



(all models)

# ICI GAS POOL HEATER

## WARNING

FOR YOUR SAFETY - This product must be installed and serviced by a contractor who is licensed and qualified in pool equipment in accordance with AS/NZ 3000 and any other local applicable regulations. 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.

Improper installation and/or operation can create unwanted electrical hazard which can cause serious injury, property damage, or death.

**EQUIPMENT INFORMATION RECORD**

DATE OF INSTALLATION	_____
INSTALLER INFORMATION	_____
INITIAL PRESSURE GAUGE READING (WITH CLEAN FILTER)	_____
PUMP MODEL	_____
HORSEPOWER	_____
FILTER MODEL	_____
CONTROL PANEL MODEL	_____
SERIAL NUMBER	_____

## TABLE OF CONTENTS

<p>Section 1. Important Safety Instructions ..... 4</p> <p>Section 2. General Information..... 6</p> <p>2.1 Technical Assistance.....6</p> <p>2.2 Warranty .....6</p> <p>2.3 Consumer Information and Safety.....6</p> <p>2.4 General Operation Description .....6</p> <p>2.5 Specifications.....7</p> <p>2.6 Dimensions.....7</p> <p>2.7 Certification Codes and Standards .....8</p> <p>Section 3. Getting Started ..... 8</p> <p>3.1 Contents .....8</p> <p>3.2 Required Equipment .....9</p> <p>Section 4. Location Requirements.....10</p> <p>4.1 Clearances..... 10</p> <p>4.2 Outdoor Installation..... 10</p> <p>4.3 Indoor Installation..... 10</p> <p>Section 5. Gas Connections ..... 14</p> <p>5.1 Supply Gas Requirements..... 14</p> <p>5.2 Inlet Gas Pressure Test ..... 14</p> <p>5.3 Special Precautions for LP Gas..... 14</p> <p>5.4 Gas Pipe Sizing Tables..... 15</p> <p>5.5 Check Burner Performance..... 15</p> <p>Section 6. Water Connections ..... 16</p> <p>6.1 Pump Sizing ..... 16</p> <p>6.2 Plumbing Connections ..... 16</p> <p>6.3 Water Pressure Switch Adjustment..... 17</p> <p>6.4 Check Valve Installation ..... 17</p> <p>6.5 Pressure Relief Valve Installation ..... 17</p> <p>6.6 Condensate Drain ..... 18</p>	<p>Section 7. Electrical Connections.....19</p> <p>7.1 Electronic Flow Response..... 19</p> <p>Section 8. Final Installation Check.....22</p> <p>8.1 Important Safety Information..... 22</p> <p>8.2 What To Do If You Smell Gas..... 22</p> <p>8.3 First Time Start-up Procedure ..... 22</p> <p>8.4 Lighting Instructions..... 22</p> <p>8.5 To Turn Off Gas To Heater ..... 22</p> <p>8.6 Shutting Down the Heater..... 22</p> <p>Section 9. Operation.....23</p> <p>9.1 Normal Operation ..... 23</p> <p>9.2 Digital Thermostat Operation..... 23</p> <p>9.3 ICI User Controls ..... 23</p> <p>Section 10. Maintenance.....25</p> <p>10.1 Water Chemistry..... 25</p> <p>10.2 Winterizing ..... 25</p> <p>10.3 Corrosion Prevention In Heaters..... 25</p> <p>10.4 Maintenance Schedule..... 26</p> <p>10.5 Service Notification ..... 26</p> <p>Section 11. Troubleshooting.....28</p> <p>11.1 Display Symbol Indicators..... 28</p> <p>Section 12. Spare Parts.....29</p> <p>12.1 Model ICI 200B ..... 29</p> <p>12.2 Model ICI 200B Spare Parts List..... 30</p> <p>12.3 Model ICI 400B ..... 31</p> <p>12.4 Model ICI 400B Spare Parts List..... 32</p>
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## Section 1. Important Safety Instructions

### READ AND FOLLOW ALL 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:

#### **⚠ DANGER**

To reduce the risk of severe injury or death, do not remove the suction fittings of your spa or hot tub. Never operate a spa or hot tub if the suction fittings are broken or missing. Never replace a suction fitting with one rated less than the flow rate marked on the equipment assembly.

#### **⚠ WARNING**

Prolonged immersion in hot water may induce hyperthermia. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 37°C. The symptoms of hyperthermia include dizziness, fainting, drowsiness, lethargy, and an increase in the internal temperature of the body. The effects of hyperthermia include: 1) unawareness of impending danger; 2) failure to perceive heat; 3) failure to recognize the need to exit spa; 4) physical inability to exit spa; 5) fetal damage in pregnant women; 6) unconsciousness resulting in a danger of drowning.

#### **⚠ WARNING**

##### **To Reduce the Risk of Injury -**

- a) The water in a spa should never exceed 40°C. Water temperatures should remain between 38°C and 40°C. The water in a spa should never exceed 40°C. Water temperatures between 38°C and 40°C are considered safe for a healthy adult. Lower water temperatures are recommended for young children and when spa use exceeds 10 minutes.
- b) Since excessive water temperatures have a high potential for causing fetal damage during the early months of pregnancy, pregnant or possibly pregnant women should limit spa water temperatures to 38°C. Before entering a spa or hot tub, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature-regulating devices varies.
- d) The use of alcohol, drugs, or medication before or during spa or hot tub use may lead to unconsciousness with the possibility of drowning.
- e) Obese persons and persons with a history of heart disease, low or high blood pressure, circulatory system problems, or diabetes should consult a physician before using a spa.
- f) Persons using medication should consult a physician before using a spa or hot tub since some medication may induce drowsiness while other medication may affect heart rate, blood pressure, and circulation.

#### **⚠ WARNING**

**Risk of electric shock** - Install the controller at least 3.5 metres from the inside wall of the pool and/or hot tub using non-metallic plumbing.

Children should not use spas or hot tubs without adult supervision.

Do not use spas or hot tubs unless all suction guards are installed to prevent body and hair entrapment.

People using medications and/or having an adverse medical history should consult a physician before using a spa or hot tub.

#### **⚠ WARNING**

To avoid injury ensure that you use this control system to control only packaged pool/spa heaters which have built-in operating and high limit controls to limit water temperature for pool/spa applications. This device should not be relied upon as a safety limit control.

#### **⚠ WARNING**

DO NOT SPRAY AEROSOLS IN THE VICINITY OF THIS APPLIANCE WHILE IT IS IN OPERATION.

DO NOT USE OR STORE FLAMMABLE MATERIALS IN OR NEAR THIS APPLIANCE.

DO NOT PLACE ARTICLES ON OR AGAINST THIS APPLIANCE.

DO NOT MODIFY THIS APPLIANCE.

DO NOT USE AN UNLINED MASONRY CHIMNEY AS THE FLUE FOR THIS APPLIANCE.

**⚠ WARNING**

People with infectious diseases should not use a spa or hot tub.

To avoid injury, exercise care when entering or exiting the spa or hot tub.

Do not use drugs or alcohol before or during the use of a spa or hot tub to avoid unconsciousness and possible drowning.

Before entering a spa or hot tub, measure the water temperature with an accurate thermometer.

Do not use a spa or hot tub immediately following strenuous exercise.

Prolonged immersion in a spa or hot tub may be injurious to your health.

Do not permit any electric appliance (such as a light, telephone, radio, or television) within 3.5 metres of a spa or hot tub.

The use of alcohol, drugs or medication can greatly increase the risk of fatal hyperthermia in hot tubs and spas.

Water temperature in excess of 38°C may be hazardous to your health.

**⚠ WARNING**

A terminal bar marked "GROUND" is provided within the controller. To reduce the risk of electrical shock which can cause serious injury or death, connect this terminal bar to the grounding terminal of your electric service or supply panel with a continuous copper conductor having green insulation and one that is equivalent in size to the circuit conductors supplying this equipment in accordance with AS/NZ 3000. In addition, where required, bonding should be extended in accordance with AS/NZ 3000 to any metal ladders, water pipes, or other metal within 3.5 m of the pool/spa.

**⚠ WARNING**

To minimize possibility of fire or electric shock, which could result in property damage, and/or serious injury, including loss of life, power to the Viron Connect should be supplied by an isolating switch or through a residual current device (RCD) with a rated residual operating current not exceeding 30mA.



**Attention Installer:** Install to provide drainage of compartment for electrical components.

## SAVE THESE INSTRUCTIONS

## Section 2. General Information

This manual provides installation and operation instructions for the AstralPool ICI pool and spa gas heater.

**Read the installation and operation instructions completely before proceeding with the installation.**

### 2.1 Technical Assistance

**Web:** [www.astralpool.com.au](http://www.astralpool.com.au) **Phone:** 1300 186 875

### 2.2 Warranty

This heater is sold with a limited factory warranty. Details are included with this heater. For warranty terms and conditions, please visit: [www.astralpool.com.au](http://www.astralpool.com.au).

All warranty issues should be resolved with your AstralPool dealer or place of purchase. Claims must include the heater serial number and model (this information can be found on the rating plate), installation date, and name of the installer. Shipping costs are not included in the warranty coverage.

The warranty does NOT cover damage caused by improper assembly, installation, operation or field modification. Also, any damage to the heat exchanger caused by improper water chemistry will NOT be covered by the warranty.

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

### 2.3 Consumer Information and Safety

The heater is designed and manufactured to provide many years of safe and reliable service when installed, operated, and maintained according to the information in this manual and the installation codes referred to throughout. Be sure to read and comply with all warnings and cautions.

#### WARNING

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

#### WARNING

Consult heater operation and installation instructions for water temperature guidelines before setting temperature.

- Spa or hot tub water temperature should never exceed 40°C (104°F). 38°C (100°F) is considered safe for a healthy adult. Special caution is recommended for young children.
- The drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness, and subsequently result in drowning.
- Pregnant women take note! Soaking in water above 38.5°C (102°F) can cause fetal damage during the first three (3) months of pregnancy (which could result in the birth of a brain-damaged or deformed child). If pregnant women are going to use a spa or hot tub, they should make sure the water temperature is below 38°C (100°F) maximum.
- The water temperature should always be checked with an accurate thermometer before entering a spa or hot tub. Temperature controls may vary by as much as 1°C/1F°.
- Persons with a medical history of heart disease, diabetes, circulatory or blood pressure problems should consult their physician before using a hot tub or spa.
- Persons taking any medication which induces drowsiness (e.g., tranquilizers, antihistamines, or anti-coagulants) should not use spas or hot tubs.
- Prolonged immersion in hot water can induce hyperthermia.
- Hyperthermia occurs when the internal body temperature reaches a level several degrees above the normal body temperature of 37°C (98.6°F). Symptoms include dizziness, fainting, drowsiness, lethargy, and an increase in the internal body temperature. The effects of hyperthermia include:
  - Lack of awareness of impending hazard
  - Failure to perceive heat
  - Failure to recognize need to leave spa
  - Physical inability to leave spa
  - Fetal damage in pregnant women
  - Unconsciousness resulting in a danger of drowning

### 2.4 General Operation Description

The ICI GAS POOL HEATER can safely be connected to PVC pipe. It accepts high water flow rates which help the heater run cooler, giving greater efficiency and long life. In addition, it is equipped with electronic start up and an accurate electronic thermostat to ensure ease of use and accurate temperature control. The electronic display tells at a glance the operational status of the heater.

The ICI GAS POOL HEATER requires a minimum of 120 litres per minute flow for the ICI 200B and 200 litres per minute for the ICI 400B models. The maximum permissible flow rate is 500 litres per minute. For flow rates in excess of 500 litres per minute, an external by-pass valve must be fitted.

### 2.5 Specifications

Model	ICI 200B	ICI 400B
Gas Inlet Rate	215 MJ/hr	400 MJ/hr
Gas Connection	AS/NZ 5601	AS/NZ 5601
Gas Usage Rate of Nominal Rate (must be within %)	+/- 5	+/- 5
NG Inlet Static Gas Pressure (kPa)	1.13 - 5	1.13 - 5
LPG Inlet Static Gas Pressure (kPa)	2.75 - 5	2.75 - 5
NG Gas Inlet Operating Pressure-High Fire (kPa)	1.13	1.13
LPG Gas Inlet Operating Pressure-High Fire (kPa)	2.75	2.75
Water Flow Rate	120 - 500	200 - 500
Min Water Operating Pressure (PSI)	5	5
Water pH	7.6 - 7.8	7.6 - 7.8
Water Total Alkalinity (ppm)	80 -120	80 -120
Water Calcium Hardness (ppm)	100 - 350	100 - 350
Water Salinity (ppm)	5000 maximum	5000 maximum
Chlorine Maximum Content (ppm)	3	3
Bromine Maximum Content (ppm)	5	5
Air-Free NG - CO Level (ppm)	30 - 60	30 - 60
Air-Free LPG - CO Level (ppm)	50 - 150	50 - 150

### 2.6 Dimensions

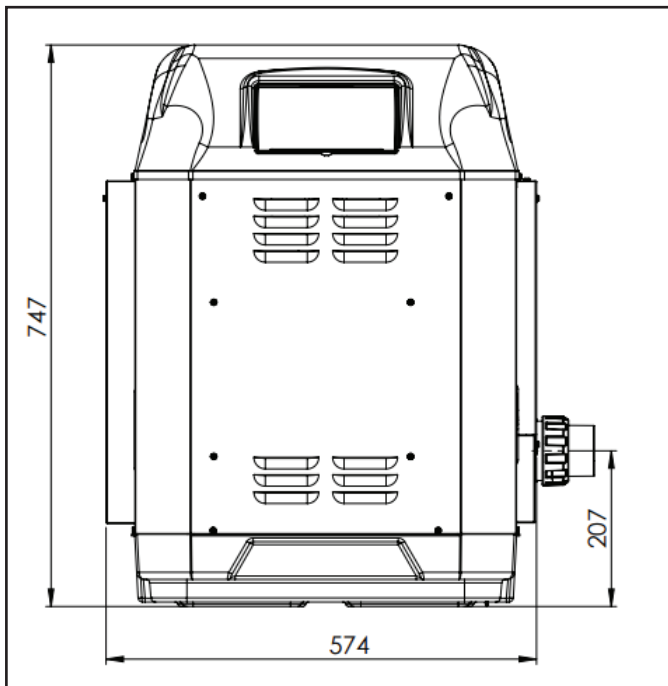


Figure 1. Front Dimensions

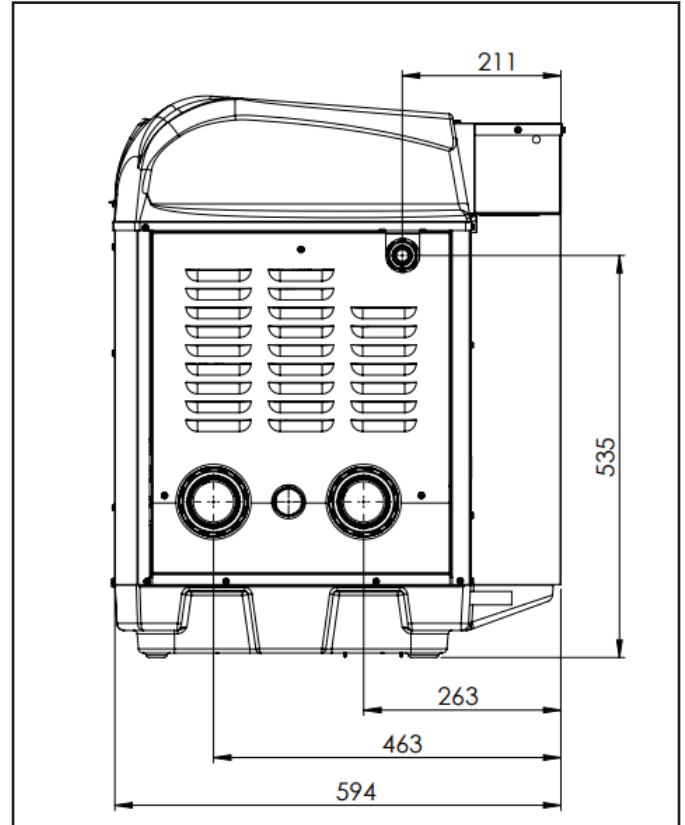


Figure 2. Side Dimensions

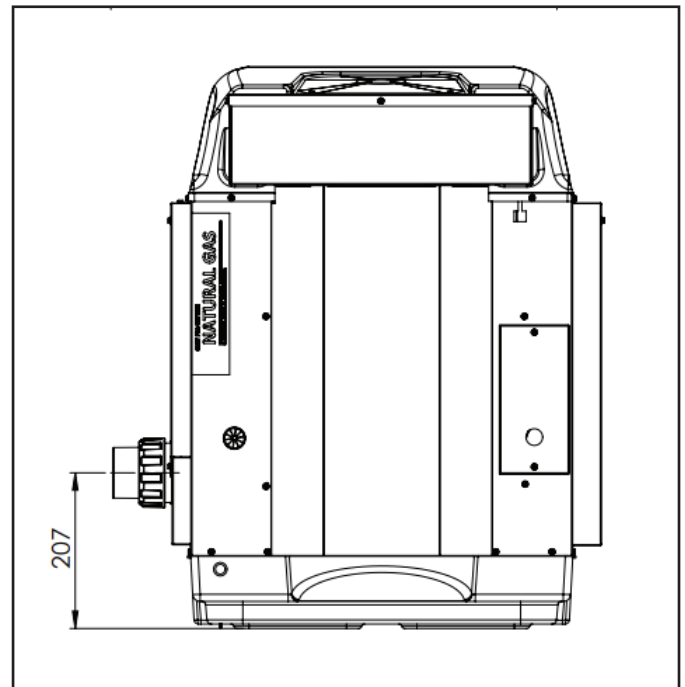


Figure 3. Header Height

## 2.7 Certification Codes and Standards

Certified	IAPMO R&T Oceana
COMPLIANT	Standard for 'Gas Pool Heaters', AS 4560
Applicable National Installation and Commissioning code(s)	<b>Standard for Gas Installations, AS/NZS 5601</b> Pay particular attention to the chapter addressing Venting of Equipment
All AstralPool Gas heaters must be installed in accordance with the local building and installation codes as per the utility or Authority Having Jurisdiction (AHJ). In the absence of local codes, please refer to the latest edition of the national codes for installation:	
The ICI pool and spa heaters meet or exceed the requirements of energy conservation regulations such as those in regions that have disallowed the use of continuously lit pilot type ignition sources.	

## Section 3. Getting Started

Install the ICI in accordance with the procedures in this manual, local codes and ordinances, and in accordance with the latest edition of the appropriate national code. See Section Section 4.

If the heater is to be operated in below freezing conditions it should be installed in a protected outdoor shelter. See Section 4.3.

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

- Field assembly (if required)
- Appropriate site location, clearances and flooring see Section Section 4.
- Sufficient combustion and ventilation air
- Properly sized gas meter and piping
- Proper electrical wiring
- Sufficient water flow

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

### 3.1 Contents

Before starting, check that you have the correct parts as indicated in Table 1. If any parts are missing or incorrect, please call your local distributor or technical support at 1300 186 875 for assistance.

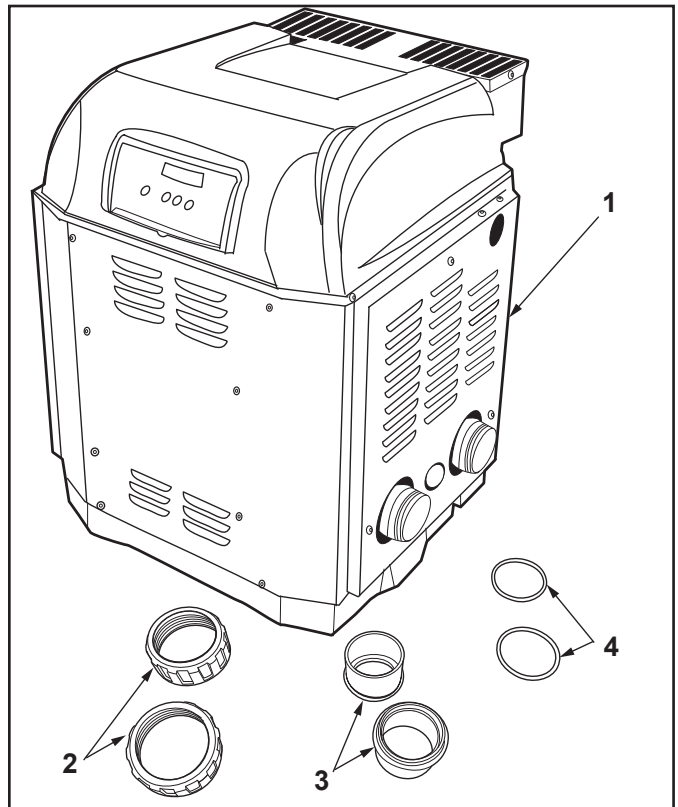


Figure 4. ICI Gas Heater Contents

Item	Description	Quantity
1	ICI Gas Heater	1
2	50mm Universal Union Nut	2
3	50mm Universal Union Tail	2
4	50mm Universal Union O-ring	2

Table 1. ICI Gas Heater Parts

### 3.2 Required Equipment

Please ensure that the following equipment is available to the installer at the time of installation.

#### 3.2.1 Required Tools

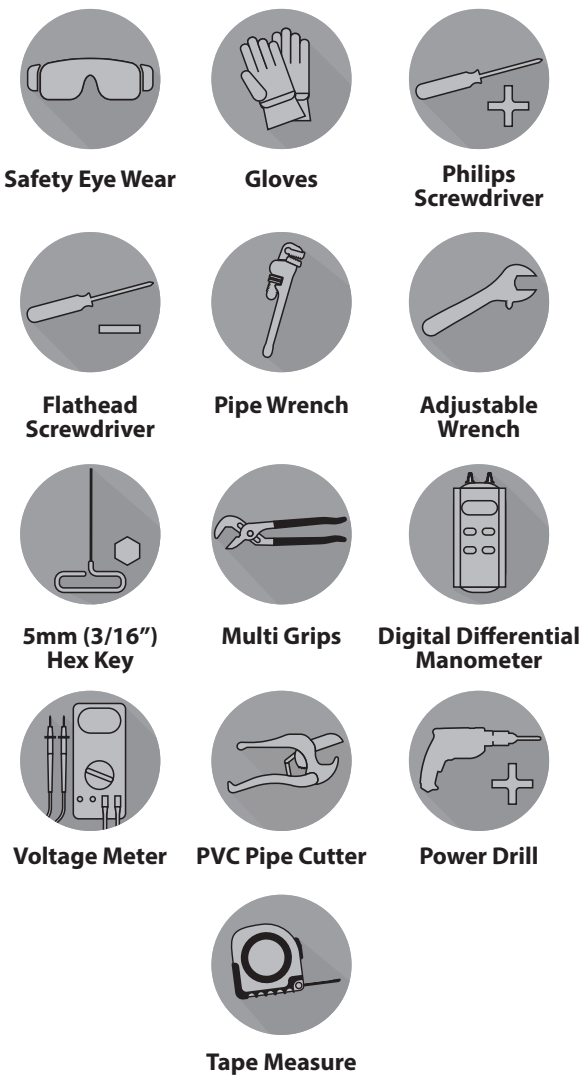


Figure 5. Required Tools

#### 3.2.2 Materials Supplied by Installer

Please ensure that all materials used during the installation are in accordance with local codes or the authority having jurisdiction (AHJ) requirements. If you have any questions regarding the materials that need to be used during this installation please call the AstralPool customer service center at 1300 186 875.

Indoor installations will require additional venting and exhaust conversion materials which are outlined in detail in Section Section 4.

**NOTE:** Required materials may differ from the materials listed. Be sure to confirm with all local and national codes before beginning the installation.

Gas Supplies	Electrical Supplies	Plumbing Supplies
Appropriately sized Gas Piping	230 VAC, 50 Hz	PVC Piping
Manual Gas Shut Off Valve		PVC Cement
Gas Union		Teflon Tape
Cap		Red RTV 300° C (600°F) rated silicone adhesive
Leak Solution		
1.6 mm (1/16") Hose "T"		
3.18 mm (1/8") - 1.6 mm (1/16") Barbed Adapter		
1.6 mm (1/16") Flexible Hose		

## Section 4. Location Requirements

### WARNING

Improper installation or maintenance can cause nausea or asphyxiation from carbon monoxide in flue gases which could result in severe injury or death. For indoor installations, as an added measure of safety, AstralPool strongly recommends installation of suitable carbon monoxide detectors in the vicinity of this appliance and in any adjacent occupied spaces.

Incorrect design and installation of heater vents and ducts can result in personal injury, damage to property, or death. To avoid such hazards, the heater must be installed only by a qualified professional service technician.

The ICI heater is shipped from the factory with an exhaust vent configured for outdoor installation. The heater is designed and certified, per AS 4560 for both outdoor and indoor installation in Australia and for indoor and outdoor installation of natural gas only heaters in New Zealand. It is shipped from the factory configured for outdoor use only, and is intended for use with permanently installed, swimming pools only. It should be installed on a level, stationary, non-mobile location and should not be subjected to intentional movement, vibration, etc. which could negatively affect the plumbing, wiring, and venting of the heater. For installation indoors, be sure to follow all the instructions provided in this instruction manual. See *Section 4.3* for details.

Location of the heater below or above the pool water level affects operation of its water pressure switch. See *Section 6.3* for more information.

**NOTE:** If the heater is to be operated in below freezing conditions it should be installed in a protected outdoor shelter.

### CAUTION

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

### 4.1 Clearances

Installation clearances must comply with AS/NZ 5601. The heater is approved for installation at reduced clearances as below.

Outdoor Clearances From	Combustible Surfaces	Non-combustible Surfaces
Front	300mm	300mm
Both Sides	300mm	300mm
Rear	300mm	50mm
Above	1000mm	1000mm

Indoor Clearances From	Combustible Surfaces	Non-combustible Surfaces
Front	300mm	300mm
Both Sides	300mm	50mm
Rear	300mm	50mm
Above	500mm	500mm

### 4.2 Outdoor Installation

#### Locate the heater:

- On a level solid surface.
- 3.5 m (12') from inner pool edge unless separated by a permanent solid barrier, i.e. a wall or fence.
- In an open area, not under a deck or other structure.
- Away from doors windows or louvres that connect in any way to occupied or inhabited areas of the building.
- Away from rainwater runoff.
- Away from potential sprinkler water intrusion.
- So that the top of the heater is at least 1 m (3') below any overhang.
- So that the top surface of the heater is at least 1 m (3') above any forced air inlet within 3 m (10').

### WARNING

Do not install the heater with the top of the vent assembly within 1.22 m (4') horizontally, 1.22 m (4') below or less than 300 mm (1') above any opening into a building. Local codes and installation requirements may vary.

### 4.3 Indoor Installation

AstralPool does not encourage installation of LP (liquid propane) gas heaters indoors. Always consult with the authority having jurisdiction (AHJ) along with all applicable national and local codes before installing a LP heater indoors. Please be sure to refer to *Section 5.3*.

The heater is Certified by IAPMO-R&T Oceana for indoor installations. Please keep in mind the clearances from *Section 4.1* when selecting an installation location. You will also need to make considerations for ventilation, see *Section 4.3.1*. In addition, when pool equipment is installed indoors, appropriate containment measures and drains should be considered for the prevention of property damage in the event of an equipment leak.

**NOTE:** An outdoor shelter is an unoccupied enclosure which does not communicate directly with occupied areas.

AstralPool **does not recommend** outdoor shelter installations that depend on internal air for combustion.

#### 4.3.1 Ventilation

When installing the heater indoors, it is imperative that an adequate supply of fresh air is provided for combustion. Failure to provide adequate ventilation voids all warranties and may be a danger to persons or property.

Two permanent openings shall be provided directly to outside. The openings shall be located to ensure the distance between the top of the upper opening and the ceiling of the room or enclosure, and the distance between the bottom of the lower opening and the floor of the room or enclosure does not exceed 5% of the height of the room or enclosure.

The minimum vertical dimension of any free ventilation opening shall be 6 mm.

The minimum free ventilation area provided directly outside by each opening shall be:

Model	Area
ICI 200B	57,000 mm <sup>2</sup>
ICI 400B	87,000 mm <sup>2</sup>

If ventilation provided is obtained from an adjacent room then these areas will increase.

The following diagram is provided as a guide only. All fluing and installation work must be carried out by an authorized person. Fluing must conform to local regulations and to installation code AS/NZ 5601. Care must be taken to provide the correct ventilation and correct fluing materials in close proximity to combustible surfaces.

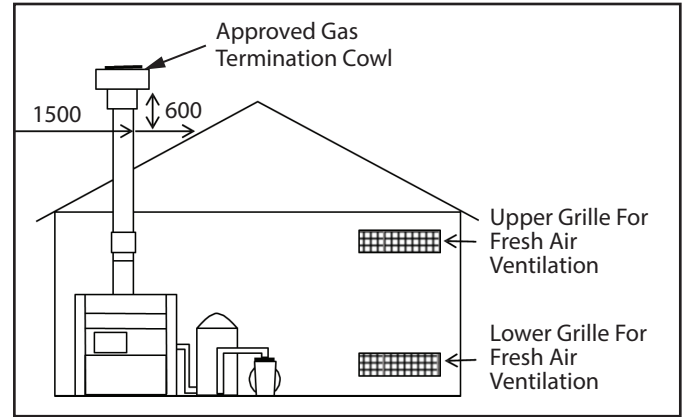


Figure 6. Ventilation Guideline Example

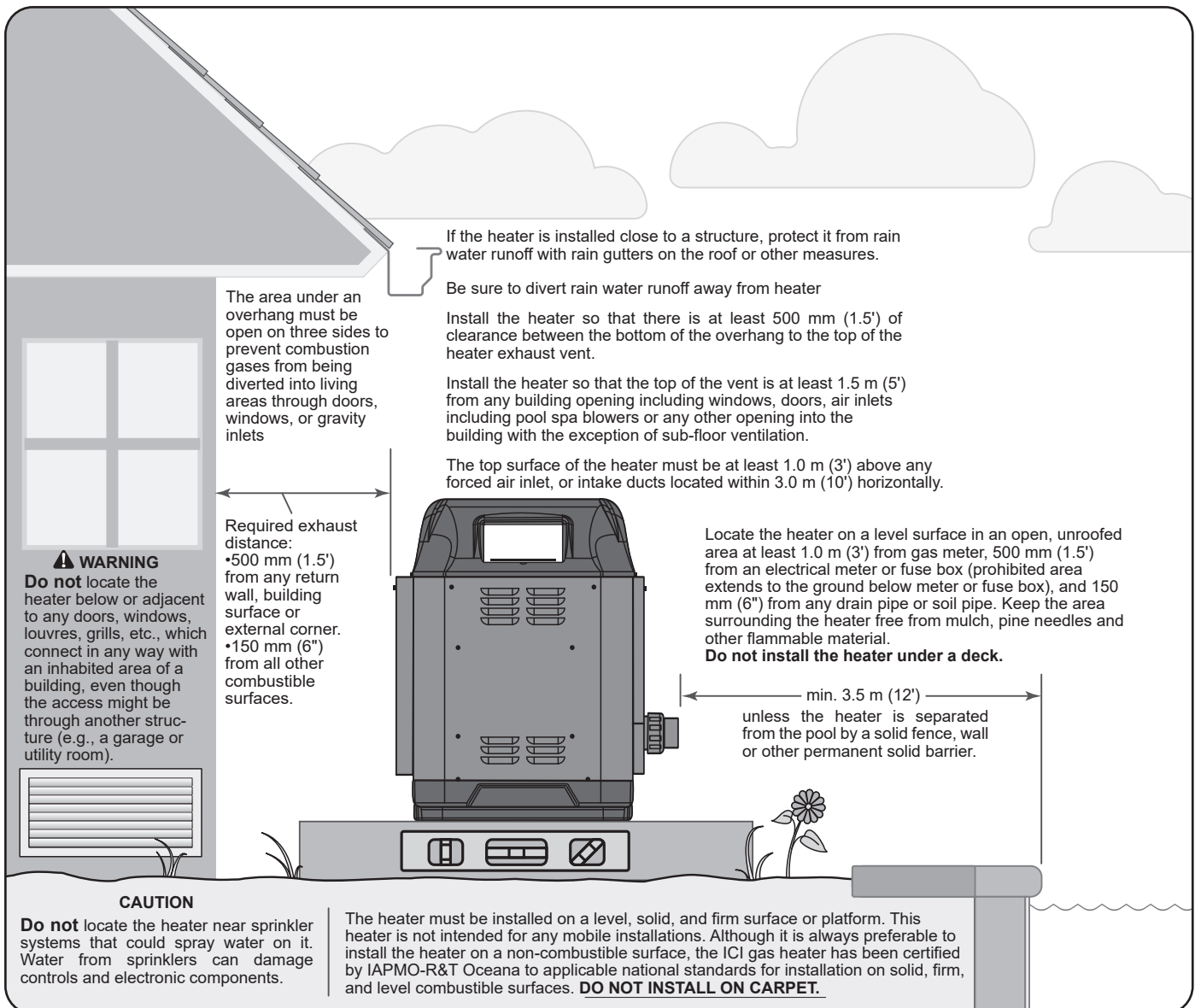


Figure 7. Location Requirements

**⚠ WARNING**

Do not install spa blowers in the same room as a gas heater. This is potentially dangerous to spa users.

**⚠ WARNING**

Do not store chemicals or fuel in the same room as the gas heater. This may cause fire or explosion. When installing in a garage the ICI GAS POOL HEATER must be installed 450 mm above floor level.

**4.3.2 Indoor Exhaust Conversion**

For indoor installations an outdoor unit must be converted by an authorized person. The appliance will be labelled as an indoor model on completion

The Indoor Flue kit for indoor units must be purchased through AstralPool and can be run up to 16m in length with a maximum of 3 x 90-degree bends.

The Indoor Flue kit for all ICI model heaters is part number 78270



Figure 8. Indoor Flue Kit Contents

Extra lengths of Flue pipe (1 mtr long) can be purchased separately.

Bends (90 & 45-degree) can also be purchased separately, 78227 – 90-degree, 78228 – 45-degree

Heater must be installed to AS/NZ 5601 standard.

Access and suitable working areas must be available to the heater ref to page 11 of this manual for minimum required clearances.

Flue pipe is supplied in 1 metre lengths and can be easily assembled with one end reduced in diameter so they slip together. It is advisable that each join be screwed or riveted together upon final assembly.

The flue pipe can be cut shorter when required with the use of a hacksaw or tin snips by cutting from the non-reduced end of the flue pipe.

The Flue temperature can reach 200 Celsius (392 farenheit) and should be kept at least 25 mm clear of any combustible surface.

**Rooftop terminations.**

All flue exiting the roof must be shielded with the gal cover. Extra lengths of gal can be supplied. Decktite fittings / flashings must be attached to the galvanised flue cover. Brace flue in high wind applications.

Locate flue cowl onto reduced end of the flue pipe. Attach with rivets / screws to hold into place

**Wall terminations.**

Wall penetration kit (Part Number 78287) can be purchased from Astralpool. See photo below

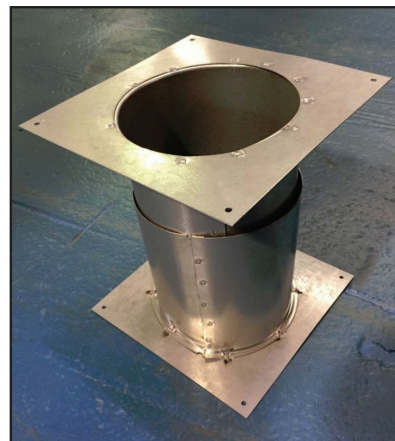


Figure 9. Wall Penetration Kit

Ensure location is suitable as flue gases exit all around cowl and may blow back onto walls, eaves, features causing discoloration or mould and moisture issues.

Condensation will occur around the flue exit area and condensation may drip from the flue outlet.

All flues exiting the wall must be shielded with the gal cover. Extra lengths of gal can be supplied. Decktite fittings / flashings / wall exiting covers must be attached to the galvanized flue cover.

For long extensions of flue exiting the wall bracing may be required in high wind applications.

Locate flue cowl onto reduced end of the gal outer covering / flue pipe. Attach with rivets / screws to hold into place. Ensure a drain hole in the cowl is facing down.

The flue pipe must slope slightly towards the cowl for the last horizontal run (approx 2°C deg) to allow condensation to drain.

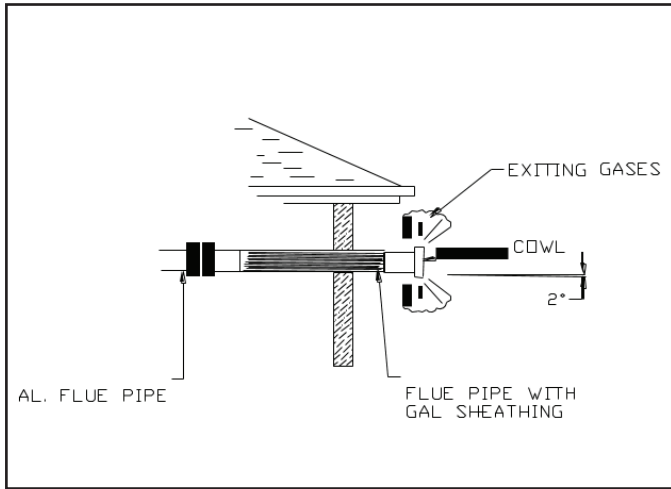


Figure 10. Wall Penetration Kit Installation

To convert an ICI heater from Outdoor to Indoor configuration, follow the steps below.

1. Remove the 4 x retaining screws (retain the 4 screws to reuse to retain the Indoor flue top) for from the Flue top and lift off the top cover.

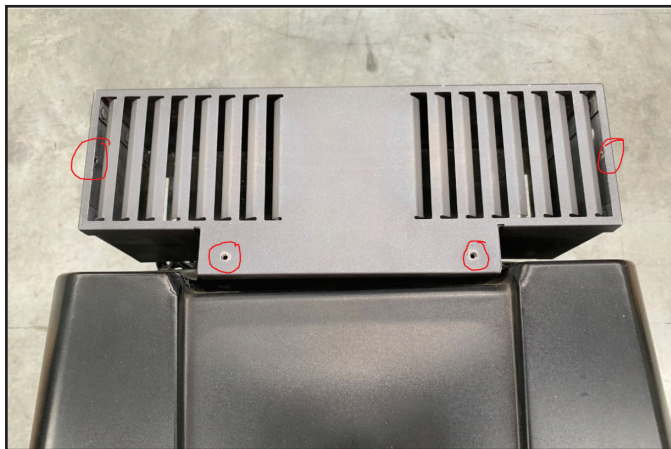


Figure 11. Remover Retaining Screws

2. Once the outdoor flue top cover is removed, you will find already fitted to the heater a spigot that the stainless steel flue 1 meter will neatly slip over.

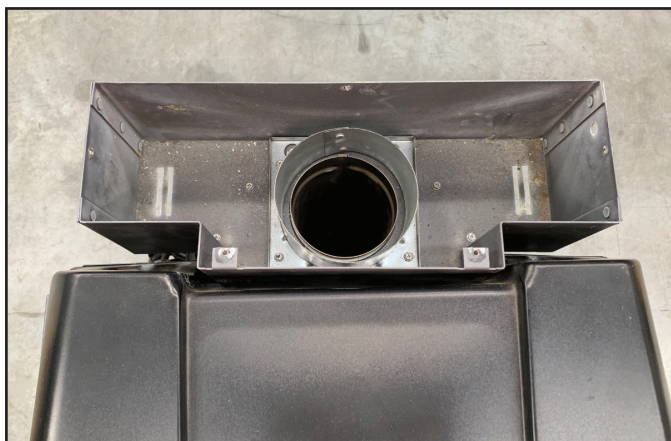


Figure 12. Spigot Location For Flue Installation

3. Slip the first section of the Stainless steel flue over the spigot



Figure 13. Install Flue into Spigot

4. Once the first section is fitted to the heater you can now fit the Indoor Flue top by sliding it over the flue tube. Locate correctly onto the heater and reuse the 4 screws from the outdoor flue top to retain the Indoor flue top to the heater.

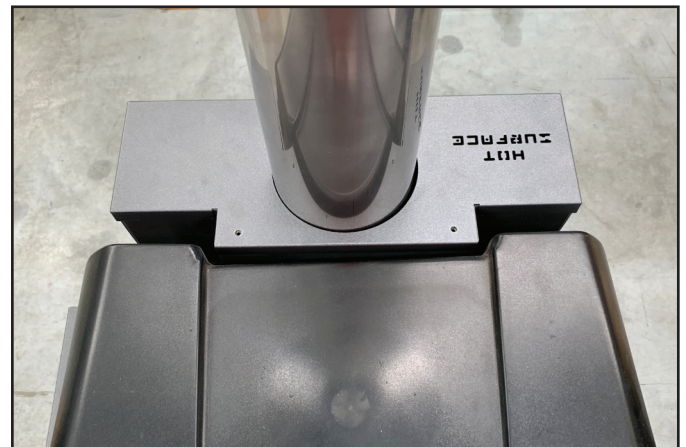


Figure 14. Indoor Flue Top Installation

5. Continue the installation of the reminder of the Flue ducting. It is advisable that each join be screwed/ riveted together to ensure the flue ducting stays together and doesn't come apart during operation of the heater .

## Section 5. Gas Connections

The gas connection is on the right hand side of the heater. A 22mm M.I. connection is provided for gas line connection. An approved manual shut off valve must be installed in the gas fitting line before the heater.

The gas fitting line should be installed by an authorised person and comply with local regulations and Australian Standard code AS/NZ 5601. The gas line from the meter will usually be of a larger size than the gas inlet connection.

The heater gas valve has a built in pressure regulator and 1/8" pressure test point. On starting the heater, a manometer must be used and the supply inlet pressure checked while the heater is running against the heater data plate. Incorrect inlet pressures may void warranty and may result in service charges, should service be required. Gas valves are preset and should only be adjusted by trained AstralPool technicians.

### 5.1 Supply Gas Requirements

- Refer to AS/NZS 5601.1 for correct gas inlet piping length from the gas meter to the heater.
- Confirm correct supply pipe size and supply pressure before proceeding with the installation.
- Check the gas meter to make sure it will supply enough gas to the heater and any other appliances using the same gas supply. If unsure, contact your local gas utility to confirm.
- It is critical that the incoming gas supply pressure at the heater is within the maximum and minimum pressure requirements as outlined in *Section 5.2*. If the range of acceptable supply pressure is not provided, the gas supply system to the heater must be modified to meet pressure requirements.
- Consider pipe fittings when determining gas pipe sizing. For every elbow used add 900 mm (3') to straight pipe length.
- Install a manual gas shutoff valve outside the heater body for service and safety. Never install the shutoff valve inside the body of the heater.
- Where required by local code, install a sediment trap/condensate fall and gas union in accordance with Australia standard 5601. See *Figure 15*.
- Do not use a restrictive gas cock.

#### ATTENTION

Do not use flexible appliance connectors on any gas connections unless the connector is Australian approved for outdoor installation, and is marked with the BTUH capacity (which must be equal to or greater than the heater rated input) and the type of gas (Natural or LP). Also, any flexible connectors, such as CSST buried underground must be certified for underground installation and meet all applicable codes. Please note, use of flexible connector still requires the installation of a sediment trap. See *Figure 15*.

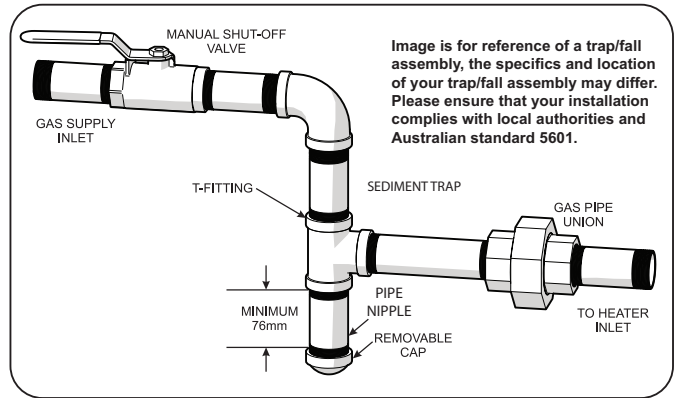


Figure 15. Manual Shut-off Valve and Sediment Trap

**NOTE:** The gas line from the meter is usually larger than the gas valve. Therefore, you will need to reduce connecting pipe as necessary. Make this reduction as close to the heater as possible.

### 5.2 Inlet Gas Pressure Test

1. Note – gas pressure must be measured when unit is operating.
2. Set thermostat to "OFF".
3. Remove top cover
4. Loosen screw from 1/8" brass test point located on inlet side of gas valve
5. Connect manometer tube to test point
6. Set thermostat to "ON" and wait for burner to ignite
7. Once burner has ignited, the manometer must indicate the nominal inlet pressure listed below.
8. Adjust inline pressure to meet minimum required pressure at main gas regulator. Do not adjust gas valve settings..
9. Tighten test point screw.
10. Refit covers.

Required Inlet Static gas pressure (ie: when heater not operating)

Natural Gas	1.13 kPa minimum	5 kPa maximum
Propane	2.75 kPa minimum	5 kPa maximum

### 5.3 Special Precautions for LP Gas

This appliance is approved for use with LP (Propane) and Natural Gas in Australia only. It is approved for use with Natural gas only in New Zealand. Under the same environmental conditions, liquid propane (LP) gas is more dense or heavier than air and will more readily collect or pool in enclosed areas if adequate ventilation is not provided. It is not recommended to install LP gas heaters in enclosed areas such as pits. Locate heaters a safe distance from LP gas cylinders and filling equipment. Consult the Australian / New Zealand Standard AS/NZS 1596 and gas installation

standard AS/NZS 5601, and any other local codes and fire protection authorities about specific installation restrictions in your area.

**For ALL installations the combustion air openings requirements and AS/NZS 5601 MUST be followed for safe and proper operation.**

## 5.4 Gas Pipe Sizing Tables

**Note:** Gas pipe sizing tables are indicative only. All pipe sizing should be calculated by an authorized person.

1.13 kPa Gas Meter Pressure					
Some areas of VICTORIA					
Maximum run of copper pipe with average number of fittings.					
Model	20 mm	25 mm	32 mm	40 mm	50 mm
ICI 200B	2 m	8 m	30 m	75 m	320 m
ICI 400B	-	4 m	14 m	35 m	140 m

1.25 kPa Gas Meter Pressure					
S.A., W.A., some areas of N.S.W.					
Maximum run of copper pipe with average number of fittings.					
Model	20 mm	25 mm	32 mm	40 mm	50 mm
ICI 200B	6 m	25 m	90 m	240 m	320 m
ICI 400B	3 m	14 m	45 m	110 m	320 m

2.75 kPa Gas Meter Pressure				
Some areas N.S.W. some areas VICTORIA, some areas Qld				
Maximum run of copper pipe with average number of fittings.				
Model	15 mm	20 mm	25 mm	32 mm
ICI 200B	4 m	40 m	160 m	320+ m
ICI 400B	2 m	20 m	85 m	280 m

## 5.5 Check Burner Performance

**Note:** This procedure must be performed with a combustion analyzer.

1. Turn off power supply to pump and heater.
2. Turn off gas supply to unit.,
3. Remove top cover.
4. Setup gas combustion analyser
5. Set up manometer to inlet side of gas valve.
6. Turn on gas supply.
7. Turn on power to heater.
8. Start heater
9. Ensure heater is running at full fan rate.
10. Check inlet gas pressure is between max and min settings.

11. While heater is running adjust gas ratio screw to achieve a recommended CO<sub>2</sub> level for Natural Gas models. Review the following CO<sub>2</sub> Level section for more details of your specific gas heater model.
12. Check meter gas usage rate to ensure gas rate is as specified. Gas rate must be within +/-5% of nominal rate.
13. Remove manometer and tighten test point.
14. Remove analyser.
15. Refit cover.

Gas inlet pressures (all models) during burner operation on high fire

- Natural Gas - 1.13 kPa
- Propane - 2.75 kPa

### CO<sub>2</sub> Level

FOR NATURAL GAS: ICI 200B

Set CO<sub>2</sub> level to 8.5% +/- 0.2 Without external top cover fitted to heater.

FOR NATURAL GAS: ICI400B

Set CO<sub>2</sub> level to 8.7% =/- 0.2% Without external top cover fitted to the heater.

FOR ULPG GAS: ICI 200B:

Set CO<sub>2</sub> level to 10.1% +/- 0.2 Without external top cover fitted to heater.

FOR ULPG GAS: ICI 400B:

Set CO<sub>2</sub> level to 11.0% +/- 0.2 Without external top cover fitted to heater.

Model	Gas Inlet Rate
ICI 200B	Natural Gas and Propane: 215 MJ/hr
ICI 400B	Natural Gas:400 MJ/hr Propane: 415 MJ/hr

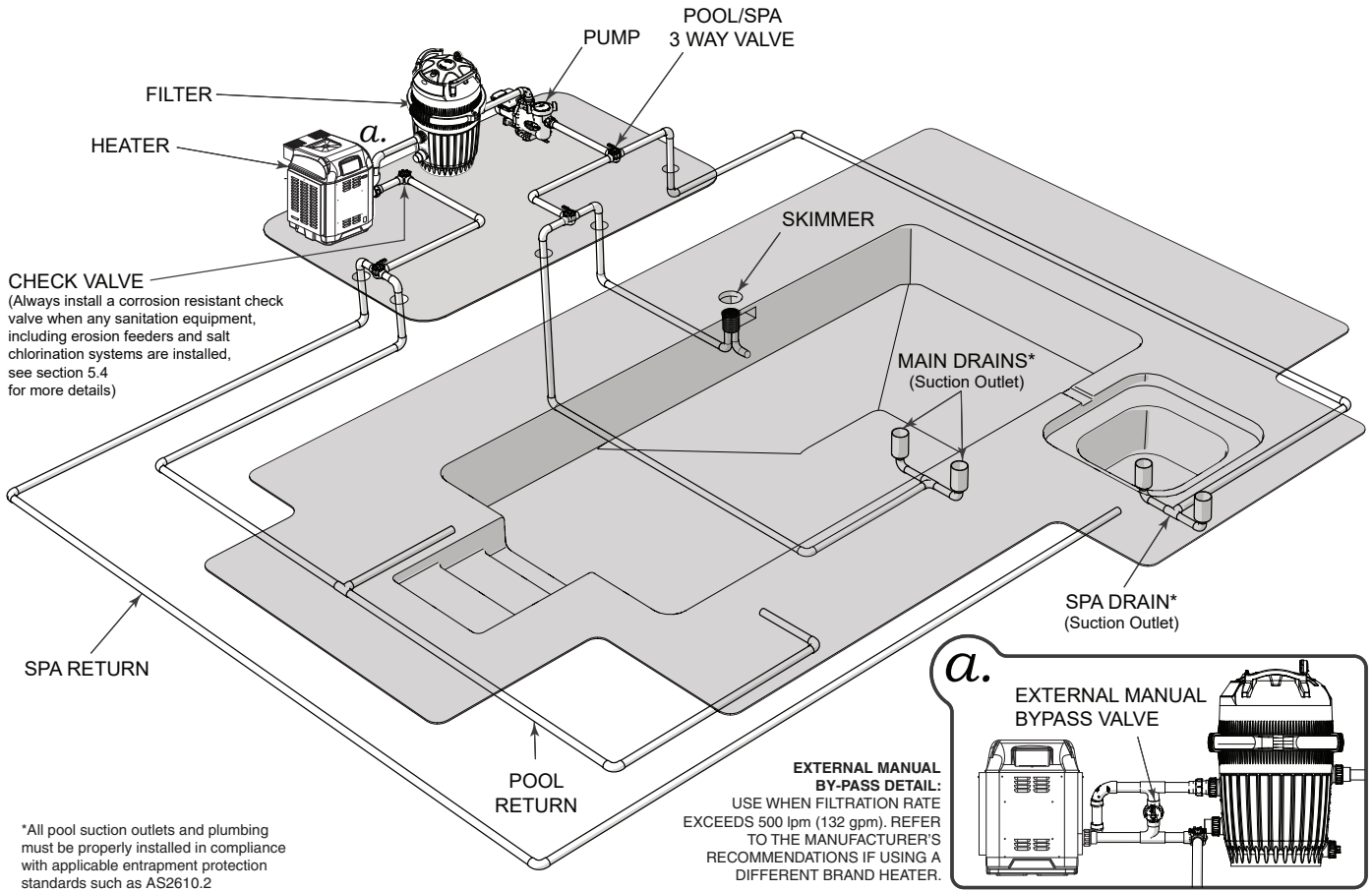


Figure 16. Typical Water Piping Configuration

## Section 6. Water Connections

The heater should always be installed after the pump and filter. The water connections are located on the right hand side of the heater. The inlet and outlet are clearly marked. Water connections must be completed in 50 mm PVC glue in plumbing.

All automatic sanitising devices must be installed after the heater and in such a way that the sanitiser cannot enter the heater without first mixing with the water in the pool or spa. Sanitisers that are connected prior to the heater will void heater warranty.

A non-return valve is not required to be fitted between the filter and the heater.

### 6.1 Pump Sizing

The flow bypass within the heater manifold will accommodate flows rates delivered to the heater from a minimum of 120 Litres per minute (lpm) (31.7 gpm) to a maximum flow of 500 lpm (132 gpm).

#### CAUTION

The system water pump must be capable of providing no less than 114 lpm (30 gpm) of flow through the heater. Flow rates at less than 114 lpm (30 gpm) may cause nuisance operation causing the heater to turn off or damage to the heater.

Model	Min LPM (gpm)	Max LPM (gpm)
ICI 200B	120 (31.7)	500 (132)
ICI 400B	200 (52.8)	500(132)

Table 2. Recommended Flow Rate Adjustment

#### 6.1.1 Manual Bypass Valve

The ICI gas heater has a built-in bypass valve that works with flow rates below 500 lpm (132 gpm). An external manual bypass valve is to be installed in any system in which the pump flow exceeds 500 lpm (132 gpm). Connect ball valve between water inlet and outlet. See inset "a." in Figure 16.

- Adjust the valve to bring the flow rate within the acceptable range. See Table 2.
- Remove the valve handle to avoid tampering.

#### 6.2 Plumbing Connections

The heater has a standard 50 mm (2") water manifold and coupling design. With this feature, only nominal 50 mm (2") PVC or CPVC may be connected to the heater. AstralPool Australia Pty Ltd recommend the use of 50mm (2") pipe with a minimum of 40mm (1.5") to be fitted to the heater.

### 6.3 Water Pressure Switch Adjustment

The ICI GAS POOL HEATER incorporates a water pressure switch which allows the burner to operate only when the circulating pump is operating. The pressure switch is set to operate with 49 kpa (7 psi) water pressure by default and can be adjusted down to minimum of 21 kpa (3 psi) with the heater installed up to 1.5 metres above or 1.2 metres below the surface level of the pool or spa. For installations outside these limits, a flow switch should be installed.

It is imperative that the following be undertaken by the person who is commissioning (first starting) your pool or spa heater. On initial start up of the heater it may be necessary to adjust the water pressure activation switch.

This switch is located behind the top right hand side panel and is screwed into the water manifold. The pressure switch is a safety device, designed to allow operation of the heater only when the circulating pump is on and there is sufficient water flow and pressure through the heater. It must shut the heater down immediately the pump is switched off.

To check the operation of the switch:

1. Connect the heater to mains power supply and turn power on. The thermostat should not yet display "θ".
2. Turn on pump. The thermostat should now display "θ".
3. Turn pump off. The thermostat should no longer display "θ".
4. If display does not respond in this way, adjust the pressure switch as detailed below. If display responds correctly, perform a final check with the heater operating.- See the section below titled "Starting the heater"

To adjust pressure switch:

1. Connect the heater to mains power supply and turn heater thermostat to "OFF".
2. Turn pump on.
3. View display of heater to confirm the "θ" has appeared on the LCD display on front of heater.
4. If no symbol is present, slide toggle up to allow adjustment, then rotate knurled wheel anti clockwise (as viewed from above) until "θ" is displayed.
5. Switch off pump.
6. View LCD display to confirm "θ" has disappeared.
7. If "θ" symbol is present when pump is OFF or "θ" does not disappear within 1 (one) second of pump turning off, the pressure switch must be adjusted.
8. With Pump turned OFF, turn knurled wheel clockwise to increase the pressure required to activate the switch.
9. Repeat steps 2 to 8 until symbol appears and disappears when pump turns on and off.

10. When the switch is correctly set, slide the toggle down to lock the knurled wheel in position.
11. If pressure switch cannot be made to activate heater when pump is turned on and off, a flow switch may need to be purchased and fitted. Contact your local AstralPool office for details.

#### CAUTION

If the pressure switch cannot be adjusted correctly, **DO NOT OPERATE THE HEATER**, contact AstralPool or an Authorised Service Agent for advice.

### 6.4 Check Valve Installation

When any equipment is located below the surface of the pool or spa, back-siphoning can occur, which can draw water backwards through the circulation system. This can be particularly concerning if chemically treated water is allowed to flow back into equipment such as heaters, filters and pumps. Make sure any chemical feeder or chlorination system outlet lines are downstream of the heater. Install a positive seal noncorrosive check valve between the sanitation equipment and the heater. Always install a check valve if there is sanitation equipment installed in the system. **Do not** install any shutoff valve in the piping between the heater outlet and the pool.

#### WARNING

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

### 6.5 Pressure Relief Valve Installation

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

A pressure relief valve is not supplied with the ICI heater. However, it is recommended that a pressure relief valve be installed and may be required by local or national codes. Be sure to check any applicable installation codes in your area to determine whether a pressure relief valve is required. If one is required, it must meet the requirements below and must be provided and installed by the installer

The maximum working pressure of this heater is 345 kPa (50 psi). Be sure to take into consideration the maximum allowable pressure of the other components in the system when installing a PRV. Any pressure relief valve installed must comply with provisions of the standard.

The ICI gas heater allows for a PRV to be directly installed into the In-Out Header assembly as shown in *Figure 17*. Remove the brass plug located between the inlet and outlet to install the PRV.

- The PRV must be compliant to AS1357.1 or ASME certified.
- Relief pressure must be at 3.45 bars (50 PSI)
- Minimum rating of 7.77 Kilowatts or 125.8 kg/hr steam rating.
- Install the PRV so that it is vertical. See *Figure 17*.
- Install a drain pipe from the pressure relief valve outlet to a safe area. This is a precaution to prevent the possibility of personal injury or property damage in the event scalding water is discharged from the pressure relief valve.
- Install the discharge pipe so that there is no trapped or standing water in the piping. Discharge piping must be facing down, terminating with a threadless nipple, no more than 6" and no less than twice the diameter of the discharge pipe from the floor. Discharge piping must be open with no reducers or shut-off valves or other restrictions.

**NOTE:** To ensure the continued proper operation of the pressure relief valve, the valve should be tested once a year. To test, lift the lever with the circulation system running to ensure that water will pass through. When the lever is down, there should be no leaks from the outlet.

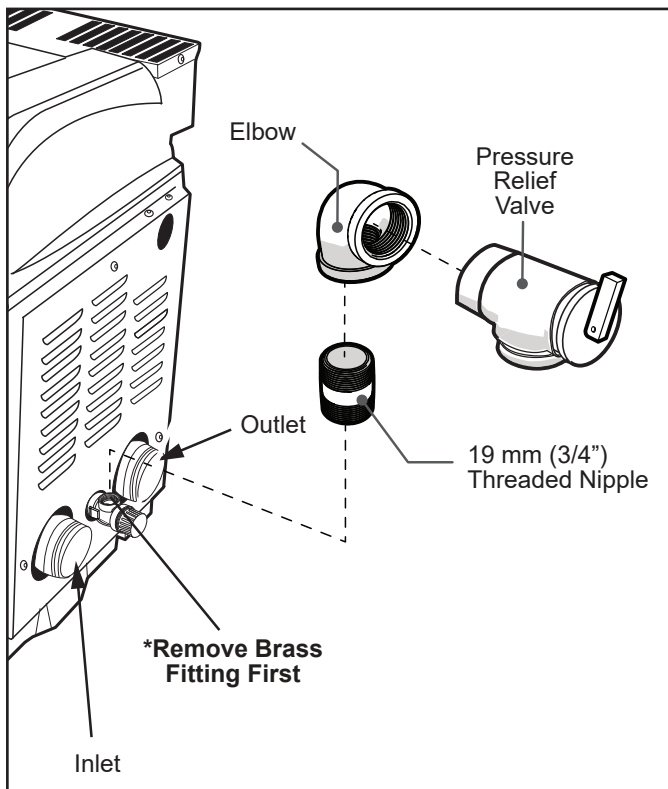


Figure 17. Pressure Relief Valve (PRV) Installation

1. Remove brass fitting from PRV connection port on the header of the ICI gas heater.
2. Install the 19mm (3/4") threaded nipple into the same connection port where the brass fitting was housed.
3. Attach the elbow onto the threaded nipple and then install the PRV, AstralPool P/N 162633.

**Note:** Ensure the PRV outlet is facing downward. Additional draining piping can be added to the PRV 3/4" fitting as required.

## 6.6 Condensate Drain

The ICI GAS POOL HEATER is a highly efficient gas appliance capable of generating up to 12 litres an hour of condensation. Suitable drainage provision must be provided to ensure condensation does not build up in the heater or flood damage surrounding areas. Do not raise the drain hose higher than the exit point of the appliance.

Alternatively, the condensate can be used to replenish or "top up" your pool water. A condensate recovery kit (part number 15129) can be purchased from your local AstralPool equipment supplier.

The condensate has a pH of approximately 6.8. Most chlorines and sanitisers used for pool water disinfection will increase the pool water pH over a period of time, so an additional advantage of the condensate produced by your ICI GAS POOL HEATER is that the low pH will counter balance the high pH of the disinfectant used in most pools.

**IMPORTANT:** Chlorines, disinfectants and sanitisers usually require a narrow bank of pH in which to work effectively. Ensure you check the pH of your pool or spa weekly, and adjust as necessary.

## Section 7. Electrical Connections

The heater is supplied with a standard 10 amp 3 pin plug for connection to a 240V 10 amp GPO. All pool or spa equipment connected to mains power should be protected by an Residual Current Device (RCD) circuit breaker.

### 7.1 Electronic Flow Response

The ICI GAS POOL HEATER is capable of being linked to the AstralPool series of Viron XT & EVO multispeed pumps via RJ12 cabling (not supplied). By taking advantage of this connection, you can ensure your heater will operate at peak performance and last for many years.

Connection to the ICI GAS POOL HEATER is via the RJ12 socket located inside the access panel where the water connections are made to the heater. Connections for the pump are made through the rear of the electrical box.

In connecting your ICI GAS POOL HEATER and Spa heater to your Viron multispeed pump, the two appliances will communicate to adjust speeds on the pump based on the demands of the heater.

- If the heater is in the ON position pump will operate at a minimum of "Medium" speed
- If the heater is operating (burner symbol on screen) the pump will operate on "High" speed
- When the heater shuts off the pump will return to the default speed set on the pump

If you require assistance with this connection, please contact your local AstralPool Australia branch for further advice.





## Section 8. Final Installation Check

In order to ensure proper function and successful installation it is required that the operation of the appliance be fully tested and confirmed. The following sections (8.1 - 8.5) address the initial start up and shut down of the heater. A successful initial startup test must be performed in order to complete the installation.

### 8.1 Important Safety Information

#### Read Before You Start:

- This appliance does not have a pilot light. It is equipped with an ignition device, which automatically lights the heater. Do NOT try to light the burners by hand.
- **BEFORE OPERATING**, smell all around the appliance for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

### 8.2 What To Do If You Smell Gas

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the Fire Department.
- Use only your hand to switch on or off the gas control switch. Never use tools. If the switch appears broken or will not move, don't try to repair it, call a qualified service technician. Force or attempted repair may result in fire or explosion.
- Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system which has been under water.

### 8.3 First Time Start-up Procedure

#### WARNING

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

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

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

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

- Confirm that pool water is flowing normally through the pool system and equipment.
- If it is a new pool or spa installation, operate the filter pump with the heater off long enough to completely clean the water. This will remove any installation residue from the water.
- Clean the filter before starting the heater.
- Start the heater in either Pool or Spa mode.

- Start the heater. See *Section 8.4*.
- When the heater starts, confirm there is adequate water flow. See *Section 6* for details.

### 8.4 Lighting Instructions

1. Turn power on to appliance.
2. Turn heater thermostat on and set the water temperature to the desired setting.
3. Wait until the main burners ignite.
4. If the gas has been recently connected it may take a few ignition attempts to bleed
5. Gas from gas fitting line.
6. To turn heater off turn off thermostat on heater.

The heater will proceed with the ignition sequence upon the following conditions being met.

1. Heater is switched on.
2. Measured water temperature is below 40deg C
3. High limit cutouts are not tripped.
4. Thermostat sensors the water temperature is below the set point.
5. Water pressure switch is closed indicating water in appliance.

### 8.5 To Turn Off Gas To Heater

- Turn off all electrical power to the appliance.
- Turn off gas isolation valve in gas line prior to heater.

### 8.6 Shutting Down the Heater

Turn the heater off by pressing the ON/OFF button. See Figure 18. Do not turn the filtration pump or circulation pump OFF for a period of 5 minutes. to allow the gas heater to cool-down. Failure to cool-down the gas heater can result in damage to pipework and the activation of the Hi-Limits switches.

## Section 9. Operation

### 9.1 Normal Operation

Once the conditions in Section 8.4 are achieved, the heater thermostat will apply power to the ignition module. The ignition module will perform a safety check (parasitic flame, gas valve power). Once completed, the ignition module will then activate the fan and ignition sequence. The ignition module will then establish flame sensing, and if satisfactory, the heater will be fully operational.

The thermostat board will indicate a lit symbol.

Should the heater fail to ignite, the ignition module will perform a post purge and then repeat ignition attempts at regular intervals to a maximum of three attempts. The sparkler symbol will be displayed on the boiler control thermostat during ignition attempts.

On internal models an air pressure will detect if the terminal becomes blocked. This switch cuts power to the ignition module if the flue pressure increases to more than 160 pa.

### 9.2 Digital Thermostat Operation

#### DIGITAL THERMOSTAT

The sophisticated digital thermostat provides temperature read out, set point temperature, operating status of the heater and any fault conditions.

#### TEMPERATURE DISPLAY

The temperature display indicates water temperature in the inlet of the heater. Therefore the pump must be operating for an accurate pool or spa water temperature to be displayed.

Comfortable pool temperature is between 26°C and 30°C. Normal spa temperature is between 36°C and 38°C. To select your desired temperature press the up or down button repeatedly until the desired temperature is reached.

To prevent rapid cycling of the heater, the thermostat has an inbuilt time delay which prevents the heater from turning on for two minutes after the set point has been reached. If the time delay is activated, the symbol "L" will be displayed on the LCD screen on the front of the heater. This is part of normal operation.

Should a fault condition occur, the heater will lock out and prevent further heating. A lock out condition is indicated by the symbols F0 to F9. To reset a lock out condition, turn the power off for five seconds.

When the water temperature is heated to within 1 degree of the thermostat set point, the ICI GAS POOL HEATER burner will modulate or turn down so that the set point is accurately maintained and not exceeded. This prevents waste of energy typically associated with on/off burners. In addition, the set point is maintained very accurately, so when using your spa pool, you will notice very little variation in water temperature.

### 9.3 ICI User Controls

The ICI gas heater's functions are controlled via the user controls at the front of the unit. In addition to the buttons, the system menus are shown in the small screen with selections chosen by the Up and Down buttons.

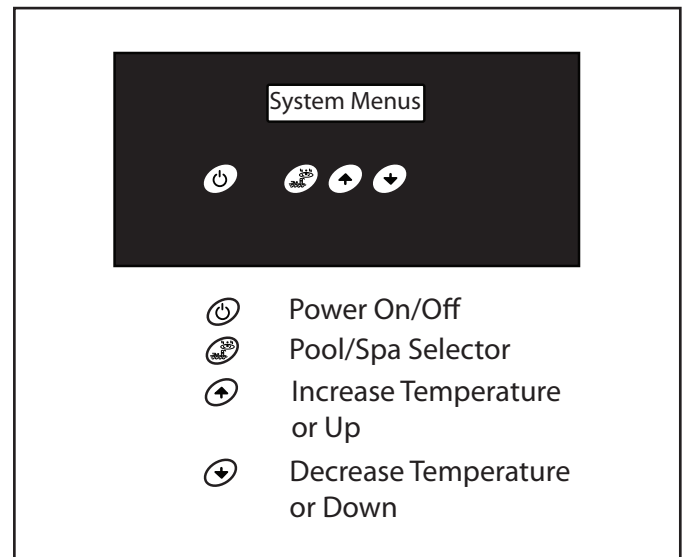


Figure 18. ICI Gas Heater Control Buttons and Screen

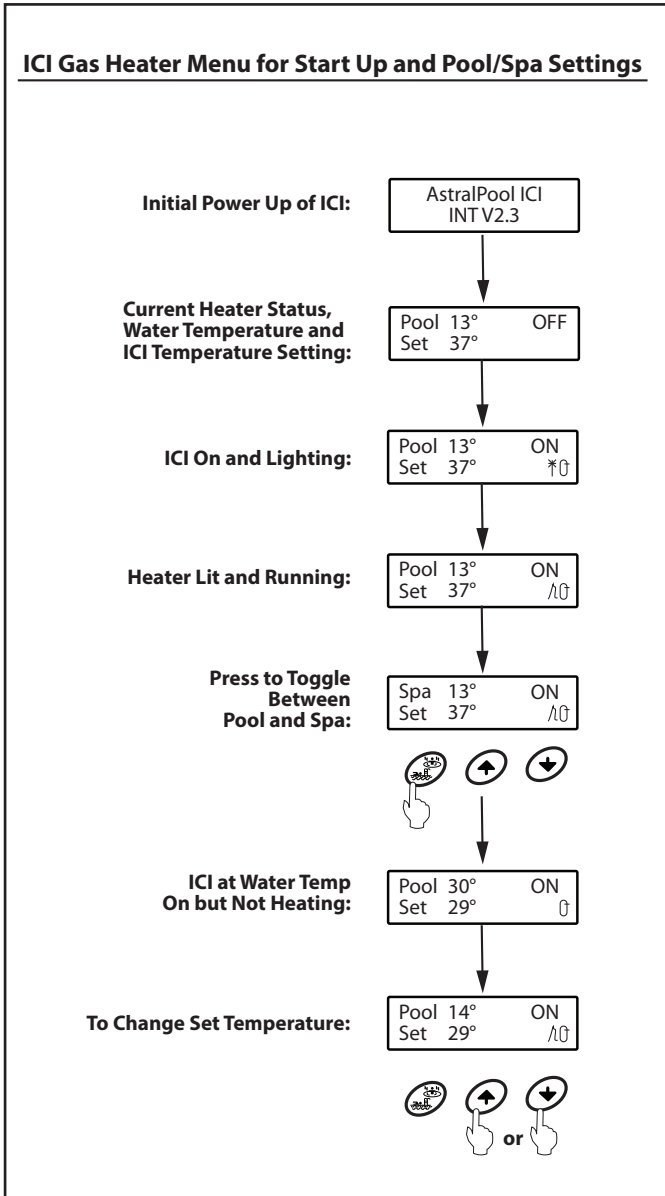


Figure 19. ICI Gas Heater Control Menu Options

## Section 10. Maintenance

It is recommended that you check the following at least every six months and at the beginning of every swimming season.

1. Examine the flue outlet and panel louvers for blockages. Make sure there are no obstructions to the flow of air to or from the appliance.
2. Keep the heater area clear and free of combustibles and flammable liquids. Chlorine should not be stored in the vicinity of the heater. Chlorine and acid vapor's, when drawn through a heater, can rapidly cause corrosion of the heat exchanger.
3. Keep the heater area free from garden refuse and debris. This will help prevent insects nesting in the unit and ensure extended life and reliability of your heater.
4. Have your heater professionally inspected at least every 2 years, preferably every 12 months.

### 10.1 Water Chemistry

It is imperative that correct chemical balance be maintained in your pool and spa water, otherwise corrosion of your heater may occur. Corrosion of the heat exchanger voids warranty. Your local pool shop specialist or spa retailer can advise correct chemical balance. Your water should be checked and maintained regularly by a pool water professional. As a guide the following parameters may be used.

<b>pH</b>	7.6 to 7.8
<b>Total Alkalinity</b>	80 to 120 ppm
<b>Calcium Hardness</b>	100 to 350 ppm
<b>Salinity</b>	5000 ppm max. Excessive Salt can damage your heater.

You should test your water chemical balance at least on a weekly basis.

Excessive sanitizer can damage your heater. Chlorine should not exceed 3 ppm and bromine should not exceed 5 ppm. Salt chlorinators, especially when used on spa pools or indoor or covered pools, can easily produce excessive chlorine levels which will damage he heater internals.

### 10.2 Winterizing

If the pool won't be used for a month or more, turn the heater off at the main gas isolation valve. For areas where there is no danger of freezing, water should circulate through your heater all year long even though you are not heating your pool.

Where freezing is possible, it is necessary to drain the water from the heater. This may be done by loosening the inlet or outlet barrel union. If the heater is below water level, isolate it from the pool first by closing shut off valves before and after the heater.

**CAUTION:** If the heater has been drained for freezing conditions, do not turn on until the system is circulating water.

### 10.3 Corrosion Prevention In Heaters

All pool and spa heaters use copper or copper nickel to make their heat exchangers as it is the most efficient material in transferring heat from the combustion chamber into the water. The typical life expectancy of a well maintained pool/spa heater is between 5 and 12 years.

The addition of sanitizers (Chlorine, Bromine etc) and other water balancing and conditioning chemicals can increase the rate of wear and tear on the heat exchanger and associated parts in your heater.

There are three most common reasons for heat exchanger corrosion which can be avoided with a little care and attention.

1. Excessive Sanitizer. This means too much Chlorine or Bromine in the water. Be careful, if the level of Chlorine or Bromine is excessively high your test kit (and the pool shops) may not read accurately or indeed may show a nil reading. Any time a salt chlorinator is operating for extended periods, (when heating the swimming pool from cold), particularly if the weather is overcast or the pool enclosed or covered, the Chlorine level may exceed normal levels. When heating a Spa Pool, turn the chlorinator down or off for the duration of the heating period.
2. Out of balance water. The water balance is a combination of pH, total alkalinity, Calcium hardness and temperature. Balanced water will help prevent corrosion of your heater. Balanced water should be between 7.2 - 7.8 pH.
3. The addition of acid to lower pH. Acid must always be added in small quantities and spread over the pool surface evenly, not added in to the skimmer. Do not add a litre at a time, add a cupful each day to lower your pH.

If you have a salt chlorinated INDOOR pool or COVERED pool be very careful of the level of Chlorine being produced. If you use a salt chlorinated spa be very careful of the level of Chlorine as the Chlorinator is usually sized for the pool and therefore should be switched off when heating the spa. Leaving the chlorinator on can raise the chlorine level very rapidly in a small volume of water.

These comments are intended as a guide only and are not definitive answers or recommendations on pool water chemistry. AstralPool's intention is to provide a little understanding of the potential problems of water chemistry and the dangers of corrosion to heaters (and other pool equipment and fittings).

**YOUR WATER SHOULD BE ADJUSTED & BALANCED PRIOR TO ANY CORRODED PARTS BEING REPLACED.**

### 10.4 Maintenance Schedule

The ICI Gas Heater incorporates moving parts and withstands high velocity water with chemicals in it. Some of these parts will wear in the normal course of use and require regular checks and maintenance. Performing these checks and maintenance will identify parts that have worn and require repair/ replacement before further serious damage is sustained. A small amount of regular care and attention to your pool equipment will help ensure long life and trouble free performance.

To protect against extremes of temperature, your unit is vented to allow expensive electronics to cool. Ants and some insects are often attracted to the warmer, dry environment inside the enclosure. We recommend that, with power turned off, you spray a surface insecticide on the surfaces surrounding the control to prevent ant and insect ingress. Repeat every three months or as necessary.

**Note:** Regular maintenance is important to ensure long life and trouble free performance of your pool equipment. If unable to perform the maintenance yourself, contact your local AstralPool office who will arrange a trained service technician to perform the maintenance for you.

### 10.5 Service Notification

When the heater is due for servicing, a message of HEATER SERVICE DUE will appear on the screen of the heater. If a Viron Connect 10 automation system is connected, the its screen will also show the same message.

This message will appear on the heater’s screen at 100 hours before the service is due. It will continue to flash on the screen and count down to 1500 hours, the first service point. If the heater is not serviced at 1500 hours, the message will change to HEATER SERVICE OVERDUE. The same message will appear prior to every service point.

Parts Required for Service:

- Minor Service Kit, P/N **SKICIMINOR** - Hot Surface Ignitor (HSI) - suitable for all models.
- Major Service Kit, P/N **SKIC1200MAJ** (Model ICI 200B) or P/N **SKICIM400MAJ** (Model ICI 400B) - Hot Surface Ignitor (HSI), Insulation.

Service	Priority	Requirement
1 (1500 hrs)	Minor	<ul style="list-style-type: none"> <li>• Hot Surface Ignitor (HSI) replacement</li> <li>• Flame Rod Sensor cleaned</li> </ul>
2 (3000 hrs)	Major	<ul style="list-style-type: none"> <li>• Hot Surface Ignitor (HSI) replacement</li> <li>• Flame Rod Sensor cleaned</li> <li>• Fire Box Insulation replacement</li> </ul>
3 (4500 hrs)	Minor	<ul style="list-style-type: none"> <li>• Hot Surface Ignitor (HSI) replacement</li> <li>• Flame Rod Sensor cleaned</li> </ul>
4 (6000 hrs)	Major	<ul style="list-style-type: none"> <li>• Hot Surface Ignitor (HSI) replacement</li> <li>• Flame Rod Sensor cleaned</li> <li>• Fire Box Insulation replacement</li> </ul>

Table 3. Service Notification Message Legend

Timing	Maintenance Check	Service Action If Required
Monthly	Operate heater for 15 min to clear residues and ensure correct operation	Start circulation pump and turn heater on, leaving to run for a few minutes. This will clear flue passages and keep components working properly
Three Monthly	Check inlet/outlet o’rings for leaks	Isolate Pump, turn power off, clean and grease O rings or replace if necessary
	Check for insects/ants	Spray a surface insecticide on the surfaces around the unit to prevent ant and insect ingress.
Three Monthly	Check surroundings for leaves, debris and flooding	Remove debris from around the base of the hearer and rectify if any flooding. Clear vegetation from around the flue
Annually	Check gas pressures	Call Service technician to perform annual gas checks and routine maintenance

Table 5. ICI Gas Heater Maintenance Schedule

Heater Screen Example (3000 hours, Flame On):

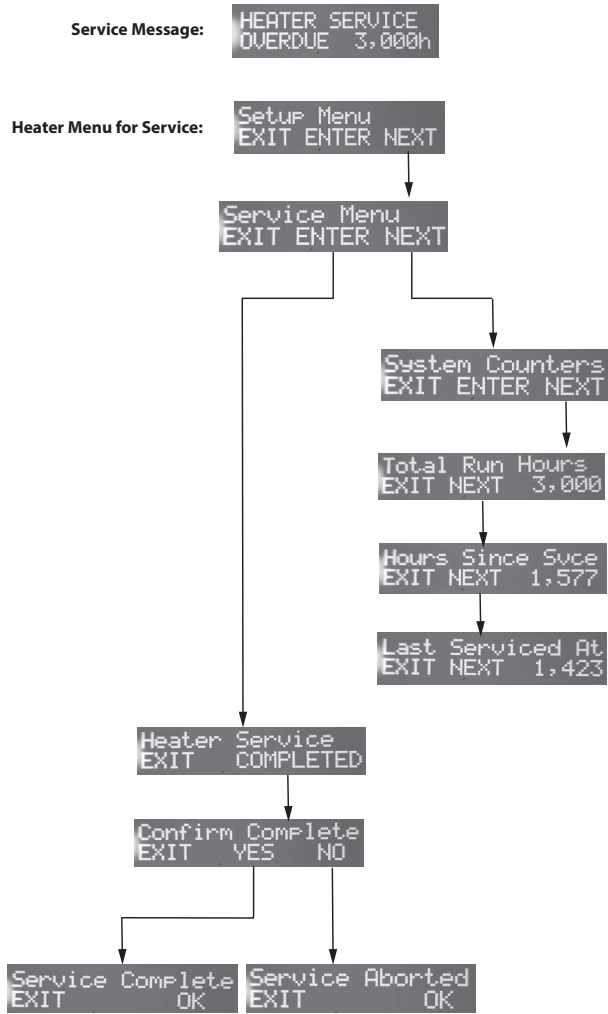


Figure 20. 3,000 hour Service Menu

## Section 11. Troubleshooting

When there is an error condition, a message is displayed on the screen and the “INFO” LED flashes. When the error situation is corrected, the error message and LED illumination ends automatically. If the heater continues to perform incorrectly, please contact the AstralPool office closest to you.

Issue	Possible Cause	Solution
Heater Will Not Light.	<ul style="list-style-type: none"> <li>No Display</li> <li>Pump Not Running</li> <li>Pump Air Locked</li> <li>Filter Dirty</li> <li>Pump Strainer Basket Clogged</li> <li>Thermostat Turned OFF</li> <li>Set Temperature Lower Than Water Temperature</li> <li>Water Too Hot - Fault Condition Displayed</li> <li>Gas Turned OFF</li> <li>Heater In A Fault Condition</li> </ul>	<ul style="list-style-type: none"> <li>Check if power to heater is turned on.</li> <li>Start pump.</li> <li>Check for leaks.</li> <li>Clean filter</li> <li>Clean strainer.</li> <li>Turn ON</li> <li>Increase Set Temperature.</li> <li>Refer to Fault Indication Table</li> <li>Turn gas cock ON.</li> <li>Refer to Fault Indication Table</li> </ul>
Heater Short Cycling (Rapid On/Off Cycling)	<ul style="list-style-type: none"> <li>Insufficient Water Flow</li> </ul>	<ul style="list-style-type: none"> <li>Clean filter and pump strainer.</li> </ul>
Heater Making Knocking Noises	<ul style="list-style-type: none"> <li>Low Water Flow</li> <li>Heater Operating After Pump Has Shut Down</li> <li>Heat Exchanger Scaled</li> </ul>	<ul style="list-style-type: none"> <li>Check pump condition.</li> <li>Shut off gas supply and Call For Service.</li> <li>Shut off gas supply and Call For Service.</li> </ul>

### 11.1 Display Symbol Indicators

Under fault conditions, the screen will display a set of alpha-numeric symbols to indicate the status of the heater. The meaning of each symbol and action to be taken are listed as follows:




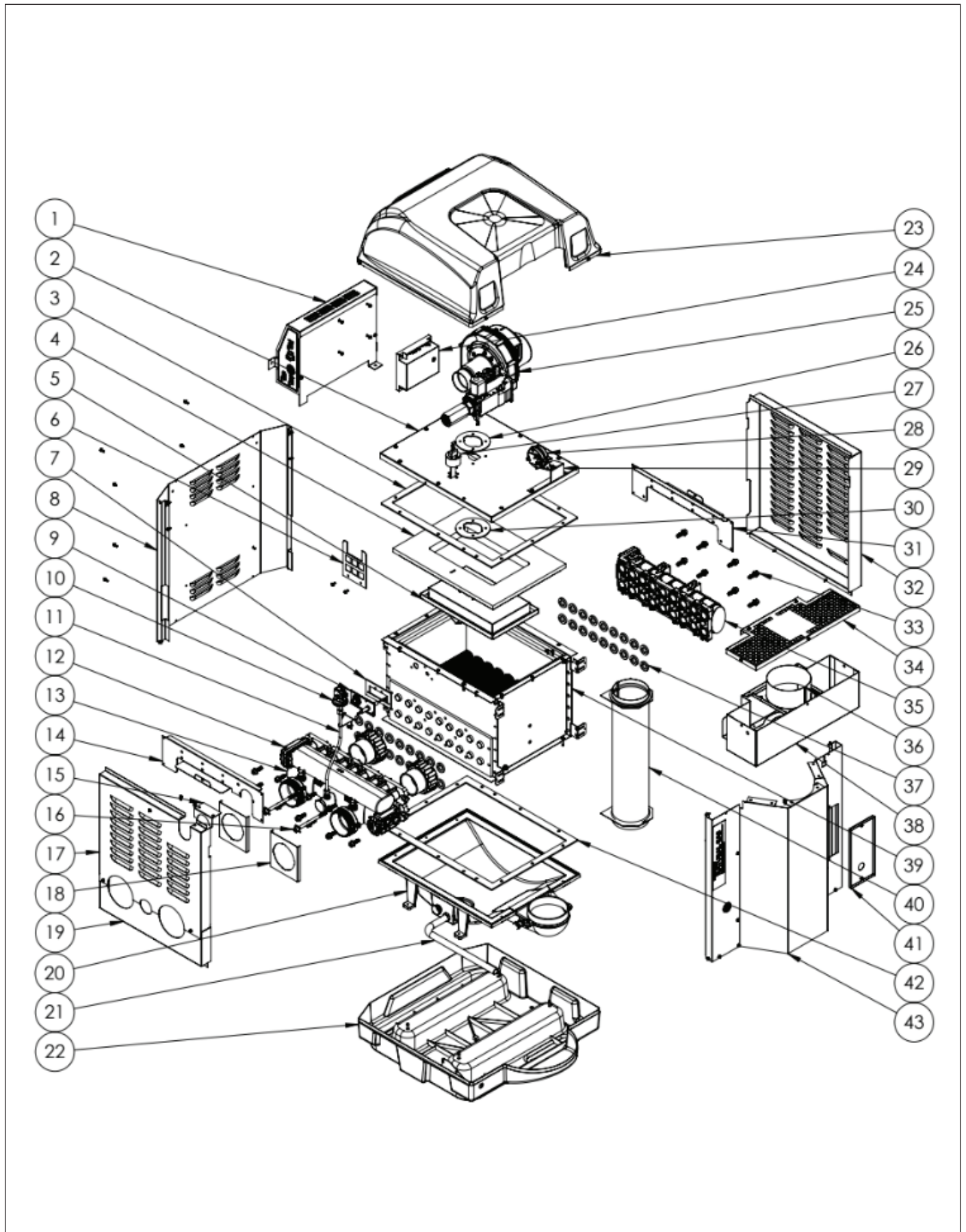
Symbol	Meaning	Action
Temp Display	Unit has power.	No action.
F0	Heater locked off, thermistor wire disconnected or water at 0°C (freeze conditions).	If water temperature reads greater than 0°C, phone for service.
F1	Thermostat reads greater than 45°C.	Allow water to cool below 40°C, turn heater OFF then ON again
F2	Mechanical Hi-limit greater than 45°C or 55°C	Allow water to cool below 30°C, turn heater OFF then ON again.
F3	Thermistor fault	Phone for service
F4	N/A	
F5	N/A	
F6	Flue temperature safety device locked out due to over-temperature	Phone for service
F7	Condensate drain blocked	Phone for service
F8	Heat exchanger sensor fault	Phone for service
F9	Heat exchanger sensor too hot; Greater than 240°C	Phone for service
L	Heater locked out on time delay for 2 minutes	No action. Heater will automatically reset after time delay.
	Pump operating and sufficient water pressure to operate heater	No action
	Thermostat calling for heat. Electronic Flame Supervision operating.	No action
	Burner operating	No action

Table 4. Error Messages

## Section 12. Spare Parts

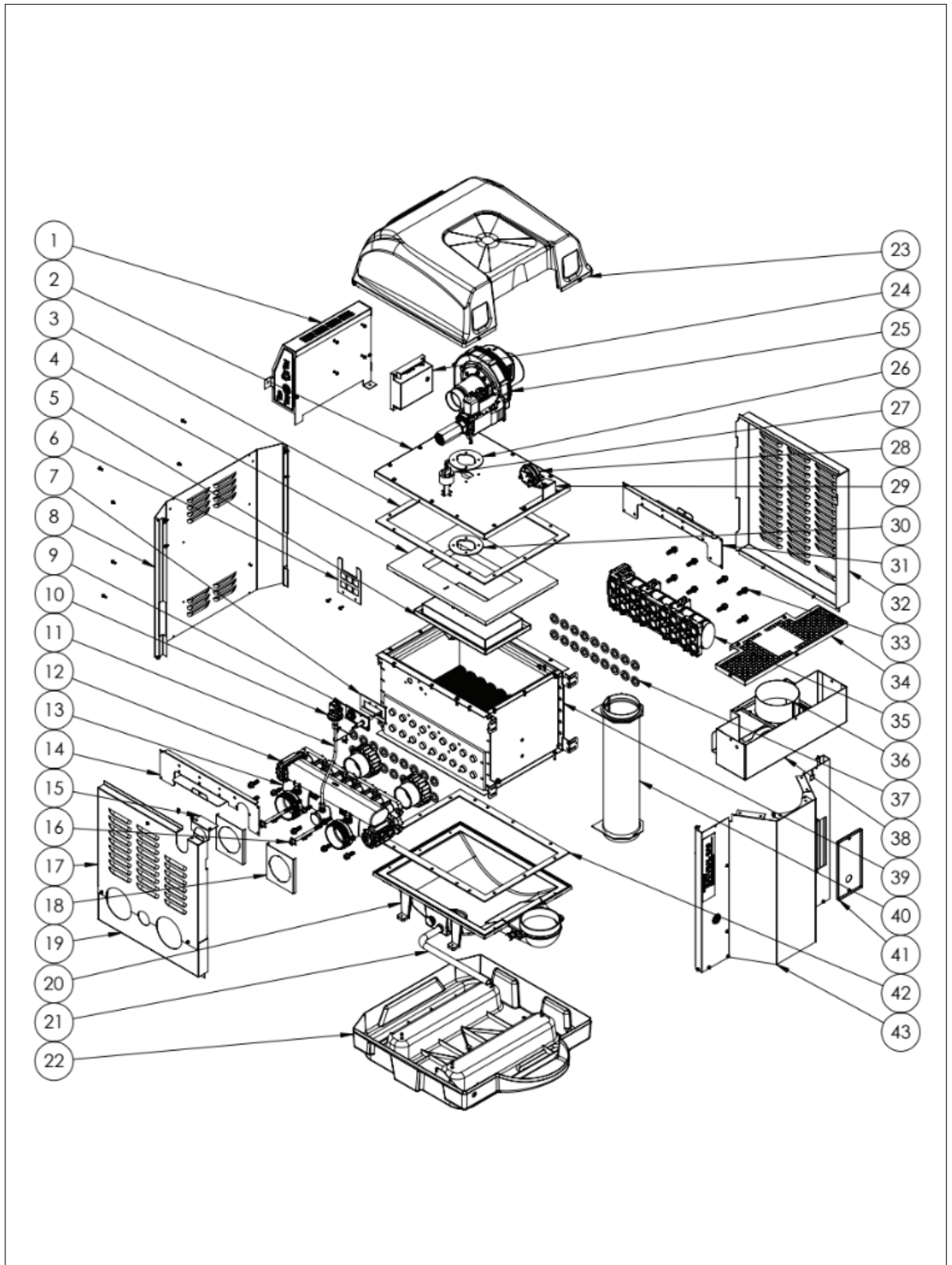
### 12.1 Model ICI 200B



## 12.2 Model ICI 200B Spare Parts List

Item #	Description	Part #	Quantity
1	USER PANEL PCB	SP781665200B	1
2	FAN PLATE-ALL MODELS	9189430	1
3	FAN GASKET –ALL MODELS	78135	1
3	GASKET- FAN PLATE-ALL MODELS	78135	1
4	FAN PLATE INSULATION-ALL MODELS	1115068	1
5	BURNER-ALL MODELS	78409	1
8	FRONT EXTERNAL PANEL-ALL MODELS	1115114	1
9	FLAME ROD WITH SIGHT GLASS-ALL MODELS	77140	1
10	PRESSURE SWITCH – ALL MODELS	71590	1
11	PRESSURE SWITCH TUBE-ALL MODELS	1115124	1
12	CROSS OVER RETURN HEADER	SP21411	1
13	IN/OUT HEADER-ALL MODELS	SP20410	1
14	WATER SHIELD-ALL MODELS	1115120	1
15	GAS INLET MASKING BRACKET-ALL MODELS	1115119	1
16	BOLT M8 X 90-SQUARE WASHER	71850	2
17	SIDE PANEL-IN/OUT LOWER-ALL MODELS	1115109	1
18	HEADER HOLE FILLER PLATE	918007	2
19	LOWER SIDE PANEL-ALL MODELS	1115118	1
20	ALUMINUM BASE-ALL MODELS	SP78126	1
21	DRAIN HOSE	SP78164	1
22	PLASTIC BASE-ALL MODELS	14610014	1
23	PLASTIC TOP COVER-ALL MODELS	78615	1
24	IGNITION MODULE –ALL MODELS	SP79138	1
25	FAN	78132	1
25	WATER SHIELD-ALL MODELS	1114690	1
26	GASKET-FAN TO PLATE	78135	1
27	H.S.I – ALL MODELS	726067	1
28	AIR PRESSURE SWITCH	77139	1
29	AIR PRESSURE MOUNT BRACKET-ALL MODELS	1115129	1
30	FIBER GASKET	78141	1
31	WATER SHIELD LEFT SIDE	1114689	1
32	EXTERNAL PANEL-LEFT SIDE	1115115	1
33	HEADER BOLTS	40152	16
34	FLUE TOP COVER OUTDOOR-ALL MODELS	1115126	1
34	FLUE TOP COVER INDOOR-ALL MODELS	1115600	1
35	RETURN HEADER	71049	1
36	INDOOR FLUE SPIGOT	1115110	1
37	GASKET-TUBE SEALS-BAG OF 9	76121	4
38	FLUE BASE-ALL MODELS	1115103	1
39	HEAT EXCHANGER 400- & INSULATION	SP111552	1
40	FLUE TUBE-ALL MODELS	SP78816	1
41	REAR ENCLOSURE CRESENT PANEL- ALL MODELS	1115102	1
42	GASKET	15125013	1
43	EXTERNAL REAR PANEL-ALL MODELS	1115101	1
NOT SHOWN	BRASS THERMOSTAT WELL – ALL MODELS	477165	1
NOT SHOWN	INSULATION KIT-4 SIDES ONLY	78859	1
NOT SHOWN	POWER CABLE – ALL MODELS	350028	1
NOT SHOWN	SENSOR LEAD THERMOSTAT	70276	1
NOT SHOWN	PIPE FITTING COMPONENT BAG	78308	1
NOT SHOWN	FLUE SENSOR	SP79140	1
NOT SHOWN	FAN PLATE SENSOR	SP79141	1
NOT SHOWN	MINOR 1500 HOURS SERVICE KIT	SKHSI	1
NOT SHOWN	MAJOR 3000 HOURS SERVICE KIT	SKICI400MAJ	1
NOT SHOWN	FLOAT SWITCH	78140	1

### 12.3 Model ICI 400B



## 12.4 Model ICI 400B Spare Parts List

Item #	Description	Part #	Quantity
1	USER PANEL PCB	SP781665400B	1
2	FAN PLATE-ALL MODELS	9189430	1
3	FAN GASKET –ALL MODELS	78135	1
3	GASKET- FAN PLATE-ALL MODELS	78135	1
4	FAN PLATE INSULATION-ALL MODELS	1115068	1
5	BURNER-ALL MODELS	78409	1
8	FRONT EXTERNAL PANEL-ALL MODELS	1115114	1
9	FLAME ROD WITH SIGHT GLASS-ALL MODELS	77140	1
10	PRESSURE SWITCH – ALL MODELS	71590	1
11	PRESSURE SWITCH TUBE-ALL MODELS	1115124	1
12	CROSS OVER RETURN HEADER	SP21411	1
13	IN/OUT HEADER-ALL MODELS	SP20410	1
14	WATER SHIELD-ALL MODELS	1115120	1
15	GAS INLET MASKING BRACKET-ALL MODELS	1115119	1
16	BOLT M8 X 90-SQUARE WASHER	71850	2
17	SIDE PANEL-IN/OUT LOWER-ALL MODELS	1115109	1
18	HEADER HOLE FILLER PLATE	918007	2
19	LOWER SIDE PANEL-ALL MODELS	1115118	1
20	ALUMINUM BASE-ALL MODELS	SP78126	1
21	DRAIN HOSE	SP78164	1
22	PLASTIC BASE-ALL MODELS	14610014	1
23	PLASTIC TOP COVER-ALL MODELS	78615	1
24	IGNITION MODULE –ALL MODELS	SP79138	1
25	FAN	78132	1
25	WATER SHIELD-ALL MODELS	1114690	1
26	GASKET-FAN TO PLATE	78135	1
27	H.S.I – ALL MODELS	726067	1
28	AIR PRESSURE SWITCH	77139	1
29	AIR PRESSURE MOUNT BRACKET-ALL MODELS	1115129	1
30	FIBER GASKET	78141	1
31	WATER SHIELD LEFT SIDE	1114689	1
32	EXTERNAL PANEL-LEFT SIDE	1115115	1
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34	FLUE TOP COVER OUTDOOR-ALL MODELS	1115126	1
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40	FLUE TUBE-ALL MODELS	SP78816	1
41	REAR ENCLOSURE CRESENT PANEL- ALL MODELS	1115102	1
42	GASKET	15125013	1
43	EXTERNAL REAR PANEL-ALL MODELS	1115101	1
NOT SHOWN	BRASS THERMOSTAT WELL – ALL MODELS	477165	1
NOT SHOWN	INSULATION KIT-4 SIDES ONLY	78859	1
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NOT SHOWN	SENSOR LEAD THERMOSTAT	70276	1
NOT SHOWN	PIPE FITTING COMPONENT BAG	78308	1
NOT SHOWN	FLUE SENSOR	SP79140	1
NOT SHOWN	FAN PLATE SENSOR	SP79141	1
NOT SHOWN	MINOR 1500 HOURS SERVICE KIT	SKHSI	1
NOT SHOWN	MAJOR 3000 HOURS SERVICE KIT	SKICI400MAJ	1

## NOTES

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**Fluidra Group Australia Pty Ltd**

219 Woodpark Road  
Smithfield NSW 2164, Australia  
1.300.186.875

[www.astralpool.com.au](http://www.astralpool.com.au)