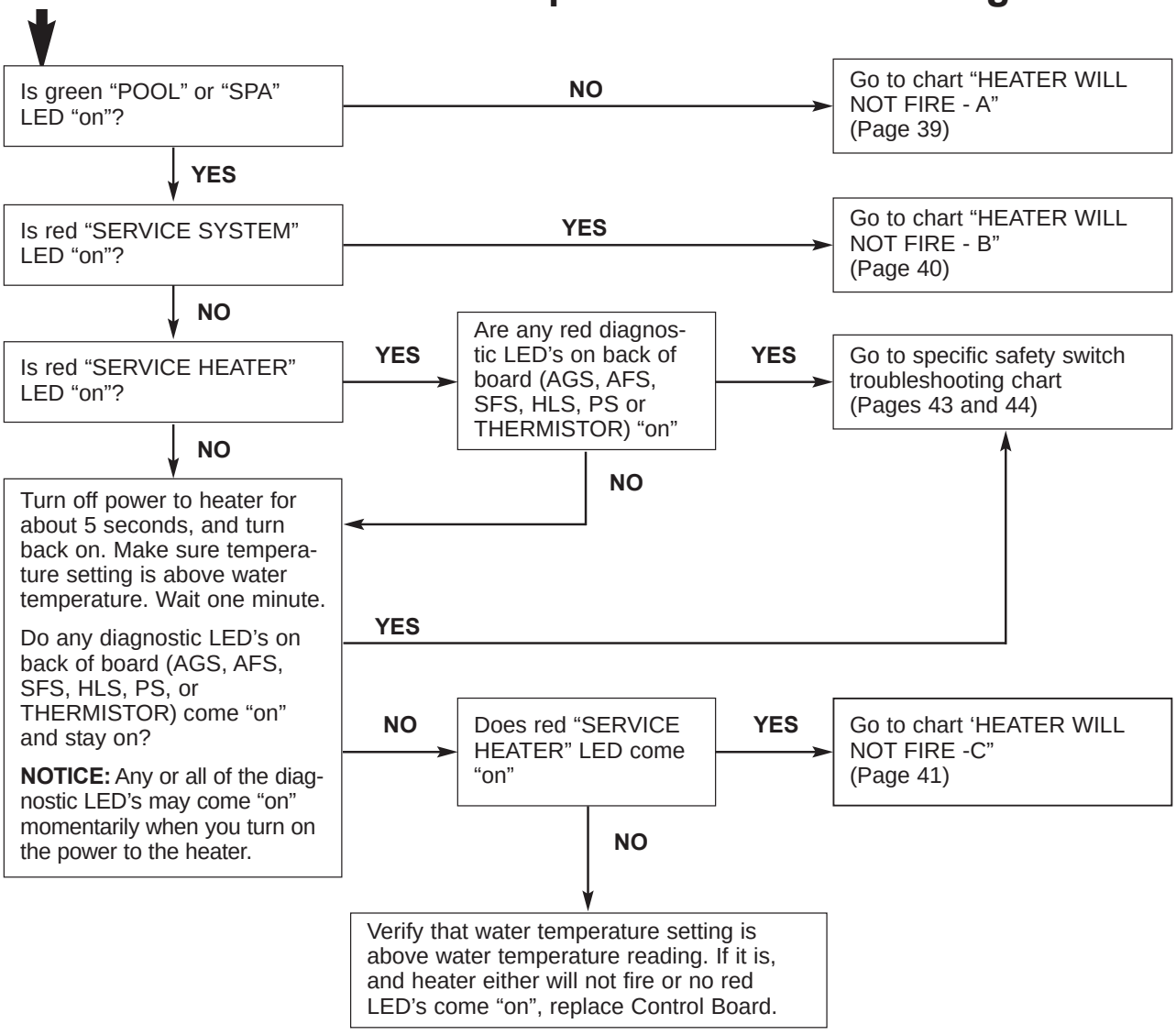
IMPORTANT! READ ME FIRST!

NOTICE: Installing the **black 120 volt** plug in the control box and then connecting the heater to a **240 volt line will destroy the trans - former, control broad, and ignition control module, and will void the warranty.** If you install the red 240 volt plug and then connect the heater to a 120 volt line, the heater will not operate.

READ THE FOLLOWING CAREFULLY:

1. Check the line voltage to your heater. This heater will operate on either 120 Volts AC or 240 Volts AC.
2. Remove the covers and check the 12-pin plug in the back of the control box. The plug must match the voltage in the heater circuit.
3. If the 12-pin plug is not plugged into the back of the control box, select the correct plug from the bag in the control box and plug it in. The **BLACK** plug is for **120 volts,** the **RED** plug is for **240 volts.**

Start here for directions to specific Troubleshooting Chart

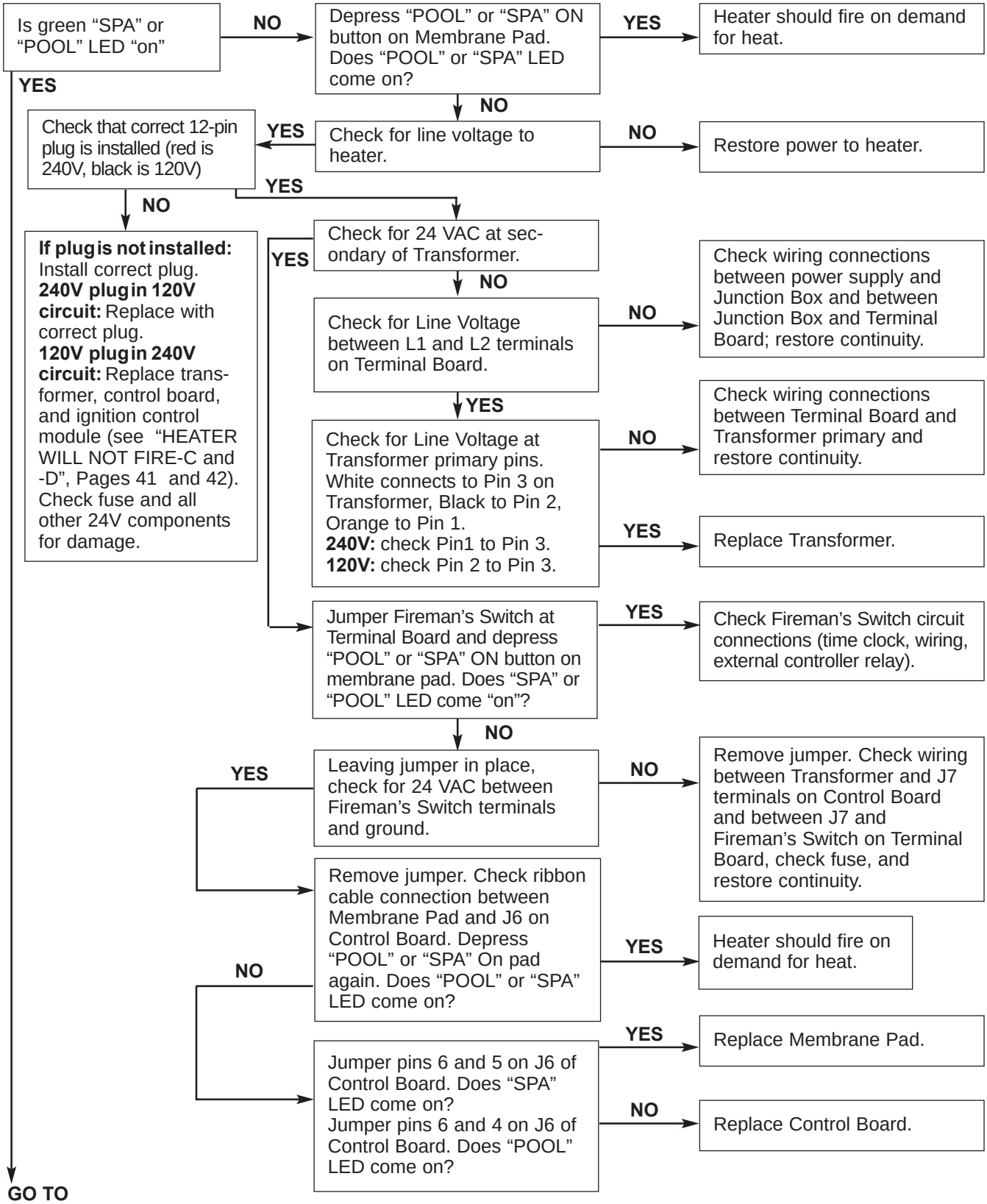


⚠ WARNING **Hazardous voltage. Can shock, burn or kill.** Disconnect power before servicing any components.

⚠ WARNING **Fire and Explosion hazard.** Do not jumper switch terminals to remedy a failed safety switch.

Heater Will Not Fire - A

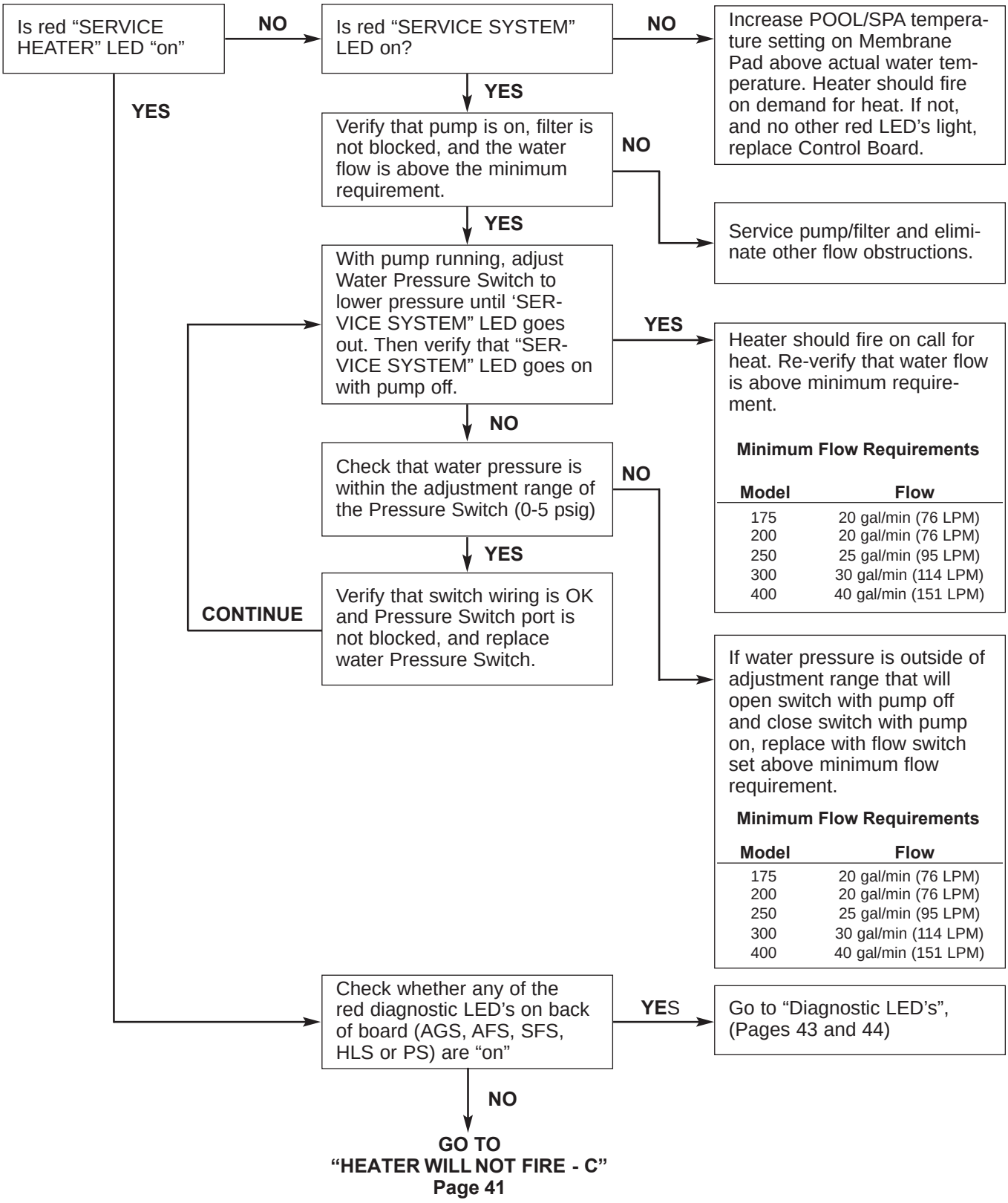
Start



GO TO “HEATER WILL NOT FIRE - B” Page 40

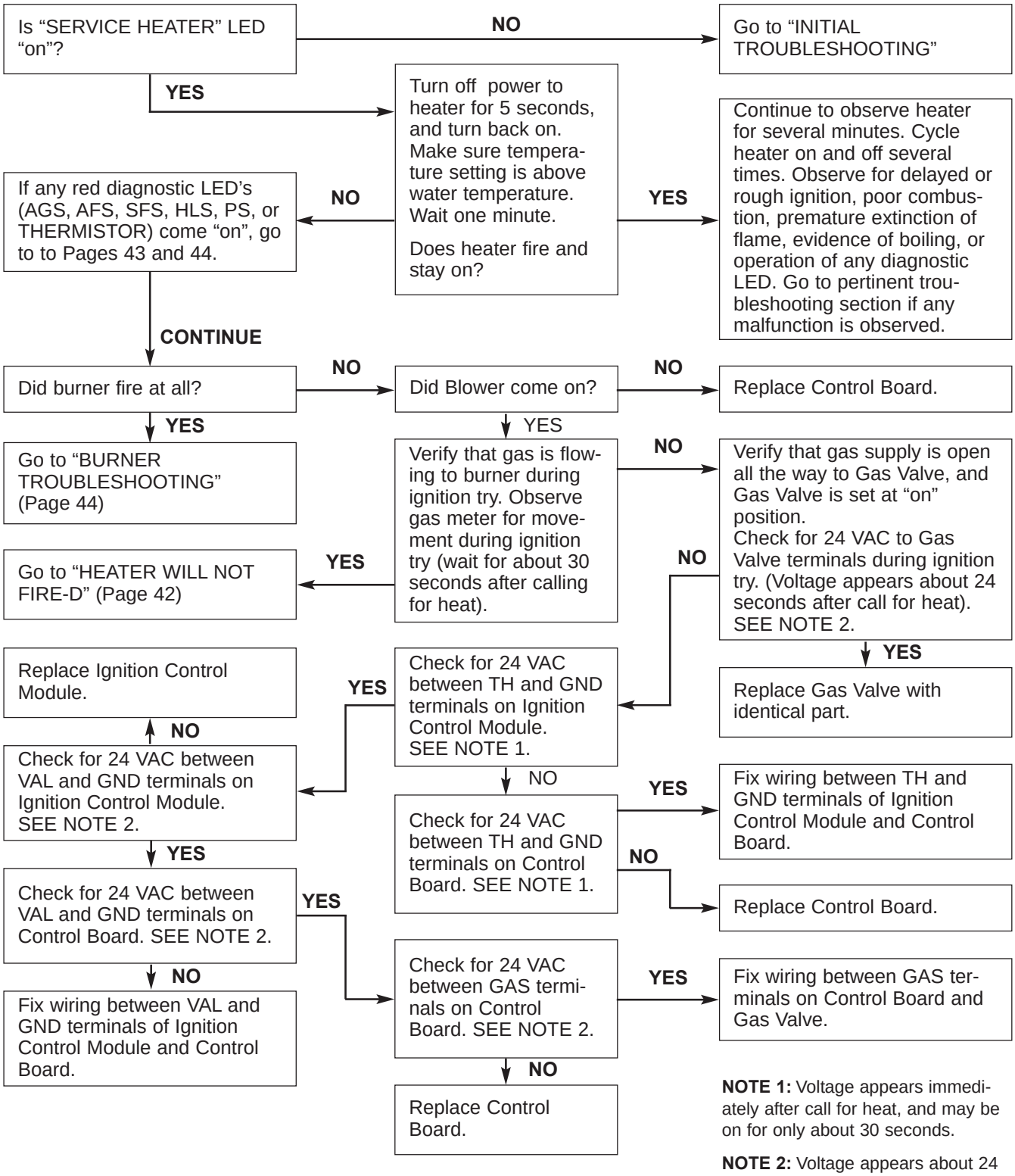
Heater Will Not Fire - B

Start



Heater Will Not Fire - C

Start



NOTE 1: Voltage appears immediately after call for heat, and may be on for only about 30 seconds.

NOTE 2: Voltage appears about 24 seconds after call for heat, and may be on for only about 7 seconds.

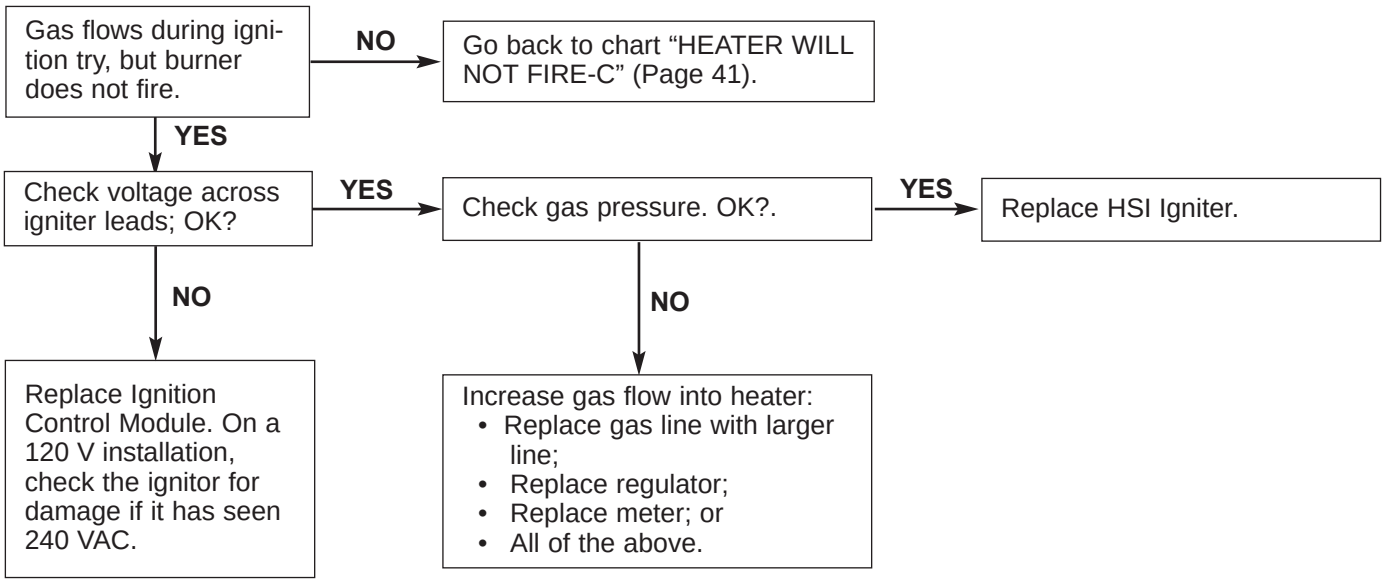
Heater Will Not Fire - D

IMPORTANT! READ ME FIRST!

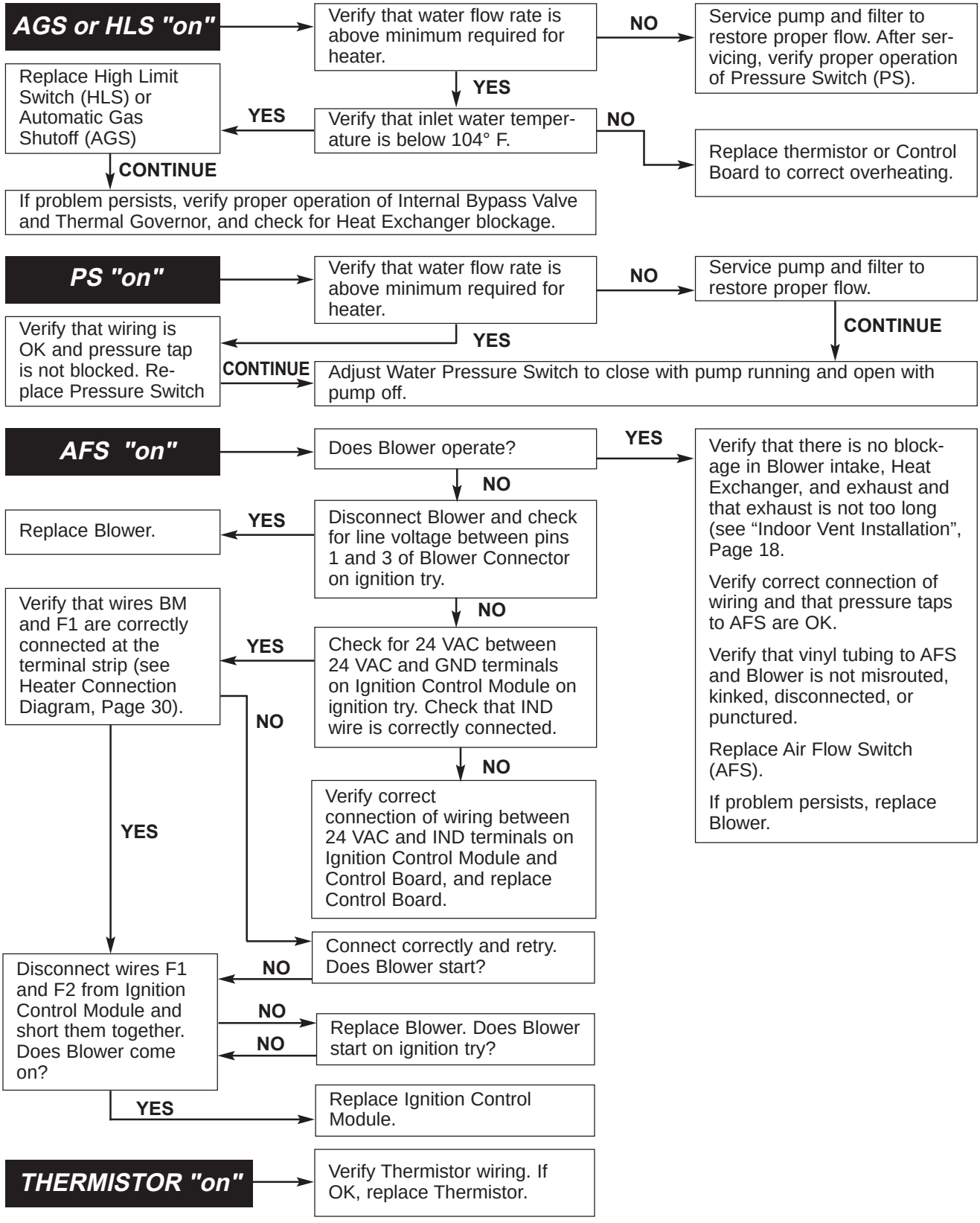
IMPORTANT! READ ME FIRST!!

If your heater is correctly connected to **240 Volts AC,** the Ignition Control Module (ICM) will convert the 240VAC to an intermittent pulse to the ignitor. Digital meters don't read this type of signal well. (An analog meter will give a better reading than a digital meter). If the ICM is bad, your voltmeter will read either 0 VAC or 240 VAC. If your ICM is good, your meter will read some voltage between 0 and 240 VAC. Exactly what reading you get will depend on the meter, but with a good ICM, the reading won't be 0 VAC or 240 VAC, but somewhere in between.

Start



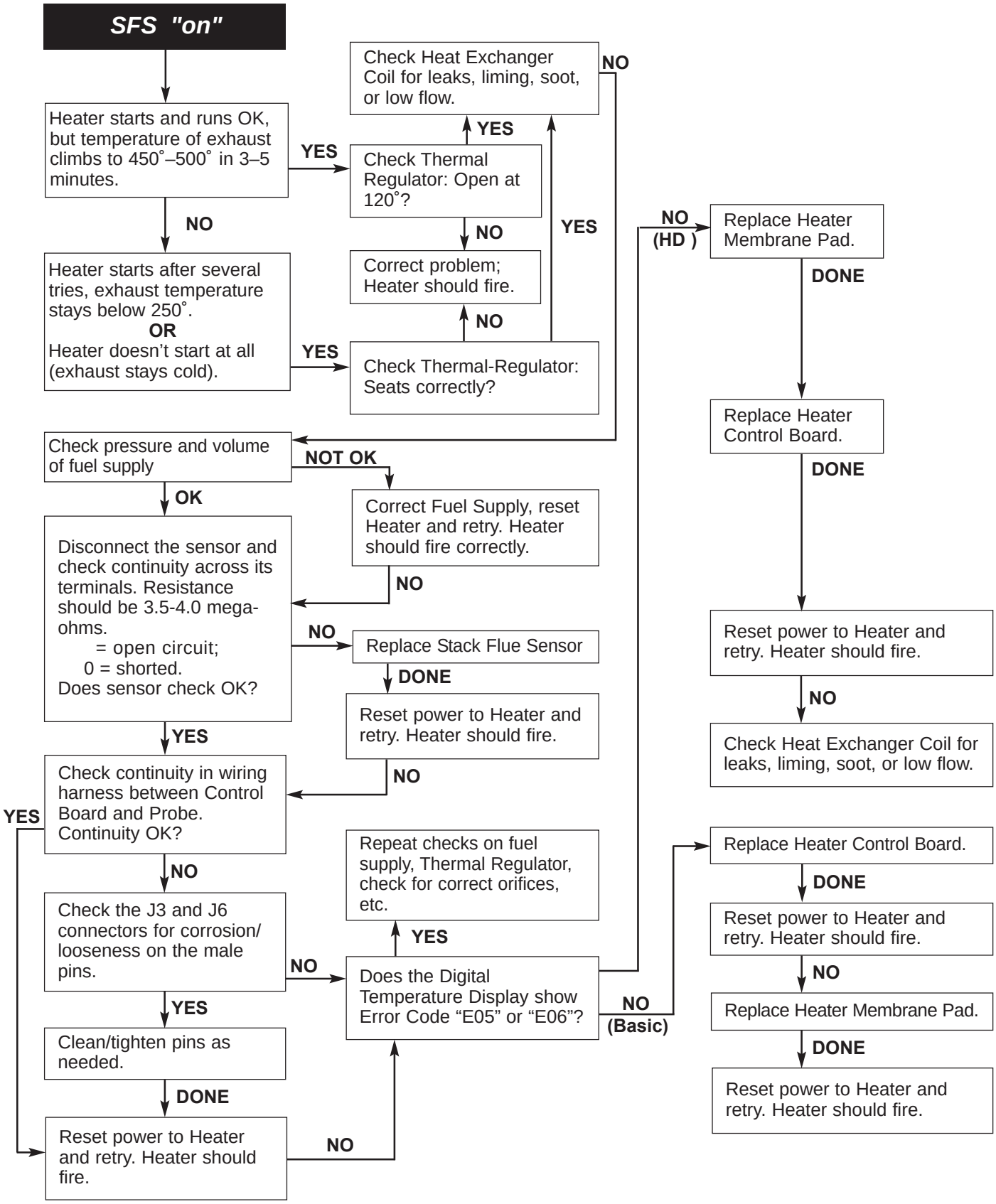
Diagnostic LED's: AGS, AFS, HLS, PS, THERMISTOR



⚠ CAUTION Do not jumper a safety switch to remedy a failed switch.

NOTE: ES1 is a spare and should be jumpered.

Diagnostic LED's: SFS



Burner Troubleshooting

SYMPTOM	CAUSE	REMEDY
Loud, high-pitched whine	Flame is too rich.	Verify pressure tap between gas valve and blower inlet. See page 15 and verify that the gas regulator setting is –0.2" (–0.5cm) wc. Contact a qualified technician or service agency to replace the gas orifice.
Flame is "fluttery." Exhaust may have acrid smell or burner may fail to stay lit.	Flame is too lean.	See page 16 and verify that the gas regulator setting is –0.2" (–0.5cm) wc. Contact a qualified technician or service agency to replace the gas orifice.
Burner pulsates or surges, especially on ignition.	Exhaust vent is too long.	Reduce length of exhaust vent and/or number of elbows.
Combustion appears normal, but flame does not stay lit.	Flame current is not being sensed.	Check for wet or damaged igniter with low resistance to ground. Replace with new igniter. Verify burner flameholder is properly grounded. Replace Ignition Control Module.

Heat Exchanger Troubleshooting

SYMPTOM	CAUSE	REMEDY
Boiling in heat exchanger. May be accompanied by "bumping" sounds.	Low water flow to heater.	Service pump and or filter.
	Heat exchanger plugged.	Service heat exchanger. Correct water chemistry.
	Bypass valve stuck open.	Service bypass valve.
	Thermal governor stuck closed.	Replace thermal governor.
Sweating.	Thermal governor failed.	Replace thermal governor.

Maintenance Instructions

CARE AND MAINTENANCE

⚠WARNING

Risk of fire or explosion from flammable vapors. Do not store gasoline, cleaning fluids, varnishes, paints, or other volatile flammable liquids near heater or in the same room with heater.

The following maintenance is recommended every six months and at the start of every swimming season:

1. Inspect the heater panels and venting system to make sure that there are no obstructions to the flow of ventilating air or burner exhaust. Check that room air intakes are open and clear of obstructions.
2. Keep the area in and around the heater clear and free from combustible materials, gasoline and other flammable vapors and corrosive liquids.
3. Test the operation of the pressure relief valve by lifting the valve lever (if installed).
4. Test for proper operation of the water pressure switch. (See “WATER PRESSURE SWITCH” (page 35) for testing instructions).
5. On enclosed installations with high-temperature Special Gas Vent systems, repeat the “Final Installation Check,” page 28. Check for evidence of joint leakage. Make sure that joints have not slipped partially or completely apart. Check pipe and fittings for cracks or breaks. The combustion air blower is permanently lubricated, and does not require periodic lubrication. The burner does not require maintenance or adjustment by the user. Call a qualified service technician if you suspect that the burner may require maintenance.

PRESSURE RELIEF VALVE (NOT FACTORY INSTALLED)

Canadian code requires and some U.S. local codes may require installation of a Pressure Relief Valve (PRV). Purchase separately and install (P/N 460925) a 3/4" pressure relief valve complying with the ANSI/ASME Boiler and Pressure Vessel Code, having a capacity equal to the Btu/hr rating of the heater.

The relief pressure of the valve MUST NOT EXCEED 50 PSI. The relief valve must be installed vertically. To install the valve, use a 3/4" x 3-1/2” brass nipple at the manifold and one brass elbow and nipple (supplied), as shown in Figure 34. No valve is allowed to be placed between the manifold adapter and the relief valve.

To avoid water damage or scalding from operation of the relief valve, install a drain pipe in the outlet of the pressure relief valve that will direct water discharging from the valve to a safe place for disposal. Do not install any reducing couplings or valves in the drain pipe. The drain pipe must be installed so as to allow complete drainage from the valve and drain line. ***The relief valve should be tested at least once a year by lifting the valve lever.***

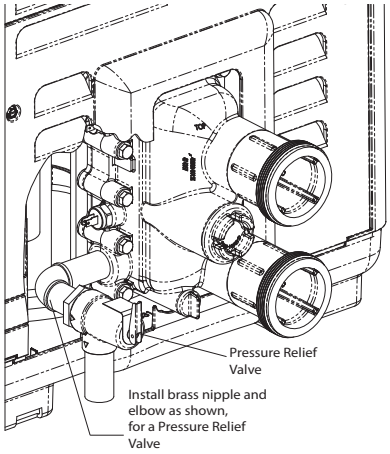


Figure 34.

⚠WARNING

Explosion hazard. Any heater installed with restrictive devices in the piping system downstream from the heater, (including check valves, isolation valves, flow nozzles, or therapeutic pool valving), must have a relief valve installed as described above.

AFTER START-UP

CHECKING WATER FLOW

⚠WARNING

Fire or flooding hazard. If the unit overheats and the burner fails to shut off, follow instructions under "To Turn Off Gas to the Appliance", page 34, and call a qualified service technician to repair unit.

After start-up, the outlet water pipe should feel slightly warmer than the inlet pipe. If it feels hot, or if you hear the water in the heater boiling, there may not be enough water flow to the appliance. Make sure that the filter is not plugged. If water temperature remains high but the unit continues to operate, turn off the appliance and call your service technician.

SPRING AND FALL OPERATION

If the pool is only used occasionally, lower the pool thermostat to 68° F (20° C) and leave the heater on. This will keep the pool and the surrounding ground warm enough so that the heater should restore the pool to a comfortable temperature within about one day.

WINTER OPERATION

⚠CAUTION

- **Operating this heater continuously at water temperatures below 68° F. (20° C) will cause harmful condensation and will damage the heater and void the warranty.**
- **If the heater has been drained for freezing condition, do NOT turn "ON" until the system is circulating water.**
- **Water trapped in the heat exchanger can result in freeze damage to the exchanger or headers. Freeze damage is specifically not covered by the warranty.**
- **When starting the heater for the swimming season with a water temperature below 50° F (10° C), the heater may be used to heat the water; however, make sure that the heater operates continuously until the water temperature reaches the heater's minimum setting of 68° F (20° C). During cold weather, if there is no danger of freezing, operate the filter pump continuously even if the heater is not operating. If air temperatures are expected to drop below freezing (32° F/0° C), shut down the heater and winterize it.**

For outdoor heaters in freezing climates, shut the heater down and drain it for winter as follows:

1. Turn off electrical supply to the heater and pump.
2. Close main gas control valve and manual gas valve (located outside the heater). Turn switch on heater gas valve to OFF.
3. In northern climates where they may be required, open drain cock located on the bottom of the manifold adapter, and drain the heat exchanger and manifold adapter completely. If heater is below pool water level, be sure to close isolation valves to prevent draining the pool (isolation valves are not required and should not be used on heaters installed above pool water level except when needed for winterizing valves). Assist the draining by blowing out the heat exchanger through the pressure switch fitting with low pressure compressed air (less than 5 PSI or 35 kPa).

⚠WARNING

Explosion hazard. Purging the system with compressed air can cause components to explode, with risk of severe injury or death to anyone nearby. Use only a low pressure (below 5 PSI or 35 kPa), high volume blower when air purging the heater, pump, filter, or piping.

4. Remove the Water Pressure Switch. Plug the port in the manifold to prevent bugs and dirt from getting into the manifold.
5. Drain the plastic inlet/outlet manifold through the outlet pipe. If the pipe does not drain naturally to the pool, install a drain cock in the outlet pipe to drain the manifold.
6. Cover air inlet grate with a plastic bag to prevent bugs, leaves, etc., from getting into the heater.

NOTICE: Water trapped in the heater can cause freeze damage. Allowing the heater to freeze voids the warranty.

To return the heater to service after winterizing:

1. Close drain cock and fittings.
2. Before starting the heater, circulate water through the heater for several minutes until all air noises stop. See also "BEFORE START-UP" (page 33) and "CARE AND MAINTENANCE" (page 46).

(See additional notes under Important Notices in Introduction.)

MAINTAINING POOL TEMPERATURE

To maintain pool temperature, make sure that the heater switch and valving are reset to pool settings after using the spa.

ENERGY SAVING TIPS

1. Keep the pool or spa covered when not in use. This will reduce heating costs, reduce water evaporation, conserve chemicals and reduce load on the filtering system.
2. Reduce pool thermostat to 78° F (25° C) or lower; reduce spa temperature to 100° F (38° C). This is accepted as being the most healthy temperature for swimming by the American Red Cross.
3. Use a time clock to start the filter pump at 6 a.m. or later. The swimming pool loses less heat after daybreak.
4. For pools used only on weekends, lower the thermostat setting by 10° F to 15° F (5° C to 8° C) during the week to reduce heat loss. A properly sized heater will restore normal temperature within one day.
5. Turn the heater off when the pool will not be used for an extended period.
6. Follow a regular program of preventive maintenance for the heater each new swimming season. Check operation of the heater and its controls.

CHEMICAL BALANCE

POOL AND SPA WATER

Your pool heater was designed specifically for your spa or pool and will give you many years of trouble-free service, provided you keep your water chemistry in proper condition.

Water chemistry should follow good swimming pool water chemistry practices. When using a chlorinator, install it down stream from the heater and at a lower level than the heater outlet. Install a corrosion resistant positive seal “Check Valve”, (P/N R172288), between the heater and the chlorinator to prevent concentrated chemicals from back-siphoning into the heater. Back-siphoning is most likely to occur when the pump stops, creating a pressure-suction differential. Do NOT sanitize the pool by putting chlorine tablets or sticks into the skimmer(s). When the pump is off, this will cause a high concentration of chlorine to enter the heater, which could cause corrosion damage to the heat exchanger.

Three major items that can cause problems with your pool heater are: improper pH, disinfectant residual, and total alkalinity. These items, if not kept properly balanced, can shorten the life of the heater and cause permanent damage.

⚠CAUTION

Heat exchanger damage resulting from chemical imbalance is not covered by the warranty.

WHAT A DISINFECTANT DOES

Two pool guests you do not want are algae and bacteria. To get rid of them and make pool water sanitary for swimming - as well as to improve the water's taste, odor and clarity - some sort of disinfectant must be used.

Chlorine and bromine are universally approved by health authorities and are accepted disinfecting agents for bacteria control.

WHAT IS A DISINFECTANT RESIDUAL?

When you add chlorine or bromine to the pool water, a portion of the disinfectant will be consumed in the process of destroying bacteria, algae and other oxidizable materials. The disinfectant remaining is called chlorine residual or bromine residual. You can determine the disinfectant residual of your pool water with a reliable test kit, available from your local pool supply store.

You must maintain a disinfectant residual level adequate enough to assure a continuous kill of bacteria or virus introduced into pool water by swimmers, through the air, from dust, rain or other sources.

CHEMICAL BALANCE, (cont'd.)

It is wise to test pool water regularly. Never allow chlorine residual to drop below 0.6 ppm (parts per million). The minimum level for effective chlorine or bromine residual is 1.4 ppm.

pH - The term pH refers to the acid/alkaline balance of water expressed on a numerical scale from 0 to 14. A test kit for measuring pH balance of your pool water is available from your local pool supply store; see Table 9.

Muriatic Acid has a pH of about 0. Pure water is 7 (neutral). Weak Lye solution have a pH of 13-14.

RULE: 7.4 to 7.6 is a desirable pH range. It is essential to maintain correct pH, see Table 9.

If pH becomes too high (over alkaline), it has these effects:

1. Greatly lowers the ability of chlorine to destroy bacteria and algae.
2. Water becomes cloudy.
3. There is more danger of scale formation on the plaster or in the heat exchanger tubing.
4. Filter elements may become blocked.

If pH is too low (over acid) the following conditions may occur:

1. Excessive eye burn or skin irritation.
2. Etching of the plaster.
3. Corrosion of metal fixtures in the filtration and recirculation system, which may create brown, blue, green, or sometimes almost black stains on the plaster.
4. Corrosion of copper tubes in the heater, which may cause leaks.
5. If you have a sand and gravel filter, the alum used as a filter aid may dissolve and pass through the filter.

CAUTION: Do not test for pH when the chlorine residual is 3.0 ppm or higher, or bromine residual is 6.0 ppm or higher. See your local pool supply store for help in properly balancing your water chemistry.

RULE: Chemicals that are acid lower pH. Chemicals that are alkaline raise pH.

ALKALINITY High or Low:

"Total alkalinity" is a measurement of the total amount of alkaline chemicals in the water, and control pH to a great degree. (It is not the same as pH which refers merely to the relative alkalinity/acidity balance.) Your pool water's total alkalinity should be 100 - 140 ppm to permit easier pH control.

A total alkalinity test is simple to perform with a reliable test kit. You will need to test about once a week and make proper adjustments until alkalinity is in the proper range. Then, test only once every month or so to be sure it is being maintained. See your local pool dealer for help in properly balancing the water chemistry.

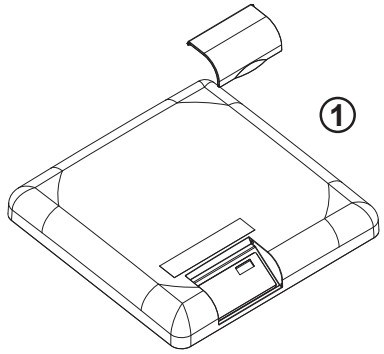
WATER CHEMISTRY PARAMETERS

Table 9.

Disinfectant levels	**Minimum**	**Ideal**	**Maximum**
Free Chlorine, ppm	1.0	2.0-4.0	5.0**
Combined Chlorine, ppm	None	None	0.2
Bromine, ppm	2.0	4-6	10.0
Other Sanitizers	Levels not established. Consult local health department before use.		
Chemical Values			
pH	7.2	7.4-7.6	7.8**
Total Alkalinity (Buffering), ppm as CaCO3	60	80-100	180
Salt ppm	2000	3200	5000**
Total Dissolved Solids, ppm	N/A	N/A	1,500 ppm > TDS at startup*
Calcium Hardness, ppm, as CaCO3	150	200-400	500-1,000
Heavy Metals	None	None	None
Biological Values			
Algae	None	None	None
Bacteria	None	None	Refer to Local Code

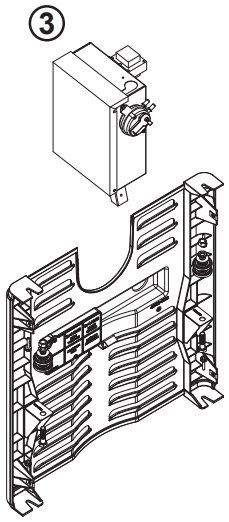
*Start-up TDS includes source water TDS and any other inorganic salt added at start-up.
NOTE (**): Failure to adhere to the listed water chemistry parameters may result in premature failure of the heat exchanger and will **void the heater warranty**.

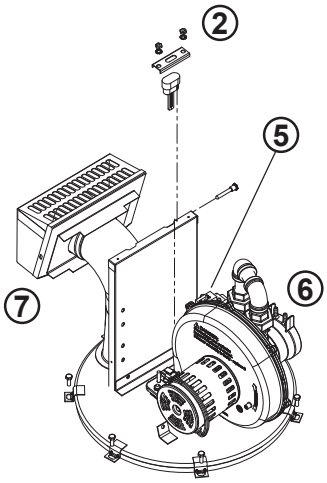
MASTERTEMP HEATER REPLACEMENT PARTS

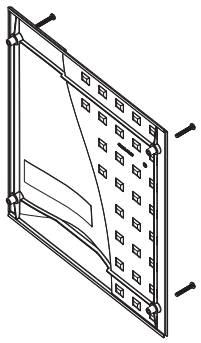


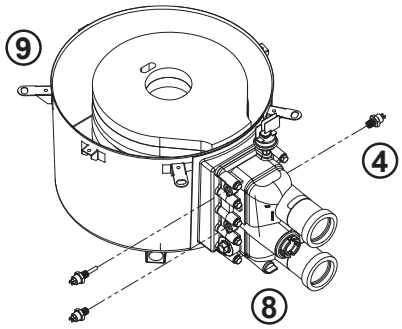
For complete
Electrical System
parts breakdown
(Key Nos. 1 through 4),
See Page 53

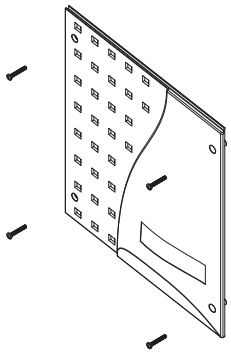
For complete
Burner System
parts breakdown
(Key Nos. 5 through 7),
See Page 51

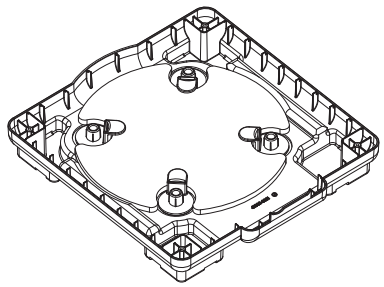


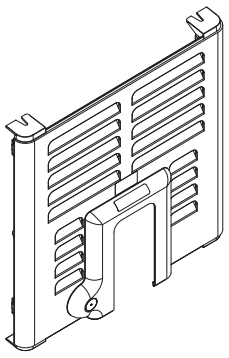








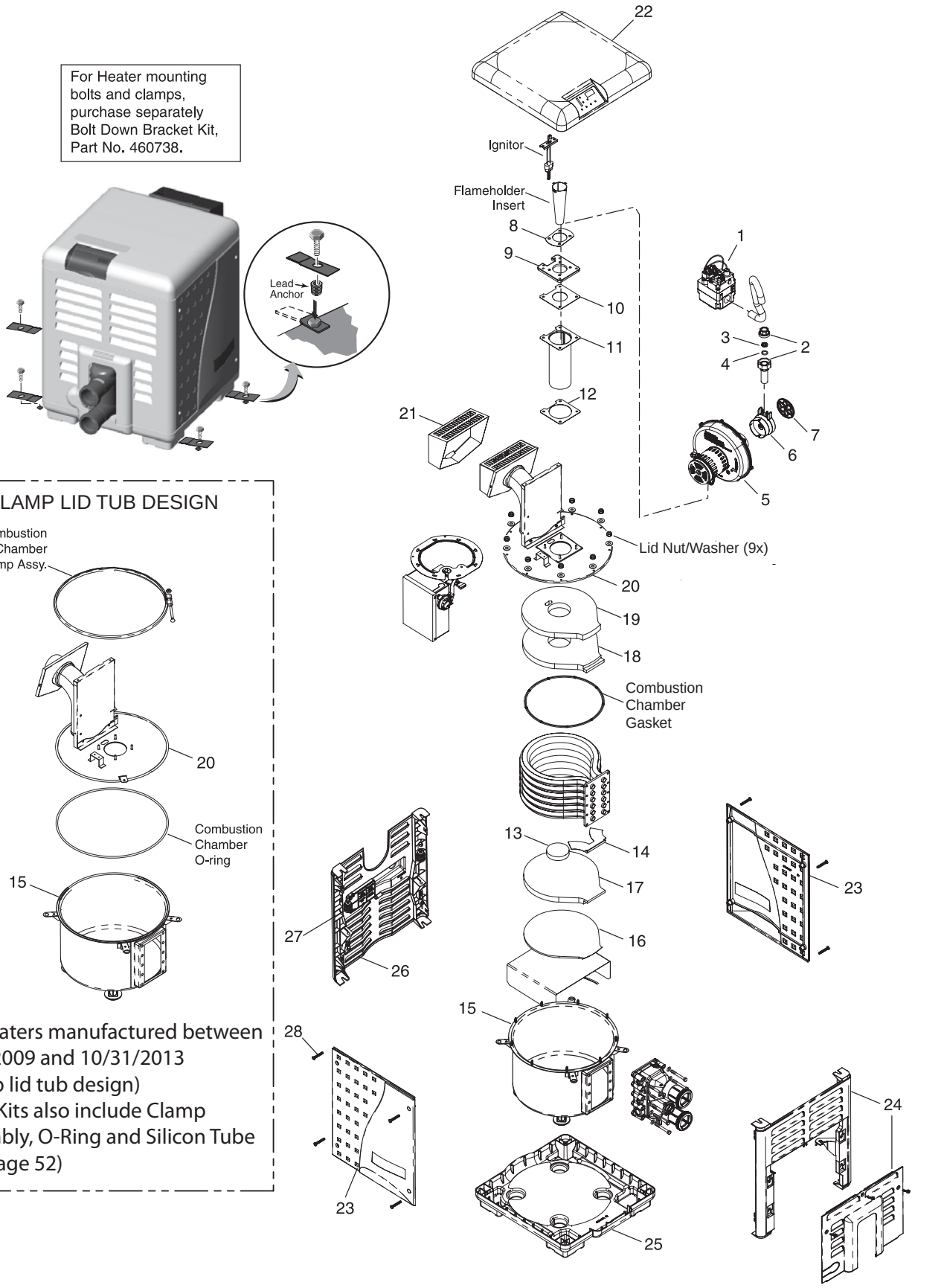




For complete
Water System
parts breakdown
(Key Nos. 8 through 9),
see Page 52

Repair Parts are available from your Pentair dealer.
If your dealer cannot supply you, call Customer Support at 1-800-831-7133.

MASTERTEMP HEATER REPLACEMENT PARTS



MASTERTEMP HEATER REPLACEMENT PARTS

REPAIR PARTS – BURNER SYSTEM

Key No.	Part Description	Qty.	Model 175NA 175LP	200NA 200LP	250NA 250LP	300NA 300LP	400NA 400LP
1	Combination Gas Control Valve Kit	1	42001-0051S	42001-0051S	42001-0051S	42001-0051S	42001-0051S
2	3/4" Union	2	38404-4097S	38404-4097S	38404-4097S	38404-4097S	38404-4097S
3	Gas Orifice	1					
4	Gas Orifice O-Ring	1					
•	Gas Orifice Kit – NG (Incl. Key Nos. 3 and 4)†		460794	77707-0431	460739	460753	77707-0411
•	Gas Orifice Kit – Propane (Incl. Key Nos. 3 and 4)†		460795	77707-0461	460740	460754	77707-0441
•	NG to Propane Conversion Kit (Incl. Key Nos. 3 and 4)†		460794	77707-1461	460741	460755	77707-1441
•	Propane to NG Conversion Kit (Incl. Key Nos. 3 and 4)†		460795	77707-1431	460742	460756	77707-1411
5	Air Blower Kit						
	Natural Gas Units	1	77707-0251	77707-0251	460743	460757	77707-0253
	Propane Units	1	77707-0254	77707-0254	460744	460758	77707-0256
•	Air Orifice Kit (Includes Key Nos. 6 and 7)	1	460798	77707-0111	460745	460759	77707-0113
6	Air Orifice	1					
7	Air Orifice Grill	1	42001-0114S	42001-0114S	42001-0114S	42001-0114S	42001-0114S
•	Blower/Adapter Plate Gasket Kit (Includes Key Nos. 8, 9, 10, 12)	1	77707-0011	77707-0011	77707-0011	77707-0011	77707-0011
•	Flameholder Kit (Includes Key Nos. 10, 11, 12, 13 and on 300 & 400 models only - Flameholder Insert)	1	77707-0202	77707-0202	460746	77707-0203	77707-0204
8	Blower/Adapter Plate Gasket	1					
9	Blower Adapter Plate	1					
10	Flameholder/Adapter Plate Gasket	1					
11	Flameholder Assembly	1					
12	Flameholder/Combustion Chamber Gasket*	1					
13	Flameholder Insulation Cap	1					
•	Flameholder Insert	1					
14	Condensate Evaporator Plate	1					
15	One Piece Metal Chamber/Combustion Chamber Assembly	1	474095♦ 474957♦♦ 42001-0200S♦♦♦	474095♦ 474957♦♦ 42001-0200S♦♦♦	474095♦ 474957♦♦ 42001-0200S♦♦♦	474095♦ 474957♦♦ 42001-0200S♦♦♦	474095♦ 474957♦♦ 42001-0200S♦♦♦
•	Insulation Kit (Includes Key No.13,14,16,17,18,19)	1	77707-0008	77707-0008	77707-0008	77707-0008	77707-0008
16	Bottom Outer Insulation Blanket*	1					
17	1" Bottom Inner Insulation	1					
18	1" Top Insulation	1					
19	Top Outer Insulation Blanket*	1					
•	Lower Enclosure Insulation	1	42001-0074S	42001-0074S	42001-0074S	42001-0074S	42001-0074S
20	One Piece Metal Elbow/Combustion Chamber Cover Assembly	1	474094♦ 474958♦♦ 42001-0214S♦♦♦	474094♦ 474958♦♦ 42001-0214S♦♦♦	474094♦ 474958♦♦ 42001-0214S♦♦♦	474094♦ 474958♦♦ 42001-0214S♦♦♦	474094♦ 474958♦♦ 42001-0214S♦♦♦
•	Combustion Chamber O-Ring Kit	1	474201♦ 474952♦♦	474201♦ 474952♦♦	474201♦ 474952♦♦	474201♦ 474952♦♦	474201♦ 474952♦♦
21	Metal Vent Cover	1	42002-0005S	42002-0005S	42002-0005S	42002-0005S	42002-0005S
	Cover Assembly	1	42001-0214S	42001-0214S	42001-0214S	42001-0214S	42001-0214S
22	Heater Top	1	42002-0034Z	42002-0034Z	42002-0034Z	42002-0034Z	42002-0034Z
23	Side Panel {Service Panel}	1	42002-0039	42002-0039	42002-0039	42002-0039	42002-0039
24	Side Panel {Manifold}	1	42002-0033	42002-0033	42002-0033	42002-0033	42002-0033
25	Heater Bottom	1	42002-0031	42002-0031	42002-0031	42002-0031	42002-0031
26	Side Panel {Flue Stack}	1	42002-0032	42002-0032	42002-0032	42002-0032	42002-0032
27	J-Box Cover	1	42002-0041	42002-0041	42002-0041	42002-0041	42002-0041
28	Screw Kit, Panel	1	474292	474292	474292	474292	474292
•	Combustion Air Intake Duct Connection Kit	1	461031	461031	461031	461031	461031

* Not available separately.

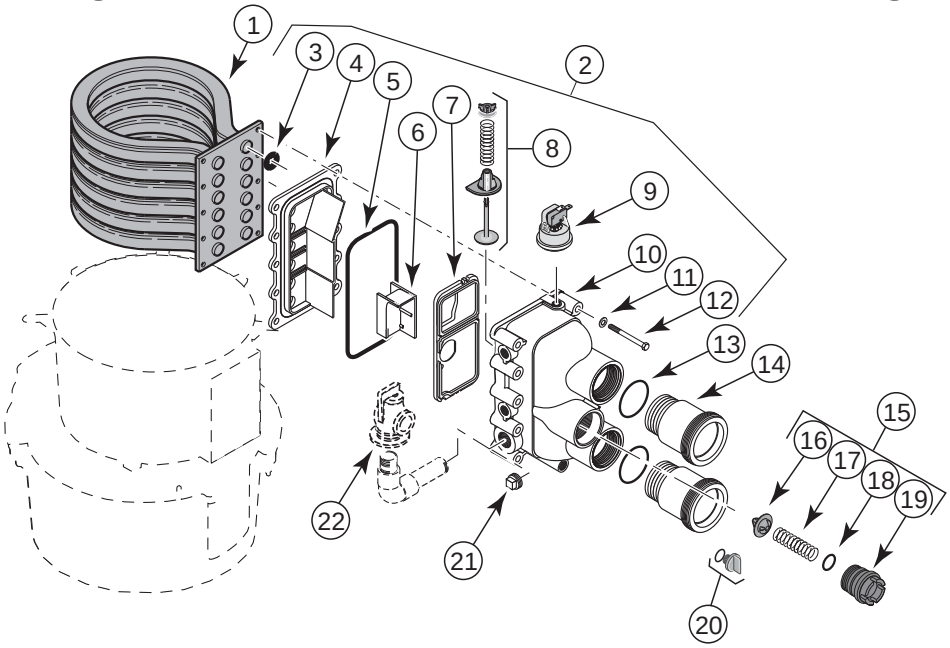
† Not included with heater. Order separately.

♦ For heaters manufactured between 1/12/2009 and 10/31/2013 (clamp lid tub design)
Note: Kits also include Clamp Assembly, O-Ring and Silicon Tube.

♦♦ For heater manufactured AFTER 10/31/2013 (New 9-bolt lid tub design)

♦♦♦ For heater manufactured BEFORE 1/12/2009

MASTERTEMP HEATER REPLACEMENT PARTS

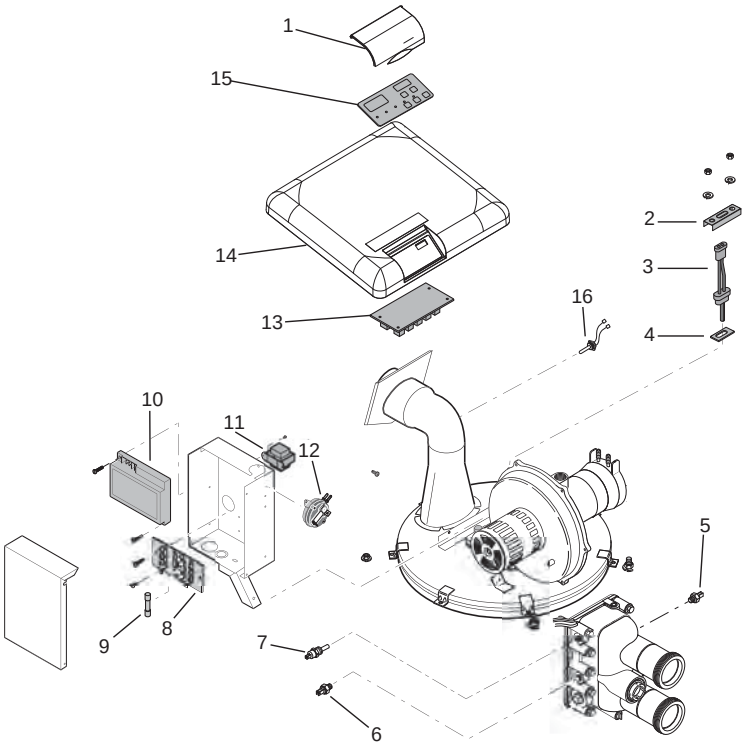


REPAIR PARTS – WATER SYSTEM

Key No.	Part Description	Qty.	Model 175NA - 200NA 175LP - 200LP	250NA 250LP	300NA 300LP	400NA 400LP
1	Tube Sheet Coil Assembly Kit **(NA, LP Series)**					
	(Includes Key No.3)	1	77707-0232 474058♦	460747 474059♦	77707-0233 474060♦	77707-0234 474061♦
1	Tube Sheet Coil Assembly Kit **(NA - HD Series)**					
	(Includes Key No.3)	1	– –	473710 474063♦	– –	77707-0244 474065♦
1	Tube Sheet Coil / Combustion Chamber Kit **(ASME SERIES)**					
	Bronze Header - Key Nos. 3-12, 15, 20-22,	1	– 472732Z	460941 474097♦ 474955♦♦	– – –	460940 474096♦ 474956♦♦
1	Tube Sheet Coil / Combustion Chamber Kit **(HD ASME SERIES)**		–	474349, 474954♦♦	–	474350, 474953♦♦
2	Manifold Kit (Includes Key Nos. 3-14, 21, & Key Nos. 5-7 in "Electrical System", Page 53	1	77707-0014	460748	77707-0015	77707-0016
•	Basic Manifold Kit (includes Key No. 3,5,10-14)		474200	474200	474200	474200
3	Coil/Tubesheet Sealing O-Ring Kit	( )	77707-0117(6)	460749(8)	77707-0118(10)	77707-0119(12)
4	Manifold Bottom Plate	1				
5	Manifold O-Ring	1				
•	O-Ring Kit (Incl. Key Nos. 3, 5)	1	77707-0120	77707-0120	77707-0120	77707-0120
6	Manifold Insert*	1				
7	Manifold Baffle Plate	1				
8	Manifold Bypass Valve	1	77707-0001	77707-0001	77707-0001	77707-0001
9	Water Pressure Switch	1	42001-0060S	42001-0060S	42001-0060S	42001-0060S
10	Manifold	1				
11	5/16" Washer, S.S.	10				
12	5/16x18x2-3/4" Hex Cap screw	10				
13	Connector Tube O-Ring	2				
14	Connector Tube Kit (Includes 1 Connector Tube and 1 O-Ring)	2	77707-0017	77707-0017	77707-0017	77707-0017
15	Thermal Regulator Kit (Incl. Key No. 16, 17, 18, 19 and Spring Clip)	1	77707-0010	77707-0010	77707-0010	77707-0010
16	Thermal Regulator (Includes Spring Clip)	1	38000-0007S	38000-0007S	38000-0007S	38000-0007S
17	Thermal Regulator Spring	1				
18	Thermal Regulator Cap O-Ring	1	35505-1313	35505-1313	35505-1313	35505-1313
•	Thermal Regulator Spring Clip	1				
19	Thermal Regulator Cap	1				
20	Drain Plug	1	U178-920P	U178-920P	U178-920P	U178-920P
21	3/4" Pipe Plug	1	U78-60ZPS	U78-60ZPS	U78-60ZPS	U78-60ZPS
22	Pressure Relief Valve (Recommended - (Purchase Separately)	1	38674-0719	38674-0719	38674-0719	38674-0719

* Not available separately. • Not illustrated.
♦ For heaters manufactured between 1/12/2009 and 10/31/2013 (clamp lid tub design) - Note: Kits also include Clamp Assembly, O-Ring and Silicon Tube.
♦♦ For ASME heater manufactured AFTER 10/31/2013 (New 9-bolt lid tub design)
♦♦♦ For heater manufactured BEFORE 1/12/2009

MASTERTEMP HEATER REPLACEMENT PARTS



REPAIR PARTS – ELECTRICAL SYSTEM

Key No.	Part Description	Qty.	Model			
			175NA - 200NA 175LP - 200LP	250NA 250LP	300NA 300LP	400NA 400LP
1	Heater Display Cover	1	42002-0035	42002-0035	42002-0035	42002-0035
2	Igniter Bracket	1	42001-0030S	42001-0030S	42001-0030S	42001-0030S
3	Igniter/Igniter Gasket Kit Incl. Key Nos. 3 and 4)	1	77707-0054	77707-0054	77707-0054	77707-0054
4	Igniter Gasket	1	42001-0066S	42001-0066S	42001-0066S	42001-0066S
5	Automatic Gas Shutoff Switch (AGS)	1	42002-0025S	42002-0025S	42002-0025S	42002-0025S
6	High Limit Switch	1	42001-0063S	42001-0063S	42001-0063S	42001-0063S
7	Thermistor	1	42001-0053S	42001-0053S	42001-0053S	42001-0053S
8	Terminal Board	1	42001-0056S	42001-0056S	42001-0056S	42001-0056S
9	Fireman's Switch Fuse (1.25A, 1-1/4")	1	32850-0099	32850-0099	32850-0099	32850-0099
10	Ignition Control Module	1	42001-0052S	42001-0052S	42001-0052S	42001-0052S
11	Transformer, 120/240V	1	42001-0107S	42001-0107S	42001-0107S	42001-0107S
12	Air Flow Switch	1	42001-0061S	42001-0061S	42001-0061S	42001-0061S
13	Control Board Kit (NA, LP Series)	1	42002-0007S	42002-0007S	42002-0007S	42002-0007S
•	Heater Wiring Harness - 120/240V	1	42001-0104S	42001-0104S	42001-0104S	42001-0104S
•	120/240 Volt Plug Kit	1	42001-0105S	42001-0105S	42001-0105S	42001-0105S
14	Heater, Top	1	42002-0034Z	42002-0034Z	42002-0034Z	42002-0034Z
15	Membrane Pad (NA, LP Series)	1	472610Z	472610Z	472610Z	472610Z
16	Stack Flue Sensor	1	42002-0024S	42002-0024S	42002-0024S	42002-0024S

• Not available separately.

* Kit parts not available separately.

NOTES

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P/N 472592 REV. L 8/14

Polaris® PB4-60

ENGLISH | ESPAÑOL

Pressure Cleaner Booster Pump

Installation and Operation Manual

For Polaris PB4-60 Booster Pumps with Serial Numbers beginning with "PB" and a manufacturing date on or after Dec 1, 2011.

⚠ WARNING

FOR YOUR SAFETY - 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 exist. In the event no such state or local requirement exists, the 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. Improper installation and/or operation can create dangerous electrical hazards, which can cause high voltages to run through the electrical system. 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 will void the warranty.

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

ATTENTION INSTALLER: This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner/operator of this equipment.

H0399500 REV E

Table of Contents

EQUIPMENT INFORMATION RECORD

DATE OF INSTALLATION _____

INSTALLER INFORMATION _____

INITIAL PRESSURE GAUGE READING (WITH CLEAN FILTER) _____

PUMP MODEL _____ **HORSEPOWER** _____

NOTES: _____

_____

_____

Section 1. IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

1.1 Safety Instructions

All electrical work must be performed by a licensed electrician and conform to all national, state, and local codes. When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

⚠ WARNING

To reduce the risk of injury, do not permit children to use this product.

⚠ WARNING

To reduce the risk of property damage or injury, do not attempt to change the backwash (multiport, slide, or full flow) valve position with the pump running.

⚠ WARNING

Polaris pumps are powered by a high voltage electric motor and must be installed by a licensed or certified electrician or a qualified swimming pool service technician.

⚠ WARNING

RISK OF ELECTRIC SHOCK, FIRE, PERSONAL INJURY, OR DEATH. Connect only to a branch circuit that is protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the circuit is protected by a GFCI. Make sure such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of electrical shock. Do not use the pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.

Due to the potential risk of fire, electric shock, or injuries to persons, Zodiac Pumps must be installed in accordance with the National Electrical Code® (NEC®), all local electrical and safety codes, and the Occupational Safety and Health Act (OSHA®). Copies of the NEC may be ordered from the National Fire Protection Association® (NFPA®) online at www.nfpa.org or call 617-770-3000, or contact your local government inspection agency.

⚠ WARNING

Incorrectly installed equipment may fail, causing severe injury or property damage.

⚠ WARNING

- Do not connect the system to an unregulated city water system or other external source of pressurized water producing pressures greater than 35 PSI.
- Trapped air in system can cause the filter lid to be blown off, which can result in death, serious personal injury, or property damage. Be sure all air is out of the system before operating.

⚠ WARNING

To minimize the risk of severe injury or death the filter and/or pump should not be subjected to the piping system pressurization test.

Local codes may require the pool piping system to be subjected to a pressure test. These requirements are generally not intended to apply to the pool equipment such as filters or pumps.

Polaris pool equipment is pressure tested at the factory.

However, if the WARNING cannot be followed and pressure testing of the piping system must include the filter and/or pump, BE SURE TO COMPLY WITH THE FOLLOWING SAFETY INSTRUCTIONS:

- Check all clamps, bolts, lids, lock rings and system accessories to ensure they are properly installed and secured before testing.
- RELEASE ALL AIR in the system before testing.
- Water pressure for test must NOT EXCEED 35 PSI.
- Water temperature for test must NOT EXCEED 100°F (38°C).
- Limit test to 24 hours. After test, visually check system to be sure it is ready for operation.

NOTICE: These parameters apply to Zodiac equipment only. For non-Zodiac equipment, consult equipment manufacturer.

⚠ WARNING

Chemical spills and fumes can weaken pool/spa equipment. Corrosion can cause filters and other equipment to fail, resulting in severe injury or property damage. Do not store pool chemicals near your equipment.

⚠ CAUTION

Do not start pump dry! Running the pump dry for any length of time will cause severe damage and will void the warranty.

⚠ CAUTION

This pump is for use with permanently installed pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it may be readily disassembled for storage and reassembled to its original integrity.

⚠ CAUTION

Do not install within an outdoor enclosure or beneath the skirt of a hot tub or portable spa. The pump requires adequate ventilation to maintain air temperature at less than the maximum ambient temperature rating listed on the motor rating plate.

SAVE THESE INSTRUCTIONS

1.2 Pool Pump Suction Entrapment Prevention Guidelines

⚠ WARNING

Pump suction is hazardous and can trap and drown or disembowel bathers. Do not use or operate swimming pools, spa, or hot tubs if a suction outlet cover is missing, broken, or loose. The following guidelines provide information for pump installation that minimizes the risk of injury to users of pools, spas, and hot tubs:

Entrapment Protection - The pump suction system must provide protection against the hazards of suction entrapment.

Suction Outlet Covers - All suction outlets must have correctly installed, screw-fastened covers in place. All suction outlet (drain) covers must be maintained. Drain covers must be listed/certified to the latest version of ANSI®/ASME® A112.19.8 or its successor standard, ANSI/APSP-16. They must be replaced if cracked, broken, or missing.

Number of Suction Outlets Per Pump - Provide at least two (2) hydraulically-balanced main drains, with covers, as suction outlets for each circulating pump suction line. The centers of the main drains (suction outlets) on any one (1) suction line must be at least three (3) feet apart, center to center. See Figure 1.

The system ***must*** be built to include at least two (2) suction outlets (drains) connected to the pump whenever the pump is running. However, if two (2) main drains run into a single suction line, the single suction line may be equipped with a valve that will shut off both main drains from the pump. The system shall be constructed such that it shall not allow for separate or independent shutoff or isolation of each drain. See Figure 1.

More than one (1) pump can be connected to a single suction line as long as the requirements above are met.

Water Velocity - The maximum water velocity through the suction fitting or cover for any suction outlet must be 1.5 feet per second unless the outlet complies with the latest version of ANSI/ASME A112.19.8 or its successor standard, ANSI/APSP-16, the standard for Suction Fittings For Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs. In any case, do not exceed the suction fitting's maximum designed flow rate.

If 100% of the pump's flow comes from the main drain system, the maximum water velocity in the pump suction hydraulic system must be six (6) feet per second or less, even if one (1) main drain (suction outlet) is completely blocked. The flow through the remaining main drain(s) must comply with the latest version of ANSI/ASME A112.19.8 or its successor standard, ANSI/APSP-16, the standard for Suction Fittings For Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs.

Testing and Certification - Suction outlet covers must have been tested by a nationally recognized testing laboratory and found to comply with the latest version of ANSI/ASME A112.19.8 or its successor standard, ANSI/APSP-16, the standard for Suction Fittings For Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs.

Fittings - Fittings restrict flow; for best efficiency use fewest possible fittings (but at least two (2) suction outlets).

Avoid fittings which could cause an air trap.

Pool cleaner suction fittings must conform to applicable International Association of Plumbing and Mechanical Officials (IAPMO®) standards.

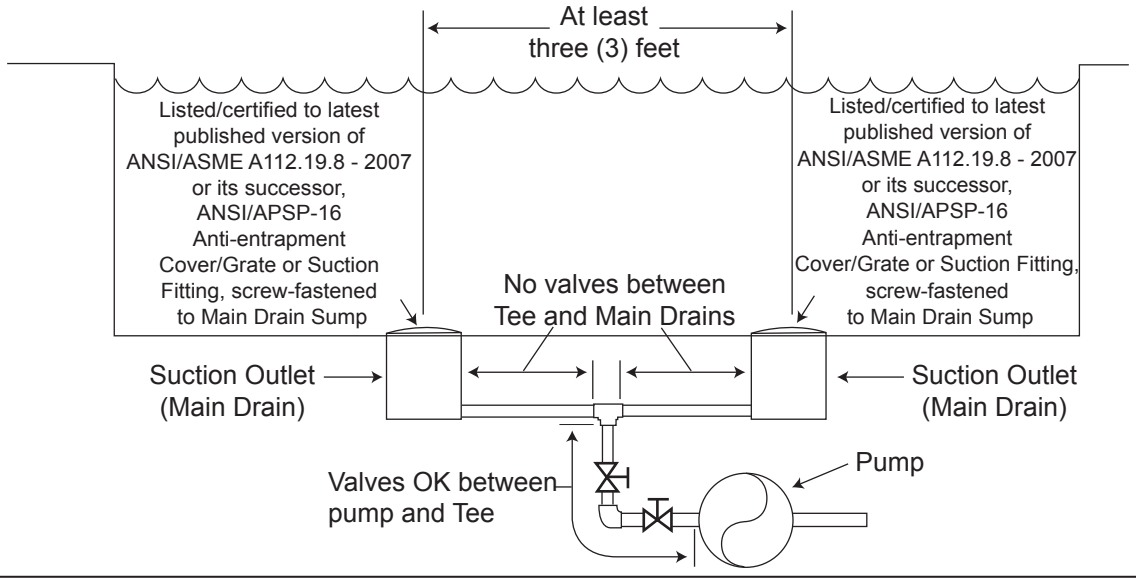


Figure 1. Number of Suction Outlets Per Pump

Section 2. General Description

2.1 Introduction

This manual contains information for the proper installation, operation and maintenance of the Polaris PB4-60 pump. Procedures in this manual must be followed exactly. To obtain additional copies of this manual contact Zodiac Pool Systems, Inc. ("Zodiac") at 800.822.7933. For address information, see the back cover of this manual.

2.2 Description

The Polaris booster pump, PB4-60, supplies high pressure water to the Polaris pool cleaner to optimize cleaner efficiency. The pump is not self-priming and should only be used when the pool filtration pump is on.

⚠ CAUTION

Running the booster pump without a filtration pump will damage the booster pump. Improper operation of the booster pump will void the warranty.

2.3 Preparation

1. Upon receipt of the pump, check the carton for damage. Open the carton and check the pump for concealed damage, such as cracks, dents or a bent base. If damage is found, contact the shipper or distributor where you purchased the pump.
2. Inspect the contents of the carton and verify that all the parts are included. See Section 7.1, Replacement Parts List.

Section 3. Installation

3.1 Electrical Installation

3.1.1 Voltage Checks

The correct voltage, as specified on the pump data plate, is necessary for proper performance and long motor life. Incorrect voltage will decrease the pump's ability to perform and could cause overheating, reduce the motor life, and result in higher electric bills.

It is the responsibility of the electrical installer to provide data plate operating voltage to the pump by ensuring proper circuit sizes and wire sizes for this specific application.

The National Electrical Code® (NEC®, NFPA-70®) requires all pool pump circuits be protected with a Ground Fault Circuit-Interrupter (GFCI). Therefore, it is also the responsibility of the electrical installer to ensure that the pump circuit is in compliance with this and all other applicable requirements of the National Electrical Code (NEC) and any other applicable installation codes.

⚠ CAUTION

Failure to provide data plate voltage (within 10%) during operation will cause the motor to overheat and void the warranty.

3.1.2 Bonding and Grounding

1. The motor frame must be grounded to a reliable grounding point using a solid copper conductor, No. 8 AWG (8.4mm^2) or larger. In Canada, No. 6 AWG (13.3mm^2) or larger must be used. If the pump is installed within five 5 feet (1,5 meter) of the inside walls of the swimming pool, spa, or hot tub, the motor frame must be bonded to all metal parts of the swimming pool, spa, or hot tub structure and to all electrical equipment, metal conduit, and metal piping within five (5) feet (1,5 meter) of the inside walls of the swimming pool, spa, or hot tub.
2. Bond the motor using the provided external lug.

⚠ WARNING

To avoid the risk of property damage, severe personal injury, and/or death, always disconnect the power source before working on a motor or its connected load.

⚠ WARNING

To avoid the risk of property damage, severe personal injury, and/or death, make sure that the control switch or time clock is installed in an accessible location so that in the event of an equipment failure or a loose plumbing fitting the equipment can be turned off. This location must not be in the same area as the pool pump, filter, and other equipment.

⚠ CAUTION

The pump must be permanently connected to a dedicated electrical circuit. No other equipment, lights, appliances or outlets may be connected to the pump circuit, with the exception of devices that may be required to operate simultaneously with the pump, such as a chlorinating device or heater.

3.2 Electrical

Motor Rating				
HP	**S.F**	**RPM**	**VOLTS**	**S.F. AMPS**
3/4	1.5	3450	230/115, 60Hz, 1PH	6.4/12.8

Table 1. Maximum Wire Size and Overcurrent Protection

MAXIMUM WIRE SIZE AND MAXIMUM OVERCURRENT PROTECTION*								
Distance from Sub-Panel			0-50 feet (15 meters)		50-100 feet (15-30 meters)		100-200 feet (30-60 meters)	
Pump Model	Branch Fuse AMPs Class: CC, G, H, J, K, RK, or T		Voltage		Voltage		Voltage	
	230 VAC	115 VAC	208-230 VAC	115 VAC	208-230 VAC	115 VAC	208-230 VAC	115 VAC
PB4-60	15A	20A	14 AWG ($2.1mm^2$)	12 AWG ($3.3mm^2$)	12 AWG ($3.3mm^2$)	10 AWG ($5.3mm^2$)	10 AWG ($5.3mm^2$)	10 AWG ($5.3mm^2$)

*Assumes three (3) copper conductors in a buried conduit and 3% maximum voltage loss in branch circuit. All National Electrical Code® (NEC®) and local codes must be followed. Table shows minimum wire size and branch fuse recommendations for a typical installation per NEC.

3.2.1 Electrical Wiring

1. The pump motor must be securely and adequately grounded using the green screw provided. Ground before attempting to connect to an electrical power supply. ***Do not ground to a gas supply line.***
2. Wire size must be adequate to minimize voltage drop during the start-up and operation of the pump. See Table 1 for wire sizes.
3. Insulate all connections carefully to prevent grounding or short-circuits. Sharp edges on terminals require extra protection. To prevent wire nuts from loosening, tape them using a suitable, listed (UL®, ETL®, CSA®) electrical insulating tape. For safety, and to prevent entry of contaminants, reinstall all conduit and terminal box covers. ***Do not force connections into the conduit box.***
4. To configure the internal wiring of the pump motor for the correct voltage, refer to the diagram on the motor data plate.
5. The starting current of the booster pump motor may exceed 15 amps on 115 VAC voltage line. It is recommended that a 20 amp service breaker be used for the pump connected to 115 VAC.
6. The booster pump motor is factory wired for 230 volts, but can be wired for either 115 or 230 volts. To rewire to 115 volt, follow the instructions on the name plate located on the back of the motor or the sizing plate on the side of the motor.
7. A separate time clock (in addition to the filtration system time clock) is recommended to control the On/Off functions of the booster pump. A manual switch can also be used.
8. If a time clock is used, set it to turn the pump on at least a half an hour after the pool filtration pump is turned on, and turn the pump off at least half an hour before the filtration pump shuts off. Periodically check the time clock settings to make sure they are properly synchronized.

3.3 Plumbing

⚠ CAUTION

Be careful not to overtighten any pipe fitting on the inlet or outlet of the booster pump. Overtightening can cause the housing to crack.

3.3.1 Requirements

The Polaris Booster Pump requires a dedicated return line. Plumb the booster pump into the system so that it always receives flow from the filtration pump.

To ensure proper function of the pump and the cleaner, refer to Figure 2 and adhere to the following guidelines for specific equipment.

1. Plumb the dedicated line upstream of all air inducing equipment.
2. If a heater is installed on the system, tap the inlet for the booster pump into the return line

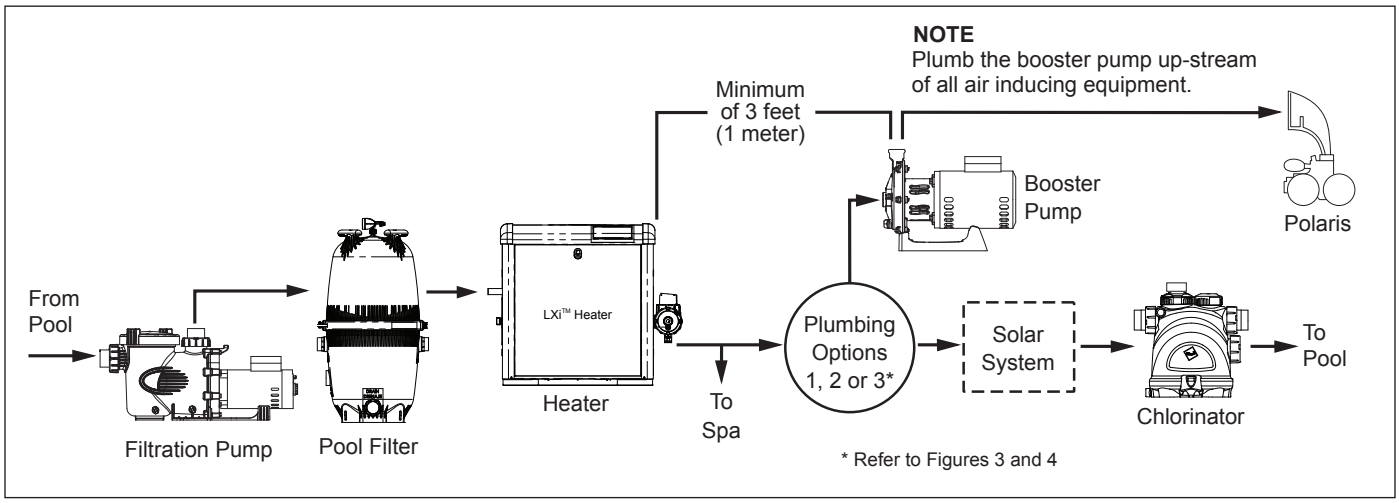


Figure 2. Typical Equipment Layout

downstream and at least three (3) feet (1 meter) from the heater discharge. See Figure 2. **Do not tap the booster pump inlet into the three-foot (1 meter) section of heat sink pipe that comes directly out of the heater**.

3. Some solar heating systems utilize the entire water flow when the panels are being purged of air. If the pump is installed in a non-flow pipe during solar panel purges, install an automatic override to shut off the pump.
4. Plumb the booster pump inlet higher, upstream and as far away as possible from a chlorinator.

3.3.2 Pipe Sizing

1. Use rigid PVC pipe with a minimum diameter of 3/4", 1-1/2" is recommended, for the dedicated return line. Flexible PVC piping is not recommended for the dedicated pool return line underground as it can be damaged by expansion and movement caused by the surge of pump pressure. Refer to Figures 3 and 4.

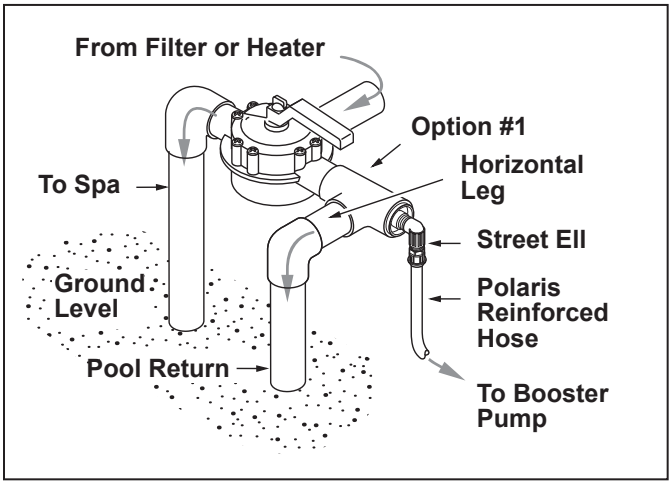


Figure 3. Preferred Plumbing Configuration

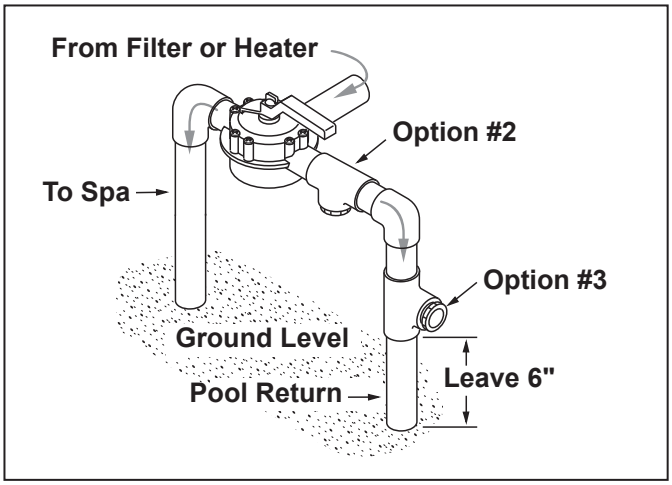


Figure 4. Alternate Plumbing Configuration

2. The booster pump inlet connection line should be at least 3/4" pipe. **The Softube Quick Connect fittings are designed to work with the Polaris reinforced hose (part #P19) only**.
3. Do not tap into the top of a horizontal line.
4. Use 90° street ells to minimize bends and loops in the Polaris reinforced hose.

3.3.3 Pump Location

1. Zodiac Pool Systems, Inc. recommends installing the pump within one 1 foot (30 cm) above the water level. The pump should not be elevated more than a few feet above the water level of the pool.
2. If the pump is located below water level, isolation valves must be installed on both the suction and return lines to prevent back flow of pool water during any routine or required servicing.

⚠ WARNING

Some Safety Vacuum Release System (SVRS) devices are not compatible with installation of check valves. If the pool has an SVRS device, be sure to confirm that it will continue to safely operate when any check valves are installed.

3. The pump and other circulation equipment must be located more than 5 feet (1,5 meter) from the water. Choose a location that will minimize turns in the piping.

NOTE In Canada, the pump must be located a minimum of 3.0 meters [approximately 10 feet] from the water (CSA C22.1).

4. The pump must be placed on a solid foundation that will not vibrate. To further reduce the possibility of vibration noise, bolt the pump to the foundation.

NOTE Zodiac® recommends bolting the pump directly to the foundation.

5. The pump foundation must have adequate drainage to prevent the motor from getting wet. The pump needs to be protected from the rain and sun.
6. Proper ventilation is required for the pump to operate normally. All motors generate heat that must be removed by providing proper ventilation.
7. Provide access for future service by leaving a clear area around the pump. Allow plenty of space above the pump for servicing.
8. If the equipment is under cover, provide adequate lighting.

3.3.4 Install the Pump

1. Mount the pump using two (2) concrete expansion anchors to ensure stability.
2. Apply four (4) to six (6) wraps of Teflon® tape to the tapered thread of the connecter barb. See Figure 5 (a).

⚠ CAUTION

Pipe dope should NEVER be used on barb threads. Pipe dope will severely weaken the plastic, causing leakage and may cause the plastic to fracture. DO NOT OVERTIGHTEN.

3. Thread and tighten the tapered thread of the connector barb into the pump port on the pump body. See Figure 5 (b).

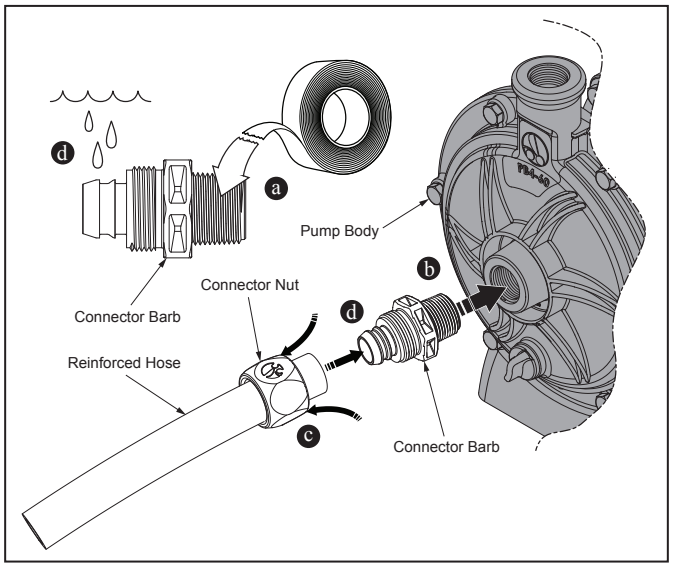


Figure 5. Prep and install Quick Connect barb and connector nut

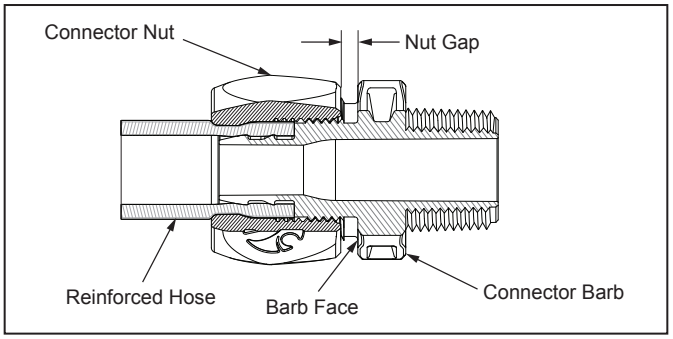


Figure 6. Tighten Connector Nut to Secure Hose

4. Trim reinforced hose to required length. Make sure cut is clean and square. Avoid unnecessary loops or bends in the hose.
5. Slide connector nut onto the trimmed end of the hose with threaded end toward the cut end of the hose. See Figure 5 (c).
6. Apply water to connector barb to help hose slide over barbs. Push trimmed edge of hose fully onto the connector barb. See Figure 5 (d).
7. Slide/Rotate the connector nut to the barb to engage threads correctly, do not cross thread connector nut. Tighten the connector nut until threads are no longer visible (gap about 1/8" or just less than the width of two dimes), or until it touches the barb face. See Figure 6.

3.3.5 Installation Recommendations

1. If the pump is located below water level, isolation valves must be installed on both sides of the pump to prevent back flow of pool water during any routine or required servicing.
2. To help prevent difficulty in priming, install the suction pipe without high points (above inlet of pump - inverted "U"s in plumbing), which can trap air.
3. The piping must be well supported and not forced together where constant stress will be experienced.
4. Always use properly sized valves. Jandy® Pro Series diverter valves and ball valves typically have the best flow capabilities.
5. Use the fewest fittings possible. Every additional fitting has the effect of moving the equipment farther away from the water.

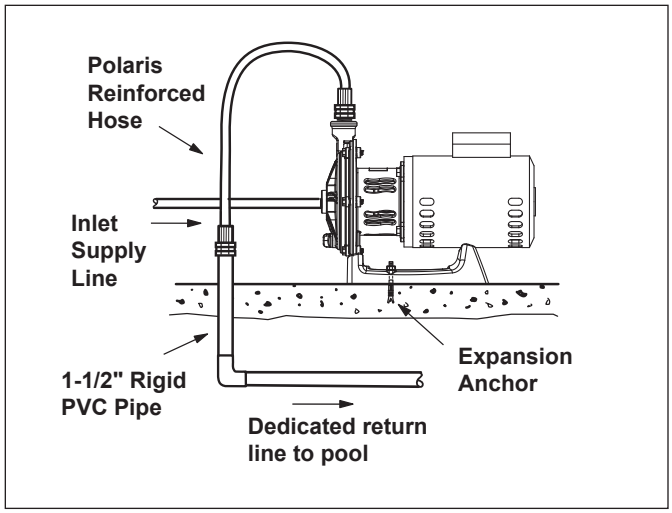


Figure 7. Complete Installation

NOTE If more than 10 suction fittings are needed, the pipe size must be increased.

3.3.6 Check the Water Flow

NOTE This pump must have minimum outlet pressure of 45 psi. Lower pressure may cause an over-current motor condition.

After the system is plumbed, verify water flow to the booster pump by disconnecting the inlet supply line at the booster pump and then turning on the filtration pump. Water should flow from the line.

If there is no water flow, check the following:

1. Verify that the installation is correct. Refer to Figure 6.
2. Use smaller eyeball fittings in the pool return lines or plug a return line.

Once flow is established, the pump is ready for operation.

3.3.7 Conduct Pressure Test

⚠ WARNING

When pressure testing a system with water, air is often trapped in the system during the filling process. This air will compress when the system is pressurized. Should the system fail, this trapped air can propel debris at a high speed and cause injury. Every effort to remove trapped air must be taken, including opening the bleed valve on the filter and loosening the pump basket lid on the filter pump while filling the pump.

⚠ WARNING

Trapped air in system can cause filter lid to be blown off, which can result in death, serious personal injury, or property damage. Be sure all air is properly out of system before operating. DO NOT USE COMPRESSED AIR TO PRESSURE TEST OR CHECK FOR LEAKS.

⚠ WARNING

When pressure testing the system with water, it is very important to make sure that the pump basket lid on the filter pump is completely secure.

⚠ WARNING

Do not pressure test above 35 PSI. Pressure testing must be done by a trained pool professional. Circulation equipment that is not tested properly can fail, which could result in severe injury or property damage.

1. Fill the system with water, using care to eliminate trapped air.
2. Pressurize the system with water to no more than 35 PSI.
3. Close the valve to trap pressurized water in the system.
4. Observe the system for leaks and/or pressure decay.
5. For technical support, contact Zodiac® technical support at 800.822.7933.

Section 4. Operation

4.1 Start-up

⚠ CAUTION

Never run the booster pump without water. Running the pump “dry” for any length of time can cause severe damage to both the pump and motor and will void the warranty.

⚠ CAUTION

Never run the booster pump without the cleaner connected. Running the pump without the cleaner connected will cause damage to the pump impeller and will void the warranty.

If this is a new pool installation, make sure all piping is clear of construction debris and has been properly pressure tested. The filter should be checked for proper installation, verifying all connections and clamps are secure according to the manufacturer's recommendations.

⚠ WARNING

To avoid risk of damage or injury, verify that all power is turned off before starting this procedure.

1. Turn filtration pump ON.
2. Open the filter pressure release to relieve the system pressure until water comes out.
3. If the filter pump is located below the water level of the pool, opening the filter pressure release valve will prime the pump with water.
4. Once all the air has left the filter, close the pressure release valve.
5. Turn on the power to the booster pump. Then turn on the booster pump.
6. The booster pump should prime. The time it takes to prime will depend on the elevation and length of pipe used on the suction supply pipe. See *Section 3.3.6* for proper elevation and pipe size.
7. If the booster pump does not prime and all the instructions to this point have been followed, check for a suction leak.

Section 5. Maintenance

5.1 Winterizing the Pump

⚠ CAUTION

The pump ***must*** be protected when freezing temperatures are expected. Allowing the pump to freeze will cause severe damage and void the warranty.

⚠ CAUTION

Do not use antifreeze solutions in the pool, spa, or hot tub systems! Antifreeze is highly toxic and may damage the circulation system. The only exception to this is Propylene Glycol. For more information see your local pool/spa supply store or contact a qualified swimming pool service company.

1. Drain ***all*** water from the pump, system equipment, and piping.
2. Remove the drain plug. Store the drain plug in a safe location and reinstall it when the cold weather season is over. ***Do not lose the o-ring.*** (Drain Plug with O-ring Set, R0537000).
3. Keep the motor covered and dry.

NOTE Covering the pump with plastic will create condensation, and this moisture will damage the pump. The best way to protect your pump is to have a qualified service technician or electrician properly disconnect the electrical wiring at the switch or junction box. Once the power is removed, the two (2) quick connect fittings can be loosened and the pump stored indoors. For safety, and to prevent entry of contaminants, reinstall all conduit and terminal box covers.

4. When the system is reopened for operation, make sure all piping, valves, wiring, and equipment are in accordance with the manufacturer's recommendations. Pay close attention to the filter and electrical connections.
5. The pump must be primed prior to starting; refer to *Section 4.1, Start-up*.

Section 6. Product Specifications and Technical Data

6.1 Replacement Parts List

To order or purchase parts for Polaris® pumps, contact your nearest Zodiac® dealer. If they cannot supply you with what you need, contact Zodiac technical support at 800.822.7933 or www.zodiacpoolsystems.com.

Key No.	Description	Qty	Order Part No.	Comments
1	Replacement Motor for Booster Pump	1	P61	
2	O-Ring, Backplate, PB4-60	1	R0536600	
3	Seal, Ceramic and Spring	1	R0445500	
4	Impeller, PB4-60	1	R0536400	
5	Volute, PB4-60	1	R0536300	(Includes Drain Plug with O-Ring)
6	Bolts with Washers and Nuts	6	R0536900	
7	Drain Plug with O-Ring, Common	1	R0537000	
8	Base, Booster, PB4-60	1	R0537100	
9	Bolts and Washers, Stainless, Motor, PB4-60	4	R0536800	
10	Quick Connect Install Kit	1	R0617100	Kit includes 1 ea 6' length of reinforced hose and 4 ea Quick Connect fittings.
11	Quick Connect Fittings	4	R0621000	Comes with 4ea Quick Connect Fittings and Installation Instructions.
12	Pump Hose 6FT Reinforced	1	P19	
13	Backplate PB4-60	1	R0536700	Includes Seal and Backplate O-ring.

6.2 Polaris PB4-60 Booster Pump Exploded View

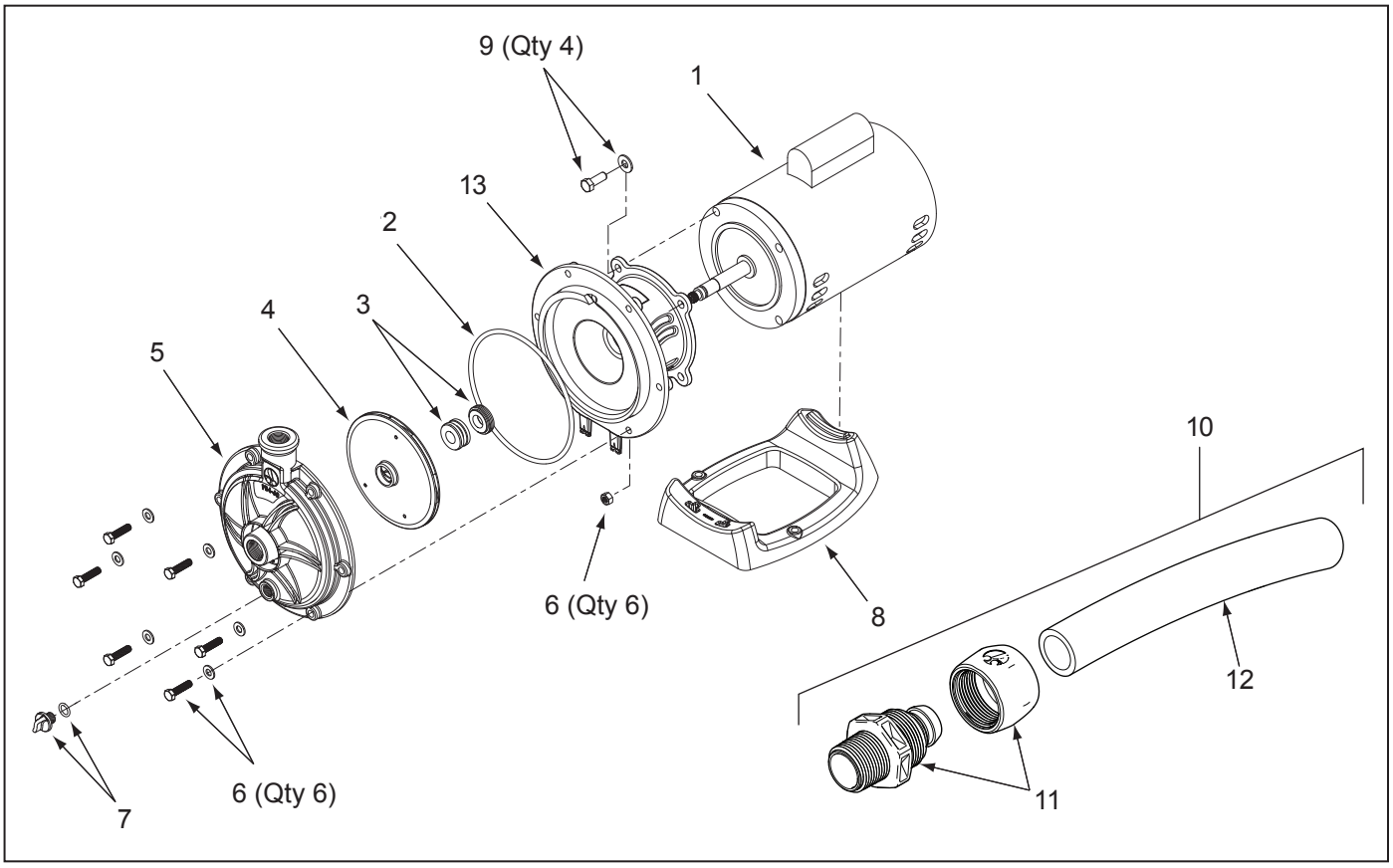
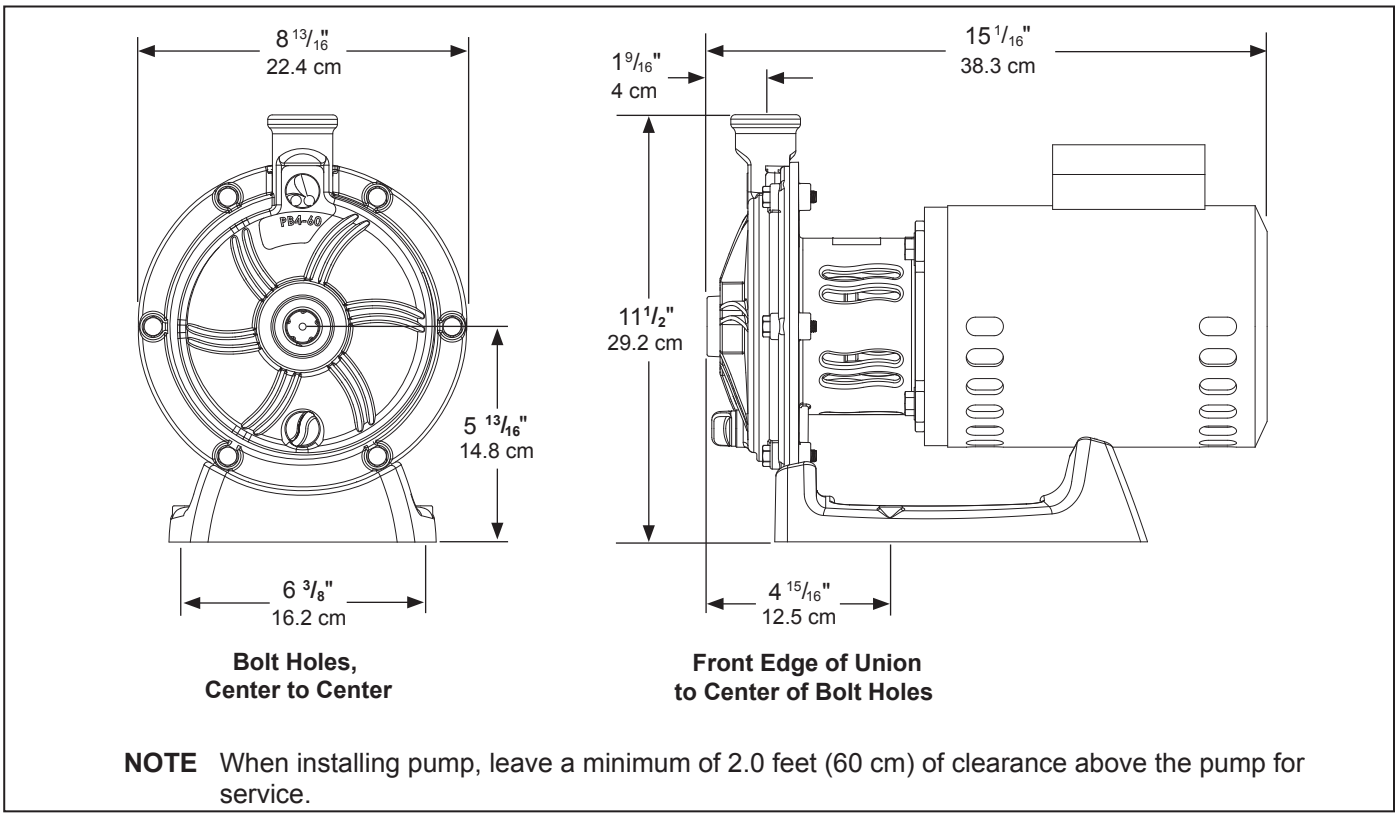


Figure 11. Polaris PB4-60 Booster Pump Exploded View

6.3 Pump Dimensions



NOTE When installing pump, leave a minimum of 2.0 feet (60 cm) of clearance above the pump for service.

Figure 12. Polaris PB4-60 Booster Pump Dimensions

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Zodiac Pool Systems, Inc.
2620 Commerce Way, Vista, CA 92081
1.800.822.7933 | www.ZodiacPoolSystems.com

H0399500 REV E

Polaris®

Polaris® PB4-60

ESPAÑOL

Bomba reforzadora del limpiador a presión

Manual de instalación y funcionamiento

Para bombas reforzadoras Polaris PB4-60 con números de serie que comienzan con "PB" y con fecha de fabricación a partir del 1º de diciembre de 2011.

⚠ ADVERTENCIA

PARA SU SEGURIDAD - Este producto debe ser instalado y mantenido por un contratista con licencia y calificaciones para equipos para piscinas otorgadas por la jurisdicción donde se instalará el producto en caso de que existan tales requisitos estatales o locales. En caso de que no existan tales requisitos estatales o locales, la persona que realiza el mantenimiento debe ser un profesional con experiencia suficiente en la instalación y mantenimiento de equipos para piscinas de tal forma que pueda seguir al pie de la letra las instrucciones de este manual. La instalación o el funcionamiento inadecuados pueden crear riesgos eléctricos peligrosos, que pueden causar altas tensiones a través del sistema eléctrico. Antes de instalar este producto, lea y siga todas las instrucciones y preste atención a las advertencias en el manual adjunto. No prestar la debida atención a las advertencias e instrucciones puede ocasionar daños a la propiedad, lesiones personales e incluso la muerte. La instalación y la operación incorrectas será causa de anulación de la garantía.

En caso de no seguir las instrucciones al pie de la letra, se puede producir un incendio o una explosión que puede causar daños a la propiedad, lesiones personales o incluso la muerte.

ATENCIÓN INSTALADOR: Este manual contiene información importante acerca de la instalación, el funcionamiento y la utilización seguros de este producto. Esta información debe ser entregada al dueño u operador de este equipo.

H0399500 Rev. E

Índice

EQUIPMENT INFORMATION RECORD (REGISTRO DE INFORMACIÓN DEL EQUIPO)

DATE OF INSTALLATION (FECHA DE INSTALACIÓN) _____

INSTALLER INFORMATION _____

(Información del instalador)

INITIAL PRESSURE GAUGE READING (WITH CLEAN FILTER) _____

(LECTURA INICIAL DEL MEDIDOR DE PRESIÓN (CON EL FILTRO LIMPIO))

PUMP MODEL _____ **HORSEPOWER** _____

(MODELO DE BOMBA) **(CABALLO DE FUERZA)**

NOTES: (NOTAS:) _____

_____

_____

Sección 1. IMPORTANTES INSTRUCCIONES DE SEGURIDAD

LEA Y SIGA ESTAS INSTRUCCIONES

1.1 Instrucciones de seguridad

Todo el trabajo de electricidad deberá realizarlo un electricista certificado de conformidad con todos los códigos nacionales, estadales y regionales. Cuando se instale y utilice este equipo eléctrico, siempre se deberán seguir las siguientes precauciones básicas de seguridad:

⚠ ADVERTENCIA

Para reducir el riesgo de lesión, no permita que los niños usen este artefacto.

⚠ ADVERTENCIA

Para reducir el riesgo de daños materiales o lesiones, no intente cambiar la posición de la válvula de retro lavado (multipuerto, deslizamiento o flujo completo) con la bomba en funcionamiento.

⚠ ADVERTENCIA

Las bombas Polaris son accionadas por un motor eléctrico de alta tensión y deben ser instaladas por un electricista con licencia (o certificado) o por un técnico que esté calificado en servicio de piscinas.

⚠ ADVERTENCIA

RIESGO DE DESCARGA ELÉCTRICA, DE INCENDIO, LESIONES PERSONALES O DE MUERTE. Conectar solamente a una rama del circuito que esté protegida por un interruptor de circuito por falla a tierra (GFCI). Contacte a un electricista autorizado si usted no puede asegurarse de que el circuito esté protegido por un GFCI. Asegúrese de que el instalador proporcione un GFCI y que sea probado de manera rutinaria. Para probar el GFCI, presione el botón de prueba. El GFCI debe interrumpir la energía. Presione el botón de reinicio. Se debe restablecer la energía. Si el GFCI no funciona de esta forma, quiere decir que está defectuoso. Si el GFCI interrumpe la energía a la bomba sin presionar el botón de prueba, quiere decir que fluye corriente de tierra, lo que indica la posibilidad de una descarga eléctrica. No utilice la bomba. Desconéctela y solicite a un representante de servicio calificado que solucione el problema antes de utilizarla.

Debido al riesgo potencial de incendio, choque eléctrico o lesiones a las personas, las bombas Zodiac se deben instalar de acuerdo con el Código Eléctrico Nacional (NEC®) de EE. UU., todos los códigos locales eléctricos y de seguridad, y la Ley de Seguridad y Salud Ocupacionales (OSHA®). Las copias del NEC pueden solicitarse a la National Fire Protection Association® (NFPA®) en el sitio web www.nfpa.org o llamando al 617-770-3000 o comunicándose con el organismo de inspecciones gubernamentales de su localidad.

⚠ ADVERTENCIA

Los equipos instalados incorrectamente pueden fallar y causar lesiones graves o daños materiales.

⚠ ADVERTENCIA

- No conecte el sistema a una red de agua no regulada de la ciudad, o a otra fuente externa de agua presurizada que produzca presiones mayores a 35 psi.
- Arrancar la bomba cuando hay aire comprimido en el sistema puede hacer que la tapa del filtro salga expulsada, lo que puede causar serias lesiones e incluso la muerte o daños a la propiedad. Antes de operar asegúrese de que todo el aire del sistema haya salido.

⚠ ADVERTENCIA

Para minimizar el riesgo de muerte o graves lesiones, el filtro y/o la bomba no deben someterse a la prueba de presurización del sistema de tuberías.

Las normas locales pueden requerir que el sistema de tuberías de la piscina sea sometido a una prueba de presión. Por lo general, estos requisitos no tienen la intención de aplicarse a equipos de la piscina, tales como filtros y bombas.

Los equipos de piscina Polaris se prueban por presión en la fábrica.

Sin embargo, si la ADVERTENCIA no se puede observar y las pruebas de presión del sistema de tuberías deben incluir el filtro y/o la bomba, ASEGÚRESE DE CUMPLIR CON LAS SIGUIENTES INSTRUCCIONES DE SEGURIDAD:

- Compruebe que todas las abrazaderas, pernos, tapas, anillos de bloqueo, y accesorios del sistema estén correctamente instalados y asegurados antes de la prueba.
- LIBERE TODO EL AIRE en el sistema antes de la prueba.
- La presión del agua para la prueba no debe exceder 35 PSI.
- La temperatura del agua para la prueba no debe exceder 38°C.
- Limite la prueba a 24 hours. Después de la prueba, verifique visualmente el sistema para asegurarse de que esté listo para funcionar.

Aviso: Estos parámetros sólo se aplican a los equipos Zodiac. Para equipos de otras marcas que no sean Zodiac, consulte al fabricante correspondiente.

⚠ ADVERTENCIA

Los derrames de productos químicos y los gases pueden debilitar los equipos de piscina. La corrosión puede producir fallas en los filtros y otros equipos, lo que podría resultar en lesiones graves o daños materiales. No almacene productos químicos para piscinas cerca de sus equipos.

⚠ PRECAUCIÓN

¡No arranque la bomba en seco! El funcionamiento de la bomba en seco puede causar daños graves e invalidará la garantía.

⚠ PRECAUCIÓN

Esta bomba es para uso en piscinas instaladas permanentemente y también se puede utilizar en tinas de hidromasaje y spas, si estuviera indicado en la documentación. No utilice en piscinas portátiles. La piscina permanente está construída dentro o sobre el suelo o en un edificio, de tal manera que no se puede desmontar fácilmente para su almacenamiento. La piscina portátil está construida de manera que puede ser fácilmente desmontada para su almacenamiento y volver a montarse en su estado original.

⚠ PRECAUCIÓN

No la instale dentro de una protección al aire libre ni debajo de la falda de una tina de hidromasaje o un spa portátil. La bomba requiere una ventilación adecuada para mantener la temperatura del aire por debajo del rango de temperatura ambiente máxima que aparece en la placa del motor.

GUARDE ESTAS INSTRUCCIONES

1.2 Pautas de prevención de atrapamiento por succión de la bomba de la piscina

⚠ ADVERTENCIA

La succión de la bomba es peligrosa y puede atrapar, ahogar y desentrañar a los bañistas. No utilizar ni operar las piscinas, los spas ni las tinas de hidromasaje si una tapa de la boca de succión está ausente, rota o suelta. Las siguientes indicaciones proporcionan información para la instalación de la bomba minimizando el riesgo de lesiones para los usuarios de piscinas, spas y tinas de hidromasaje:

Protección contra atrapamiento - El sistema de succión de la bomba debe proporcionar protección contra los peligros de atrapamiento por succión.

Tapas de las bocas de succión - Todas las bocas de succión deben tener tapas instaladas correctamente y atornilladas en su lugar. Debe hacérsele mantenimiento a todas las tapas de las bocas de succión. Las tapas de drenaje deben cumplir con la última edición de la norma ANSI®/ASME® A112.19.8 o su estándar sucesor, ANSI/APSP-16 . Deben reemplazarse si están agrietadas, rotas o ausentes.

Número de las bocas de succión por bomba – Deben proporcionarse al menos dos (2) drenajes principales hidráulicamente equilibrados, con sus tapas, como bocas de succión para cada línea de succión de la bomba de circulación. Los centros de los drenajes principales (bocas de succión) en una (1) línea de succión deben estar separados por lo menos tres (3) metros de distancia, de centro a centro. Véase Figura 1.

El sistema debe estar construido para incluir al menos dos (2) bocas de succión (drenajes) conectadas a la bomba siempre que la bomba esté funcionando. Sin embargo, si dos (2) colectores principales llegan a una sola línea de succión, esta línea de succión individual puede ser equipada con una válvula que cerrará los dos drenajes principales de la bomba. El sistema deberá ser construido de tal manera que no permita el cierre por separado o independiente (aislamiento) de cada uno de los drenajes. Véase Figura 1.

Se puede conectar más de una (1) bomba a una línea de succión única, siempre y cuando se cumplan los requisitos.

Velocidad del agua - La velocidad máxima del agua a través del accesorio de succión o la cubierta de cualquier boca de succión debe ser de 1.5 metros por segundo, a menos que la boca se ajuste a la última edición de la norma ANSI / ASME A112.19.8 o su estándar sucesor, ANSI/APSP-16, la norma concerniente a accesorios de succión para el uso en piscinas de natación, piscinas de chapoteo, jacuzzis, spas y tinas de hidromasaje. En cualquier caso, no exceda la velocidad máxima de flujo del accesorio de succión.

Si el 100% del caudal de la bomba viene del sistema de drenaje principal, la velocidad máxima del agua en el sistema hidráulico de succión de la bomba debe ser de seis (6) metros por segundo o menos, incluso si uno (1) de los drenajes principales (boca de succión) está completamente bloqueado. El flujo a través de los drenajes principales restantes debe cumplir con la última edición de la norma ANSI/ASME A112.19.8 o su estándar sucesor, ANSI/APSP-16, la norma concerniente a accesorios de succión para el uso en piscinas de natación, piscinas de chapoteo, jacuzzis, spas y tinas de hidromasaje.

Pruebas y certificación – Las tapas de la boca de succión deben haber sido probadas por un laboratorio de pruebas reconocido a nivel nacional y cumplir con la última edición de la norma ANSI/ASME A112.19.8 o su estándar sucesor, ANSI/APSP-16, la norma concerniente a accesorios de succión para el uso en piscinas de natación, piscinas de chapoteo, jacuzzis, spas y tinas de hidromasaje.

Accesorios – Accesorios de restricción de flujo; para la mejor eficiencia posible utilizar la menor cantidad de accesorios (pero por lo menos dos (2) bocas de succión).

Evite accesorios que pudieran atrapar aire.

Las conexiones y accesorios de limpieza por succión deben ajustarse a las normas aplicables de la Association of Plumbing and Mechanical Officials (IAPMO®).

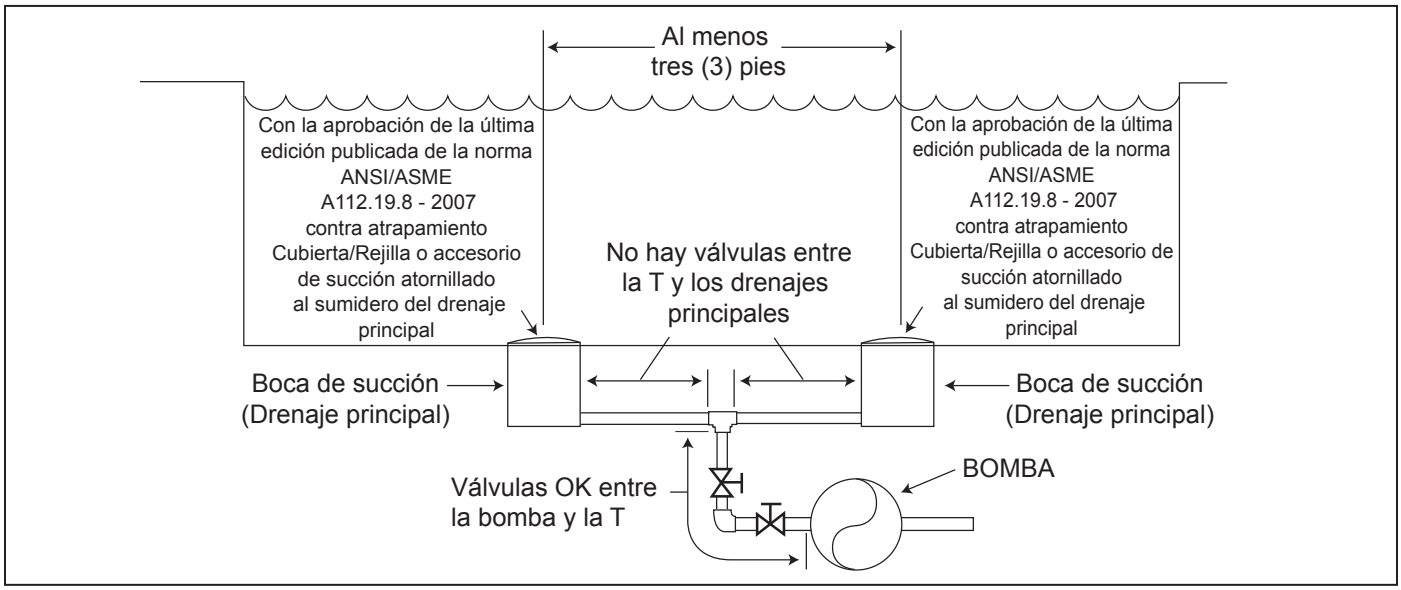


Figura 1. Número de bocas de succión por bomba

Sección 2. Descripción General

2.1 Introducción

Este manual contiene información para la instalación, el funcionamiento y el mantenimiento adecuados de la bomba Polaris PB4-60. Los procedimientos indicados en este manual se deben seguir con exactitud. Para obtener copias adicionales de este manual, póngase en contacto con Zodiac Pool Systems, Inc. (“Zodiac”) al 800.822.7933. Para mayor información de direcciones, consulte la contraportada de este manual.

2.2 Descripción

La bomba reforzadora Polaris, PB4-60, suministra agua a alta presión al limpiador de piscinas Polaris para optimizar su eficiencia. La bomba no se ceba automáticamente y sólo debe utilizarse cuando esté activada la bomba de filtrado de la piscina.

⚠ PRECAUCIÓN

Si la bomba reforzadora no se utiliza con una bomba de filtrado, la bomba reforzadora resultará dañada. La operación incorrecta de la bomba reforzadora anulará la garantía.

2.3 Preparación

1. Tras la recepción de la bomba, revise si la caja presenta daños. Abra la caja y revise si la bomba presenta daños ocultos, tales como grietas, abolladuras o la base doblada. Si encuentra algún daño, póngase en contacto con el proveedor de la bomba.
2. Inspeccione el contenido de la caja y verifique que estén todas las piezas. Consulte la sección 7.1, Lista de piezas de repuesto.

Sección 3. Instalación

3.1 Instalación eléctrica

3.1.1 Chequeos de voltaje

El voltaje correcto, como se especifica en la placa de la bomba, es necesario para un rendimiento adecuado y una larga vida del motor. Un voltaje incorrecto disminuirá el desempeño de la bomba y podría causar sobrecalentamiento, reduciendo la vida útil del motor y resultando en cuentas eléctricas más altas.

Es responsabilidad del instalador eléctrico proporcionar el voltaje de funcionamiento indicado en los datos de la placa la bomba, garantizando los tamaños adecuados de circuito y de cable para esta aplicación específica.

El Código Eléctrico Nacional (NEC®, NFPA-70®) de EE. UU. requiere que todos los circuitos de bomba de la piscina estan protegidos con un interruptor del circuito de fallos de conexión a tierra. Por lo tanto, también es responsabilidad del instalador eléctrico asegurarse de que el circuito de la bomba esté en el cumplimiento de éste y todos los demás requisitos aplicables del Código Eléctrico Nacional (NEC) y otros códigos aplicables a la instalación.

⚠ PRECAUCIÓN

No proporcionar el voltaje indicado en placa (dentro de un 10%) durante la operación causará que el motor se sobrecaliente y anulará la garantía.

3.1.2 Interconectar cables y conectar a tierra

1. La carcasa del motor debe estar conectada a tierra mediante una conexión a tierra fiable con un conductor de cobre sólido, Nº. 8 AWG (8.4 mm^2) o uno más grande. En Canadá, debe utilizarse Nº 6 AWG (13.3 mm^2) o mayor. Si la bomba está instalada a no más de cinco (5) pies (1.5 metros) de las paredes interiores de la piscina, el spa o la tina de hidromasaje, la carcasa del motor debe estar interconectada con todas las partes metálicas de la estructura de la piscina, el spa o la tina de hidromasaje y con todas las tuberías de los equipos eléctricos, conductos de metal y tubos de metal a no más de cinco (5) pies (1.5 metros) de las paredes interiores de la piscina, el spa o la tina de hidromasaje.
2. Unir el motor utilizando el terminal de externo provisto.

⚠ ADVERTENCIA

Con el fin de evitar el riesgo de daños a la propiedad, lesiones personales graves y/o muerte, siempre desconecte la fuente de alimentación eléctrica antes de trabajar en un motor o cualquier componente conectado a él.

⚠ ADVERTENCIA

Con el fin de evitar el riesgo de daños a la propiedad, lesiones personales graves y/o muerte, asegúrese de que el interruptor de control o el reloj registrador estén instalados en un lugar accesible, de modo que en caso de una falla del equipo o de las tuberías, el equipo pueda ser fácilmente apagado. Este lugar debe ser un lugar distinto a donde se encuentra la bomba de la piscina, filtros y otros equipos.

⚠ PRECAUCIÓN

La bomba debe estar permanentemente conectada a un circuito eléctrico dedicado. Ningún otro equipo, luces, electrodomésticos, o tomas pueden estar conectados al circuito de la bomba, con la excepción de los productos que pueden ser necesarios para operar simultáneamente con la bomba, como un dispositivo de cloración o la calefacción.

3.2 Eléctrico

Potencia del motor				
HP	**S.F**	**RPM**	**VOLTS**	**S.F. AMPS**
3/4	1.5	3450	230/115, 60Hz, 1PH	6.4/12.8

3.2.1 Cableado eléctrico

1. El motor de la bomba debe ser puesto a tierra adecuadamente y de forma segura con el tornillo verde proporcionado. Complete el aterramiento antes de conectar al suministro de energía eléctrica. ***No conecte a tierra en una tubería de suministro de gas.***
2. El tamaño del cable debe ser adecuado para minimizar la caída de tensión durante el arranque y funcionamiento de la bomba. Vea la Tabla 1 para conocer los tamaños de cable sugeridos.
3. Aísle todas las conexiones con cuidado para evitar cable a tierra o cortocircuitos. Los bordes afilados en los terminales requieren una protección extra. Para evitar que las tuercas

Tabla 1. Tamaño máximo del cable y protección contra sobrecorriente

TAMAÑO MÁXIMO DEL CABLE Y MÁXIMA PROTECCIÓN CONTRA SOBRECORRIENTE*								
Distancia desde el sub-tablero			De 0 a 50 pies (15 metros)		De 50 a 100 pies (de 15 a 30 metros)		De 100 a 200 pies (de 30 a 60 metros)	
Modelo de bomba	Clase de amperaje del fusible secundario: CC, G, H, J, K, RK o T		Voltaje		Voltaje		Voltaje	
	230 VAC	115 VCA	208-230 VAC	115 VCA	208-230 VAC	115 VCA	208-230 VAC	115 VCA
PB4-60	15A	20A	14 AWG (2,1mm²)	12 AWG (3,3mm²)	12 AWG (3,3mm²)	10 AWG (5,3mm²)	10 AWG (5,3mm²)	10 AWG (5,3mm²)

*Asume tres (3) cables de cobre en un conducto enterrado y un máximo de 3% de pérdida de voltaje por rama del circuito. Deben seguirse todos los códigos eléctricos locales y los de la National Electrical Code (NEC®) de EE. UU. La tabla muestra el tamaño de cable mínimo y recomendaciones de fusibles secundarios para una instalación típica según el NEC.

de los cables se aflojen, séllelas con una cinta aisladora eléctrica adecuada que tenga una marca de aprobación reconocida (UL®, ETL®, CSA®). Por razones de seguridad, y para evitar la entrada de contaminantes, reinstale todos los conductos y tapas de la caja de terminales. ***No fuerce las conexiones en la caja de conexiones.***

4. Para configurar el cableado interno del motor de la bomba en el voltaje correcto, consulte el diagrama que se encuentra en la placa de datos del motor.
5. La corriente inicial del motor de la bomba reforzadora puede superar los 15 amp si se trabaja con una línea de voltaje de 115 VCA. Se recomienda utilizar un disyuntor de servicio de 20 amp para la bomba conectada a 115 VCA.
6. El motor de la bomba reforzadora está cableado en fábrica para 230 voltios, pero puede cablearse para 115 o 230 voltios. Para realizar un nuevo cableado para 115 voltios, siga las instrucciones que se encuentran en la placa de identifiación ubicada en la parte trasera del motor o en la placa de tamaños al lado del motor.
7. Se recomienda el uso de un reloj registrador independiente (además del reloj registrador del sistema de filtrado) para controlar las funciones de encendido/apagado de la bomba reforzadora. También puede utilizarse un interruptor manual.
8. Si se utiliza un reloj registrador, configúrelo para que encienda la bomba por lo menos media hora después de encender la bomba de filtrado de la piscina y para que apague la bomba por lo menos media hora antes de que se apague la bomba de filtrado. Revise periódicamente las configuraciones del reloj registrador para asgurarse de que estén sincronizadas correctamente.

3.3 Plomería

⚠ PRECAUCIÓN

Tenga cuidado de no apretar demasiado ningún accesorio de los tubos ya sea en la entrada o la salida de la bomba reforzadora. Un apriete excesivo podría hacer que la carcasa resultara agrietada.

3.3.1 Requisitos

La bomba reforzadora Polaris necesita una línea de retorno dedicada. Conecte la bomba reforzadora al sistema de manera tal que siempre reciba el flujo de la bomba de filtrado.

Para garantizar el funcionamiento correcto de la bomba y el limpiador, consulte la Figura 2 y observe las siguientes pautas para equipos específicos.

1. Conecte la línea dedicada en sentido ascendente de todo el equipo con inducción de aire.
2. Si hay un calentador instalado en el sistema, conecte la entrada de la bomba reforzadora en la línea de retorno en sentido descendente y por lo menos a tres (3) pies (1 metro) de la descarga del calentador. Véase Figura 2. No conecte la entrada de la bomba reforzadora en la sección de tres pies (1 metro) del tubo del disipador térmico que sale directamente del calentador.
3. Algunos sistemas de calentamiento solar utilizan todo el flujo de agua cuando purgan el aire de los paneles. Si la bomba está instalada en una tubería sin flujo durante las purgas del panel solar, instale un mecanismo de desviación automática para apagar la bomba.
4. Conecte la entrada de la bomba reforzadora en una ubicación más alta, en sentido ascendente y lo más lejos posible del clorador.

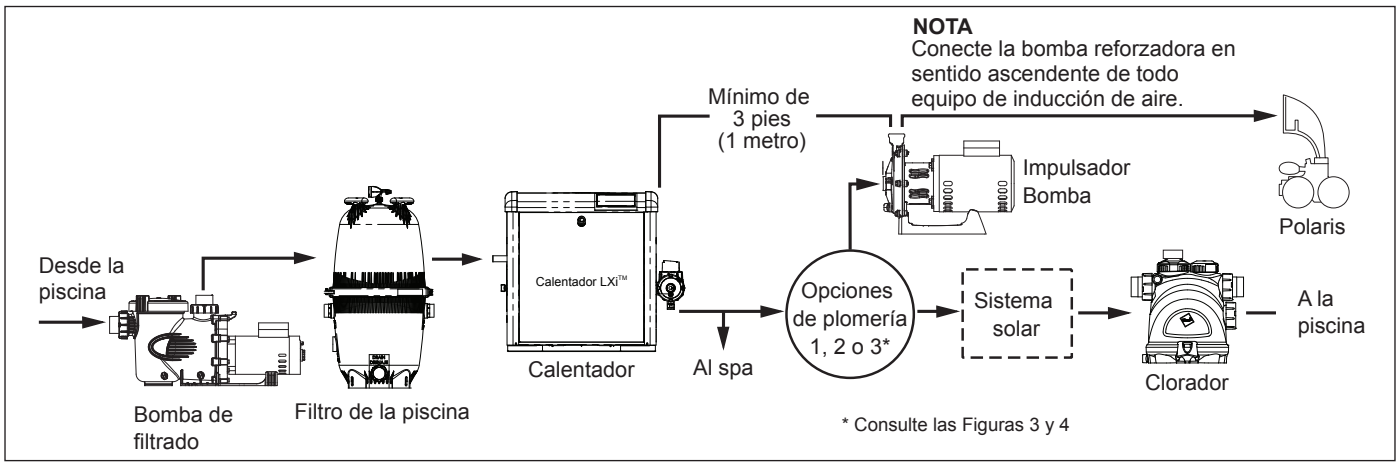


Figura 2. Disposición típica del equipo

3.3.2 Dimensiones de la tubería

1. Se recomienda el uso de tubos de PVC rígidos que tengan un diámetro mínimo de 3/4 pulg., 1-1/2 pulg. para la línea de retorno dedicada. Los tubos de PVC flexibles no se recomiendan para la línea de retorno dedicada subterránea de la piscina, ya que pueden dañarse por la expansión y los movimientos causados por el aumento de presión de la bomba. Consulte las Figuras 3 y 4.

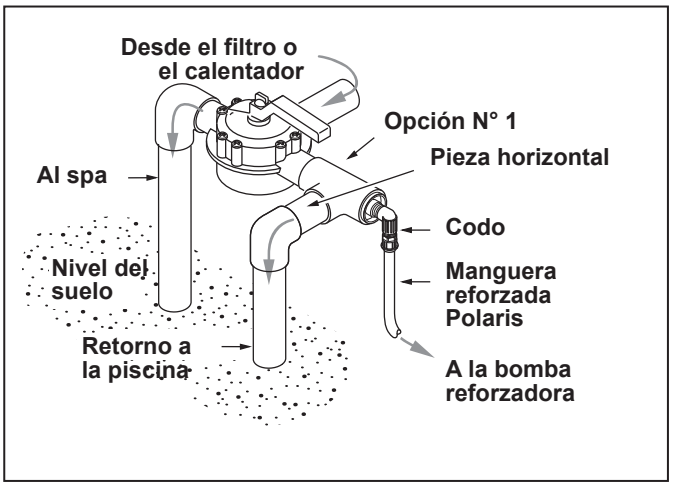


Figura 3. Configuración de plomería preferible

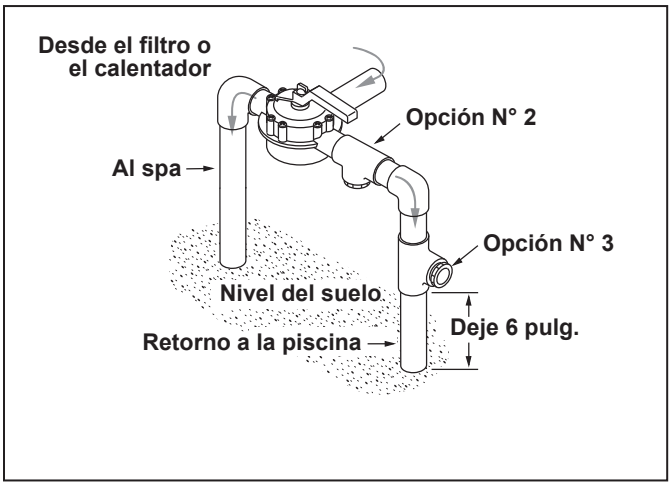


Figura 4. Configuración de plomería alternativa

2. La línea de conexión de entrada de la bomba reforzadora debe ser de al menos 3/4 pulg. **La Softube Quick Connect accesorios fueron diseñada para funcionar con la manguera reforzada Polaris (pieza n.° P19) únicamente.**

3. No la conecte en la parte superior de una línea horizontal.

4. Utilice codos de 90° para minimizar las curvas y los bucles de la manguera reforzada Polaris.

3.3.3 Ubicación de la bomba

1. Zodiac Pool Systems, Inc. recomienda la instalación de la bomba a no más de 1 pie (30 cm) por encima del nivel del agua. La bomba no debe elevarse a más de un metro por encima del nivel del agua de la piscina.

2. Si la bomba se ubica por debajo del nivel del agua, deben instalarse válvulas de aislamiento tanto en la línea de succión como en la de retorno para evitar el reflujo del agua de la piscina durante cualquier servicio de rutina o necesario.

⚠ ADVERTENCIA

Algunos sistemas de liberación de vacío de seguridad (SVRS) no son compatibles con la instalación de válvulas de antirretorno. Si la piscina tiene un dispositivo de SVRS, asegúrese de confirmar que seguirá operando de manera segura cuando se instalen las válvulas de antirretorno.

3. La bomba y los otros equipos de circulación deben estar ubicados a más de cinco (5) pies (1.5 metros) del agua. Elija un lugar que reduzca al mínimo las curvas en la tubería.

NOTA En Canadá, la bomba debe estar ubicada a un mínimo de 3 metros [aproximadamente 10 pies] del agua (CSA C22.1).

4. La bomba debe ser colocada sobre una base sólida que no vaya a vibrar. Para reducir aún más la posibilidad de ruido por vibración, fije con pernos la bomba a la base.

NOTA Zodiac® recomienda utilizar pernos para fijar la bomba directamente a la base.

5. La base de la bomba debe tener un drenaje adecuado para evitar que el motor se moje. La bomba debe estar protegida de la lluvia y el sol.

6. Es necesaria una ventilación adecuada para que la bomba funcione con normalidad. Todos los motores generan calor que debe ser retirado por mediante una ventilación adecuada.

7. Proporcione acceso para poder realizar el servicio de mantenimiento o reparaciones, dejando un espacio suficiente alrededor de la bomba. Deje bastante espacio encima de la bomba para el servicio de mantenimiento y reparación.

8. Si el equipo está cubierto, proporcione iluminación adecuada.

3.3.4 Instalación de la bomba

1. Instale la bomba utilizando dos (2) anclajes de expansión para hormigón con el objetivo de garantizar la estabilidad.

2. Aplique cuatro (4) a seis (6) capas de cinta de Teflon® a la rosca cónica del conector de lengüeta. Véase la figura 5 (a).

⚠ PRECAUCIÓN

JAMÁS debe usarse compuesto de tuberías en las roscas de lengüetas. El compuesto de tuberías debilitará gravemente el plástico, causando fugas, y puede ocasionar la fractura del plástico. NO APRIETE DEMASIADO.

3. Enrosque y ajuste la rosca cónica del conector lengüeta en el puerto de la bomba, ubicado en el cuerpo de la bomba. Véase la figura 5 (b).

4. Recorte la manguera reforzada a la longitud requerida. Asegúrese de que el corte sea limpio y perpendicular. Evite los bucles o dobleces innecesarios en la manguera.

5. Deslice la tuerca del conector sobre el extremo recortado de la manguera con el extremo con rosca mirando hacia la punta recortada de la manguera. Véase la figura 5 (c).

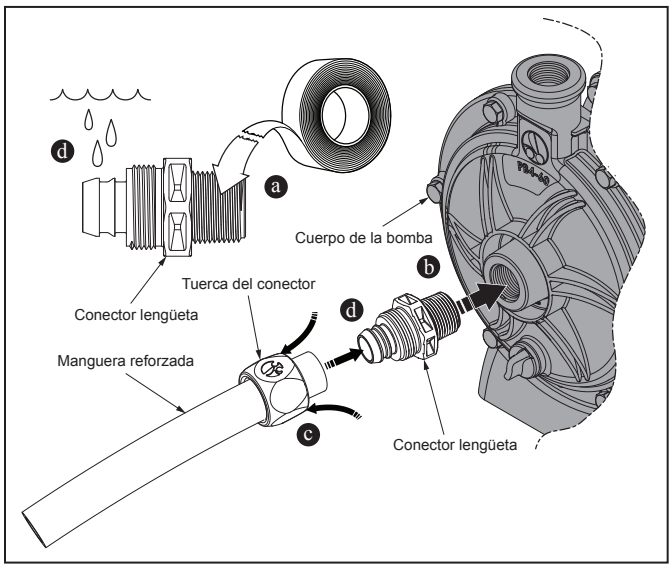


Figure 5. Preparación e instalar Quick Connect lengüeta del conector y tuerca del conector

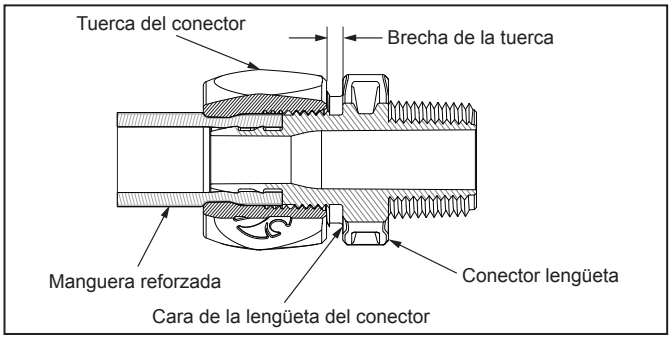


Figure 6. Apriete la tuerca del conector para asegurar la manguera

6. Aplique agua a la lengüeta del conector para ayudar a deslizar la manguera sobre las lengüetas. Empuje el borde recortado de la manguera hasta que cubra por completo la lengüeta del conector. Véase la figura 5 (d).
7. Deslice/rote la tuerca del conector hasta la lengüeta para acoplar las roscas correctamente; no estropee la rosca de la tuerca del conector. Ajuste la tuerca del conector hasta que ya no se vean las roscas (un espacio de alrededor de 1/8" o apenas menos del ancho de dos monedas de diez centavos) o hasta que toque la cara de la lengüeta. Véase la figura 6.

3.3.5 Recomendaciones de instalación

1. Si la bomba se ubica por debajo del nivel del agua, deben instalarse válvulas de aislamiento en ambos lados de la bomba para evitar el reflujo del agua de la piscina durante cualquier servicio de rutina o necesario.
2. Para ayudar a prevenir problemas en el cebado, se debe instalar la tubería de succión sin puntos elevados (por encima de la entrada de la bomba - "U" invertida en plomería) que puedan atrapar el aire.
3. La tubería debe estar bien apoyada y colocada en un lugar donde no quede expuesta a un estrés constante.
4. Siempre use válvulas del tamaño correcto. Las válvulas de desviación Jandy® Pro Series y las válvulas de bola típicamente tienen las mejores capacidades de flujo.
5. Use la menor cantidad de conexiones o accesorios posibles. Todo accesorio o conexión adicional tiene el efecto de alejar más el equipo del agua.

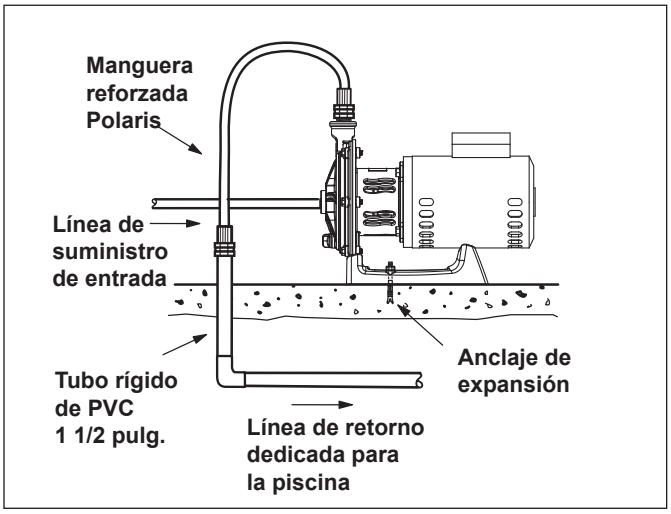


Figura 7. Complete la instalación

NOTA Si son necesarios más de 10 accesorios de succión, el tamaño de la tubería debe aumentarse.

3.3.6 Revisar el flujo de agua

NOTE Esta bomba debe tener una presión de salida mínima de 45 psi. Una presión menor puede causar una condición de sobrecorriente del motor.

Después de instalar la tubería del sistema, verifique el flujo de agua a la bomba reforzadora desconectando la línea de suministro de entrada en la bomba reforzadora y luego encendiendo la bomba de filtrado. El agua debería fluir desde la línea.

Si no hay flujo de agua, revise lo siguiente:

1. Verifique que la instalación sea correcta. Consulte la Figura 6.
2. Utilice accesorios de tipo globo ocular más pequeños en las líneas de retorno de la piscina o conecte una línea de retorno.

Una vez establecido el flujo, la bomba está lista para funcionar.

3.3.7 Realizar prueba de presión

⚠ ADVERTENCIA

Cuando se presuriza un sistema con agua para probarlo, a menudo queda aire atrapado en el sistema durante el proceso de llenado. Este aire se comprime cuando el sistema está bajo presión. En caso de fallo del sistema, el aire atrapado puede impulsar partículas a gran velocidad y causar lesiones. Se deben hacer todos los esfuerzos posibles para eliminar el aire atrapado durante el llenado de la bomba, incluida la apertura de la válvula de purga del filtro y el aflojamiento de la tapa de la canasta de la bomba.

⚠ ADVERTENCIA

El aire atrapado en el sistema puede hacer que salte la tapa del filtro, lo que puede causar lesiones graves e incluso la muerte o daño a la propiedad. Antes de operar la bomba, asegúrese de que todo el aire haya sido extraido correctamente del sistema. NO USE AIRE COMPRIMIDO PARA HACER PRUEBAS DE PRESIÓN O COMPROBAR SI HAY FUGAS.

⚠ ADVERTENCIA

Cuando se realice la prueba de presión del sistema con agua, es muy importante asegurarse de que la tapa de la canasta de la bomba de filtro esté completamente afianzada.

⚠ ADVERTENCIA

No pruebe con presiones mayores de 35 PSI. La prueba de presión debe ser realizada por un profesional de piscinas entrenado. Todo equipo de circulación que no se haya probado adecuadamente puede fallar, lo que podría provocar lesiones graves o daños materiales.

1. Llene el sistema con agua, teniendo cuidado de eliminar el aire atrapado.
2. Presurice el sistema con agua a no más de 35 PSI.
3. Cierre la válvula para atrapar agua presurizada en el sistema.
4. Observe el sistema para detectar fugas y/o caídas de presión.
5. Para obtener soporte técnico, contacto con el soporte técnico de Zodiac® al 800.822.7933.

Sección 4. Operación

4.1 Puesta en marcha

⚠ PRECAUCIÓN

Nunca opere la bomba reforzadora sin agua. Hacer funcionar la bomba “en seco” por cualquier cantidad de tiempo puede causar graves daños a la bomba y al motor y anulará la garantía.

⚠ PRECAUCIÓN

Nunca opere la bomba reforzadora sin haber conectado el limpiador ya que esto causará daños al impulsor de la bomba y anulará la garantía.

Si se trata de una piscina nueva, asegúrese de que toda la tubería esté libre de residuos de construcción y que haya sido debidamente probada a presión. El filtro debe ser revisado para verificar su correcta instalación, comprobando que todas las conexiones y abrazaderas estén aseguradas de acuerdo a las recomendaciones del fabricante.

⚠ ADVERTENCIA

Para evitar el riesgo de daños a la propiedad o lesiones personales verifique que la alimentación eléctrica esté apagada antes de iniciar este procedimiento.

1. Encienda la bomba de filtrado.
2. Abra la liberación de presión del filtro para aliviar la presión del sistema hasta que salga agua.
3. Si la bomba de filtrado se encuentra por debajo del nivel del agua de la piscina, abrir la válvula de liberación de presión del filtro cebará la bomba con agua.
4. Una vez que haya salido todo el aire del filtro, cierre la válvula de liberación de presión.
5. Energice la bomba reforzadora. Luego encienda la bomba reforzadora.
6. La bomba reforzadora debería cebarse. El tiempo que toma el cebado dependerá de la altura y la longitud de la tubería utilizada en el suministro de succión. Consulte la *sección 3.3.6* para conocer la elevación correcta y el tamaño del tubo.
7. Si la bomba reforzadora no se ceba y todas las instrucciones se han seguido hasta este punto, revise si hay una fuga de succión.

Sección 5. Mantenimiento

5.1 Preparación de la bomba para el invierno

⚠ PRECAUCIÓN

La bomba *debe* protegerse cuando se esperen temperaturas de congelación. Permitir que la bomba se congele causará daños graves y anulará la garantía.

⚠ PRECAUCIÓN

¡No use soluciones anticongelantes en los sistemas de piscina, spa, o jacuzzi! El anticongelante es altamente tóxico y puede dañar el sistema de circulación. La única excepción a esto es el propilenglicol. Para más información, consulte en su tienda proveedora de artículos de piscina/spa o póngase en contacto con una empresa calificada de servicios de piscina.

1. Drene toda el agua de la bomba, el equipo del sistema y las tuberías.
2. Retire el tapón de drenaje. Almacene el tapón de drenaje en un lugar seguro y reinstálelo cuando la temporada de frío haya terminado. No pierda la junta tórica. (Tapón de drenaje con juego de junta tórica, R0537000).
3. Mantenga el motor cubierto y seco.

NOTA Cubrir la bomba con un plástico hará que se genere condensación, y esta humedad dañará la bomba. La mejor forma de proteger su bomba es solicitar a un técnico o electricista de servicio calificado que desconecte correctamente el cableado eléctrico en la caja terminal. Una vez que se quita la electricidad, pueden aflojarse los dos (2) accesorios de conexión rápida y la bomba puede almacenarse bajo techo. Por razones de seguridad, y para evitar la entrada de contaminantes, reinstale todos los conductos y tapas de la caja de terminales.

4. Cuando el sistema se vuelva a abrir para usarse, asegúrese de que todas las tuberías, válvulas, cableado y el equipo estén de acuerdo con las recomendaciones del fabricante. Preste mucha atención a las conexiones eléctricas y el filtro.
5. La bomba debe ser cebada antes de su arranque; Véase *la Sección 4.1, Arranque*.

Sección 6. Especificaciones del producto y datos técnicos

6.1 Lista de piezas de repuesto

Para ordenar o comprar piezas para las bombas Polaris®, contacte su distribuidor Zodiac más cercano. Si no pueden suministrarle lo que necesita, comuníquese con el soporte técnico de Zodiac al 800.822.7933 o visite www.zodiacpoolsystems.com.

Key No.	Description	Qty	Order Part No.	Comments
1	Motor de repuesto para la bomba	1	P61	
2	Junta tórica, placa de apoyo, PB4-60	1	R0536600	
3	Sello, cerámica y resorte	1	R0445500	
4	Impulsor, PB4-60	1	R0536400	
5	Voluta, PB4-60	1	R0536300	(Incluye tapón de drenaje con junta tórica)
6	Pernos con arandelas y tuercas	6	R0536900	
7	Tapón de drenaje con junta tórica, común	1	R0537000	
8	Base, reforzador, PB4-60	1	R0537100	
9	Pernos y arandelas, inoxidables, motor, PB4-60	4	R0536800	
10	Quick Connect juego para la instalación	1	R0617100	El kit incluye uno (1) 6' de largo de manguera reforzada, y 4 Quick Connect accesorios.
11	Quick Connect guarniciones	4	R0621000	Incluye cuatro (4) Quick Connect accesorios y instrucciones de instalacion.
12	Manguera de la bomba de 6 pies Reforzada	1	P19	
13	Placa de apoyo PB4-60	1	R0536700	Incluye sello y tórica de la placa apoyo

6.2 Plano de despiece de la bomba reforzadora Polaris PB4-60

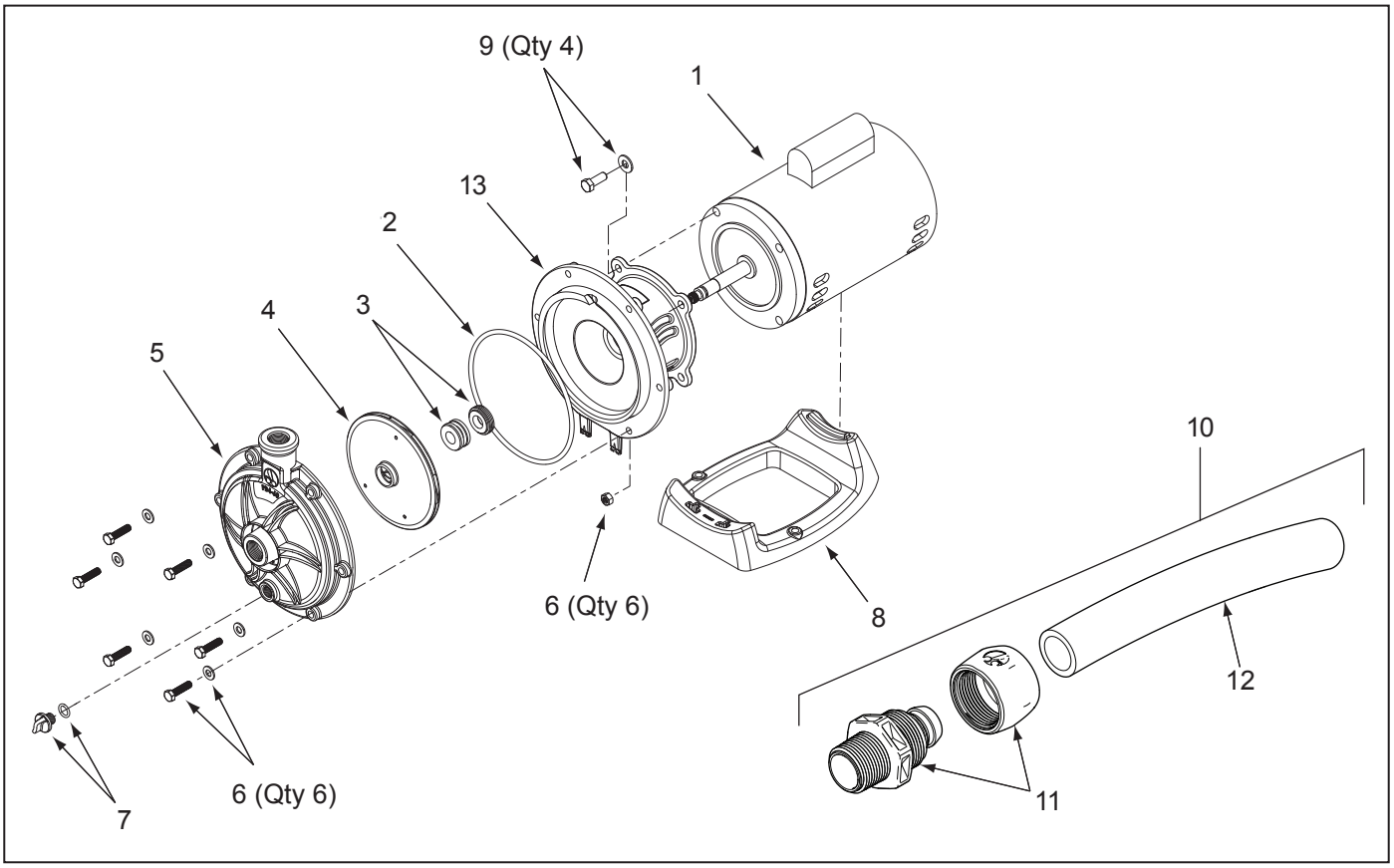
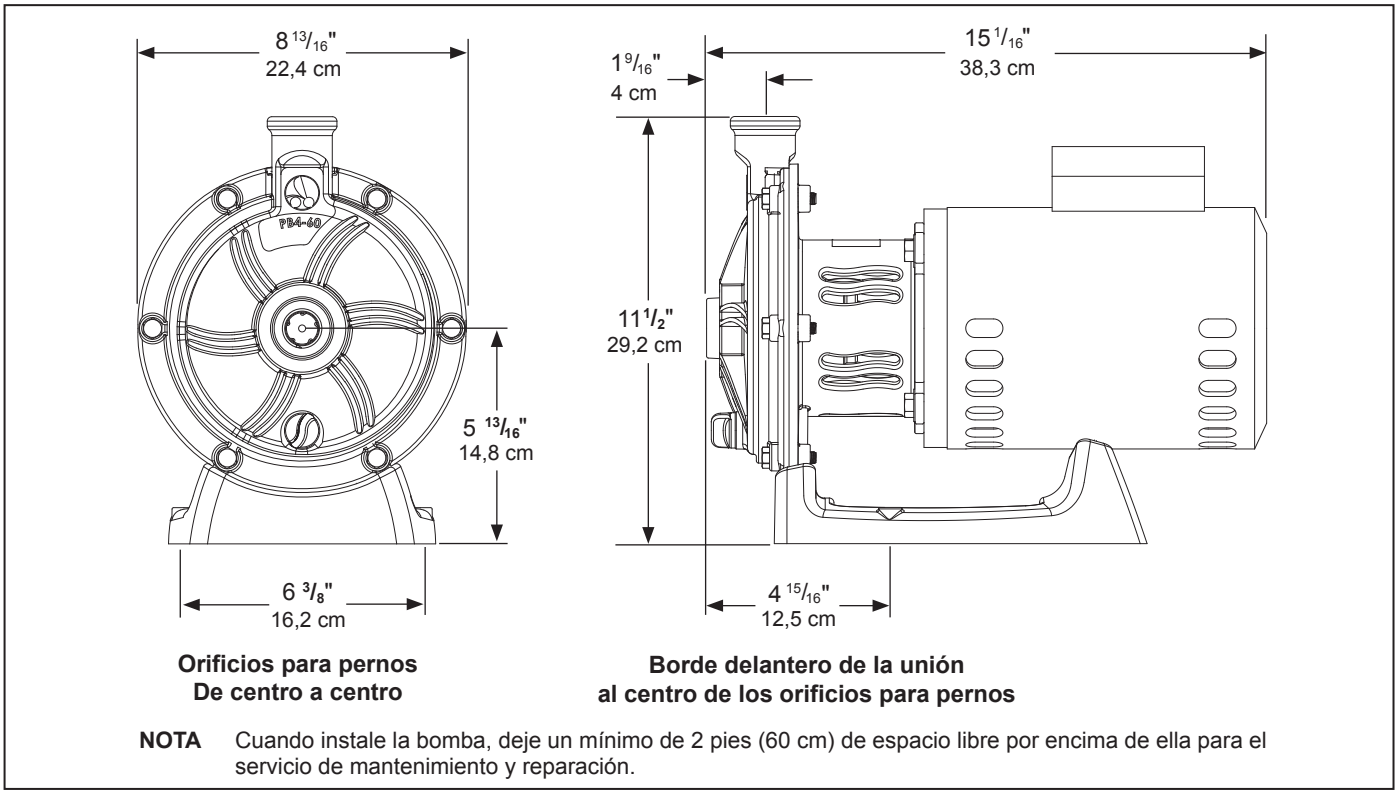


Figura 11. Plano de despiece de la bomba reforzadora Polaris PB4-60

6.3 Dimensiones de la bomba



NOTA Cuando instale la bomba, deje un mínimo de 2 pies (60 cm) de espacio libre por encima de ella para el servicio de mantenimiento y reparación.

Figure 12. Dimensiones de la bomba Polaris reforzadora PB4-60

NOTAS

NOTAS

NOTAS

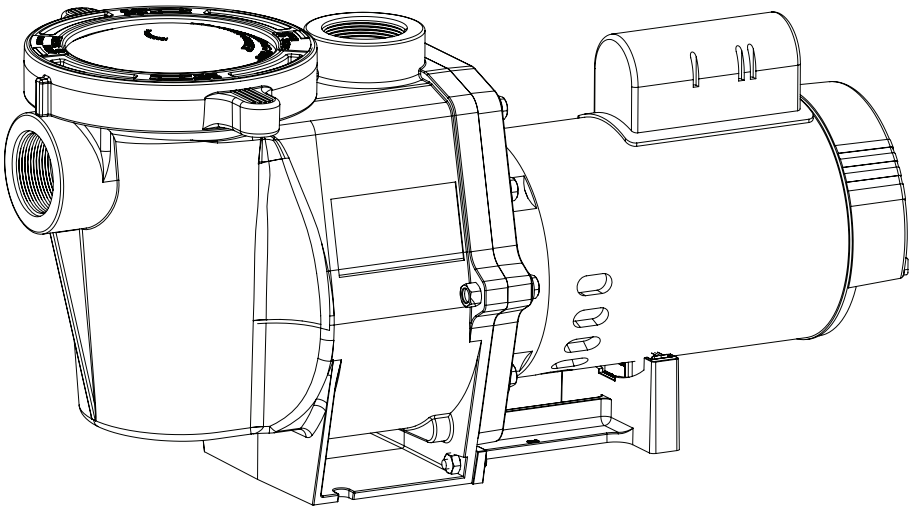
Zodiac Pool Systems, Inc.
2620 Commerce Way, Vista, CA 92081
1.800.822.7933 | www.ZodiacPoolSystems.com

H0399500 REV. E

Polaris®

PENTAIR

WHISPERFLO®
HIGH PERFORMANCE PUMP



INSTALLATION AND USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

CUSTOMER SERVICE / TECHNICAL SUPPORT

If you have questions about ordering Pentair Aquatic Systems replacement parts, and pool products, please contact:

Customer Service and Technical Support, USA
(8 A.M. to 4:30 P.M. — Eastern/Pacific Times)
Phone: (800) 831-7133
Fax: (800) 284-4151

Web site
Visit *www.pentairpool.com* or *www.staritepool.com*

Sanford, North Carolina (8 A.M. to 4:30 P.M. ET)
Phone: (919) 566-8000
Fax: (919) 566-8920

Moorpark, California (8 A.M. to 4:30 P.M. PT)
Phone: (805) 553-5000 (Ext. 5591)
Fax: (805) 553-5515

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P/N 071109 Rev. J 8/29/14

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

IMPORTANT NOTICE

This guide provides installation and operation instructions for this product. Consult Pentair with any questions regarding this equipment.

Attention Installer: This guide contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment after installation or left on or near the pump.

Attention User: This manual contains important information that will help you in operating and maintaining this product. Please retain it for future reference.

READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

This is the safety alert symbol. When you see this symbol on your system or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

⚠ DANGER Warns about hazards that can cause death, serious personal injury, or major property damage if ignored.

⚠ WARNING Warns about hazards that may cause death, serious personal injury, or major property damage if ignored.

⚠ CAUTION Warns about hazards that may or can cause minor personal injury or property damage if ignored.

NOTE indicates special instructions not related to hazards.

Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.

When installing and using this electrical equipment, basic safety precautions should always be followed, include the following:

⚠ WARNING Do not permit children to use this product.

⚠ WARNING **RISK OF ELECTRICAL SHOCK.** Connect only to a branch circuit protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the circuit is protected by a GFCI.

⚠ WARNING This unit must be connected only to a supply circuit that is protected by a ground-fault circuit-interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of an electric shock. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.

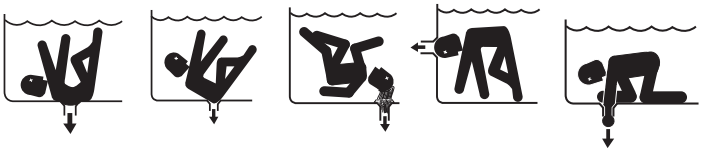
⚠ CAUTION This pump is for use with permanent swimming pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently-installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it is capable of being readily disassembled for storage and reassembled to its original integrity.

General Warnings

- Never open the inside of the drive motor enclosure. There is a capacitor bank that holds a 230 VAC charge even when there is no power to the unit.
- The pump is not submersible.
- The pump is capable of high flow rates; use caution when installing and programming to limit pumps performance potential with old or questionable equipment.
- Code requirements for the electrical connection differ from state to state. Install equipment in accordance with the National Electrical Code and all applicable local codes and ordinances.
- Before servicing the pump; switch OFF power to the pump by disconnecting the main circuit to the pump.
- This appliance is not intended for use by persons (including children) of reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

⚠ DANGER FAILURE TO FOLLOW ALL INSTRUCTIONS AND WARNINGS CAN RESULT IN SERIOUS BODILY INJURY OR DEATH. **THIS PUMP SHOULD BE INSTALLED AND SERVICED ONLY BY A QUALIFIED POOL SERVICE PROFESSIONAL. INSTALLERS, POOL OPERATORS AND OWNERS MUST READ THESE WARNINGS AND ALL INSTRUCTIONS IN THE OWNER'S MANUAL BEFORE USING THIS PUMP. THESE WARNINGS AND THE OWNER'S MANUAL MUST BE LEFT WITH THE POOL OWNER.**

⚠ DANGER SUCTION ENTRAPMENT HAZARD: STAY OFF THE MAIN DRAIN AND AWAY FROM ALL SUCTION OUTLETS!



THIS PUMP PRODUCES HIGH LEVELS OF SUCTION AND CREATES A STRONG VACUUM AT THE MAIN DRAIN AT THE BOTTOM OF THE BODY OF WATER. THIS SUCTION IS SO STRONG THAT IT CAN TRAP ADULTS OR CHILDREN UNDER WATER IF THEY COME IN CLOSE PROXIMITY TO A DRAIN OR A LOOSE OR BROKEN DRAIN COVER OR GRATE.

THE USE OF UNAPPROVED COVERS OR ALLOWING USE OF THE POOL OR SPA WHEN COVERS ARE MISSING, CRACKED OR BROKEN CAN RESULT IN BODY OR LIMB ENTRAPMENT, HAIR ENTANGLEMENT, BODY ENTRAPMENT, EVISCERATION AND/OR DEATH.
The suction at a drain or outlet can cause:

Limb Entrapment: When a limb is sucked or inserted into an opening resulting in a mechanical bind or swelling. This hazard is present when a drain cover is missing, broken, loose, cracked or not properly secured.

Hair Entanglement: When the hair tangles or knots in the drain cover, trapping the swimmer underwater. This hazard is present when the flow rating of the cover is too small for the pump or pumps.

Body Entrapment: When a portion of the body is held against the drain cover trapping the swimmer underwater. This hazard is present when the drain cover is missing, broken or the cover flow rating is not high enough for the pump or pumps.

Evisceration/Disembowelment: When a person sits on an open pool (particularly a child wading pool) or spa outlet and suction is applied directly to the intestines, causing severe intestinal damage. This hazard is present when the drain cover is missing, loose, cracked, or not properly secured.

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

Mechanical Entrapment: When jewelry, swimsuit, hair decorations, finger, toe or knuckle is caught in an opening of an outlet or drain cover. This hazard is present when the drain cover is missing, broken, loose, cracked, or not properly secured.

NOTE: ALL SUCTION PLUMBING MUST BE INSTALLED IN ACCORDANCE WITH THE LATEST NATIONAL AND LOCAL CODES, STANDARDS AND GUIDELINES.

⚠WARNING TO MINIMIZE THE RISK OF INJURY DUE TO SUCTION ENTRAPMENT HAZARD:

- A properly installed and secured ANSI/ASME A112.19.8 approved anti-entrapment suction cover must be used for each drain.
- Each suction cover must be installed at least three (3') feet apart, as measured from the nearest point to nearest point.
- Regularly inspect all covers for cracks, damage and advanced weathering.
- If a cover becomes loose, cracked, damaged, broken or is missing, replace with an appropriate certified cover.
- Replace drain covers as necessary. Drain covers deteriorate over time due to exposure to sunlight and weather.
- Avoid getting hair, limbs or body in close proximity to any suction cover, pool drain or outlet.
- Disable suction outlets or reconfigure into return inlets.

⚠WARNING A clearly labeled emergency shut-off switch for the pump must be in an easily accessible, obvious place. Make sure users know where it is and how to use it in case of emergency.

The Virginia Graeme Baker (VGB) Pool and Spa Safety Act creates new requirements for owners and operators of commercial swimming pools and spas.

Commercial pools or spas constructed on or after December 19, 2008, shall utilize:

(A) A multiple main drain system without isolation capability with suction outlet covers that meet ASME/ANSI A112.19.8a Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs and either:

(i) A safety vacuum release system (SVRS) meeting ASME/ANSI A112.19.17 Manufactured Safety Vacuum Release systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems and/or ASTM F2387 Standard Specification for Manufactured Safety Vacuum Release Systems (SVRS) for Swimming pools, Spas and Hot Tubs or

(ii) A properly designed and tested suction-limiting vent system or

(iii) An automatic pump shut-off system.

Commercial pools and spas constructed prior to December 19, 2008, with a single submerged suction outlet shall use a suction outlet cover that meets ASME/ANSI A112.19.8a and either:

(A) A SVRS meeting ASME/ANSI A112.19.17 and/or ASTM F2387, or

(B) A properly designed and tested suction-limiting vent system, or

(C) An automatic pump shut-off system, or

(D) Disabled submerged outlets, or

(E) Suction outlets shall be re-configured into return inlets.

For Installation of Electrical Controls at Equipment Pad (ON/OFF Switches, Timers and Automation Load Center)

⚠CAUTION Install all electrical controls at equipment pad, such as on/off switches, timers, and control systems, etc. to allow the operation (startup, shut-down, or servicing) of any pump or filter so the user does not place any portion of his/her body over or near the pump strainer lid, filter lid or valve closures. This installation should allow the user enough space to stand clear of the filter and pump during system start-up, shut down or servicing of the system filter.

⚠DANGER HAZARDOUS PRESSURE: STAND CLEAR OF PUMP AND FILTER DURING START UP

Circulation systems operate under high pressure. When any part of the circulating system (i.e. locking ring, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the pump housing cover filter lid and valves to violently separate which can result in severe personal injury or death. Filter tank lid and strainer cover must be properly secured to prevent violent separation. Stand clear of all circulation system equipment when turning on or starting up pump.

Before servicing equipment, make note of the filter pressure. Be sure that all controls are set to ensure the system cannot inadvertently start during service. Turn off all power to the pump. **IMPORTANT: Place filter manual air relief valve in the open position and wait for all pressure in the system to be relieved.**

Before starting the system, fully open the manual air relief valve and place all system valves in the "open" position to allow water to flow freely from the tank and back to the tank. Stand clear of all equipment and start the pump.

IMPORTANT: Do not close filter manual air relief valve until all pressure has been discharged from the valve and a steady stream of water appears. Observe filter pressure gauge and be sure it is not higher than the pre-service condition.

General Installation Information

- All work must be performed by a qualified service professional, and must conform to all national, state, and local codes.
- Install to provide drainage of compartment for electrical components.
- These instructions contain information for a variety of pump models and therefore some instructions may not apply to a specific model. All models are intended for use in swimming pool applications. The pump will function correctly only if it is properly sized to the specific application and properly installed.

⚠WARNING Pumps improperly sized or installed or used in applications other than for which the pump was intended can result in severe personal injury or death. These risks may include but not be limited to electric shock, fire, flooding, suction entrapment or severe injury or property damage caused by a structural failure of the pump or other system component.

⚠WARNING The pump can produce high levels of suction within the suction side of the plumbing system. These high levels of suction can pose a risk if a person comes within the close proximity of the suction openings. A person can be seriously injured by this high level of vacuum or may become trapped and drown. It is absolutely critical that the suction plumbing be installed in accordance with the latest national and local codes for swimming pools.

Warnings and safety instructions for Pentair Aquatic Systems pumps and other related products are available at: **http://www.pentairpool.com/pool-owner/safety-warnings/** or call (800) 831-7133 for additional free copies of these instructions.

Please refer to **http://www.pentairpool.com/pool-owner/safetywarnings/** for warning and safety instructions related to this product.

SAVE THESE INSTRUCTIONS

INSTALLATION

Only a qualified plumbing professional should install the WhisperFlo® High Performance Pump. Refer to *"Pump Warning And Safety Instructions"* on pages ii - iii for additional installation and safety information.

Location

Be sure the pump location meets the following requirements:

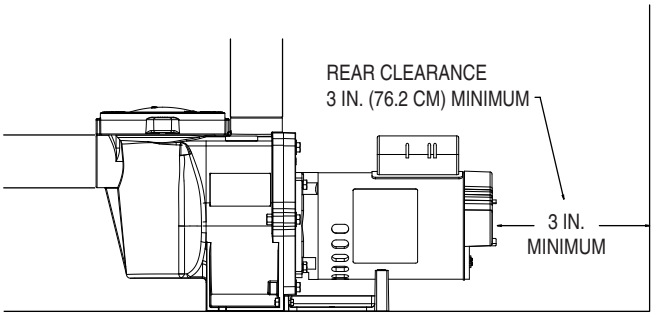
Note: Do not install this pump within an outer enclosure or beneath the skirt of a hot tub or spa unless marked accordingly.

1. Install the pump as close to the pool or spa as possible. To reduce friction loss and improve efficiency, use short, direct suction piping returns.
2. Install a minimum of 5 feet (1.52 meters) from the inside wall of the pool and spa. Canadian installations require a minimum of 9.8 feet (3 meters) from pool water level.
3. Install the pump a minimum of 3 feet (.9 meters) from the heater outlet.
4. Do not install the pump more than 10 feet (3 meters) above the water level.
5. Install the pump in a well ventilated location protected from excessive moisture (i.e., rain gutter downspouts, sprinklers, etc.)
6. Install the pump with a rear clearance of at least 3 inches (76.2 mm) so that the motor can be removed easily for maintenance and repair.

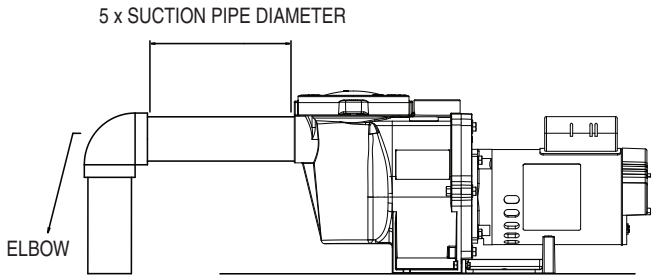
Piping

1. For improved pool plumbing, it is recommended to use a larger pipe size. When installing the inlet and outlet fittings (male adaptors), use thread sealant.
2. Piping on the suction side of the pump should be the same or larger than the return line diameter.
3. Plumbing on the suction side of the pump should be as short as possible.
4. It is recommended that a valve, elbow or tee installed in the suction line should be no closer to the front of the pump than five (5) times the suction line pipe diameter

   Example:
   A 2 inch (50.8 mm) pipe requires a 10 inch (254 mm) straight run in front of the suction inlet of the pump. This will help the pump prime faster and last longer.



Pump Rear Clearance



Recommended Piping

Fittings and Valves

1. Do not install 90° elbows directly into pump inlet.
2. Flooded suction systems should have gate valves installed on suction and discharge pipes for maintenance, however, the suction gate valve should be no closer than five times the suction pipe diameter as described in this section.
3. Use a check valve in the discharge line when using this pump for any application where there is significant height to the plumbing after the pump.
4. Be sure to install check valves when plumbing in parallel with another pump. This helps prevent reverse rotation of the impeller and motor.

⚠WARNING **RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.** This pump must be installed by a licensed or certified electrician or a qualified service professional in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pump at the circuit breaker before servicing the pump. Failure to do so could result in death or serious injury to service people, pool users or others due to electric shock and/or property damage.
Read all servicing instructions before working on the pump.

Electrical Wiring Installation

1. Be sure all electrical breakers and switches are turned off before wiring motor.
2. Be sure the supply line voltage matches the motor voltage listed on the motor plate (example 230 VAC or 115 VAC). If they do not match, permanent motor damage may occur.
3. Use strain relief and be sure all electrical connections are clean and tight.
4. Cut wires to the appropriate length so they don't overlap or touch when connected to the terminal board.
5. Permanently ground the motor using the green ground terminal located on the inside of the motor canopy or access plate, see Figure 1. Use the correct wire size and type specified by National Electrical Code. Make sure the ground wire is connected to an electrical service ground.
6. Bond the motor to the pool structure in accordance with the National Electrical Code. Use a solid No. 8 AWG or larger copper conductor. Run a wire from the external bonding to the pool bonding structure.
7. Connect the wire from the accessible bonding lug on the motor to all metal parts of the swimming pool, spa, or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet (1.52 meters) of the inside walls of the swimming pool, spa, or hot tub. For Canada, a 6 AWG or larger solid copper bonding conductor is required.
8. The pump should be permanently connected to either a circuit breaker, 2-pole timer or 2-pole relay. If AC power is supplied by a GFCI circuit breaker, use a dedicated circuit breaker that has no other electrical loads.

Pentair offers 2-Pole 20 Amp GFCI breakers (P/N PA220GF) which offer 6 milliamp personnel protection while meeting 2008 to current NEC Standards for Pool Pumps.

Note: When the pump is started and stopped by removing power with a relay or timer, a two-pole device should be used to apply and remove power to both POWER LINE TERMINALS.

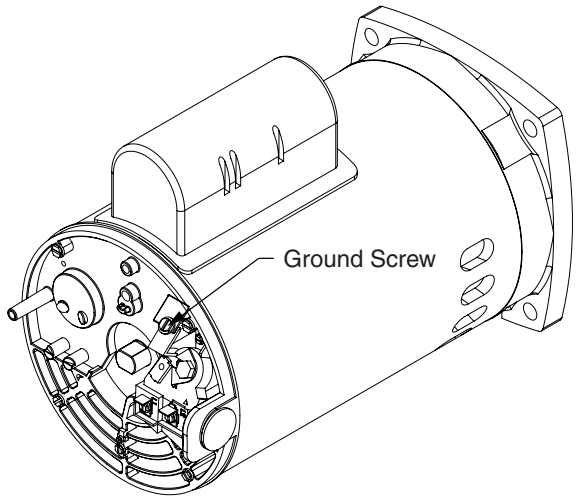


Figure 1. Field Wiring Compartment

MAINTENANCE

⚠WARNING DO NOT open the strainer pot if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, make sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.

⚠CAUTION To prevent damage to the pump and for proper operation of the system, clean pump strainer and skimmer baskets regularly.

Pump Strainer Basket

The pump strainer basket (or 'strainer pot', 'hair and lint pot'), is located in front of the volute. Inside the chamber is the basket which must be kept clean of leaves and debris at all times. View basket through the 'See Through Lid' to inspect for leaves and debris.

Regardless of the length of time between filter cleaning, it is most important to visually inspect the basket at least once a week. A dirty basket will reduce the efficiency of the filter and heater and also put an abnormal stress on the pump motor which would result in a costly repair bill.

Cleaning the Pump Strainer Basket

1. Turn off the pump at the circuit breaker.
2. Relieve pressure in the system by allowing the water to cool.
3. Gently tap the clamp in a counter-clockwise direction to remove the clamp and lid.
4. Remove debris and rinse out the basket. Replace the basket if it is cracked.
5. Put the basket back into the housing. Be sure to align the notch in the bottom of the basket with the rib in the bottom of the volute.
6. Fill the pump pot and volute up to the inlet port with water.
7. Clean the cover, O-ring, and sealing surface of the pump pot. ***Note:*** It is important to keep the lid O-ring clean and well lubricated.
8. Reinstall the lid by placing the lid on the pot. Be sure the lid O-ring is properly placed. Seat the clamp and lid on the pump then turn clockwise until the handles are horizontal.
9. Turn the power "ON" at the house circuit breaker. Reset the pool time clock to the correct time.
10. Open the High Flow manual air relief valve on top of the filter.
11. Stand clear of the filter. Start the pump.
12. Bleed air from the filter until a steady stream of water comes out. Close the High Flow™ Manual Air Relief Valve.

⚠WARNING **THIS SYSTEM OPERATES UNDER HIGH PRESSURE**. When any part of the circulating system (e.g., Lock Ring, Pump, Filter, Valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to separate which can result in serious injury, death, or property damage. To avoid this potential hazard, follow above instructions.

Winterizing

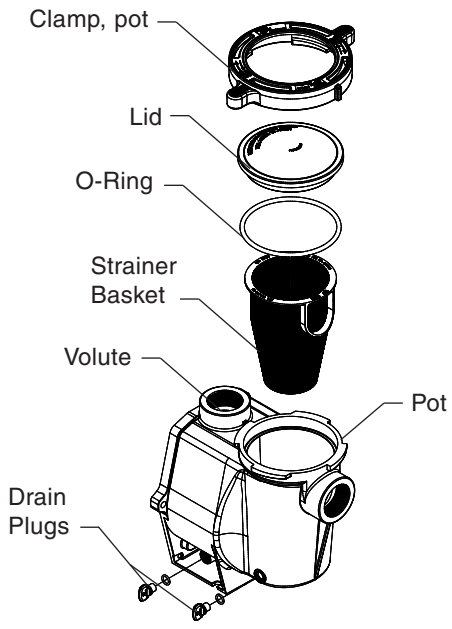
You are responsible for determining when freezing conditions may occur. If freezing conditions are expected, take the following steps to reduce the risk of freeze damage. ***Freeze damage is not covered under warranty.***

To prevent freeze damage, follow the procedures below:

1. Shut off electrical power for the pump at the circuit breaker.
2. Drain the water out of the pump housing by removing the two thumb-twist drain plugs from the housing. Store the plugs in the pump basket.
3. Cover the motor to protect it from severe rain, snow and ice.

Note: Do not wrap motor with plastic or other air tight materials during winter storage. The motor may be covered during a storm, winter storage, etc., but never when operating or expecting operation.

In mild climate areas, when temporary freezing conditions may occur, run your filtering equipment all night to prevent freezing.



Strainer Pot Assembly

ENGLISH

SERVICING

⚠WARNING Always disconnect power to the pump at the circuit breaker and disconnect the communication cable before servicing the pump. Failure to do so could result in death or serious injury to service people, users or others due to electric shock. Read all servicing instructions before working on the pump.

⚠WARNING **DO NOT** open the strainer pot if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid the possibility of personal injury, make sure the suction and discharge valves are open and strainer pot temperature is cool to touch, then open with extreme caution.

⚠CAUTION Be sure not to scratch or mar the polished shaft seal faces; seal will leak if faces are damaged. The polished and lapped faces of the seal could be damaged if not handled with care.

Care of Electric Motor

Protect from heat

1. Shade the motor from the sun.
2. Any enclosure must be well ventilated to prevent overheating.
3. Provide ample cross ventilation.

Protect against dirt

1. Protect from any foreign matter or splashing water.
2. Do not store (or spill) chemicals on or near the motor.
3. Protect from any foreign matter or splashing water.
4. Avoid sweeping or stirring up dust near the motor while it is operating.
5. If a motor has been damaged by dirt it voids the motor warranty.
6. Clean the lid and clamp, O-ring, and sealing surface of the pump pot.

Protect against moisture

1. Protect from splashing or sprayed water.
2. Protect from extreme weather.
3. Protect from any foreign matter or splashing water.
4. If a motor has become wet - let it dry before operating. Do not allow the pump to operate if it has been flooded.
5. If a motor has been damaged by water it voids the motor warranty.

Note: When replacing the motor, be certain that the motor support is correctly positioned to support the size of motor being installed.

Shaft Seal Replacement

The Shaft Seal consists primarily of two parts, a rotating member and a ceramic seal.

The pump requires little or no service other than reasonable care, however, a Shaft Seal may occasionally become damaged and must be replaced.

Note: The polished and lapped faces of the seal could be damaged if not handled with care.

Pump Disassembly

All moving parts are located in the rear sub-assembly of this pump.

Tools required:

- 3/32 inch Allen head wrench
- 1/2 inch open end wrench
- 9/16 inch open end wrench
- Flat blade screwdriver
- #2 Phillips scewdriver

To remove and repair the motor subassembly, follow the steps below:

1. Turn off the pump circuit breaker at the main panel.
2. Drain the pump by removing the drain plugs.
3. Remove the 6 bolts that hold the main pump body (strainer pot/volute) to the rear sub-assembly.
4. GENTLY pull the two pump halves apart, removing the rear sub-assembly.
5. Use a 3/32 inch Allen head wrench to loosen the two holding screws located on the diffuser.
6. Hold the impeller securely in place and remove the impeller lock screw by using a #2 Phillips screwdriver. The screw is a left-handed thread and loosens in a clockwise direction.
7. Remove the shaft cap located at the back of the motor and hold the shaft secure with a ½ inch open-end wrench.
8. To unscrew the impeller from the shaft, twist the impeller counterclockwise.
9. Remove the four bolts from the seal plate to the motor, using a 9/16 inch wrench.

⚠CAUTION **DO NOT run the pump dry.** If the pump is run dry, the mechanical seal will be damaged and the pump will start leaking. If this occurs, the damaged seal must be replaced. ALWAYS maintain proper water level. If the water level falls below the suction port, the pump will draw air through the suction port, losing the prime and causing the pump to run dry, resulting in a damaged seal. Continued operation in this manner could cause a loss of pressure, resulting in damage to the pump case, impeller and seal and may cause property damage and personal injury.

Pump Reassembly

1. When installing the replacement shaft seal, use silicone sealant on the metal portion before pressing into the seal plate, being careful to keep off of the seal face. Ensure the seal is fully seated and allow 24 hours for sealant to cure. (Complete seal plate w/seal replacement kit available, P/N 350201/350101.)
2. Before installing the ceramic section of the seal into the impeller, be sure the impeller is clean. Use a light density soap and water to seal the seal. Press the seal into the impeller with your thumbs and wipe off the ceramic and carbon faces with a clean cloth.
3. Remount the seal plate to the motor by installing bolts in an X pattern and tightening to 70 in-lbs.
4. Clean the motor shaft thread and the impeller insert, then screw the impeller onto the motor shaft.
5. Screw in the impeller lock screw (counter-clockwise and tighten to 25 in-lbs. while holding the motor shaft with wrench).
6. Remount the diffuser onto the seal plate. Make sure the plastic pins and holding screw inserts are aligned.
7. Grease the diffuser O-ring and seal plate gasket.
8. Grease the bolt threads, assemble the motor sub-assembly to the strainer pot-pump body by using the two through bolts for proper alignment. Do not tighten the through bolts until all 6 bolts are in place and finger tightened. Torque in a cross pattern to 110 in-lbs.
9. Fill the pump with water.
10. Reinstall the pump lid and plastic clamp; see the next section, 'Restart Instructions'.
11. Reprime the system.

Restart Instructions

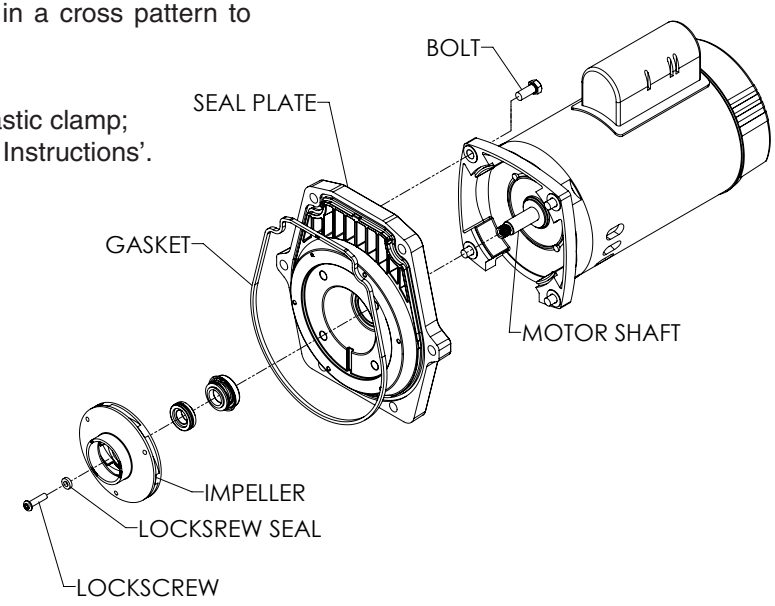
If pump is installed below the water level of the pool, close return and suction lines prior to opening hair and lint pot on pump. Make sure to re-open valves prior to operating.

Priming the Pump

The pump strainer pot must be filled with water before the pump is initially started. Follow these steps to prime the pump:

1. Remove the pump lid plastic clamp. Remove the pump lid.
2. Fill the pump strainer pot with water.
3. Reassemble the pump cover and plastic clamp onto the strainer pot. The pump is now ready to prime.
4. Open the air release valve on the filter, and stand clear of the filter.
5. Turn on the switch or time clock.
6. When water comes out of the air release valve, close the valve. The system should now be free of air and recirculating water to and from the pool.
7. For 2-speed pumps:

- Pump should run on high-speed for priming.
- The pump should not run longer than 8 minutes before priming is achieved.



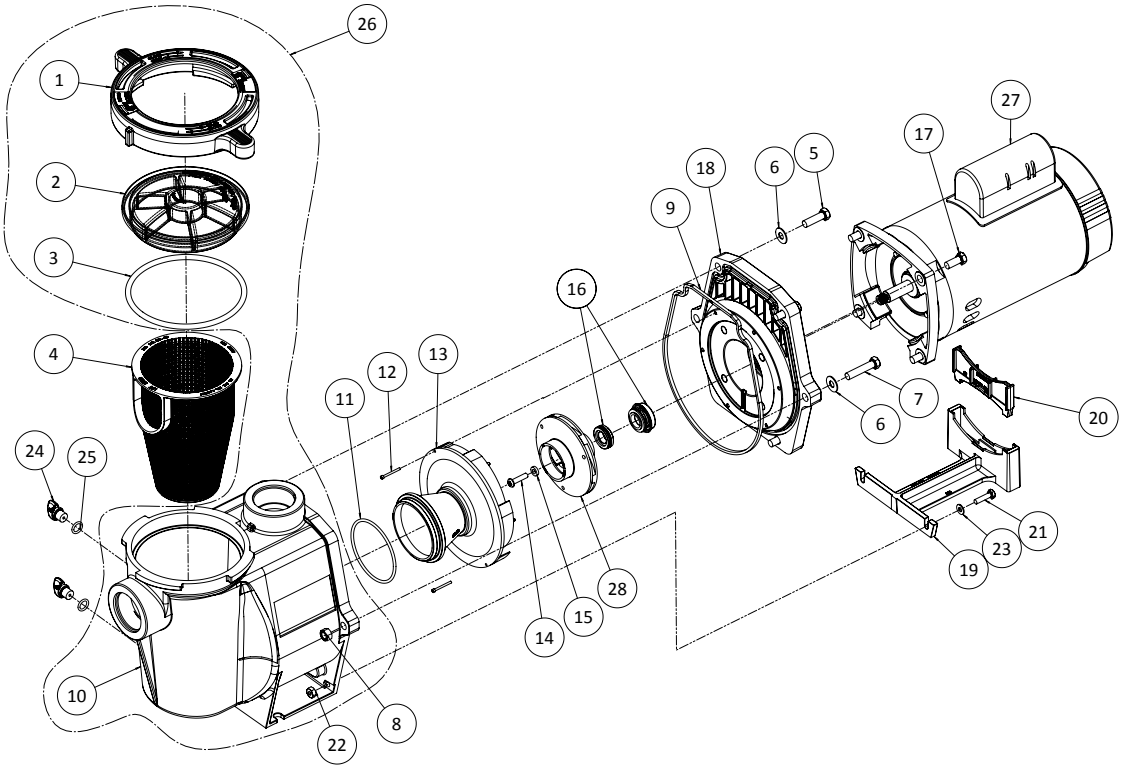
Motor Assembly

TROUBLESHOOTING

Problem	Possible Cause	Corrective Action
Pump failure.	Pump will not prime - Air leak, too much air.	Check suction piping and valve glands on any suction gate valves. Secure lid on pump strainer pot and be sure lid gasket is in place. Check water level to be sure skimmer is not drawing air.
	Pump will not prime - Not enough water.	Be sure the suction lines, pump, strainer, and pump volute are full of water. Be sure valve on suction line is working and open (some systems do not have valves). Check water level to make sure water is available through skimmer.
	Pump stainer gasket is clogged.	Clean pump strainer pot.
	Pump strainer gasket is defective.	Replace gasket.
Reduced capacity and/or head.	Air pockets or leaks in suction line.	Check suction piping and valve glands on any suction gate valves. Secure lid on pump strainer pot and be sure lid gasket is in place. Check water level to be sure skimmer is not drawing air.
	Clogged impeller.	Turn off electrical power to the pump. Disassemble (see page 4, 'Pump Disassembly')
		Clean debris from impeller. If debris cannot be removed, complete the following steps: 1. Remove left hand thread anti-spin bolt and o-ring. 2. Remove, clean, and reinstall impeller. Reassemble (see page 5, 'Pump Reassembly')
	Pump strainer clogged.	Clean suction trap.

REPLACEMENT PARTS

WhisperFlo® High Performance Pump Parts List



Item No.	P/N	Description
1	357199	Clamp, Cam & Ramp, Almond
1	357150	Clamp, Cam & Ramp, Black
2	357151	Cover, Clear, WFE Pump
2	357156	Cover, chemical resistant Cam & Ramp
3	350013	O-Ring, WFE Cover
4	070387	Strainer Basket, WFE
5	070430	Bolt, 3/8 - 16 x 1.25 Hex Head. SS, 4 Req.
6	072184	Washer, 3/8 x 13/16 O.D. SS, 6 Req.
7	070431	Bolt, 3/8 - 16 x 1.75 Hex Head. SS, 2 Req.
8	071403	Nut, 3/8, 16 Hex Head, 2 Req.
9	357100	Black Gasket for Seal Plate
10	357149	Volute & Seal Plate, Almond Replacement Kit
10	350015	Volute, WFE Pump & Pot, Almond
10	357157	Volute, WFE Pump & Pot, Black ❶
11	355227	O-Ring Parker No. 2-238, WFE Pump
12	071660	Set Screw, 4-40 x 1-1/8 WFE, 2 Req.
13	072928	Diffuser assembly, WFE-12, 3 HP Only
13	072927	Diffuser assembly, WFE 2-8, 1/2 HP-2.5 HP
14	071652	Set Screw, 1/4 - 20 x 1 in. Phillips

Item No.	P/N	Description
15	075713	Rubber Washer, WFE Pump
16	071734S	Seal PA-7 w/ ceramic seat, PS1000
16	071728	Seal A7 w/ ceramic seat, PS201 ❶
17	070429	Bolt 3/8 - 16 x 7/8 SS Hex Head, 4 Req.
18	350201	Seal Plate Kit WFE Almond (Includes Mechanical Seal installed) Items 9, 16 & 18
18	350101	Seal Plate Kit WFE Black (Includes Mechanical Seal installed) Items 16 & 18
19	070927	Foot, WFE Pump, Almond
19	357159	Foot, Black ❶
20	070929	Foot Insert, WFE Pump, Almond
20	357160	Foot Insert, WFE Pump, Black ❶
21	071657	Screw 1/4 - 20 x 1 In. Hex Head, SS, 2 Req.
22	071406	Nut, 1/4 - 20 Hex Head, SS, 2 Req.
23	072183	Washer, 1/4 x 5/8 OD, SS, 2 Req.
24	071131	Knob, Drain Plug, Almond, 2 Req.
24	357161	Knob, Drain Plug, Black, 2 Req. ❶
25	192115	O-Ring, Drain Plug, 2 Req.
26	357149	Volute/Seal Plate Replacement Kit, Almond (Incl. Items: 1-4, 9, 10, 16, 18, 24, and 25)
27	*See Motor Table on next page*	

Item No.	P/N	Description
		Motors
27	355008S	3/4 HP, 60 Hz, WFE-2, 3 & 24, 1 spd., almond, 31 lbs. ❷
27	355010S	1 HP, 60 Hz, WFE-4 & 26, 1 spd., almond, 33 lbs. ❷
27	355012S	1-1/2 HP, 60 Hz, WFE-6 & 28, 1 spd., almond, 39 lbs. ❷
27	355014S	2 HP, 60 Hz, WFE-8 & 30, 1 spd., almond, 40 lbs. ❷
27	355016S	3 HP, 60 Hz, WFE-12, 1 spd., almond, 40 lbs. ❷
27	356630S	1 HP, WFDS-4 & 26, 2 spd., 34 lbs. ❹
27	071320S	1-1/2 HP, WFDS-6 & 28, 2 spd., 36 lbs. ❹
27	071321S	2 HP, WFDS-8 & 30, 2 spd., 45 lbs. ❹
27	355018S	1/2 HP, WF-2 & 23, 1 spd., almond, 39 lbs. ❸
27	355020S	3/4 HP, WF-3 & 24, 1 spd., almond, 26 lbs. ❸
27	355022S	1 HP, WF-4 & 26, 1 spd., almond, 28 lbs. ❸
27	355024S	1-1/2 HP, WF-6 & 28, 1 spd., 39 lbs. ❸
27	355026S	2 HP, WF-8 & 30, 1 spd., 32 lbs. ❸
27	355033S	3 HP, WF-12, 1 spd., almond, 40 lbs. ❸
27	355203S	1 HP, WFK-4, 3 ph, 1 spd., black, 28 lbs.
27	355204S	1-1/2 HP, WFK-6, 3 ph, 1 spd., black, 30 lbs.
27	355205S	2 HP, WFK-8, 3 ph, 1 spd., black, 37 lbs.
27	355398S	3 HP, WFK-12, 3 ph, 1 spd., black, 35 lbs.
27	356626S	1 HP, WFK-4, 3 ph, 1 spd., almond, 28lbs.
27	356627S	1-1/2 HP, WFK-6, 3 ph, 1 spd., almond, 30lbs.
27	356628S	2 HP, WFK-8, 3 ph, 1 spd., almond, 37 lbs.
27	356629S	3 HP, WFK-12, 3 ph, 1 spd., almond, 35 lbs.
27	354805S	1 HP, WFK-4, TEFC, 3 ph, 1 spd., almond, 28lbs.
27	354807S	1-1/2 HP, WFK-6, TEFC, 3 ph., 1 spd., almond, 30lbs.
27	354809S	2 HP, WFK-8, TEFC, 3 ph., 1 spd., almond, 37 lbs.
27	354811S	3 HP, WFK-12, TEFC, 3 ph., 1 spd., almond, 35 lbs.

Not Shown

79129900	2-Speed Toggle Switch
350202	Seal Plate Kit: Seal plate (almond), Gasket (black), with installed Seal (Includes items: 9, 16, & 18)
350203	Seal Plate Kit: Seal plate (black), Gasket (black), with installed Seal (Includes items: 9, 16, & 18)
357244	Pot Assembly, Black NPT. (Includes items: 1-4, 10, 24 [qty. 2], 25 [qty. 2]).
357243	Pot Assembly, Almond NPT. (Includes items: 1-4, 10, 24 [qty. 2], 25 [qty. 2]).

Power End Sub-assembly

Includes Items: 12-18, 27-28

075136	WFE-2
075137	WFE-3, WFE-24
075138	WFE-4, WFE-26 ❷
075139	WFE-6, WFE-28 ❷
075140	WFE-8, WFE-30 ❷
075141	WFE-12 ❷
075145	WFDS-3, WFDS-24 ❹
075142	WFDS-4, WFDS-26 ❹
075143	WFDS-6, WFDS-28 ❹
075144	WFDS-8, WFDS-30
075251	WF-2, WF-23 ❸
075252	WF-3, WF-24 ❸
075253	WF-4, WF-26 ❸
075254	WF-6,WF-28 ❸
075255	WF-8,WF-30 ❸
075256	WF-12 ❸

Fluid Ends-All Parts, w/o Motor

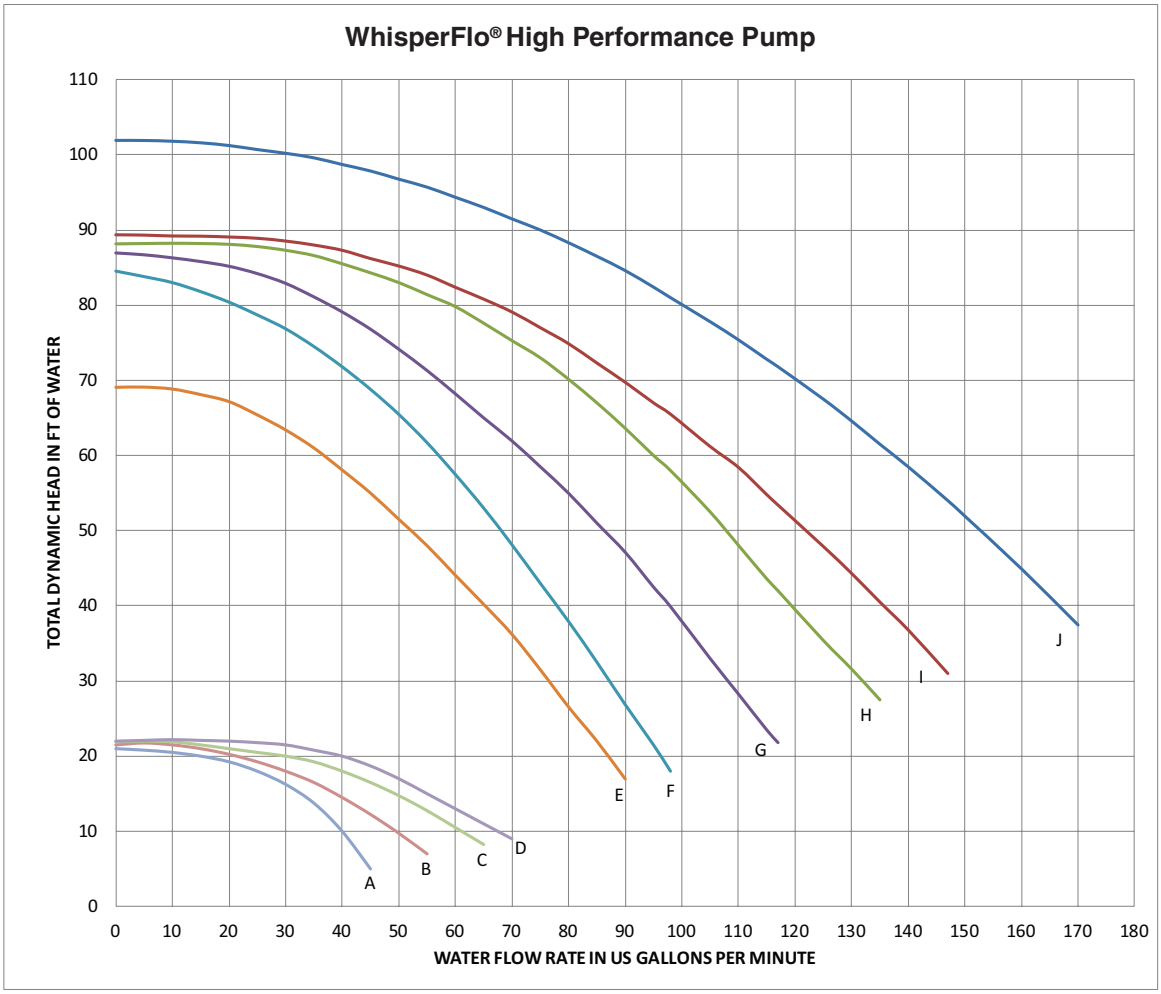
075451	WFE-2 fluid end, 1/2 HP
075452	WFE-3 fluid end, 3/4 HP
075453	WFE-4 fluid end, 1 HP
075454	WFE-6 fluid end, 1-1/2 HP
075455	WFE-8 fluid end, 2 HP
075456	WFE-12 fluid end, 3 HP

❶ CSA/CUL (only) for Canada
❷ Energy efficient, single phase
❸ Standard efficiency, single phase
❹ Two speed, single phase

Impeller Chart

HP	PUMP MODEL	STD PART NO.
1/2	WFE-2, WF-2, WF-23, WFK-2	073126
3/4	WFE-3, WFE-24, WF-3, WF-24, WFK-3, WFDS-24	073127
1	WFE-4, WFE-26, WF-4, WF-26, WFK-4, WFDS-4, WFDS-26	073128
1½	WFE-6, WFE-28, WF-6, WF-28, WFK-6, WFDS-6, WFDS-28	073129
2	WFE-8, WFE-30, WF-8, WF-30, WFK-8, WFDS-8, WFDS-30	073130
3	WFE-12, WF-12, WFK-12	073131

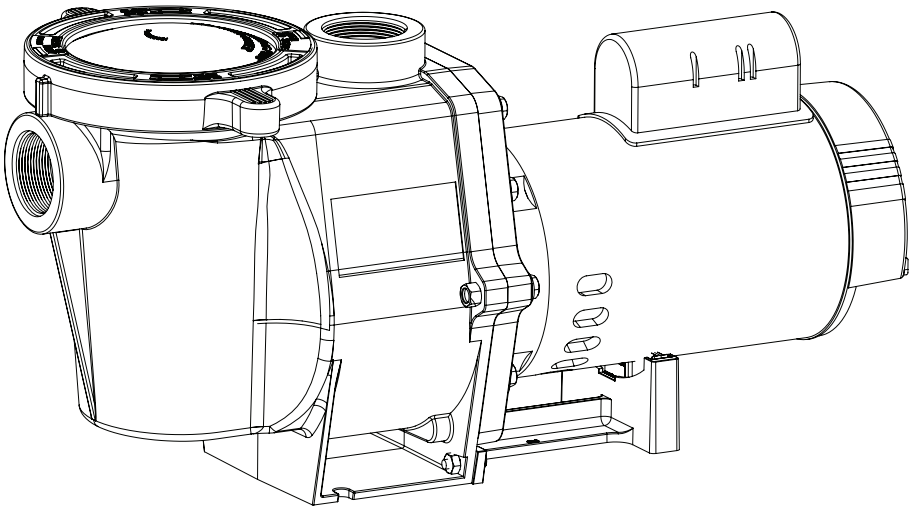
Pump Performance Curves



Curve	Model
A	WFDS-3, WFDS-24
B	WFDS-4, WFDS-26
C	WFDS-6, WFDS-28
D	WFDS-8, WFDS-30
E	WFE-2, WF-2, WF-23, WFK-2
F	WFE-3, WFE-24, WF-3, WF-24, WFK-3, WFDS-3, WFDS-24
G	WFE-4, WFE-26, WF-4, WF-26, WFK-4, WFDS-4, WFDS-26
H	WFE-6, WFE-28, WF-6, WF-28, WFK-6, WFDS-6, WFDS-28
I	WFE-8, WFE-30, WF-8, WF-30, WFK-8, WFDS-8, WFDS-30
J	WFE-12, WF-12, WFK-12

PENTAIR

WHISPERFLO®
BOMBA DE ALTO RENDIMIENTO



GUÍA DE INSTALATIÓN Y DEL USUARIO

INSTRUCCIONES IMPORTANTES DE SEGURIDAD
LEA Y SIGA TODAS LAS INSTRUCCIONES
GUARDE ESTAS INSTRUCCIONES

ATENCIÓN AL CLIENTE / SOPORTE TÉCNICO

Si tiene alguna pregunta sobre cómo realizar pedidos de piezas de repuesto de Pentair Aquatic Systems, utilice la siguiente información de contacto:

Servicio del Cliente y Soporte Técnico, USA
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Teléfono: (800) 831-7133

Fax: (800) 284-4151

Sitio web

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Fax: (919) 566-8920

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ESPAÑOL

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P/N 071109 Rev. J 8/29/14

INSTRUCCIONES Y ADVERTENCIAS DE SEGURIDAD IMPORTANTES DE LA BOMBA

Nota Importante:

Atención Instalador: Esta guía contiene información importante sobre la instalación, el funcionamiento y el uso seguro de este producto. Esta información debe ser entregada al propietario y/o al operador de este equipo después de la instalación del limpiador de piscina. **Atención Usuario:** Este manual contiene información importante que le ayudará a utilizar y mantener este limpiador.

LEA Y SIGA TODAS LAS INSTRUCCIONES
GUARDE ESTAS INSTRUCCIONES

Éste es el símbolo de alerta de seguridad.
Cuando vea este símbolo en su sistema o en este manual, busque alguna de las siguientes palabras y esté alerta ante la posibilidad de lesiones.

⚠ PELIGRO Advierte sobre peligros que pueden causar la muerte, lesiones personales graves o daño a la propiedad si son ignorados.

⚠ ADVERTENCIA Advierte sobre peligros que podrían causar la muerte, lesiones personales graves o daño a la propiedad si son ignorados.

⚠ PRECAUCIÓN Advierte sobre los peligros que podrían o pueden causar lesiones personales menores o daños a la propiedad si son ignorados.

NOTA indica instrucciones especiales no relacionadas a peligros.

Lea cuidadosamente y siga las instrucciones de seguridad del equipo que aparecen en este manual. Mantenga las etiquetas de seguridad en buen estado; reemplácelas si faltan o están dañadas.

Cuando instale y utilice este equipo eléctrico, siempre debe respetar precauciones de seguridad básicas, incluyendo las siguientes:

⚠ ADVERTENCIA No permita que los niños utilicen este producto.

⚠ ADVERTENCIA Riesgo de choque eléctrico. Conecte sólo a un circuito eléctrico protegido por un interruptor de circuito con descarga a tierra (GFCI). Comuníquese con un electricista calificado si no puede verificar que el circuito esté protegido por un interruptor GFCI.

⚠ ADVERTENCIA Conecte sólo a un circuito eléctrico protegido por un interruptor de circuito con descarga a tierra (GFCI). Este GCFI debe ser provisto por el instalador y debe ser probado de manera rutinaria. Para probar el GFCI presione el botón de prueba. El GFCI debería interrumpir la energía eléctrica. Presione el botón de reinicio. Debería restaurar la energía. Si el GFCI no funciona de esta manera, el GFCI tiene una falla. Si el GFCI interrumpe la energía a la bomba sin que se presione el botón de prueba, hay presencia de corriente de tierra, indicando la posibilidad de un choque eléctrico. No utilice esta bomba. Desconecte la bomba y haga que un representante de servicio técnico calificado corrija el problema antes de utilizar el equipo.

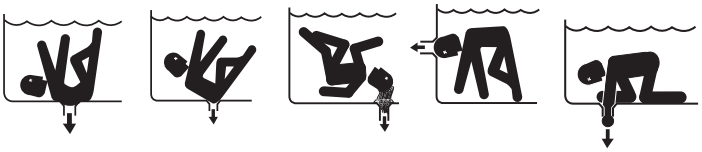
⚠ PRECAUCIÓN Esta bomba se utiliza para piscinas permanentes y también puede ser utilizada en jacuzzis o spa si está indicado. No la utilice con piscinas desmontables. Una piscina con instalación permanente es una piscina construida en el suelo o en una base de manera que no puede ser desmontada. Una piscina desmontable está construida de manera que puede ser fácilmente desmontable para su almacenamiento y rearmada de acuerdo a su formato original.

Advertencias generales

- Nunca abra el interior de la caja del motor. Hay un banco capacitor que admite una carga de hasta 230 VCA incluso cuando la unidad no tenga energía eléctrica.
- La bomba del spa no es sumergible.
- La bomba puede trabajar con flujos máximos altos; tenga cuidado cuando realice la instalación y programación para limitar el potencial de rendimiento de las bombas con equipos antiguos o de origen desconocido.
- Los requisitos de códigos para la conexión eléctrica difieren de un estado a otro. Instale los equipos de acuerdo con el Código Eléctrico Nacional y todos los códigos y ordenanzas locales aplicables.
- Antes de realizarle el servicio técnico a la bomba, APAGUE la energía a la bomba desconectando el circuito principal a la bomba.
- Este dispositivo no debe ser utilizado por personas (incluidos niños) con capacidades físicas, sensoriales o mentales reducidas, o falta de experiencia y conocimiento, a menos que hayan recibido instrucciones y sean supervisados por una persona responsable por su seguridad.

⚠ PELIGRO SI NO SE RESPETAN TODAS LAS INSTRUCCIONES Y ADVERTENCIAS LAS CONSECUENCIAS PUEDEN SER HERIDAS GRAVES O LA MUERTE. **LA BOMBA DEBE SER INSTALADA Y REVISADA ÚNICAMENTE POR UN PROFESIONAL DE SERVICIO DE PISCINAS CALIFICADO. LOS INSTALADORES, OPERADORES Y PROPIETARIOS DE LAS PISCINAS DEBEN LEER ESTAS ADVERTENCIAS Y TODAS LAS INSTRUCCIONES QUE APARECEN EN EL MANUAL DEL PROPIETARIO ANTES DE UTILIZAR ESTA BOMBA. ESTAS ADVERTENCIAS Y EL MANUAL DEL PROPIETARIO DEBEN PERMANECER CON EL PROPIETARIO DE LA PISCINA.**

⚠ PELIGRO PELIGRO DE TRAMPA DE SUCCIÓN: ¡MANTÉNGASE ALEJADO DEL DRENAJE PRINCIPAL Y DE TODAS LAS SALIDAS DE SUCCIÓN!



LA BOMBA PRODUCE ALTOS NIVELES DE SUCCIÓN Y CREA UN FUERTE VACÍO EN EL DRENAJE PRINCIPAL EN LA BASE DEL CUERPO DE AGUA. ESTA SUCCIÓN ES TAN FUERTE QUE PUEDE ATRAPAR A ADULTOS O NIÑOS DEBAJO DEL AGUA SI SE ACERCAN DEMASIADO AL DRENAJE O SI HAY ALGUNA PARTE DE LA CUBIERTA O PARRILLA DEL DRENAJE SUELTA O AVERIADA.

EL USO DE CUBIERTAS NO APROBADAS O PERMITIR EL USO DE UN SISTEMA DE ACUICULTURA CUANDO FALTAN CUBIERTAS, SE ENCUENTRAN FRACTURADAS O AVERIADAS PUEDE TENER COMO RESULTADO EL ATRAPAMIENTO DEL CUERPO O DE UN MIEMBRO, ENREDO DEL CABELLO, ATRAPAMIENTO DEL CUERPO, DESTRIPAMIENTO Y/O LA MUERTE.

La sección en el drenaje o salida puede causar:

Atrapamiento de miembros: Cuando se succiona un miembro o éste es insertado en una apertura que tiene como resultado una obstrucción mecánica o hinchazón. Este riesgo está presente cuando falta una cubierta del drenaje, o está rota, suelta, quebrada o no está bien asegurada.

Enredo del cabello: Cuando el cabello se enreda o se anuda en la cubierta del drenaje, atrapando al nadador debajo del agua. Este riesgo está presente cuando la velocidad del flujo de la cubierta es demasiado baja para la o las bombas.

Atrapamiento corporal: Cuando una porción del cuerpo queda contra la cubierta del drenaje y atrapa al nadador debajo del agua. Este riesgo existe cuando falta la cubierta del drenaje, cuando ésta está quebrada o cuando la velocidad de flujo de la cubierta no es lo suficientemente alta para la o las bombas.

Destripamiento: Cuando una persona está sentada en una piscina abierta (especialmente una piscina poco profunda para niños) o salida de un spa y se aplica la succión directamente a los intestinos, causando un daño intestinal severo. Este riesgo está presente cuando falta una cubierta del drenaje, o está suelta, quebrada o no está bien asegurada.

Atrapamiento mecánico: Cuando quedan atrapados en una entrada o en la cubierta del drenaje objetos tales como: joyas, trajes de baño, accesorios para el cabello, dedos de la mano o del pie o nudillos. Este riesgo está presente cuando falta la cubierta del drenaje, o está rota, suelta, quebrada o no está bien asegurada.

NOTA: LA INSTALACIÓN DE PLOMERÍA DE SUCCIÓN DEBE SER INSTALADA DE ACUERDO CON LOS CÓDIGOS, ESTÁNDARES Y PAUTAS NACIONALES Y LOCALES MÁS ACTUALIZADOS.

INSTRUCCIONES Y ADVERTENCIAS DE SEGURIDAD IMPORTANTES DE LA BOMBA

⚠ ADVERTENCIA PARA MINIMIZAR EL RIESGO DE LESIONES DEBIDO AL PELIGRO DE ATRAPAMIENTO POR SUCCIÓN:

- Para cada drenaje debe utilizarse una cubierta de succión anti-atrapamiento aprobada de acuerdo a ANSI/ASME A112.19.8 que debe estar correctamente instalada y asegurada.
- Cada cubierta de succión debe estar instalada al menos a tres pies (0,9 m) de distancia, medidos entre los 2 puntos más cercanos.
- Inspecciones regularmente todas las cubiertas para controlar que no existan quebraduras, daños o erosión por exposición a la intemperie.
- Si falta una cubierta o si ésta se afloja, quiebra, daña o rompe, reemplácela con una cubierta certificada adecuada.
- Reemplace las cubiertas de drenaje cuando sea necesario. Las cubiertas de drenaje se deterioran con el tiempo debido a la exposición al sol y a la intemperie.
- Evite que el cabello, los miembros o el cuerpo estén próximos a cualquier cubierta de succión, drenaje de la piscina o salida.
- Desactive las salidas de succión reconfigure las entradas de retorno.

⚠ ADVERTENCIA Debe existir un interruptor de emergencia para la bomba en un lugar fácilmente accesible y visible. Asegúrese que de los usuarios conozcan dónde está y sepan cómo usarla en caso de emergencia.

La ley de seguridad para piscinas y spa Virginia Graeme Baker (VGB) crea nuevos requisitos para los dueños y operadores de piscinas y spa comerciales.

Las piscinas y spa comerciales construidos después del 19 de diciembre de 2008 deben utilizar:

(A) Un sistema de drenaje principal múltiple sin aislación con cubiertas de salida de succión que cumplan con las características ASME/ANSI A112.19.8a para accesorios de succión en piscinas, piscinas poco profundas para niños, spas y jacuzzis ya sea:

(i) Un sistema de seguridad de alivio de vacío (SVRS) que cumpla con la normativa ASME/ANSI A112.19.17 Manufactured Safety Vacuum Release systems (SVRS) para sistemas de succión en piscinas residenciales y comerciales, spa, jacuzzis y piscinas poco profundas para niños, y/o especificaciones estándar ASTM F2387 para Manufactured Safety Vacuum Release Systems (SVRS) en piscinas, spa y jacuzzis o

(ii) un sistema de ventilación bien diseñado y con un sistema probado de limitación de succión

(iii) un sistema de apagado automático de bomba

Las piscinas o spa comerciales construidos con anterioridad al 19 de diciembre de 2008 con una salida de succión sumergida deben utilizar una salida de succión que cumpla con ASME/ANSI A112.19.8a y:

(A) un SVRS que cumpla con los requisitos ASME/ANSI A112.19.17 y/o ASTM F2387, o bien

(ii) un sistema de ventilación bien diseñado y con un sistema probado de limitación de succión o bien

(iii) un sistema de apagado automático de bomba, o

(D) salidas sumergidas desactivadas, o

(E) Salidas de succión que deben ser reconfiguradas como entradas de retorno.

Para la instalación de controles eléctricos en la superficie de apoyo del equipo (interruptores ENCENDIDO/APAGADO, relojes o centro de carga automática)

⚠ PRECAUCIÓN Instale todos los controles eléctricos en la superficie de apoyo del equipo, como interruptores de encendido/apagado y sistemas de control, etc. para permitir el funcionamiento (arranque, apagado o servicio) de cualquier bomba o filtro de manera que el usuario no coloque ninguna porción de su cuerpo por encima o cerca de la tapa del filtro de la bomba, la tapa del filtro o el cierre de la válvula. Esta instalación debería permitirle al usuario utilizar espacio suficiente para permanecer alejado del filtro y la bomba durante el arranque, apagado o servicio del filtro del sistema.

⚠ PELIGRO **PRESIÓN PELIGROSA: MANTÉNGASE ALEJADO DE LA BOMBA Y FILTRO DURANTE EL ARRANQUE**

Los sistemas de circulación operan bajo alta presión. Cuando cualquier parte del sistema de circulación (es decir anillo de seguridad, bomba, filtro y válvulas, etc) está siendo controlado por el servicio técnico, es posible que ingrese aire al sistema y que éste se presurice.

El aire presurizado puede provocar que las válvulas y la tapa del filtro de la cubierta de la caja de la bomba se separen violentamente lo cual puede tener como resultado lesiones graves o la muerte. La tapa del tanque del filtro y la cubierta del filtro deben estar correctamente aseguradas para evitar una separación violenta. Manténgase alejado del equipo del sistema de circulación cuando encienda o arranque la bomba.

Antes de realizar el servicio al equipo, tome nota de la presión del filtro. Asegúrese de que se realicen todos los controles para asegurar que el sistema no arranque sin aviso durante el servicio técnico. Desconecte la energía a la bomba. **IMPORTANTE: Coloque la válvula de alivio de aire manual del filtro en posición abierta y espere que se libere la presión del sistema.**

Antes de iniciar el sistema, abra totalmente la válvula de liberación de aire manual y ubique todas las válvulas del sistema en posición "abierto" para permitir que el agua fluya libremente desde y hacia el tanque. Aléjese de los equipos y arranque la bomba.

IMPORTANTE: No cierre la válvula de alivio de aire manual del filtro hasta que se haya descargado la totalidad de la presión de la válvula y aparezca un chorro de agua constante. Observe el indicador de presión del filtro y asegúrese de que no es más alto que el estado anterior al servicio.

Información general para la instalación

- La instalación y el servicio deben ser efectuados por un profesional de servicio calificado, y deben cumplir con todos los códigos nacionales, estatales y locales.
- En la instalación se debe colocar un drenaje en el compartimiento para los componentes eléctricos.
- Estas instrucciones contienen información para una variedad de modelos de bombas y por lo tanto algunas instrucciones pueden no aplicarse a un modelo específico. Todos los modelos deben ser utilizados en aplicaciones de piscinas. La bomba funcionará correctamente sólo si tiene el tamaño adecuado para la aplicación específica y si está correctamente instalada.

⚠ ADVERTENCIA Las bombas de tamaño incorrecto o instaladas de manera incorrecta o utilizadas en aplicaciones diferentes a aquellas para las cuales la bomba fue diseñada pueden tener como resultado daños personales severos o la muerte. Estos riesgos incluyen pero no se limitan a choque eléctrico, incendio, inundación, succión, atrapamiento, lesiones graves o daño a la propiedad causados por una falla estructural de la bomba u otro componente del sistema.

⚠ ADVERTENCIA La bomba puede producir niveles altos de succión dentro del lado de succión del sistema de plomería.

Estos altos niveles de succión pueden implicar un riesgo si una persona se acerca demasiado a los orificios de succión. Este alto nivel de vacío puede causar daños severos en personas, quienes también podrían quedar atrapadas y ahogarse. Es de primordial importancia que el sistema de plomería sea instalado de acuerdo a los más recientes códigos nacionales y locales para las aplicaciones de piscinas.

Antes de instalar este producto, lea y siga todas las advertencias e instrucciones incluidas. Llame al (800) 831-7133 para obtener copias adicionales de estas instrucciones sin costo.

Instrucciones y advertencias de seguridad y la versión en español de este manual del producto, se puede encontrar en línea a: **http://www.pentairpool.com/es/pool-owner/manuals/** o llame al (800) 831-7133 para obtener copias adicionales de estas instrucciones sin costo.

GUARDE ESTAS INSTRUCCIONES

INSTALACIÓN

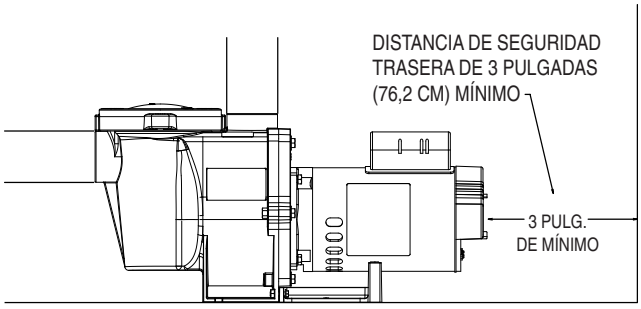
Sólo personal de servicio calificado debe instalar la bomba WhisperFlo®. Consulte la sección “Instrucciones de seguridad y advertencias de la bomba” en las páginas 11 a 12 para obtener información adicional sobre pautas para la instalación y la seguridad.

Ubicación

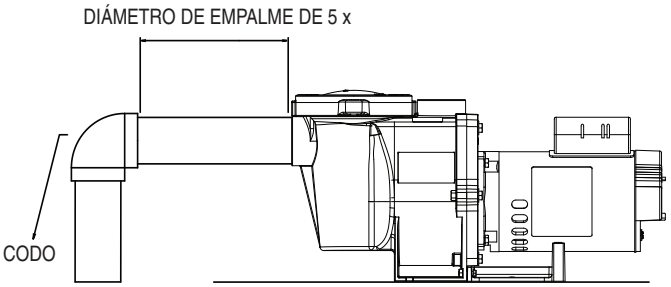
1. Instale la bomba lo más cerca posible a la piscina o spa. Para reducir la pérdida de fricción y mejorar la eficacia, use un mecanismo de succión corta y directa y retornos de tuberías.
2. Realice la instalación a un mínimo de 5 pies (1,52 m.) de la pared interior de la piscina y el spa. En Canadá, las instalaciones deben estar como mínimo a una distancia de 9,8 pies (3 metros) del agua de la piscina.
3. Instale la bomba a un mínimo de 3 pies (0,9 metros) de la salida del calefactor.
4. No instale la bomba a más de 10 pies (2,44 m) por encima del nivel del agua.
5. Instale la bomba en un área cubierta y bien ventilada para protegerla de la humedad excesiva (es decir, lluvia, sistemas de aspersión, etc.)
6. Para jacuzzis y spas, no instale dentro de una caja exterior o debajo de la base de un jacuzzi o spa.
7. Instale la bomba con una distancia de separación trasera de al menos 3 pulgadas (76,2 mm) de manera que el motor pueda ser extraído fácilmente cuando debe ser reparado y cuando se realice el mantenimiento.

Tuberías

1. Para una mejor plomería en la piscina, se recomienda utilizar un tamaño de tubería más grande. Cuando instale los accesorios para entradas y salidas (adaptadores macho), use un sellador de roscas.
2. Utilice tamaños de caños más grandes para una mejor tubería. El diámetro de empalme debe ser el mismo o mayor que el diámetro de la línea de retorno.
3. Las tuberías en el lado de succión de la bomba deben ser lo más cortas posibles.
4. Se recomienda una válvula, codo o pieza en forma de T en la línea de succión no debería estar más cerca al frente de la bomba que cinco veces el diámetro de la tubería de la línea de succión (es decir, una tubería de 2 pulgadas (5,1 cm) necesita un espacio recto enfrente de la entrada de succión de la bomba de 10 pulgadas (254 mm)). Esto ayudará a que el cebado de la bomba sea más rápido y dure por más tiempo.



Distancia de seguridad de la parte trasera de la bomba



Recomendado mínimo Diámetro de empalme

Conexiones y Válvulas

1. No instale codos de 90° directamente en la entrada de la bomba.
2. Los sistemas de succión deberían tener válvulas de compuertas instaladas en las tuberías de succión y descarga para mantenimiento; sin embargo, la válvula de compuerta de succión no debe estar más cerca que cinco veces el diámetro de la tubería de succión como se describe en el párrafo anterior.
3. Utilice una válvula de retención en la línea de descarga al utilizar esta bomba para cualquier aplicación donde hay altura significativa de la tubería después de la bomba.
4. Asegúrese de instalar las válvulas de comprobación cuando nivela en paralelo con otra bomba. Esto ayuda a evitar la rotación inversa del propulsor y el motor.

⚠ ADVERTENCIA

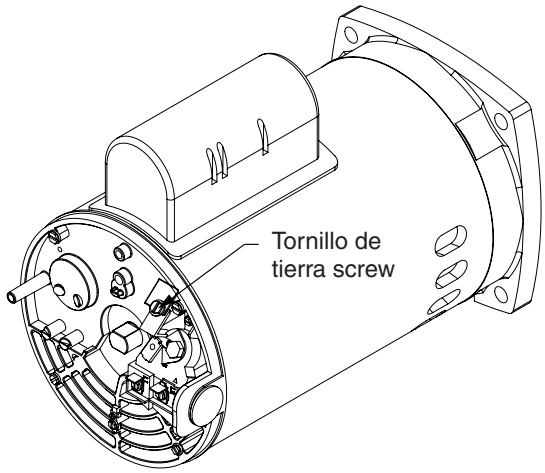
RIESGO DE CHOQUE ELÉCTRICO O ELECTROCUCIÓN. Esta bomba debe ser instalada por un electricista autorizado o matriculado o un profesional de servicio calificado de acuerdo con el Código Eléctrico Nacional y todos los códigos y ordenanzas locales aplicables. Una instalación inadecuada generará un riesgo eléctrico que puede ocasionar la muerte o lesiones graves a los usuarios, los instaladores u otras personas debido a un choque eléctrico, y también puede provocar daños a la propiedad.

Siempre desconecte la energía eléctrica a la bomba en el interruptor de circuito antes de realizar el servicio de la bomba. Si no se hace esto, las personas que realizan el servicio, los usuarios u otras personas pueden resultar muertas o con heridas de gravedad debido al electrochoque.

Lea todas las instrucciones de servicio antes de comenzar a trabajar en la bomba.

Instalación de cableado eléctrico

1. Asegúrese de que todos los interruptores y conmutadores eléctricos estén apagados antes de cablear el motor.
2. Asegúrese de que el voltaje de la línea de suministro coincida con el voltaje del motor descrito en la placa del motor (por ejemplo, 230 VCA o 115 VCA). Si no coinciden, puede ocurrir un daño permanente al motor.
3. Utilice el alivio de tensión y asegúrese de que todas las conexiones eléctricas estén limpias y ajustadas.
4. Corte los cables en la longitud adecuada, de modo de que no se superpongan o toquen cuando estén conectados.
5. Conecte el motor a tierra de manera permanente utilizando el cable a tierra verde, como se muestra a continuación. Utilice el tamaño y tipo de cable correcto especificado por el Código Eléctrico Nacional. Asegúrese de que el cable a tierra esté conectado a una conexión a tierra de servicio eléctrico.
6. Una el motor a la estructura conforme lo estable el Código Eléctrico Nacional. UL requiere el uso de un conductor de interconexión de cobre sólido de un diámetro mínimo de 8 AWG. Pase un cable desde el tornillo o terminal de interconexión externa hasta la estructura de interconexión.
7. Conecte el cable desde el conector de cable accesible en el motor hasta todas las partes metálicas de la estructura y todo el equipo eléctrico, conducto metálico y tubería metálica a 5 pies (1,5 m) de las paredes internas de la estructura. Para Canadá, se requiere un conductor de interconexión de cobre sólido de 6 AWG o más largo.
8. La bomba debe conectarse de manera permanente ya sea a un interruptor de circuito, reloj o relé de 2 polos. Si se suministra energía CA a través de un interruptor de circuito GFCI, utilice un interruptor de circuito especial que no posea otras cargas eléctricas.



Nota: *Cuando la bomba se monta permanentemente dentro de 5 pies (1.524 m) de las paredes interiores de una piscina, tiene que usar un No. 8 AWG o conductor más grande para conectar al tirón de conductor que pega.*

Nota: Cuando la bomba se arranca y detiene al desconectar la energía mediante un relé o reloj, se debe utilizar un dispositivo de dos polos para aplicar y desconectar la energía de las dos TERMINALES DE LÍNEA DE ENERGÍA.

ESPAÑOL

MANTENIMIENTO

ADVERTENCIA **NO** abra el depósito del filtro si el cebado de la bomba falla o si la bomba ha estado funcionando sin agua en el depósito del filtro. Las bombas que funcionan en estas circunstancias pueden experimentar una acumulación de presión de vapor y pueden contener agua caliente escaldada. Si abre la bomba puede resultar herido de gravedad. Para evitar la posibilidad de lesiones personales, asegúrese de que las válvulas de succión y descarga estén abiertas y la temperatura del depósito del filtro esté fría para el tacto, luego ábrala con extrema precaución.

PRECAUCIÓN Para evitar el daño de la bomba y para un adecuado funcionamiento del sistema, limpie el filtro de la bomba y las canastillas de los desnatadores con regularidad.

Canastilla del filtro de la bomba

La canastilla del filtro (o "depósito del filtro") se encuentra enfrente del alojamiento de la bomba. La canastilla del filtro debe mantenerse limpia y sin suciedad. Inspeccione la canastilla a través de la tapa en la parte superior del alojamiento.

Asegúrese de inspeccionar visualmente la canastilla del filtro cada 1 a 4 semanas. Las canastillas del filtro sucias reducen la eficiencia del filtro y del calefactor y ejercen una presión anormal sobre el motor de la bomba. La acumulación de bacterias puede ensuciar la tapa.

Limpieza de la canastilla del filtro de la bomba

1. Apague la bomba en el interruptor de circuito.
2. Libere presión en el sistema.
3. Gire la tapa y abrazadera en el sentido contrario a las agujas del reloj y retírelas de la bomba.
4. Retire los residuos y limpie la canastilla. Reemplace la canastilla si está rajada.
5. Vuelva a colocar la canastilla en la caja. Asegúrese de alinear la perforación en la parte inferior de la canastilla con el acanalado en la parte inferior del alojamiento.
6. Llene el depósito y el alojamiento de la bomba hasta el puerto de entrada con agua.
7. Limpie la tapa y la abrazadera, el anillo tórico y la superficie de sellado del depósito de la bomba.
   Nota: Es importante que mantenga el anillo tórico de la tapa limpio y bien lubricado.
8. Vuelva a instalar la tapa colocando la abrazadera y la tapa en el depósito. Asegúrese de que el anillo tórico de la tapa esté bien colocado.
   Coloque la abrazadera y la tapa sobre la bomba, luego gire en sentido de las agujas del reloj hasta que las manijas del anillo de seguridad estén horizontales.
9. Encienda la bomba en el interruptor de circuito.
10. Abra la válvula de alivio de aire manual en la parte superior del filtro. Aléjese del filtro.
11. Espere hasta que se libere toda la presión. Ponga en marcha la bomba.
12. Purgue el aire del filtro hasta que un flujo constante de agua salga de la válvula de alivio de aire del filtro. Cierre la válvula de alivio de aire manual.

ADVERTENCIA **ESTE SISTEMA OPERA BAJO ALTA PRESIÓN.**

Cuando cualquier parte del sistema de circulación (es decir anillo de seguridad, bomba, filtro, válvulas, etc.) está siendo controlado por el servicio técnico, es posible que ingrese aire al sistema y que éste se presurice. El aire presurizado puede causar que la tapa se separe, lo que puede provocar heridas graves, la muerte o daño a la propiedad. A fin de evitar este riesgo potencial, siga las instrucciones que se mencionan arriba.

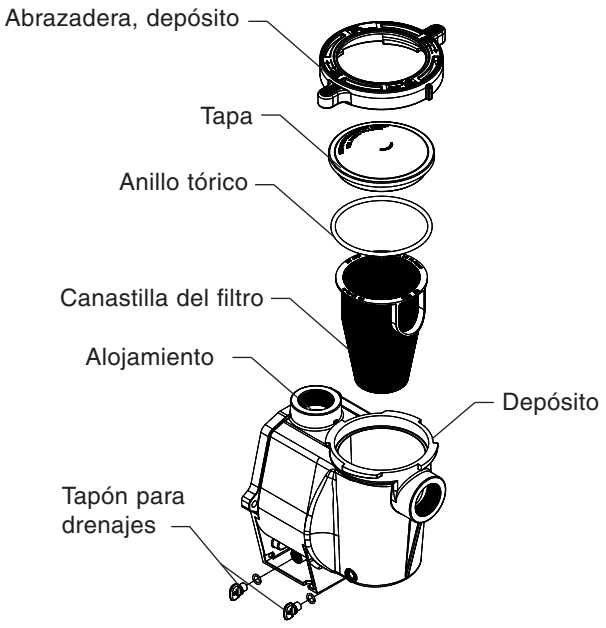
Acondicionamiento para el invierno

- En áreas de clima templado, en caso de condiciones temporales de congelamiento, haga funcionar su equipo de filtración toda la noche para evitar el congelamiento.
- Usted es responsable de determinar cuándo pueden ocurrir condiciones de congelamiento. Si se esperan condiciones de congelamiento, siga los siguientes pasos para reducir el riesgo de daño por congelamiento. El daño por congelamiento no se encuentra cubierto por la garantía.

Para evitar el daño por congelamiento, siga las instrucciones a continuación:

1. Apague el suministro eléctrico de la bomba en el interruptor de circuito.
2. Drene el agua de la caja de la bomba retirando los dos tapones de drenaje de la tapa. Guarde los tapones en la canastilla de la bomba.
3. Cubra el motor para protegerlo de la lluvia fuerte, la nieve o el hielo.

Nota: No envuelva el motor con plástico u otros materiales hermetizados durante el almacenamiento de invierno. El motor puede estar cubierto durante una tormenta, el almacenamiento de invierno, etc., pero nunca cuando esté funcionando o se espere que comience a funcionar.



Conjunto del depósito del filtro

SERVICIO

⚠ ADVERTENCIA Siempre desconecte la energía hacia la bomba en el interruptor de circuito antes de realizar el servicio a la bomba. Si no se hace esto, las personas que realizan el servicio, los usuarios u otras personas pueden resultar muertas o con heridas de gravedad debido al electrochoque. Lea todas las instrucciones de servicio antes de comenzar a trabajar en la bomba.

⚠ ADVERTENCIA **NO** abra el depósito del filtro si el cebado de la bomba falla o si la bomba ha estado funcionando sin agua en el depósito del filtro. Las bombas que funcionan en estas circunstancias pueden experimentar una acumulación de presión de vapor y pueden contener agua caliente escaldada. Si abre la bomba puede resultar herido de gravedad. Para evitar la posibilidad de lesiones personales, asegúrese de que las válvulas de succión y descarga estén abiertas y la temperatura del depósito del filtro esté fría para el tacto, luego ábrala con extrema precaución.

⚠ PRECAUCIÓN Asegúrese de no rayar o marcar las caras pulidas del sello del eje; el sello perderá si las caras se encuentran dañadas. Las caras pulidas y recubiertas del sello se podrían dañar si no son tratadas con cuidado.

Cuidado del motor

Protéjalo del calor

1. Cubra el motor del sol.
2. Cualquier caja del motor debe estar bien ventilada para evitar el sobrecalentamiento.
3. Proporcione amplia ventilación cruzada.

Protéjalo contra la suciedad.

1. Protéjalo contra cualquier materia extraña o salpicadura de agua.
2. No almacene (o derrame) químicos sobre o cerca del motor.
3. Protéjalo contra cualquier materia extraña o salpicadura de agua.
4. Evite barrer o levantar polvo cerca del motor mientras está en funcionamiento.
5. Si un motor se daña por suciedad, la garantía del motor se anula.
6. Limpie la tapa y la abrazadera, el anillo tórico y la superficie de sellado del depósito de la bomba.

Protéjalo contra la humedad

1. Protéjalo contra las salpicaduras o pulverizaciones de agua.
2. Protéjalo de las temperaturas extremas.
3. Protéjalo contra cualquier materia extraña o salpicadura de agua.
4. Si un motor se moja, déjelo secar antes de ponerlo en funcionamiento. No permita que la bomba funcione si se ha inundado.
5. Si un motor se daña por agua, la garantía del motor se anula.

Nota: Cuando está reemplazando el motor, asegúrese que el soporte de motor está colocado correctamente para soportar el tamaño del motor que se está instalando.

El sello de eje

El sello de eje consiste principalmente en dos piezas, un miembro rotativo y un sello cerámico. La bomba requiere de poco o de ningún mantenimiento además de atención razonable, sin embargo, podría ser que de vez en cuando se dañe el sello de eje y tenga que reemplazarse.

Nota: Las caras pulidas y labradas del sello se pueden dañar si no se usa con cuidado.

Desmontaje de bomba

Todas piezas móviles se encuentran en el montaje de abajo por atrás de esta bomba.

Herramientas requeridas:

- 3/ Llave de boca de 3/32 pulgada (.2381 cm)
- 1/Llave de boca de 1/2 pulgada (15.24 cm).
- 9/Llave de boca de 9/16 pulgada (1.429 cm).
- F Destornillador con cabeza plana.

Para quitar y reparar el montaje de abajo del motor ejecute los siguientes procedimientos.

1. Apague el cortacircuito de bomba en el panel principal.
2. Vacíe la bomba al quitar los tapones de drenaje.
3. Quite los 6 pernos que sujetan el cuerpo de bomba principal (olla de colador/voluta) al montaje de abajo por atrás.
4. SUAVEMENTE separe las dos mitades de bomba, quitando el montaje de abajo por atrás.
5. Use una llave de boca de 3/32 pulgada (.2381 cm) para desapretar los dos tornillos que soportan y que se encuentran en el difusor.
6. Mantenga el impulsor seguramente en lugar y quite el tornillo de llave del impulsor al usar un desarmador (desatornillador) de cruz. Este tornillo tiene rosca a mano izquierda y se desaprieta en el sentido de las agujas del reloj.
7. Quite la tapa del eje que se encuentra en la parte de atrás del motor y mantenga el eje seguro con una llave de boca de 1/2 pulgada (15.24 cm).
8. Para destornillar el impulsor del eje, déle vuelta al impulsor en el sentido opuesto de las agujas del reloj.
9. Quite los cuatro pernos de la placa de sello al motor, usando una llave de 9/16 pulgada (1.429 cm).

⚠ PRECAUCIÓN **NO haga funcionar la bomba en seco.** Si hace funcionar la bomba en seco, el sello mecánico se dañará y la bomba comenzará a perder. Si esto ocurre, deberá cambiar el sello dañado. SIEMPRE mantenga el nivel de agua adecuado. Si el nivel de agua cae por debajo del puerto de succión, la bomba extraerá aire del puerto de succión, perderá cebado y funcionará en seco, lo que dañará el sello. El funcionamiento continuo en este estado puede causar una pérdida de presión, lo que dañará la caja de la bomba, el propulsor y sello y puede provocar la pérdida de propiedad y lesiones personales.

Armar la bomba de nuevo

1. Cuando este instalando el sello mecánico de la flecha, use un sellador de silicón en la parte metálica de la flecha antes de presionar contra la placa de sello, y teniendo mucho cuidado de mantener el sellador de silicón alejado del la cara de sellado de la bomba. Asegúrese que el sello se encuentre completamente asentado y deje pasar 24 horas para permitir que el sellador seque. (Kid de remplazo completo con la placa de sello y el sello mecánico esta disponible, P/N 350201/350101.)
2. Antes de instalar la sección cerámica del sello en el impulsor, asegúrese que el impulsor está limpio. Use un jabón de poca densidad y agua para sellar el sello. Empuje el sello en el impulsor con los dedos gordos y pase un paño para limpiar las caras cerámicas y de carbón.
3. Reinstalar de nuevo la placa de sello al motor. Ajustando los Pernos, 3/8-16 x 7/8 (2,22 cm) de cabeza hexagonal, a un torque de 7,91 Nm de manera cruzada (apretar uno de los pernos y después apretar el perno opuesto y repita la misma secuencia hasta que todos los pernos estén ajustados al torque requerido).
4. Limpie la rosca de la flecha y la rosca del impulsor, después enrosque el impulsor a la flecha del motor.
5. Atornille el tornillo de cierre del impulsor (en el sentido opuesto de las agujas del reloj para apretar).
6. Monte de nuevo el difusor en la placa de sello. Asegúrese que las clavijas plásticas y las inserciones de tornillos de mantener están alineado.
7. Engrase el anillo en O del difusor y empaque de placa de sello o el anillo en O antes de armar de nuevo.
8. Engrase las roscas de perno, arme el montaje de abajo del motor al cuerpo de olla de colar y bomba al usar los dos pernos que corren a través para tener alineamiento adecuado. Colocar los Pernos, 3/8 -16 x 2 de cabeza hexagonal 18-8 acero inoxidable (se requieren 2) a través de la placa de sellado y la voluta y no los ajuste hasta que los Pernos de 3/8, 16 x 1-1/4 (3,18 cm) cabeza hexagonal 18-8 acero inoxidable (se requieren 4) estén ajustados a mano. Ajustar todos los pernos a un torque de 12,43 Nm, de manera cruzada.
9. Llene la bomba con agua.
10. Instale de nuevo la tapa de bomba y abrazadera plástica; vea INSTRUCCIONES PARA ENCENDER DE NUEVO.
11. Prepare de nuevo el sistema.

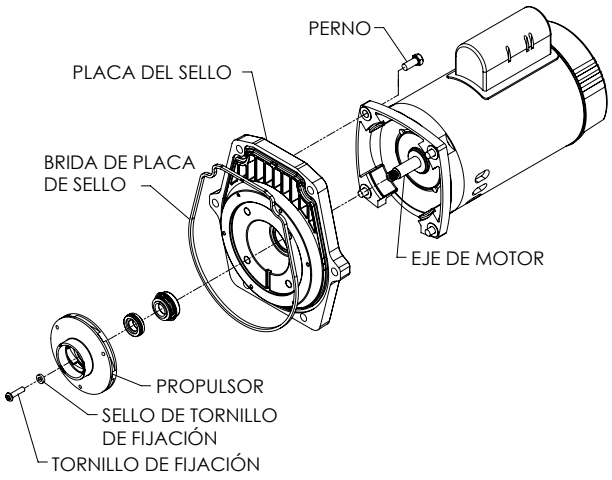
Instrucciones para encender de nuevo

Si se instala la bomba debajo del nivel de agua en la piscina, cierre las líneas de regreso y de aspiración antes de abrir la olla de pelo y pelusa en la bomba. Asegúrese de abrir de nuevo las válvulas antes de usar.

Imprimar la bomba

La olla de colador de bomba tiene que llenarse con agua antes de que se empiece la bomba incialmente. Siga estos pasos para imprimar la bomba.

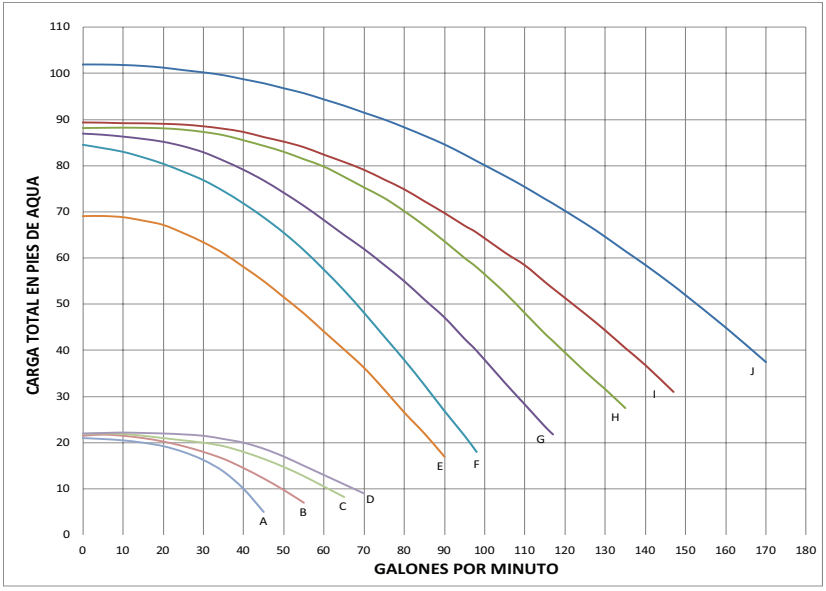
1. Quite la abrazadera plástica de la tapa de la bomba. Quite la tapa de la bomba.
2. Llene la olla de colador de bomba con agua.
3. Arme de nuevo el cubierto de bomba y abrazadera plástica en la olla de colador. Ahora la bomba está lista para imprimar.
4. Abra válvula de escape de aire en el filtro y manténgase a distancia del filtro.
5. Encienda el interruptor o reloj.
6. Cuando agua sale de la válvula de escape de aire, cierre la válvula. Este sistema ahora debe estar libre de aire y circulando agua de nuevo a la piscina y de vuelta.
7. Para bomba de 2 velocidades:
8. La bomba debe funcionar en alta velocidad para imprimar.
9. La bomba no debe funcionar por más de 8 minutos antes de que se logre imprimar.



LOCALIZADOR DE AVERÍAS

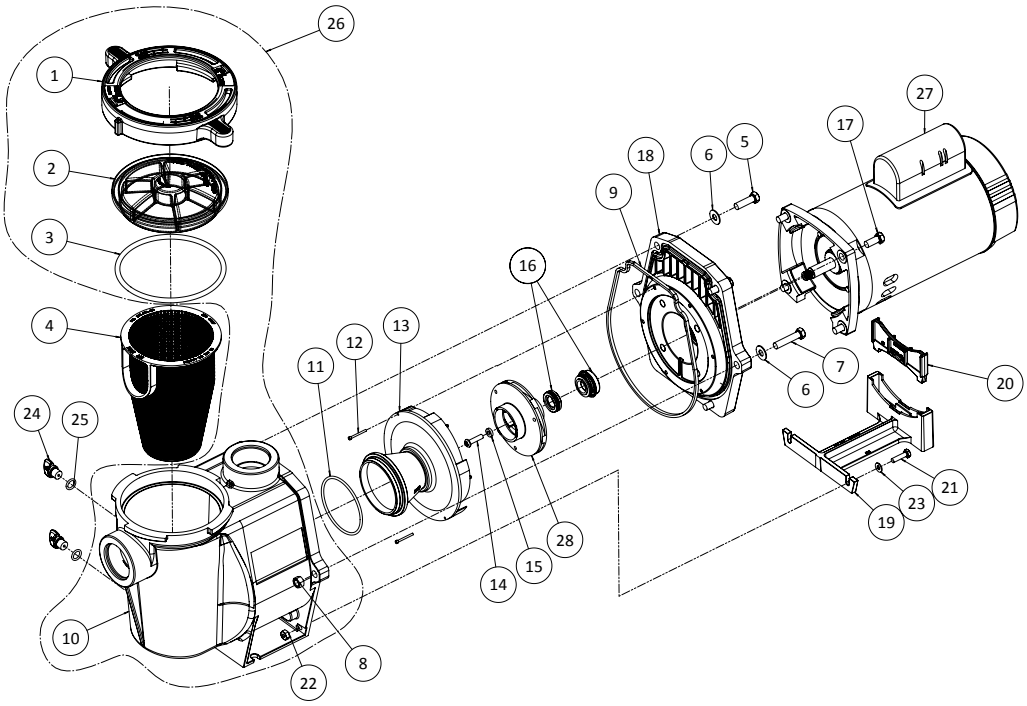
Problema	Posible causa	Medida correctiva
Si la bomba falla.	La bomba no imprima – demasiado aire.	Revise la tubería de succión y las prensastopas en cualquier válvulas de puerta de aspiración. Cierre la tapa en la olla de coladora de bomba y asegúrese que el empaque de tapa está en lugar.Revise el nivel de agua para asegurarse que la desnatadora no está jalando aire.
	La bomba no imprima—no hay agua suficiente	Asegúrese que las líneas de aspiración, el colador de bomba, y la voluta de bomba están llenas con agua. Asegúrese que la válvula en la línea de aspiración está funcionando y abierta, (algunos sistemas no tienen válvulas). Revise el nivel de agua para asegurarse que hay agua disponible a través de la desnatadora.
	El colador de bomba está atascado Empaque de colador de bomba defectuoso.	Limpie la olla de coladora de bomba. Reemplazar empaque.
Capacidad reducida y/o presión baja de agua.	Bolsas de aire o fugas en la línea de aspiración.	Revise la tubería de succión y las prensastopas en cualquier válvulas de puerta de aspiración. Cierre la tapa en la olla de coladora de bomba y asegúrese que el empaque de tapa está en lugar.Revise el nivel de agua para asegurarse que la desnatadora no está jalando aire.
	Impulsor atascado.	Apague la energía eléctrica en los interruptores de circuito de la bomba. Desensamblar (Referir a Desensamblaje de la bomba, página 16). Remover la basura del impulsor, si la basura no pueden ser removida por complete, siga las siguientes instrucciones: 1. Remueva el Tornillo de 1/4, 20x1, LH, Phillips MS 18-8 de acero inoxidable y la arandela de goma del impulsor. 2. Remueva el impulsor, termine de limpiarlo y vuelva a instalar. Reensamblar (Referir a Armar la bomba de nuevo, página 17).
	Colador de bomba atascado.	Limpie el depósito de aspiración.

Curvas de rendimiento de la bomba



Curva	Modelo
A	WFDS-3, WFDS-24
B	WFDS-4, WFDS-26
C	WFDS-6, WFDS-28
D	WFDS-8, WFDS-30
E	WFE-2, WF-2, WF-23, WFK-2
F	WFE-3, WFE-24, WF-3, WF-24, WFK-3, WFDS-3, WFDS-24
G	WFE-4, WFE-26, WF-4, WF-26, WFK-4, WFDS-4, WFDS-26
H	WFE-6, WFE-28, WF-6, WF-28, WFK-6, WFDS-6, WFDS-28
I	WFE-8, WFE-30, WF-8, WF-30, WFK-8, WFDS-8, WFDS-30
J	WFE-12, WF-12, WFK-12

PIEZAS DE REEMPLAZO



Número de artículo	P/N	Descripción
1	357199	Abrazadera, Cam & Ramp, Almendra
1	357150	Abrazadera, Cam & Ramp, Negro
2	357151	Tapa, transparente, bomba WFE
2	357156	Tapa, resistente química, Cam & Ramp
3	350013	Tapa WFE Anillo en O
4	070387	Canastilla del filtro, WFE
5	070430	Perno, 3/8 - 16 x 1,25, cabeza hexagonal acero inox, 4 Req.
6	072184	Arandelas, 3/8 x 13/16 O.D. acero inox, 6 Req.
7	070431	Perno, 3/8 - 16 x 1,75, cabeza hexagonal acero inox, 2 Req.
8	071403	Tuerca, 3/8, 16 hex hd., 2 req.
9	357100	Placa de sello de Empaque, Negro
10	357149	Voluta & placa de sello, Almendra Kit de reemplazo
10	350015	Voluta & Olla de Bomba WFE, Almendra
10	357157	Voluta & Olla de Bomba WFE, Negro ❶
11	355227	Anillo en O Parker de Bomba WFE, #2-238
12	071660	Tornillo de Tope, #4-40 X 1-1/8 SFE, 2 req.
13	072928	Montaje de Difusor, WFE- 12, Sólo 3 HP
13	072927	Montaje de Difusor, WFE- 2-8, .5 HP–2.5 HP
14	071652	Tornillo de Tope, 1/4, 20 x 1 lh. Phillips

Número de artículo	P/N	Descripción
15	075713	Arandela de Hule de Bomba WFE
16	071734S	Sello PA-7 con Asiento Ceramico, PS1000 ❶
16	071728	Sello A7 con Asiento Ceramico, PS201
17	070429	Perno, 3/8, 16 x 7/8 s/s hex hd., 4 req.
18	350201	Placa de Sello Juego WFE, Almendra (Incluye sello mecánico instalado) # 9, 16 & 18
18	350101	Placa de Sello Juego WFE, Negro (Incluye sello mecánico instalado) # 16 & 18
19	070927	Pie WFE - Bomba 4, Almendra
19	357159	Pie, Negro ❶
20	070929	Inserción de Pie de Bomba WFE, Almendra ❶
20	357160	Inserción de Pie de Bomba WFE, Negro
21	071657	Tornillo, 1/4, 20 x 1 pulg. hex hd. s/s, 2 req.
22	071406	Tuerca, 1/4, 20 hex. hd. s/s, 2 req.
23	072183	Tuerca, 1/4, 20 hex. hd. s/s, 2 req.
24	071131	Tapón con Perilla para Desagüe, Almendra 2 req.
24	357161	Tapón con Perilla para Desagüe, Negro 2 req. ❶
25	192115	Tapón de Desagüe de O-anillo, 2 req.
26	357149	Juego para Reemplazar Voluta/Placa de Sello, Almendra (Incluye #1-4, 9, 10, 16, 18, 24, and 25)
27	*Página siguiente*	

Número de artículo	Núm. de pieza	Descripción
		Motores
27	355008S	3/4 HP, 60 Hz, WFE-2, 3 & 24, 1 spd., Almendra, 31 lbs. ❷
27	355010S	1 HP, 60 Hz, WFE-4 & 26, 1 spd., Almendra,, 33 lbs. ❷
27	355012S	1-1/2 HP, 60 Hz, WFE-6 & 28, 1 spd., Almendra,, 39 lbs. ❷
27	355014S	2 HP, 60 Hz, WFE-8 & 30, 1 spd., Almendra,, 40 lbs. ❷
27	355016S	3 HP, 60 Hz, WFE-12, 1 spd., Almendra, 40 lbs. ❷
27	356630S	1 HP, WFDS-4 & 26, 2 spd., 34 lbs. ❹
27	071320S	1-1/2 HP, WFDS-6 & 28, 2 spd., 36 lbs. ❹
27	071321S	2 HP, WFDS-8 & 30, 2 spd., 45 lbs. ❹
27	355018S	1/2 HP, WF-2 & 23, 1 spd., Almendra, 39 lbs. ❸
27	355020S	3/4 HP, WF-3 & 24, 1 spd., Almendra, 26 lbs. ❸
27	355022S	1 HP, WF-4 & 26, 1 spd., Almendra, 28 lbs. ❸
27	355024S	1-1/2 HP, WF-6 & 28, 1 spd., 39 lbs. ❸
27	355026S	2 HP, WF-8 & 30, 1 spd., 32 lbs. ❸
27	355033S	3 HP, WF-12, 1 spd., Almendra, 40 lbs. ❸
27	355203S	1 HP, WFK-4, 3 ph, 1 spd., Negro, 28 lbs.
27	355204S	1-1/2 HP, WFK-6, 3 ph, 1 spd., Negro, 30 lbs.
27	355205S	2 HP, WFK-8, 3 ph, 1 spd., Negro, 37 lbs.
27	355398S	3 HP, WFK-12, 3 ph, 1 spd., Negro, 35 lbs.
27	356626S	1 HP, WFK-4, 3 ph, 1 spd., Almendra, 28lbs.
27	356627S	1-1/2 HP, WFK-6, 3 ph, 1 spd., Almendra, 30lbs.
27	356628S	2 HP, WFK-8, 3 ph, 1 spd., Almendra, 37 lbs.
27	356629S	3 HP, WFK-12, 3 ph, 1 spd., Almendra, 35 lbs.
27	354805S	1 HP, WFK-4, TEFC, 3 ph, 1 spd., Almendra, 28lbs.
27	354807S	1-1/2 HP, WFK-6, TEFC, 3 ph., 1 spd., Almendra, 30lbs.
27	354809S	2 HP, WFK-8, TEFC, 3 ph., 1 spd., Almendra, 37 lbs.
27	354811S	3 HP, WFK-12, TEFC, 3 ph., 1 spd., Almendra, 35 lbs.

No Mostrado

79129900	2-Velocidad Toggle Interruptor
350202	Placa de Sello Juego: Placa de Sello (Almendra), Empaque (Negro), con instalado Sello (Incluye Artículos: 9, 16, & 18)
350203	Placa de Sello Juego: Placa de Sello (Negro), Empaque (Negro), con instalado Sello (Incluye Artículos: 9, 16, & 18)
357243	Olla la Asamblea, Almendra NPT. (Incluye Artículos: 1-4, 10, 24 [qty. 2], 25 [qty. 2])
357244	Olla la Asamblea, Negro NPT. (Incluye Artículos: 1-4, 10, 24 [qty. 2], 25 [qty. 2])

Fondo Potencia Submontaje. Incluye Artículos: 12-18, 27-28

075136	WFE-2
075137	WFE-3, WFE-24
075138	WFE-4, WFE-26 ❷
075139	WFE-6, WFE-28 ❷
075140	WFE-8, WFE-30 ❷
075141	WFE-12 ❷
075145	WFDS-3, WFDS-24 ❹
075142	WFDS-4, WFDS-26 ❹
075143	WFDS-6, WFDS-28 ❹
075144	WFDS-8, WFDS-30
075251	WF-2, WF-23 ❸
075252	WF-3, WF-24 ❸
075253	WF-4, WF-26 ❸
075254	WF-6,WF-28 ❸
075255	WF-8,WF-30 ❸
075256	WF-12 ❸

Fondo Líquido - Todas las Partes sin el Motor

075451	WFE-2 fluid end, 1/2 HP
075452	WFE-3 fluid end, 3/4 HP
075453	WFE-4 fluid end, 1 HP
075454	WFE-6 fluid end, 1-1/2 HP
075455	WFE-8 fluid end, 2 HP
075456	WFE-12 fluid end, 3 HP

❶ CSA/CUL (sólo) para Canadá.
❷ Energía eficiente, sola fase.
❸ Eficiencia Estánder, sola fase.
❹ Dos velocidad, sola fase.

Tabla de impulsor

HP	TAMAÑO	NO. DE PIEZA STD.
1/2	WFE-2, WF-2, WF-23, WFK-2	073126
3/4	WFE-3, WFE-24, WF-3, WF-24, WFK-3, WFDS-24	073127
1	WFE-4, WFE-26, WF-4, WF-26, WFK-4, WFDS-4, WFDS-26	073128
1½	WFE-6, WFE-28, WF-6, WF-28, WFK-6, WFDS-6, WFDS-28	073129
2	WFE-8, WFE-30, WF-8, WF-30, WFK-8, WFDS-8, WFDS-30	073130
3	WFE-12, WF-12, WFK-12	073131

NOTES/NOTAS

NOTES/NOTAS

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