eternal®

ADVANCED HYBRID WATER HEATING

Installation ● Operation Manual

Natural Gas (NG) - Factory Default

Liquid Propane Gas (LPG) - Optional Orifice

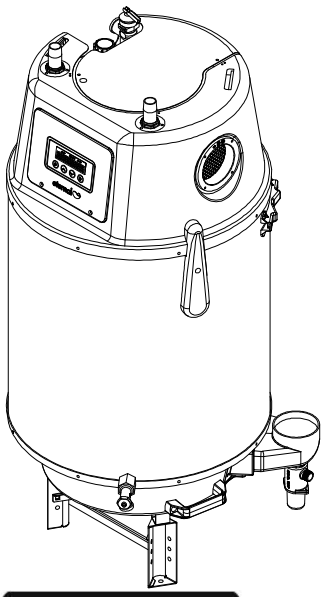
RESIDENTIAL WATER HEATERS

POWER VENT OR DIRECT VENT CONVERTIBLE

ELECTRONIC IGNITION

Model GU125T / 518(11,12)1125

GU160T / 518(11,12)1160



Certified System Quality ISO 9001

Service Information Center:

Call us first if you have any questions with this product. We can help you with questions about assembly and Water Heater operation or if there are any damaged or missing parts when you unpack this unit from the shipping box. Please call before returning to the store.

1-866-946-1096

8:00am-4:30pm CST, Monday through Friday

IMPORTANT:

- **Only specially trained and authorized personnel are permitted to service this water heater.**
- **NOTE TO ASSEMBLER / INSTALLER:**
  Leave this manual with the consumer.
- **NOTE TO CONSUMER:**
  Keep this manual for future reference.
- **RECORD YOUR SERIAL #_____**
  (see clear CSA label on Gas Water Heater)

WARNING

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Read this Operator's Manual carefully and be sure your Water Heater is properly assembled, installed and maintained. Failure to follow these instructions exactly could result in fire, explosion, serious bodily injury and/or property damage.

WARNING

California Proposition 65 lists chemical substances known to the state to cause cancer, birth defects, death, serious illness or other reproductive harm. This product may contain such substances, be their origin from fuel combustion (gas, oil) or components of the product itself.

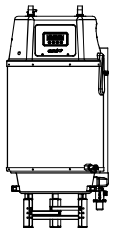
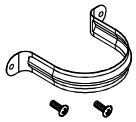
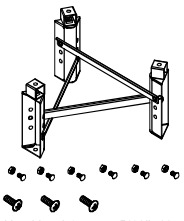
WARNING

Only a licensed professional can install Eternal units for safety and code compliance. Venting and plumbing codes can vary by location. Installation instructions and all applicable codes must be followed or property damage, severe injury, or death may result. Failure to use a licensed plumber or contractor, follow venting, plumbing, and building codes, or follow installation instructions may be unlawful and will void the product warranty. Grand Hall is not responsible for any costs incurred for repairing any problems resulting from failure to follow installation instructions or applicable codes.

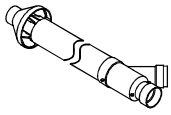
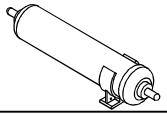
157320069 Date 2014/11/20

Table of Contents

Included Accessories

P/N	Item	Description	Qty
518111125 518111160	GU125T GU160T Eternal Hybrid Condensing Tank Type Water Heater		1
157270069 157320114	Operating and Installation Manual Registration Card		1
157010126	Propane Gas Label		1
151140097	Mesh Screen 3"		2
150290239	1/2" Gas Adaptor		1
305070273	Drain Valve Assembly		1
150320032 150320132	LP Orifice		1
190018003	Pipe Clamp 3"	 Philips Head Screw M5x12 : 2pcs	1
332070125	Condensate Trap Assembly		1
332070080	Water Hearter Stand Assembly (*) The stand assembly / installation manual, please refer to page 38~39	 Philips Head Screw : 5/16"x18 : 6pcs Nut : 5/16"x6pcs Philips Head Screw : M8x12 : 3pcs	1

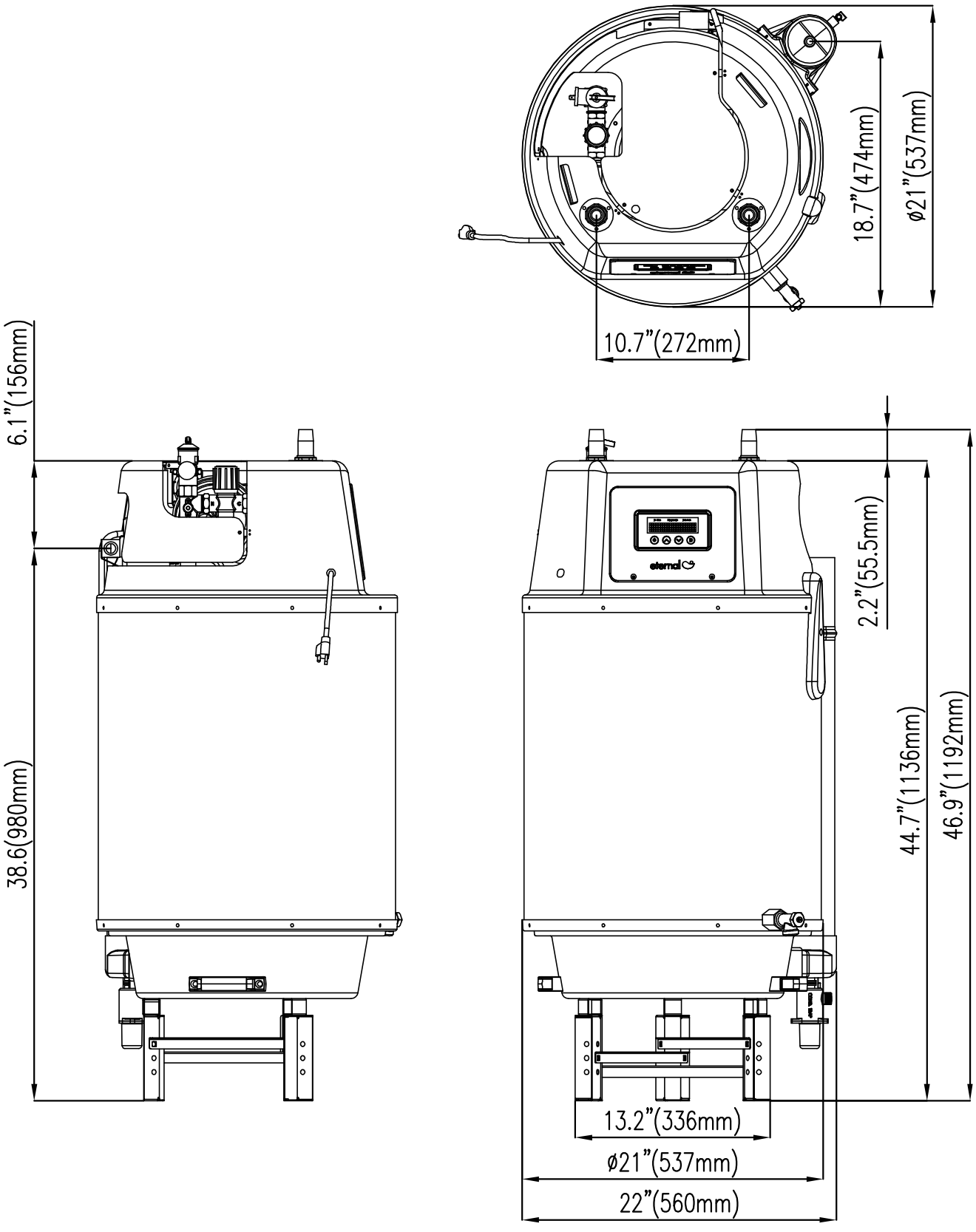
Optional Accessories

P/N	Item	Description	Qty
151140130	Horizontal Terminator 3"		1
312070025	EC Adaptor 3"		1
ECHCVT02	Concentric Kit		1
ECHNK02	Eternal Condensate Neutralizer Kit		1

Eternal Hybrid Water Heater Technical Specifications			
Model Name		GU125T	GU160T
Energy Factor (*) / Thermal Efficiency (*)		0.82 Energy Factor / 96%	
Installation		Indoor / Floor Standing	
Vent Run	3" PVC	Up to 100ft, 6 Elbows Max, 5ft Deduction Per Elbow	
Condensate pH Level		4 pH	
Gas Type		Pre-set For NG / LP Conversion Kit Included	
Unit Connections	Water	3/4" male NPT	
	Gas	1/2", 3/4" Female NPT	
	Electricity	Dedicated 120VAC, 60Hz w/3 Pronged Power Cord	
Gas Input Rate	Max	75,000 BTU/Hr	100,000 BTU/Hr
Gas Supply Pressure	NG / LP	3.5" WC to 10.5" WC / 8" WC to 14" WC	
Ignition System		Direct Electronic Ignition w/Automatic Flame Sensing	
Burner System		Sealed Combustion with Metal Fiber Premix Burner	
Gas Valve System		Dual Stage Negative Pressure Modulation	
Reserve Tank		20 Gallons	20 Gallons
First Hour Rating		120 Gallons	160 Gallons
Activation Sensing		Tank Temperature	
Temperature Control		Thermistor Starts with Heating Cycle	
Output Temperature Setting Range		Mechanical Tempering Valve from 70°F to 145°F(Factory Preset 120°F)	
Unit Dimensions (Round x Height)		20.9" x 46.9"	
Unit Weight		120	
Safety Devices		T&P Valve, Flame Rod, Remaining Flame Detection, Fan RPM Check, Vent Blockage Detection, Thermostat Switches(194°F), 1 x 5A Fuse, Intake Blockage Detection.	

* Maximum manifold pressure is indicated on the rating label on right side of the unit.
* Independent DOE tested.
* AHRI Certified.

Dimensions - GU125T / 518(11,12)1125
GU160T / 518(11,12)1160



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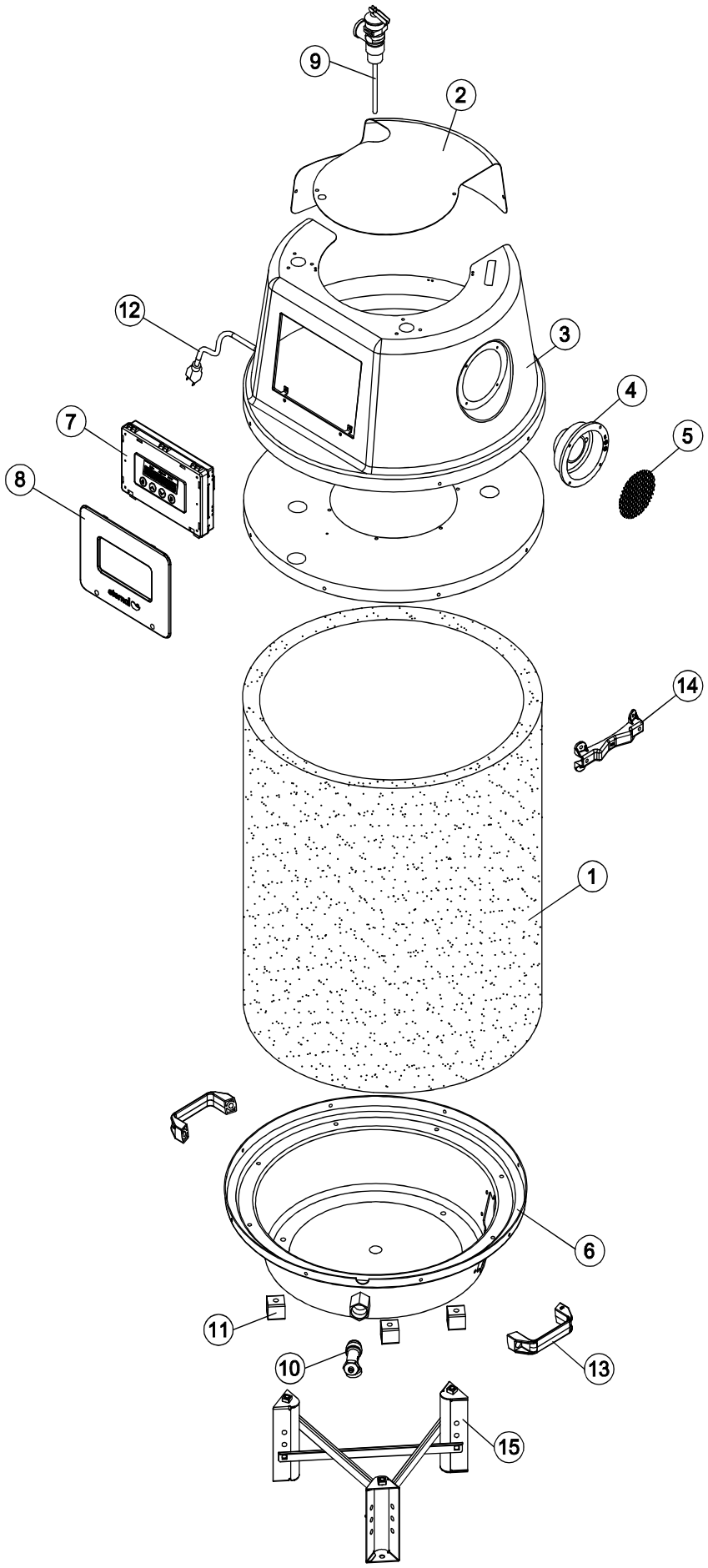
GU160T / 518(11,12)1160



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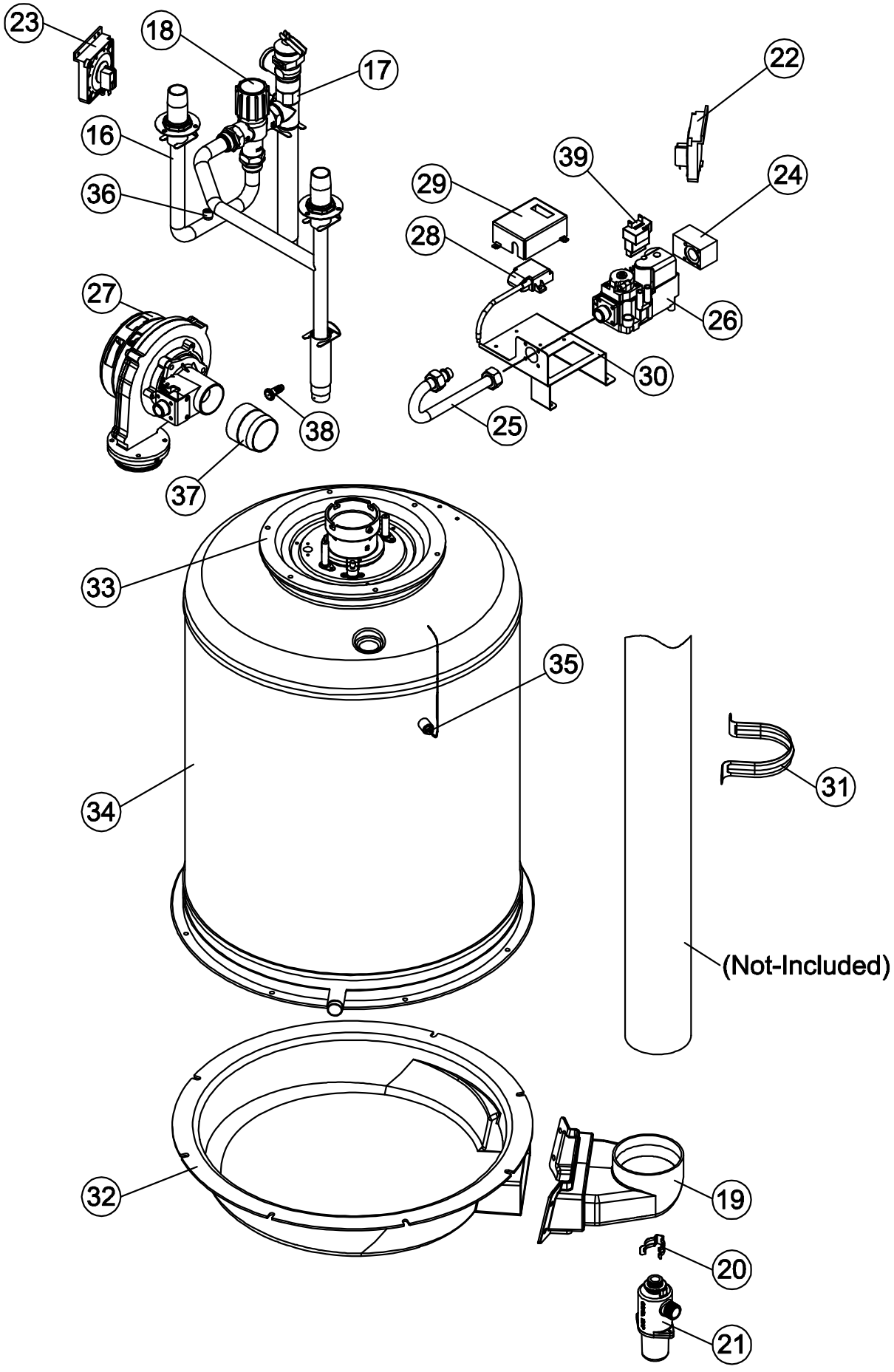


Dimensions - GU125T / 518(11,12)1125
GU160T / 518(11,12)1160

KEY	DESCRIPTION	PARTS No.
1	Pour Foam(PU)	332120087
2	Top Service Panel	332040047
3	Top Cover	332040046
4	Air Intake	152320178
5	Mesh Screen	151320057
6	Chassis	332010013
7	Main Controller	193320041(GU125T) / 193320101(GU160T)
8	Controller Cover	152320048
9	T&P Relief Valve	194140151
10	Drain Valve	150050273
11	Pipe Foot	155140027
12	Main Power Cord	192320148
13	Handle	195320059
14	Pipe Support	151320061
15	Water Heater Stand	332070080
16	Outlet Water Pipe	332060040
17	Two Way Valve	150320023
18	Tempering Valve	194320110
19	Exhaust Adaptor	152320028
20	Trap Clamp	151010032
21	Condensate Trap	332070125
22	Intake Air Pressure Switch	192320116(GU125T) / 192290098(GU160T)
23	Exhaust Air Pressure Switch	192320117(GU125T) / 192290098(GU160T)
24	Gas Adaptor	150320054
25	Gas Tube	150320038
26	Gas Valve	194140204
27	Radial Blower Assembly	192320037(GU125T) / 192320100(GU160T)
28	Ignitor	193320094
29	Ignitor Box	332010036
30	Gas Valve Support	332010037
31	Pipe Clamp	190180003
32	Exhaust Chamber	152320027
33	Burner Assembly	332010014
34	Water Tank	332020005
35	H/E Thermistor	193320113
36	Outlet Thermistor	193320091
37	Radial Blower Adaptor	152320065
38	APS Adaptor	152140233
39	GV Power Plug	152140205

Instructions for Your Safety

WARNING

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

Installation Codes

☐ The installation must conform with local codes or, in the absence of local codes, with National Fuel Gas Code, ANSI Z223.1/NFPA 54.

☐ Properly ground the unit in accordance with all local codes or, in the absence of local codes, with the National Electrical Codes, ANSI/NFPA 70.

Before Installation

☐ This water heater does not have a pilot. It is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand.

☐ Smell all around the water heater area for evidence of leaking gas. Be sure to smell next to the floor because LP gas is heavier than air and will settle on the floor.

☐ Use only your hand to turn the manual gas valve knob. Never use tools. If the knob will not turn by hand, don't try to repair it. Call a qualified service technician. Forced or attempted repair could result in a fire or explosion.

☐ Do not use this water heater if any part has been under water. Immediately call a qualified service technician to inspect the water heater and to replace any damaged parts.

WARNING

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.

TO TURN OFF GAS TO WATER HEATER

☐ Turn off all electrical power to the water heater if service is to be performed.

☐ Turn the manual gas valve located on the outside of the unit clockwise to the off position.

Vapors from flammable liquids will explode and catch fire causing death or severe burns. Do not use or store flammable products such as gasoline, solvents or adhesives in the same room or area near the water heater.

Keep flammable products

☐ Far away from water heater

☐ In approved containers

☐ Tightly closed

☐ Out of children's reach

Vapors

☐ Cannot be seen

☐ Vapors are heavier than air

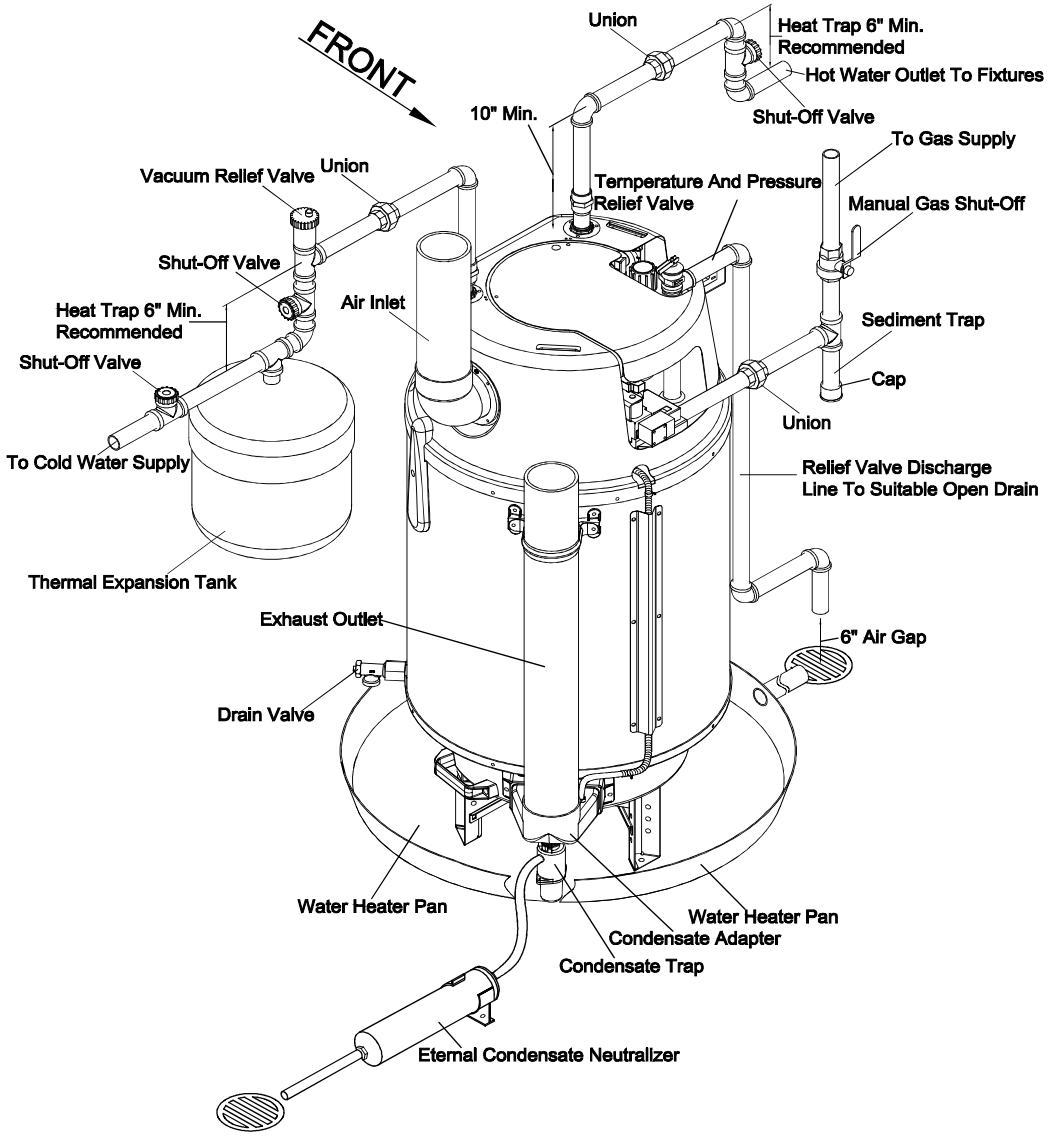
☐ Go a long way on the floor

☐ Can be carried from other rooms to the main burner by air currents

WARNING

Use this water heater at your own risk. The set outlet water temperature can cause severe burns instantly or death from scalds. Test the water before bathing or showering. Do not leave children or the disabed without supervision.

Typical Installation



Thermal Expansion

Determine if a check valve exists in the inlet water line. Check with your local water utility company. It may have been installed in the cold water line as a separate backflow preventer, or it may be part of a pressure reducing valve, water meter or water softener. A check valve located in the cold water inlet line can cause what is referred to as a "**closed water system.**" A cold water inlet line with no check valve or backflow prevention device is referred to as an "**open**" water system.

As water is heated, it expands in volume and creates an increase in the pressure within the water system. This action is referred to as "**thermal expansion.**" In an "**open**" water system, expanding water which exceeds the capacity of the water heater flows back into the city main where the pressure is easily dissipated.

A "**closed water system,**" however, prevents the expanding water from flowing back into the main supply line, and the result of "**thermal expansion**" can create a rapid and dangerous pressure increase in the water heater and system piping. This rapid pressure increase can quickly reach the safety setting of the relief valve, causing it to operate during each heating cycle. Thermal expansion, and the resulting rapid and repeated expansion and contraction of components in the water heater and piping system can cause premature failure of the relief valve, and possibly the heater itself. Replacing the relief valve will not correct the "**problem!**"

The suggested method of controlling thermal expansion is to install an expansion tank in the cold water line between the water heater and the check valve (see illustration above). The expansion tank is designed with an air cushion built in that compresses as the system pressure increases, thereby relieving the over pressure condition and eliminating the repeated operation of the relief valve. Other methods of controlling thermal expansion are also available. Contact your installing contractor, water supplier or plumbing inspector for additional information regarding this subject.

Installation Preparation

Unpacking Your Eternal Water Heater

☐ Unpack the unit carefully and make sure that the included accessories are put aside so they will not be lost.
- Operator's manual ● Warranty Registration Card ● Included Parts

☐ Inspect the water heater for possible shipping damages.

Additional Safety Instructions

☐ Check the markings of the rating plate on the water heater to be certain the type of gas being furnished corresponds to what the water heater is equipped for.

☐ Do not connect this water heater to a fuel type not in accordance with the rating plate.

- Read the Safety guidelines in the beginning of this manual.
- The internal computer controlled regulator is preset by the manufacturer and should not be adjusted by the user.
- Maintain proper space around the unit for servicing. Install the unit so that it can be connected or removed easily.
- The electrical connection requires a means for switching off the power supply.
- Avoid installing the unit in an area with high levels of dust, sand, or debris. These particles may clog the air vent or impair the function of the fan, leading to improper combustion. Regular maintenance is needed.
- Do not install the unit where the exhaust vent is pointing into any opening in a building or where the noise may disturb neighbors.

Water Heater Placement

☐ Carefully choose the location for the new heater, as placement is a very important consideration for the safety of the occupants in the building and for the most economical use of the appliance.

☐ Whether replacing an old water heater or putting the water heater in a new location, consider the following critical points:

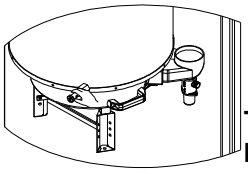
- The location selected should be as close to the vent termination point as possible, and centered within the water piping system for best hot water delivery.
- If vented through an outside wall or through the roof using 3" vent piping, the total vent run cannot exceed 95 feet with one 90° elbow. If more elbows are required, the venting distance must be reduced 5 feet for every 90° elbow.
- Condensation may be created at times as the combustion gases exit the vent cap. Discoloration of surfaces in proximity to the vent cap may occur.

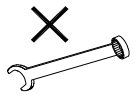
CAUTION

Before Commencing The Installation

Check that it is in accordance with relevant building and mechanical codes, as well as any local, state or federal regulations.

CAUTION





The drain valve must be tightened by Hand ONLY, not by tools of any kind.

WARNING

☐ All water heaters eventually can leak. The appliance should be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the appliance or to lowers floors of the structure. It is required that a suitable drain pan be installed under the appliance drain pans are available at your local hardware store. Such drain pan must have a clearance of at least 1.0" (2.5cm) greater than any point on the water heater's outer jacket and must be piped to an adequate drain.

☐ The minimum inlet gas pressure must be within the value specified by the manufacturer and the minimum value listed is only for the purpose of input adjustment.

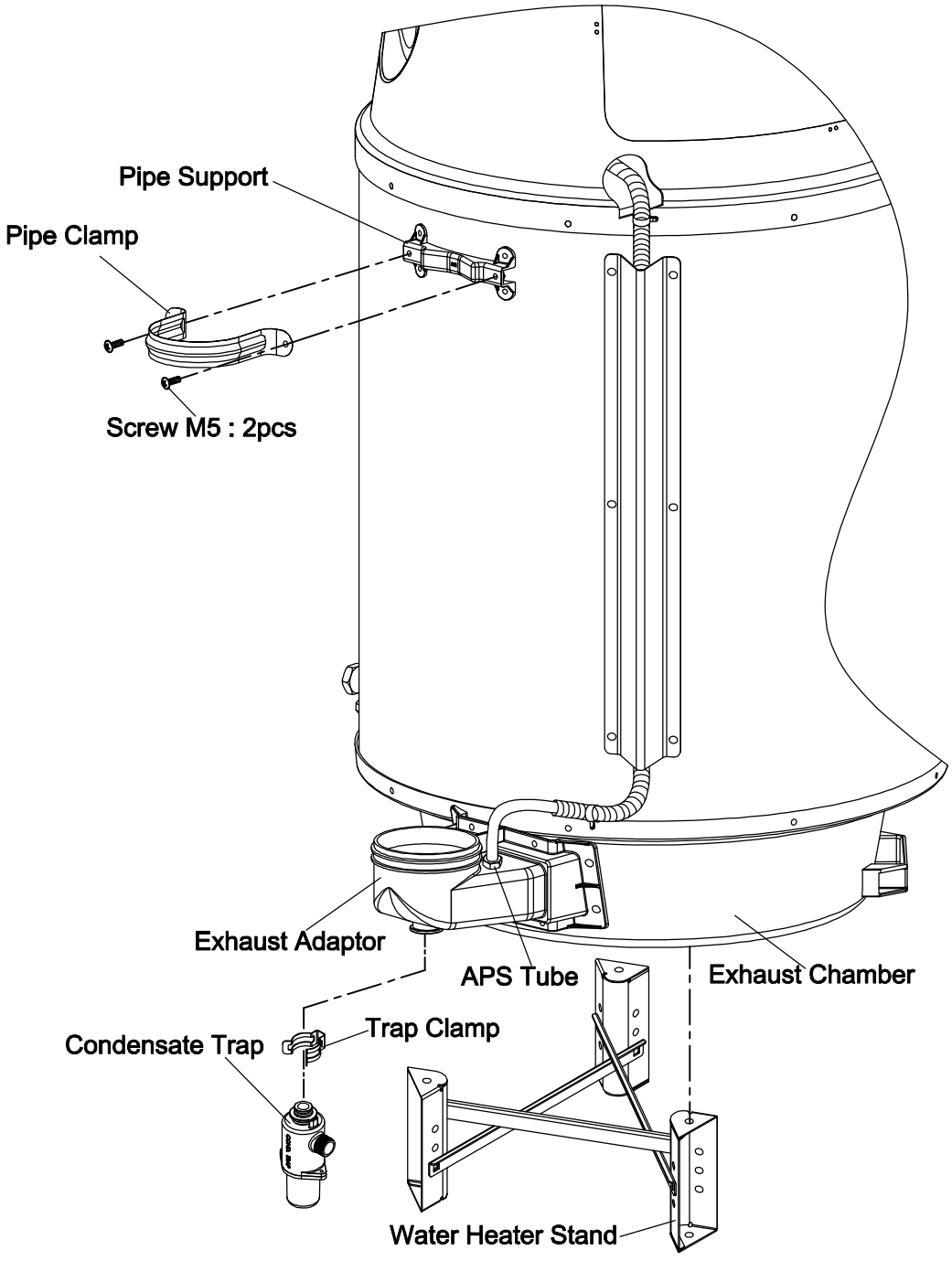
☐ If a water heater is installed in a closed water supply system, such as one having a backflow preventer in the cold water supply line, then a thermal expansion tank is required, contact the water supplier or local plumbing inspector on how to control this situation.

☐ The Temperature and Pressure (T&P) relief valve must be certified as meeting the requirement of the Standard for Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems ANSI Z21.22/CAN1-4.4. The valve must be marked with a maximum set pressure not to exceed the marked hydrostatic working pressure of the water heater (150 psi) and a discharge capacity not less than the water heater input rate as marked on the rating plate.

Exhaust / Water Hearter Stand / Condensate Trap Installation

Installation Procedure:

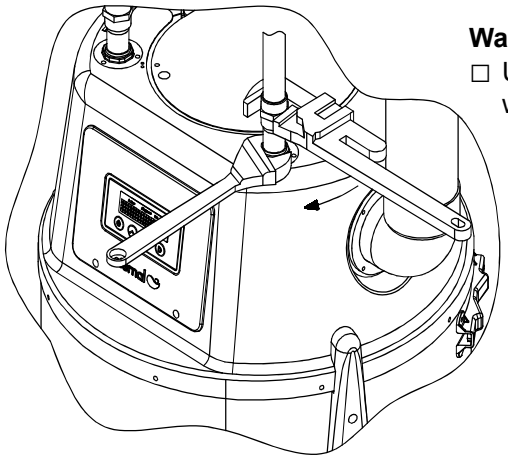
1. Assemble the included water heater stand as per installation procedure.
2. Insert condensate trap into the exhaust adaptor, and install trap clamp.
3. Place exhaust pipe inside exhaust adaptor socket bottom. Then, hold the exhaust pipe in place, by attaching the pipe clamp to the pipe support using 2 (M5) screws.



WARNING

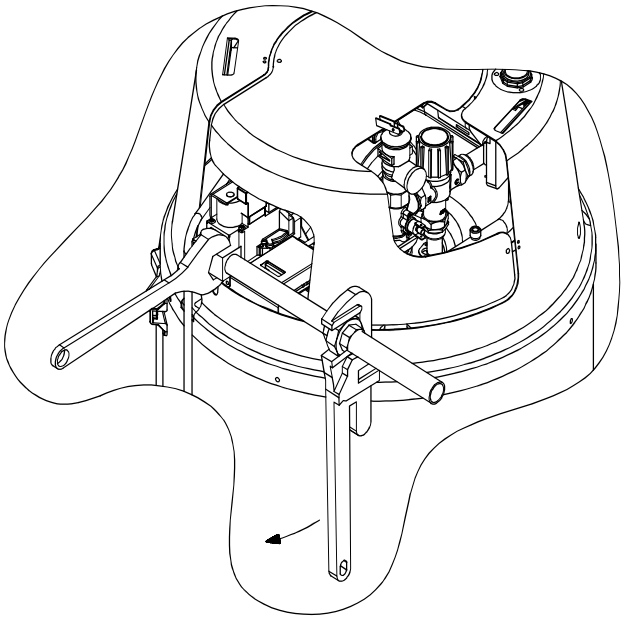
☐Factory supplied water heater stand & condensate trap must be installed.

Piping Installation



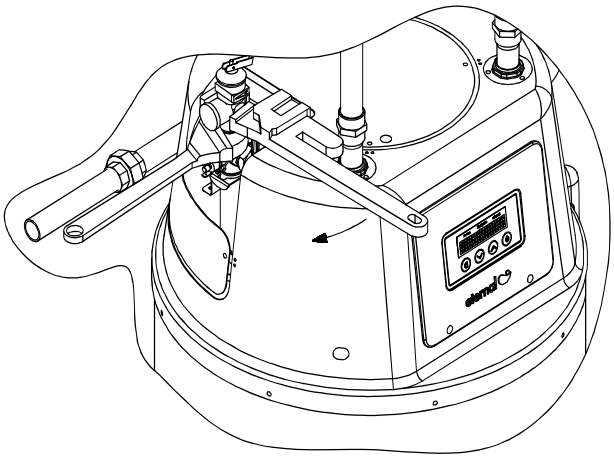
Water Pipe Installation

☐ Use spanner to fix the water pipe holder and then tighten water pipe with pipe wrench.



Gas Pipe Installation

☐ Use Spanner to fix gas adaptor and then tighten gas pipe with pipe wrench.



T&P Relief Valve Installation (Factory Installed)

☐ Use spanner to fix valve and then tighten T&P valve with pipe wrench.

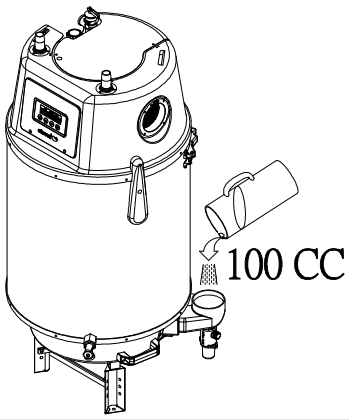
Condensate Disposal

CAUTION

The condensate trap must be filled and unobstructed to allow unrestricted flow of condensate. The condensate should not be subject to conditions where freezing could occur. If the condensate is subjected to freezing or obstruction, it will result in potential water damage to the water heater and surrounding area.

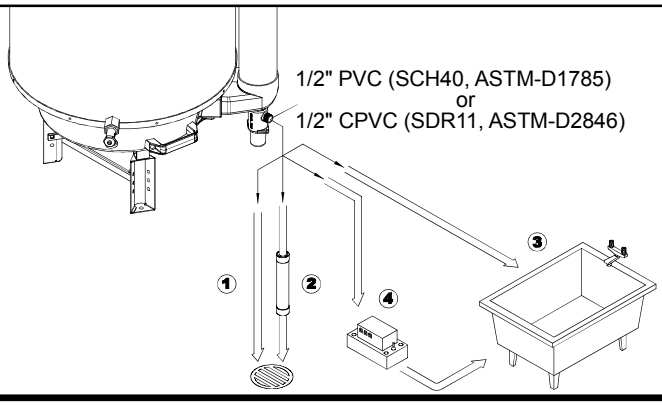
The condensate trap must be filled with water prior to using the water heater.

☐Pour water down the exhaust adaptor until water visibly flows out of the condensate drain before first use.



NOTICE

The condensate drain line material must be an approved material by the authority having jurisdiction. In absence of such authority, PVC and CPVC piping must comply with ASTM D1785 or D2846. This pipe must be connected to the condensate trap. The end of the pipe should drain to a laundry tub or to a floor drain.



NOTICE

Eternal water heater will typically produce a condensate that is considered slightly acidic with a Ph content of approximately 3-4. Install a neutralizing filter if required by authority having jurisdiction (See figure above).

Ways to Dispose Condensate:

1. Direct to drain from the unit.
2. Drain through neutralizer from the unit.
3. Drain to laundry tub from the unit. In this case, the unit must be higher then the laundry tub.
4. When installing a condensate pump, ensure the pump is approved for use with a condensing appliance. The pump should be equipped with an overflow switch to prevent property damage from potential condensate spillage.

☐ **Cleaning Out The Condensate Trap**

Over time, blockage of the trap by debris may occur; when the condensate cannot be released, the unit will go into error and will shut down. When this occurs, the trap must be cleaned.

☐ **To Remove Trap**

1. Remove clip securing trap to the nipple.
2. Gently pull trap body downwards to remove.

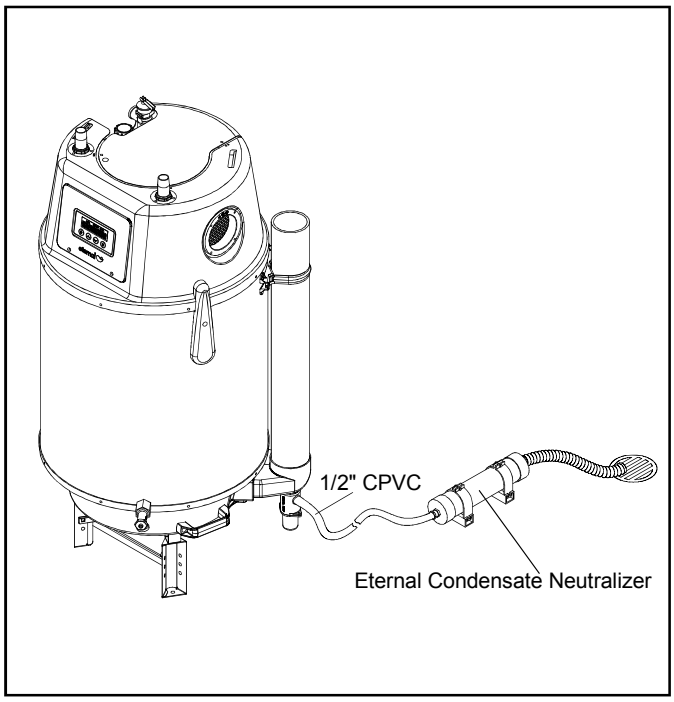
Condensate Piping

CAUTION

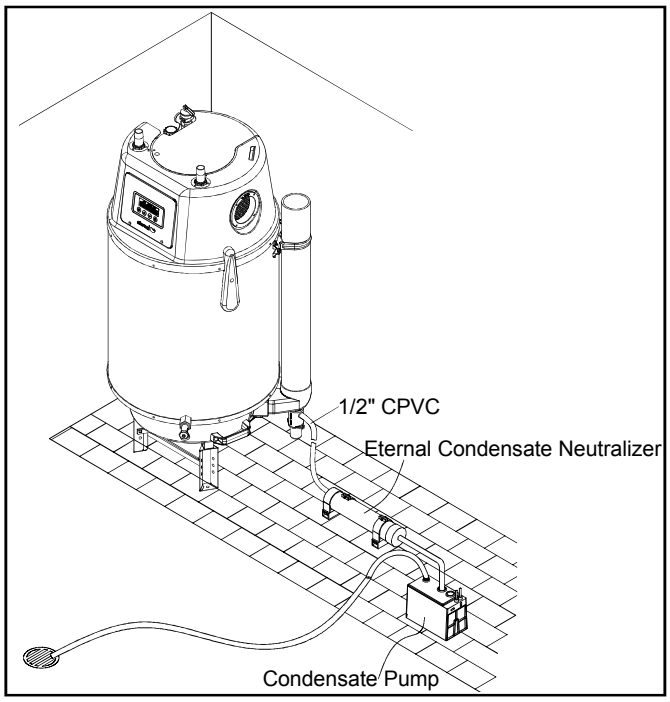
The end of the drain pipe must not be submerged in water or blocked in any way.
Taking measures to prevent the condensate drain lines from freezing is recommended (insulation, heat tape, electric heater, etc.)

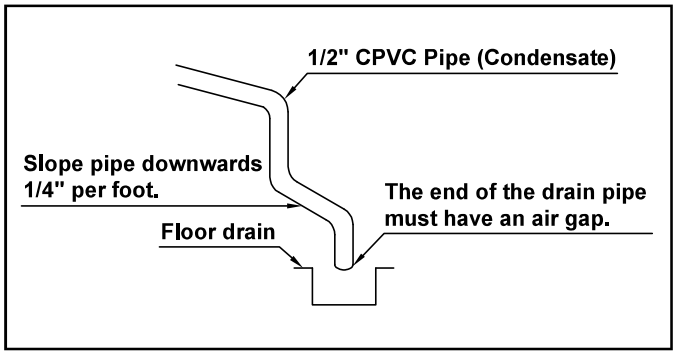
- ☐ This water heater is a high efficiency, fully condensing appliance which produces condensate during operation. The water heater incorporates a collection and removal system of condensate which must be properly drained in order to ensure proper operation of this appliance.
- ☐ **Please use PVC or CPVC for the drain line.** Do not use steel, black iron, or any other material which can corrode when contacting with condensate water.
- ☐ Keep the length of the drain pipe as short as possible. Long runs, or applications where the nearest drain is above the water heater, will require the use of a condensate pump. Size the pump to allow for a maximum condensate discharge of 2 GPH from the water heater.
- ☐ Horizontal runs must be sloped 1/4" per foot towards the drain or condensate pump.
- ☐ Be sure to check that condensate is freely flowing from the drain piping after the system has been installed. Condensate will begin flowing out of the water heater within 15 minutes after operation has started.

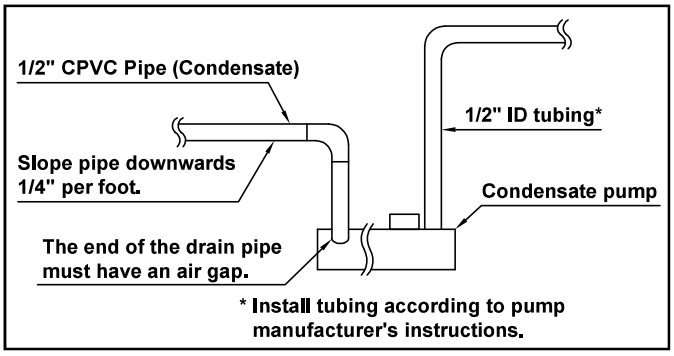
Condensate Piping to Floor Drain



Condensate Piping to Condensate Pump







Indoor Installation

Clearances

From top of water heater	12 inches	From back of unit	4 inch
From front of unit	4 inches (*)	From left side of unit (gas piping side)	6 inches
From side wall flue or vent connector in any direction	6 inches	From right side of unit	6 inches

*For accessibility when performing maintenance, 24" clearance in front of the unit it is recommended.

Combustion Air Supply

☐ GU125T / GU160T can be used either as a Power-Vent or Direct-Vent appliance. When used as a Power-Vent appliance, the water heater should be located in an area where enough air is available for proper combustion and ventilation. Follow the latest edition of ANSI Z223.1 and any of your local codes that are applicable.

☐ GU125T / GU160T is a Category IV vented appliance and manufacturer's ventilation specifications should be followed.

☐ In general, these requirements specify that if the unit is installed in a confined space, there must be permanent air supply openings if Eternal isn't installed as Direct-Vent.

WARNING - high elevation installations

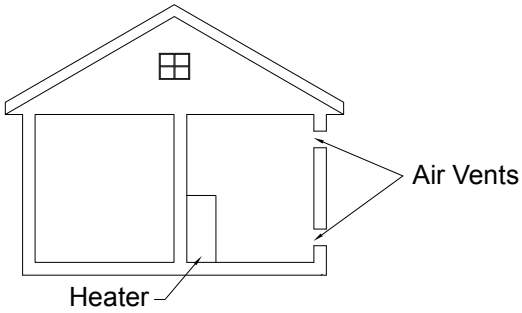
Natural gas at high altitude might contain less heating value than typical 1,000 BTU/ cuft and therefore can cause improper air / gas mix leading to improper combustion. For natural gas installations at high altitude above 3000 ft, be sure to configure the dipswitch setting correctly. Please call 886-946-1096.

Minimum Recommended Air Supply to Water Heater as Power-Vent

Model #	Water Heater Capacity	Outside Air Area	Inside Air Area
GU125T	Max. 75,000 Btu/hour	20 sq.in.	75 sq.in.
GU160T	Max. 100,000 Btu/hour	25 sq.in.	100 sq.in.

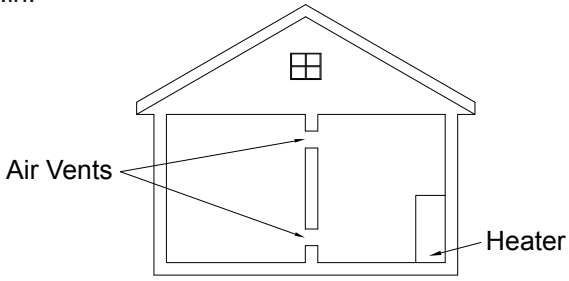
Air supply from outside building:

When combustion air is supplied directly through an outside wall, such as intake louver openings into the dwelling, each opening should give a minimum free area of one square inch per 4,000 Btu/hour of the total input ratings of all appliances in the enclosed area.



Air supply from inside building:

When combustion air is supplied from inside the building, each opening should give a minimum free area of one square inch per 1,000 Btu/hour of the total input ratings of all appliances in the enclosed area. These openings should never be less than 40 sq.in.



The minimum required total space volume without air vents is 50 cuft. per every 1,000 Btu/hour.

Model #	Water Heater Capacity	Minimum Required Air Volume
GU125T	Max. 75,000 Btu/hour	3,750 cu.ft
GU160T	Max. 100,000 Btu/hour	5,000 cu.ft

Floor Mounting

FOR INSTALLATIONS IN THE STATE OF CALIFORNIA

For installation in California this water must be braced or anchored to avoid falling or moving during an earthquake. See instructions for correct installation procedures. Instructions may be obtained form California Office of the State Architect. 1102 Q Street, Suite 5100, Sacramento, CA 95811.

INSTALLATION REQUIREMENTS FOR THE COMMONWEALTH OF MASSACHUSETTS

Massachusetts Code requires this water heater to be inatalled in accordance with Massachusetts 248-CMR 2.00: State Plumbing Code and 248-CMR 5. See Commonwealth of Massachusetts below.

For all side wall terminated, horizontally vented power vent, direct vent, and power direct vent gas fueled water heaters installed in every dwelling, buliding or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the side wall exhaust vent terminations is less than seven (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements should be satisfied:

Installation of Carbon Monoxide Detectors

At the time of installation of the side wall horizontal vented gas fueled equipment, the installing plumber or gasfitter should observe that a hard wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter should observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building or structure served by the sidewall horizontal vented gas fueled equipment. It should be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard wired carbon momoxide detectors.

In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.

In the event that the requirements of this subdivision can not be met at the time of completion of installation, the owner should have a period thirty(30) days to comply with the above requirements provided that during said thirty(30) day period, a battery operated carbon monoxide detector with an alarm should be installed.

Approved Carbon Monoxide detectors

Each carbon monoxide detector as required in accordance with the above provisions should comply with NFPA 720 and be ANSI/UL 2034 listed and CSA certified.

Signage

A metal or plastic identification plate should be permanently mounted to the exterior of the building at a minimum height of eight(8) feet above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign should read, in print size no less than one-half(1/2) inch in size. GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS.

Inspection

The state or local gas inspector of the side wall horizontally vented gas fueled equipment should not spprove the installtion unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08(2)(a) 1 through 4.

Exemptions:

The following equipment is exempt from 248 CMR 5.05(2)(a)1 through 4:

1. The equipment listed in Chapter 10 entitled Equipment Not Required To Be Vented in the most current edition of NFPA 54 as adopted by the Board; and
2. Product Approved side wall horizontally vented gas fueled equipment installed in a room or structure separate from the dwelling, building, or structure used in whole or in part for residential purposes.

Manufacturer Requirements- Gas Equipment Venting System Provided

When the manufacturer of Product Approved side wall horizontally vented gas equipment provides a venting system design or venting system components with the equipment, the instructions provided by the manufacturer for installation of the equipment and the venting system should include:

1. Detailed instructions for the installation of the venting system design or the venting system components; and
2. A complete parts list for the venting system design or venting system.

Manufacturer Requirements- Gas Equipment Venting System Not Provided

When the manufacturer of a Product Approved side wall horizontally vented gas fueled equipment dose not provide the parts for venting the flue gases, but identifies special venting systems, the following requirement should be satisfied by the manufacturer:

1. The referenced special venting system instructios should be included with the appliance or equipment installation instructions; and
2. The special venting systems should be Product Approved by the Board, and the instructions for that system should include a parts list and detailed installation instructions.

A copy of all installation instructions for all Product Approved side wall horizontally vented gas fueled equipment, all venting instructions, all parts lists for venting instructions, and/or all venting design instructions should remain with the appliance or equipment at the completion of the installation.

Venting Intake & Exhaust Material

WARNING

This water heater must be properly vented for removal of exhaust gases to the outside of the home. Correct installation of the vent pipe system is mandatory for the safe and efficient operation of this water heater and is an important factor in the life of the unit.

Vent Pipe Material

Eternal Hybrid Water Heater is a gas burning appliance with fan-assisted exhaust. The appliance must be vented with 3" Category IV special venting, which is air tight to prevent leakage of exhaust gases.
The appliance must be vented separately from all other appliances.
The following type of non-metallic vent can be used:

- PVC (schedule 40, ASTM-D1785)
- CPVC (schedule 40, ASTM-D2846)
- PVC-DWV (ANSI/ASTM-D2665)
- ABS (schedule 40, ASTM-D2661)
- Polypropylene Pipe Single wall & Components (ULC-S636, UL-1738)

* Note : Do not use cellular foam core pipe.

Cementing PVC, ABS or CPVC PIPE and FITTING

All primers, cleaners and cements must meet all local codes and applicable standards of the American Society for Testing Materials (ASTM).

NOTICE-VENTING GUIDELINES

The following guidelines should be followed when installing the exhaust outlet piping:

☐ Venting should be as direct as possible with a minimum number of pipe fittings.
☐ Venting diameter must not be reduced unless specially noted in the installation instructions.
☐ Support all horizontal pipe runs every 3½ feet according to local codes.
☐ Vents running through unconditioned spaces where below freezing temperatures are expected should be properly insulated to prevent freezing. For horizontal runs, wrap the vent pipe with self-regulating 3 or 5 watt heat tape. The heat tape must be U.L. listed and installed per manufacturer's instructions.
☐ Do not connect this venting system with an existing vent or chimney.
☐ Do not connect common vent with the vent pipe of any other water heater or appliance.
☐ Do not use bushing as reducer.

WARNING

For installations in Canada, field supplied plastic vent piping must comply with CAN/CGA-B149.1(latest edition) and be certified to the Standard For Type BH Gas Venting Systems, ULC S636 Components of this listed system shall not be interchanged with other vent systems or unlisted pipe/fittings. All plastic components and specified primers and glues of the certified vent system must be from a single system manufacturer and not intermixed with other system manfacturer's vent system parts. The supplied vent connectors are certified as part of the water heater.

WARNING

If Eternal combustion air inlet is located in an area likely to cause or contain contamination, the combustion air must be repiped and terminated at another location. Contaminated combustion air will damage the unit and its burner system, resulting in possible severe personal injury, death or substantial property damage.

Venting Specification

Direct Vent

GU125T / GU160T is factory configured as a sealed combustion unit with dedicated intake and exhaust connections.

When installed as a Direct Vent appliance, all combustion air is drawn directly from outside of the home.

Direct Vent configuration is for indoor only.

Recommended for facilities with difficulty accessing combustion air.

Power Vent

Is for indoor only.

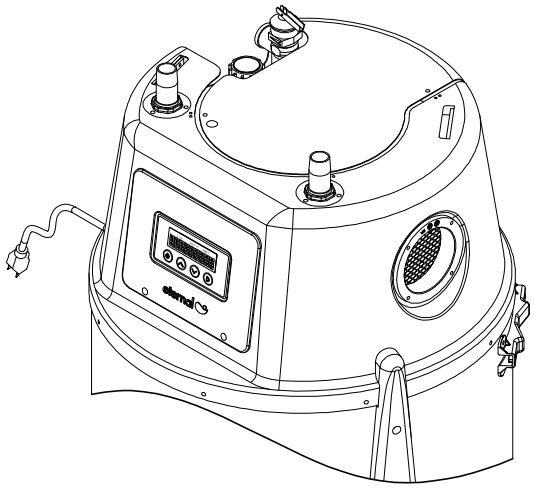
Is not sealed combustion if intake is not used to bring air directly from outside.

WARNING

Insufficient air supply used with Power Vent appliance may cause the building to experience negative pressure inside. Negative pressure is not allowable by most building codes and can cause back drafting of cold air from outside through the unit, potentially freezing the heat exchanger / tank.

How To Configure Unit For Power-Vent

To configure the unit for power vent, leave intake open.



Maximum Allowable Vent and Combustion Air Piping Length

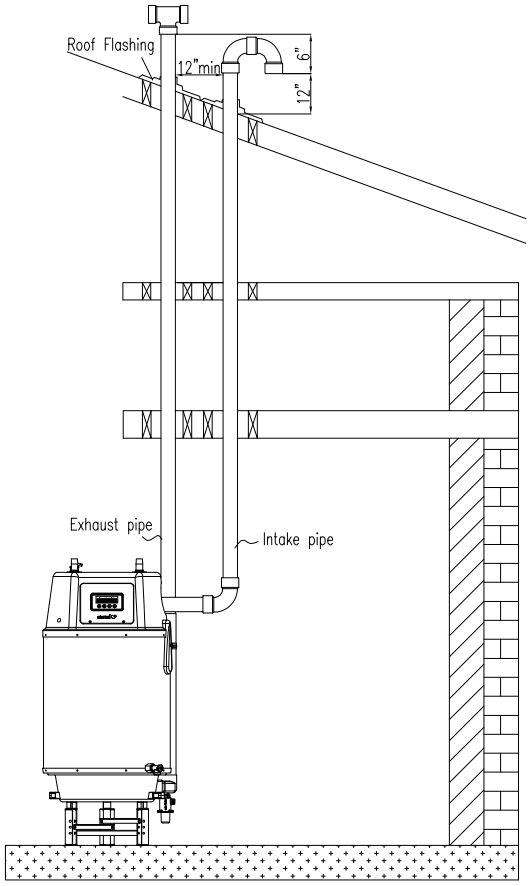
3 inch Piping	
Feet	Max # of 90° elbows
100	6

- Reduce the maximum allowable length for each elbow used as follows:
  - 45 degree elbow : Deduct 3 feet
  - 90 degree elbow : Deduct 5 feet
- Some terminations are considered types of elbows, and correct deduction should be applied. Such as, a turn down 90˚ or an open T termination is considered 1x90˚ elbow, and a candycane termination is considered as 2x90º elbows.
- The intake and exhaust vent lengths can be of equal length or less; there is no balancing requirement between intake and exhaust.
- To avoid accumulation of condensate water in the exhaust vent run, it is recommended to position the start of the horizontal section lower, then slope upwards with no less than 1/4" rise per foot of pipe towards the venting termination to allow condensation flow back into the unit.
- Horizontal runs require adequate support at 3 1/2 foot intervals and vertical runs suppart at 5 foot intervals.

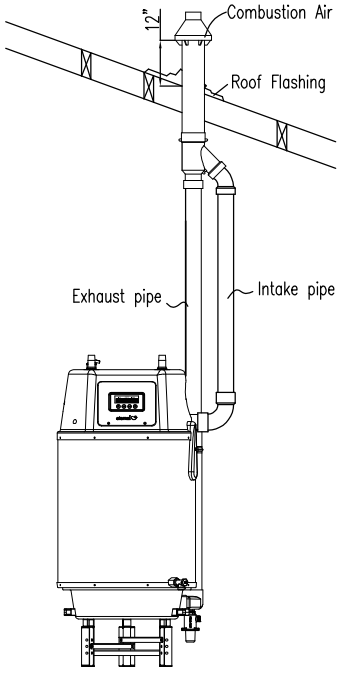
Vertical Termination

Below diagrams are examples of vertical terminations.

☐ Through roof (Direct Vent)



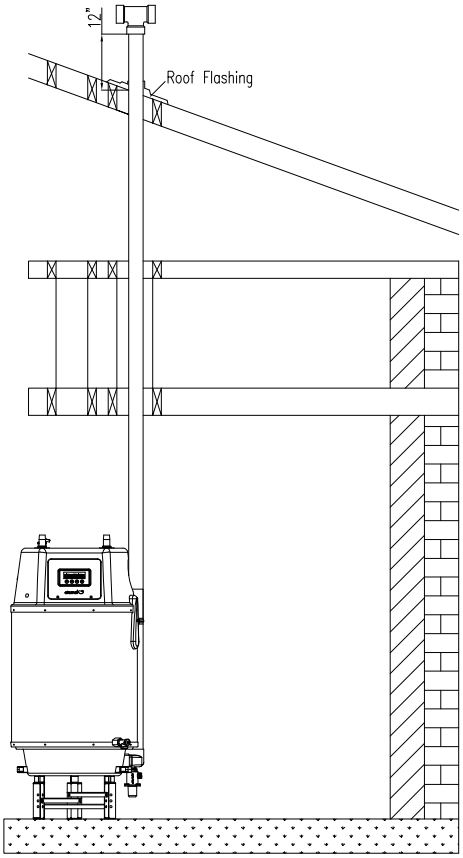
☐ Through roof (Concentric Vent)



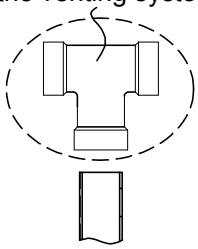
WARNING

The Grand Hall approved concentric kit is a unique pipe-in-pipe venting system designed for termination. Do not try to replicate or make your own. For more information, please refer to **Concentric Vent Kit** section in the Operation manual.

Through roof (Power Vent)



An open tee is recommended to use as a termination to alleviate and prevent back pressure in the venting system.



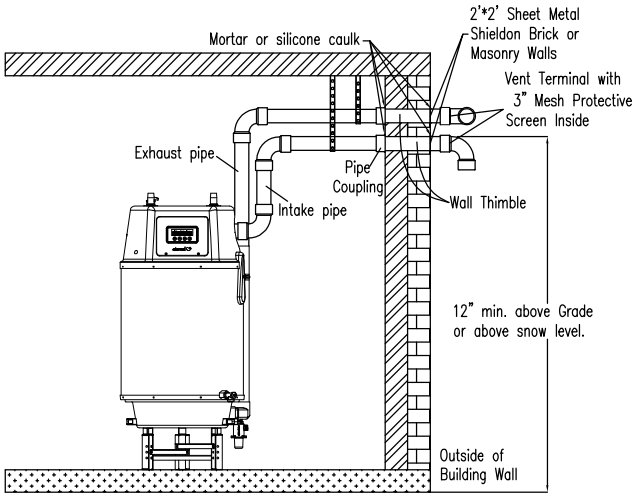
NOTICE

- ☐ Minimum twelve (12) inches above anticipated snow level.
- ☐ The termination cannot be connected to an existing vent piping or chimney.
- ☐ The total vertical and horizontal runs cannot exceed the maximum length with a maximum number of 90 degree elbows as specified in the table of page 19.
- ☐ Eternal can be vented straight up and a horizontal section is not required for vertical terminations.

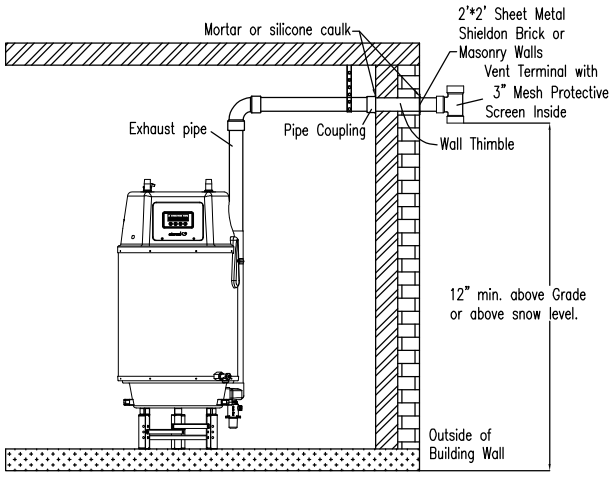
Horizontal Termination

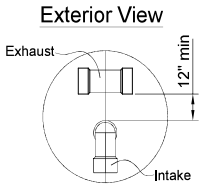
Below diagrams are examples of horizontal terminations.

☐ Side Wall (Direct Vent)



☐ Side Wall (Power Vent)





WARNING

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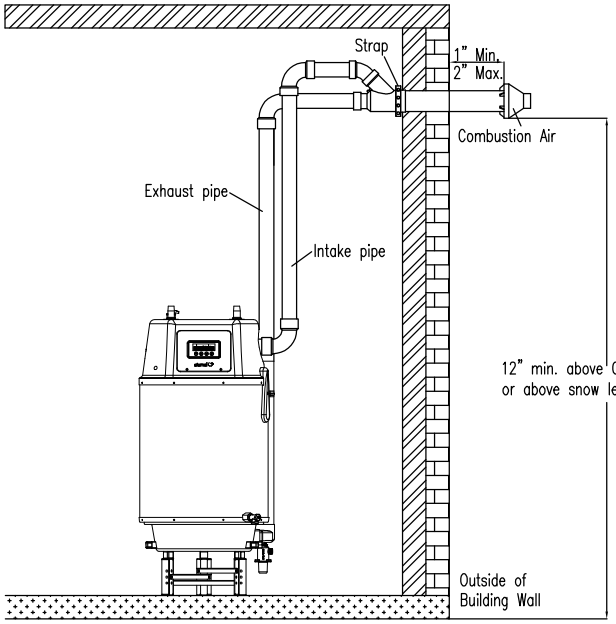
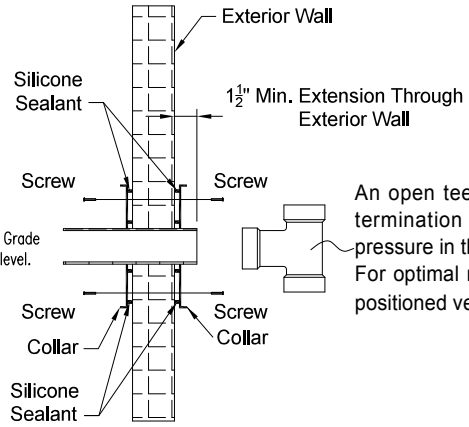
☐ Side Wall (Concentric Vent)





An open tee is recommended to use as a termination to alleviate and prevent back pressure in the venting system.
For optimal results, the open tee should be positioned vertically.

WARNING

☐ Once the vent terminal location has been determined, make a hole through the exterior wall to accommodate the vent pipe. Vent pipe must only exit exterior wall horizontally.
☐ Place the 3" metal mesh screen inside the terminal fitting and connect it as shown to the vent pipe on the exterior of the building.
☐ Seal any opening around the vent pipe or fittings with mortar or silicone caulk "silicone caulk, as show above."
☐ Complete the rest of the vent pipe installation to the water heater's vent connector fitting on the blower outlet. If necessary, support horizontal run as previously mentioned.

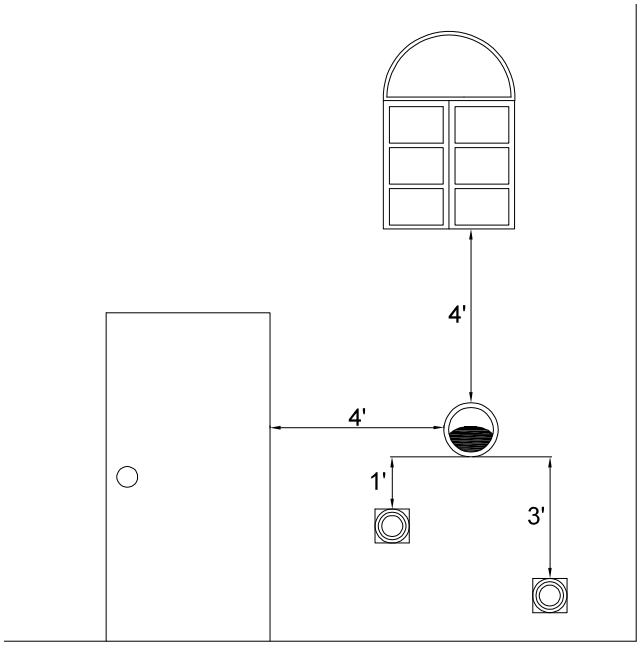
Clearance Requirements from Vent Terminations to Building Openings

All clearance requirements are in accordance with ANSI Z21.10.3 and the National Fuel Gas Code, ANSI Z223.1 and in Canada, in accordance with NSCNGPIC.

☐ **Vent Clearances When Heater is Installed Indoors**

Maintain the following clearances to any opening in any building:

- 4' below, 4' horizontally from, or 1' above any door, operable window, or gravity air inlet into any building.
- 3' above any forced air inlet within 10'.



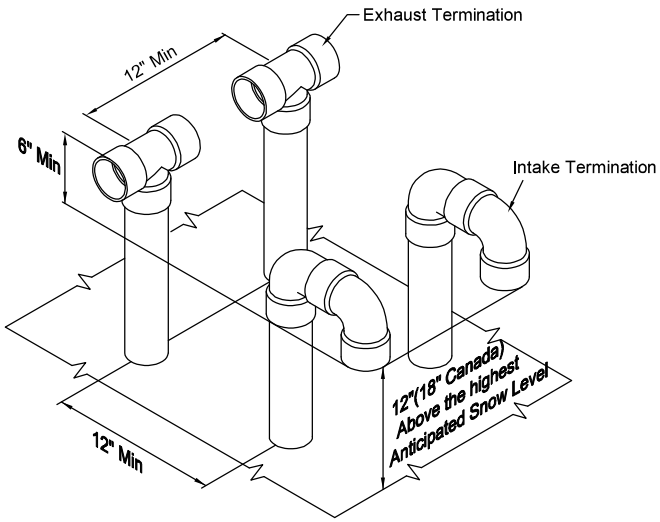
WARNING

For Installations in Canada, clearances are as follows: To windows, doors, & gravity air inlets: 36". To forced air inlets: 6'. These clearance requirements hold true for all of the above situations.

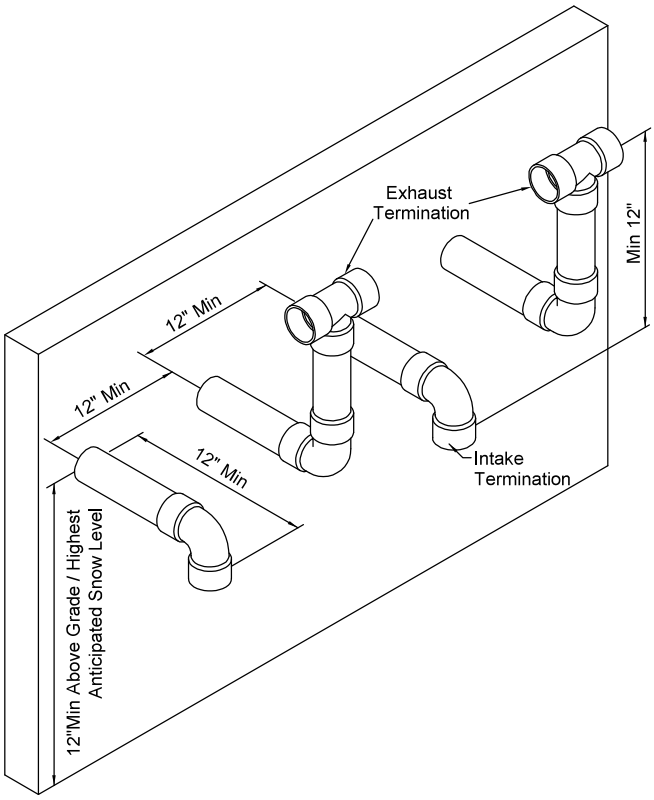
Multiple Units Termination

*** Multiple Unit Termination**

☐ Vertical Terminations



☐ Horizontal Terminations



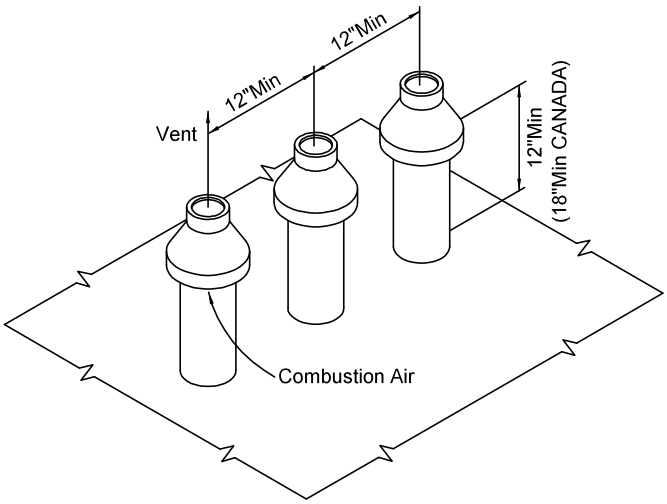
WARNING

The Grand Hall approved concentric kit is a unique pipe-in-pipe venting system designed for termination. Do not try to replicate or make your own. For more information, please refer to **Concentric Vent Kit** section in the Operation manual.

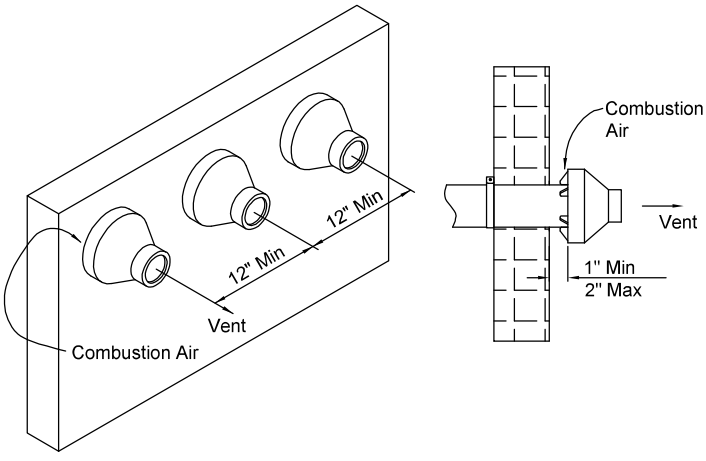
*** Concentric Multivent Termination**

When two or more direct vent units are vented near each other, each unit must be individually vented, but next unit's vent termination must be at least 12 inches away from the first unit. Vent terminations are important to avoid recirculation of flue gases.

☐ Vertical Terminations



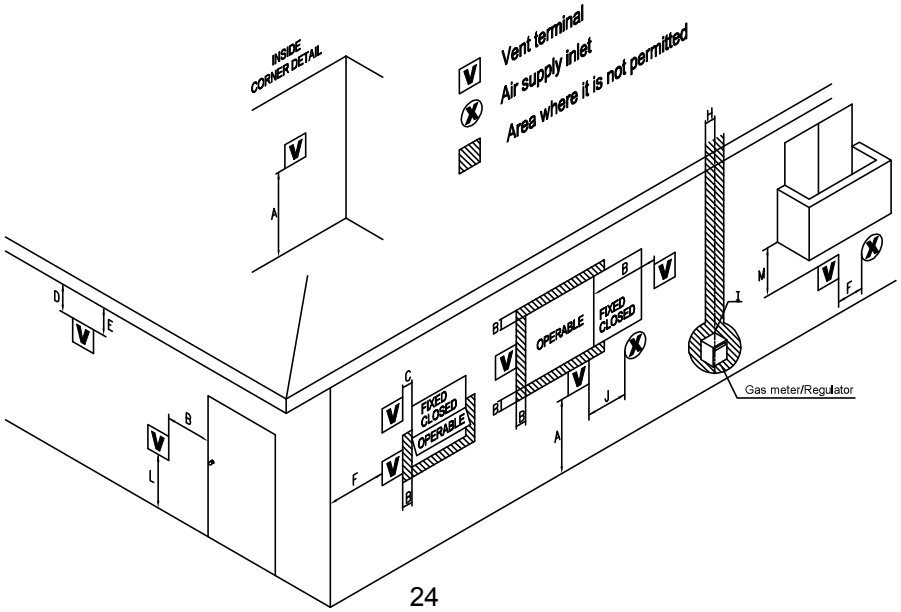
☐ Horizontal Terminations



Vent Pipe Installation & Terminator Position

	Description	US Installations		Canadian Installations
		Other than Direct Vent	Direct Vent	
A	Clearance above grade, veranda, porch, deck, or balcony	1 foot	1 foot	1 foot
B	Clearance to window or door that may be opened	4 feet below or to side of opening; 1 foot above opening	1 foot	3 feet
C	Clearance to permanently closed window	*	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet from the center line of the terminal	*	*	*
E	Clearance to unventilated soffit	*	*	*
F	Clearance to outside corner	*	*	*
G	Clearance to inside corner	*	*	*
H	Clearance to each side of center line extended above meter/ regulator assembly	*	*	3 feet within a height 15 feet above the meter/regulator assembly
I	Clearance to service regulator vent outlet	*	*	3 feet
J	Clearance to non-mechanical air supply inlet to the building or the combustion air inlet to any other appliance	4 feet below or to side of opening; 1 foot above opening	1 foot	3 feet
K	Clearance to a mechanical air supply inlet	3 feet above if within 10 feet horizontal	3 foot	6 feet
L	Clearance above paved sidewalk or a paved driveway located on public property	7 feet	*	7 feet
M	Clearance under veranda, porch, deck, or balcony	*	*	1 foot

*For clearances not specified in ANSI Z223.1 / NFPA 54 or CAN/CSA-B 149.1, please use clearances in accordance with local installation codes and the requirement of the gas supplier.



Gas Supply Piping

NOTICE

- ☐ A manual gas control valve (shut-off valve) must be connected to the unit before the gas line.
- ☐ Check the gas inlet pressure and make sure the type of gas matches matching the rating plate located on your water heater. Also, check to make sure your gas meter is capable of supplying sufficient BTU load to all appliances. Insufficient gas pressure and volume will cause your water heater to be deficient in performance and may not work properly.
- ☐ When connections are completed, check for gas leaks by applying soapy water to all gas fittings and connections. Presence of soap bubbles foaming is a sign of gas leak.
- ☐ This appliance and its individual shut-off valve must be isolated from the gas supply piping system by unplugging the unit and turning off the main gas valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 PSI.

Gas Piping System Codes

Size gas piping system correctly by following ANSI Z223.1/NFPA 54, or by local code.

- ☐ When measuring the inlet supply pressure, the water heater and all other gas appliances sharing the gas supply line must be firing at maximum capacity.
- ☐ Maximum gas pressure must not exceed listed value.
- ☐ Low gas pressure could be caused by an undersized gas pipe; this will cause the water heater's performance to diminish and it would not be able to reach maximum performance.

NATURAL GAS SUPPLY PIPING

Pipe size	Cubic Feet of Natural Gas												
Length	10’	20’	30’	40’	50’	60’	70’	80’	90’	100’	125’	150’	200’
1/2"	172	118	95	81	72	65	60	56	52	50	44	40	34
3/4"	360	247	199	170	151	137	126	117	110	104	92	83	71
1"	678	466	374	320	284	257	237	220	207	195	173	157	134
1 1/4"	1390	967	768	657	583	528	486	452	424	400	355	322	275
1 1/2"	2090	1430	1150	985	873	791	728	677	635	600	532	482	412
2"	4020	2760	2220	1900	1680	1520	1400	1300	1220	1160	1020	928	794

Based on 0.60 specific gravity for natural gas at 0.5" W.C. pressure drop DOE standard is 1000 BTU per cubic ft. of natural gas

NATURAL GAS SUPPLY PIPING

Pipe size	Cubic Feet of Natural Gas												
Length	10’	20’	30’	40’	50’	60’	70’	80’	90’	100’	125’	150’	200’
1/2"	454	312	250	214	190	172	158	147	138	131	116	105	90
3/4"	949	552	524	448	397	360	331	308	280	273	242	219	188
1"	1787	1228	986	844	748	678	624	580	544	514	456	413	353
1 1/4"	3669	2522	2025	1733	1536	1392	1280	1191	1118	1056	936	848	726
1 1/2"	5497	3778	3034	2597	2302	2085	1919	1785	1675	1582	1402	1270	1087
2"	10588	7277	5844	5001	4433	4016	3695	3437	3225	3046	2700	2446	2094

Based on 0.60 specific gravity for natural gas at 3.0" W.C. pressure drop; **8.0" W.C. or greater supply pressure**. DOE standard is 1000 BTU per cubic ft. of natural gas

PROPANE GAS SUPPLY PIPING

Pipe size	KBTU of Propane Gas											
Length	10’	20’	30’	40’	50’	60’	80’	100’	125’	150’	175'	200’
1/2"	291	200	160	137	122	110	101	94	89	84	74	67
3/4"	608	418	336	287	255	231	212	197	185	175	155	140
1"	1150	787	632	541	480	434	400	372	349	330	292	265
1 1/4"	2350	1620	1300	1110	985	892	821	763	716	677	600	543
1 1/2"	3520	2420	1940	1660	1480	1340	1230	1140	1070	1010	899	814
2"	6790	4660	3750	3210	2840	2570	2370	2200	2070	1950	1730	1570

Based on 1.50 specific gravity for propane gas at 0.5" W.C. pressure drop; 11" W.C. supply pressure

LP Conversion

NOTICE

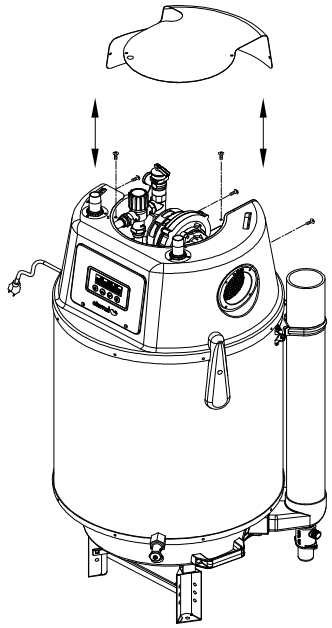
Contact the local propane gas supplier for recommended sizing of piping, tanks and 100% lockup gas regulator.
☐ Adjust the propane supply regulator provided by the gas supplier for 13" w.c. maximum pressure.

NOTICE

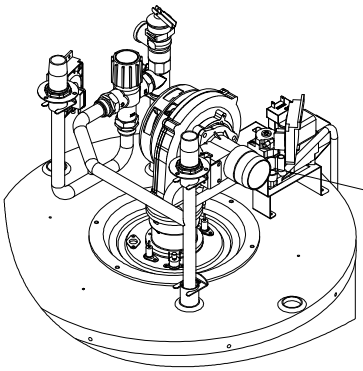
LP Conversion kit is included in the accessory box. Conversion can only be completed by a qualified professional.

How to convert to LP

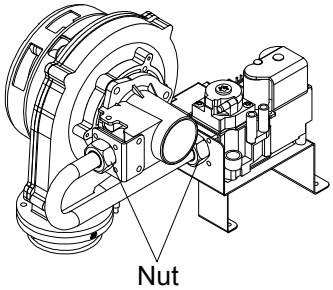
1. Remove top service panel by loosening 5 screws.



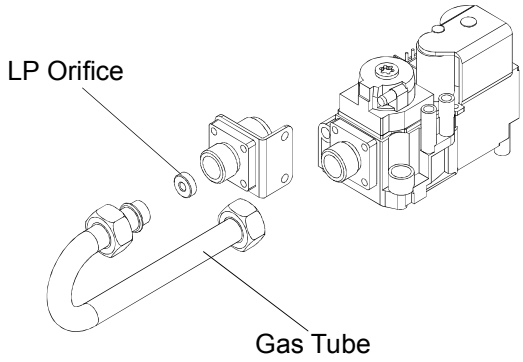
2. Locate the gas valve towards lower left of the unit.



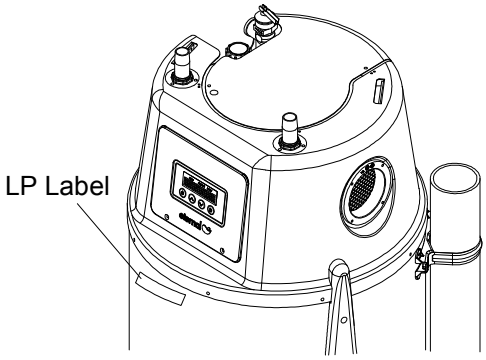
3. Loosen the two nuts connecting the gas tube to gas valve.



4. Insert LP orifice into the nozzle, retighten gas tube and make sure no gas leaks.



5. Reassemble the top service panel and apply the LP label which is in the accessory kit.



WARNING

Prior to start up, ensure the unit is set to fire propane. Check the rating label for the type of fuel. If there is a conflict or doubt on the setup, remove the gas valve and check for the propane orifice. Failure to ensure proper setup could result in severe personal injury, death or substantial property damage.

Water Supply Connection

WATER SUPPLY CONNECTION

☐ Important: Do not install this water heater with iron or galvanized piping.
☐ The water fittings on the Eternal water heater are 3/4" NPT.
☐ When installing more than one unit to supply higher volumes of hot water in residential applications, the number of Eternal water heaters required and the header pipe sizing needs to be properly sized to meet the total hot water demand.
☐ All pipes, pipe fittings, valves and other components including solder, must be approved for use in potable water systems.
☐ The use of unions and manual shut off valves on both the cold water inlet and hot water outlet are recommended.
☐ The use of brass, stainless steel or copper unions/nipples are recommended for Eternal water heaters.
☐ Taking measures to prevent water pipes from freezing are important. In the event of frozen water pipes, Eternal will not be able to activate its freeze protection function due to loss of water pressure and will be susceptible to freeze causing serious unit damage.

WARNING

☐ The use of galvanized or dielectric unions are prohibited for use with an Eternal water heater. Failure to comply with this warning will void warranty.

WARNING

☐ Be careful not to reverse the hot water outlet and cold water supply line connections to the water heater. This will cause your water heater to operate improperly and void warranty. Make sure the hot and cold lines are connected properly.

FILLING THE WATER

☐ Close the water heater drain valve by turning the knob to the right. The drain valve is on the lower right side of the water heater. Refer to the figure below.
☐ Open the cold water supply valve to the water heater.
☐ To ensure complete filling of the tank, allow air to purge by opening the nearest hot water faucet. Allow water to run until a constant, smooth flow is obtained.
☐ Check all new water piping for leaks. Repair as needed.

CAUTION

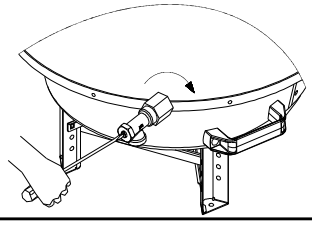
☐ Never use this water heater unless it is completely filled with water.
☐ Be certain there are no loose particles or dirt in the piping. Keep a copper pipe diameter at NPT 3/4 inch diameter to allow full flow. If the hot and cold connections are reversed, the heater will not work properly . Be sure to connect them correctly.
☐ If water flow is low, check the filter by removing the draining valve.

DRAINING THE WATER

☐ Close water supply shut-off valve to the unit first.
☐ Connect garden hose to the draining valve located on the lower left side of the unit.
☐ Open the valve by using a flat head screwdriver to drain water with the hose.
☐ After draining the tank, turn the valve body counterclockwise by hand to remove the draining valve from the unit and clean the filter.

CAUTION

Do not open the drain valve without connecting a hose so that water can be diverted to an area where water damage is not a problem. Do not remove the draining valve from the unit without first draining the tank.



Temperature and Pressure Relief Valve

The following 3/4", maximum 150psi valves are approved by CSA for use with GU125T / GU160T :
- WATTS 100XL- 4

CAUTION

☐ The temperature-pressure relief valve should be manually opened once a year.
☐ No one should be in front of or around the outlet of the temperature-pressure relief valve discharge line when in use.
☐ If after manually opening the valve, it fails to completely reset and continues to release water, immediately close the cold water inlet to the water heater, follow the draining instructions, and replace the temperature-pressure relief valve with a new one.

Troubleshooting Thermal Expansion
If a water heater is installed in a closed water supply system, such as one having a backflow preventer in the cold water supply line, then a thermal expansion tank is required, Contact the water supplier or local plumbing inspector on how to control this situation.

Electrical Connection

Installation Codes:
Follow the requirements of the local authority having jurisdiction. In the absence of such requirements, follow the latest edition of the National Electrical Code ANSI/NFPA 70.

Grounding and Surges
☐ Do not plug electrical power to the unit until all plumbing and gas piping is complete and the water heater has been filled with water.
☐ The use of a surge protector is recommended to protect from power surges.
☐ Do not connect 220-240V AC to this unit. It will damage the water heater and void the warranty.
☐ Do not disconnect the power supply when the unit is in normal operation.
☐ A battery back-up may be used to supply hot water during periods of power outages. We recommend a computer-grade UPS (uninterruptable power supply; true sine wave) with at least 600VA rating for extended coverage.

WARNING

☐ The water heater must be electrically grounded.
☐ Do not rely on the gas or water piping to ground the metal parts of the water heater, because plastic pipe may isolate the water heater electrically. Service and maintenance personnel who work on or around the water heater may be standing on wet floors, and could be electrocuted by an ungrounded water heater.

The water heater requires an electrical power supply of 120 VAC/60Hz, and it must be properly grounded to function.
☐ A means for switching off the 120 VAC power supply must be provided.
☐ Wire the heater exactly as shown in the wiring diagram in the page of 37.
☐ Check all new water piping for leaks. Repair as needed.

CAUTION

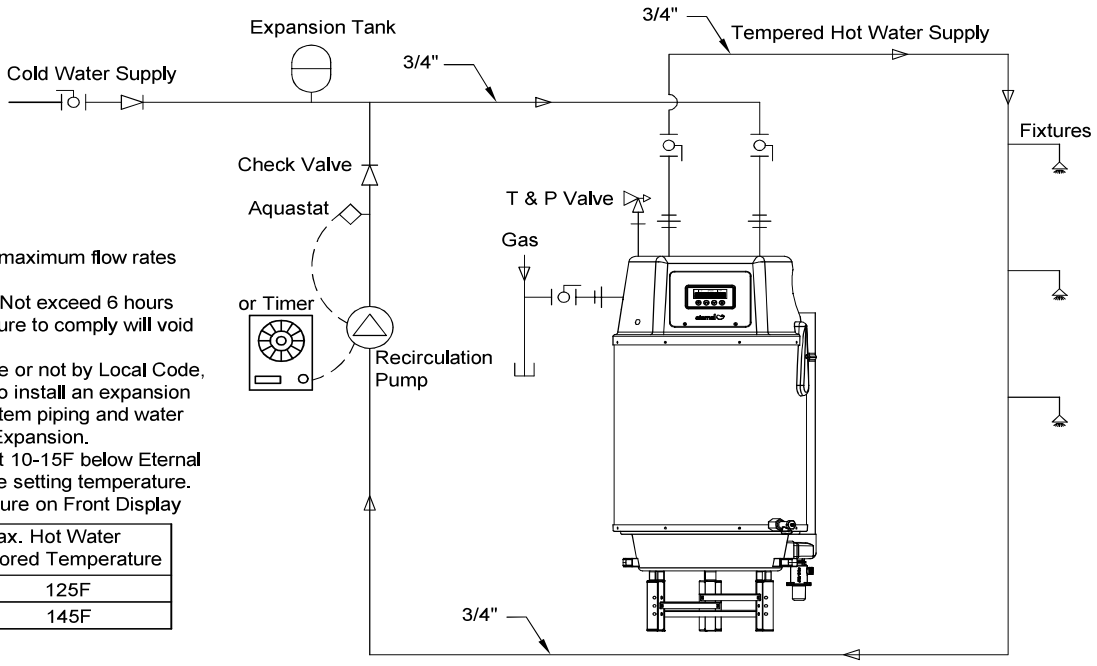
Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

WARNING

All units come with a factory installed 3-pronged power (grounded) plug. It is required to run a dedicated electrical line to the water heater to prevent electrical interference.

Recirculation System with an Eternal Water Heater

Equipment	QTY
Eternal	1

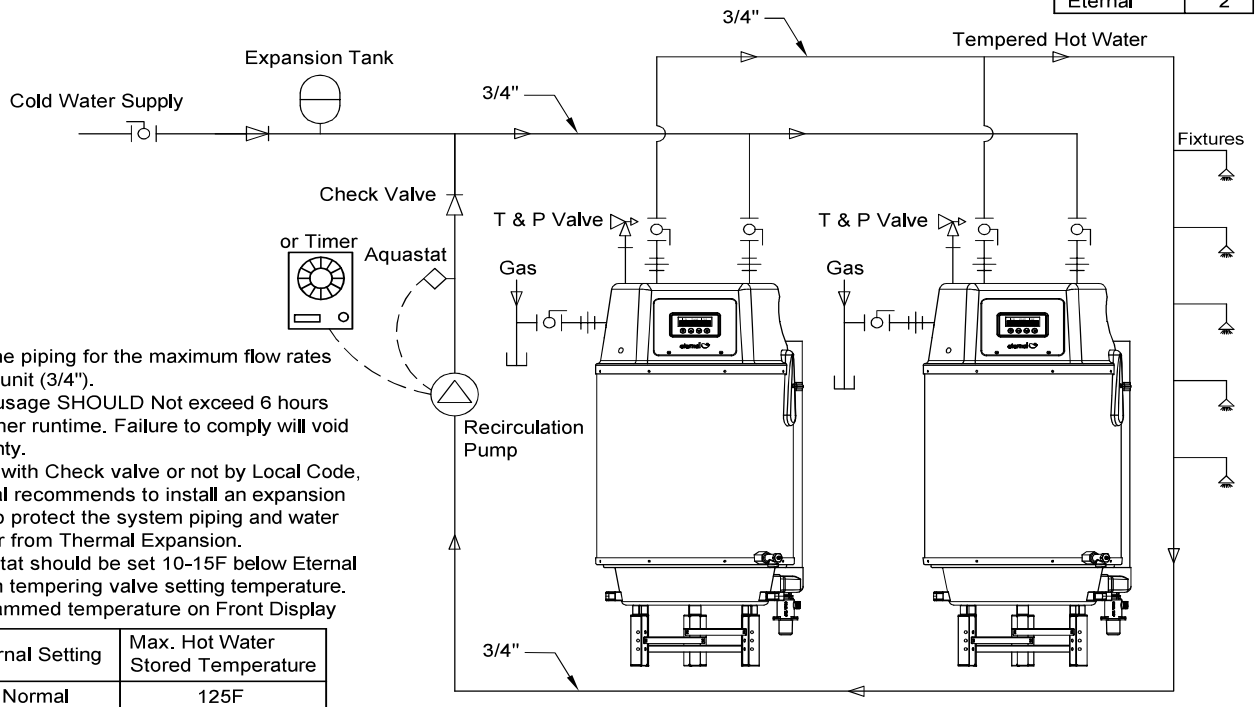


Note :
1. Size the piping for the maximum flow rates of the unit (3/4").
2. Daily usage SHOULD Not exceed 6 hours of burner runtime. Failure to comply will void warranty.
3. Either with Check valve or not by Local Code, Eternal recommends to install an expansion tank to protect the system piping and water Heater from Thermal Expansion.
4. Aquastat should be set 10-15F below Eternal built-in tempering valve setting temperature.
5. Programmed temperature on Front Display

Eternal Setting	Max. Hot Water Stored Temperature
Normal	125F
Hotter	145F

Recirculation with 2 Units Manifold(Parellel)

Equipment	QTY
Eternal	2



Note :
1. Size the piping for the maximum flow rates of the unit (3/4").
2. Daily usage SHOULD Not exceed 6 hours of burner runtime. Failure to comply will void warranty.
3. Either with Check valve or not by Local Code, Eternal recommends to install an expansion tank to protect the system piping and water Heater from Thermal Expansion.
4. Aquastat should be set 10-15F below Eternal built-in tempering valve setting temperature.
5. Programmed temperature on Front Display

Eternal Setting	Max. Hot Water Stored Temperature
Normal	125F
Hotter	145F

These diagrams are for reference as basic guides. Each installation should be engineered properly and compliant to Local and State Codes.

WARNING

Pump control such as aquastat or timer must be used in recirculation applications or long burner runtime occur and cause premature failure. Daily usage should not exceed 6 hours. Failure to comply with this warning will void warranty.

Operating Instructions

Starting Up

☐ Once the unit has been properly installed, check the gas and water connections for leaks.

☐ Check for proper ventilation and combustible air supply to the water heater. Purge the gas and water lines to remove debris; then follow these steps to turn on your unit.

1. Close the manual gas shut-off valve located on the gas line.
2. Fully open the manual water shut-off valve on the water supply line.
3. To ensure complete filling of the tank, allow air to exit by opening the nearest hot water faucet. Allow water to run until a constant flow is obtained. This will let air out of the water heater and piping.
4. Open a hot water tap to check that water will flow to that tap. Then close the hot water tap.
5. Fully open the manual shut-off gas valve.
6. Plug in the 120 VAC/60Hz power supply to the water heater and turn on the unit.

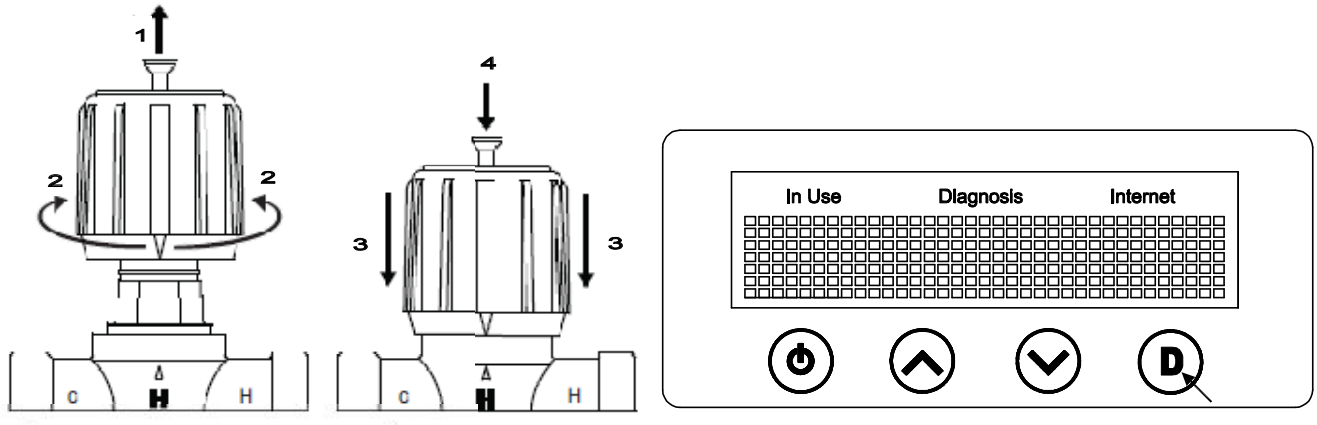
CAUTION

☐ **Never use this hot water heater unless it is completely filled with water.**
The tank must be filled with water. Water must flow from the hot water faucet before turning "ON" gas to the water heater.

Temperature Setting Procedure

Hot Water Stored Temperature Setting:Normal(125˚F), Hotter(145˚F), High output(165˚F)

- Tempering Valve Adjustment
  Loosen hand wheel screw, lift hand wheel, turn to desired temperature as indicated on the front display the hand wheel and retighten screw.
- Tempering Valve Adjustment
  It is possible to limit the temperature range 70°F~145°F using this feature.



1. Loosen screw, lift hand wheel.
2. Turn hand wheel clockwise or counter clockwise to adjust temperature.
3. Reposition hand wheel tolock postition.
4. Retighten screw.

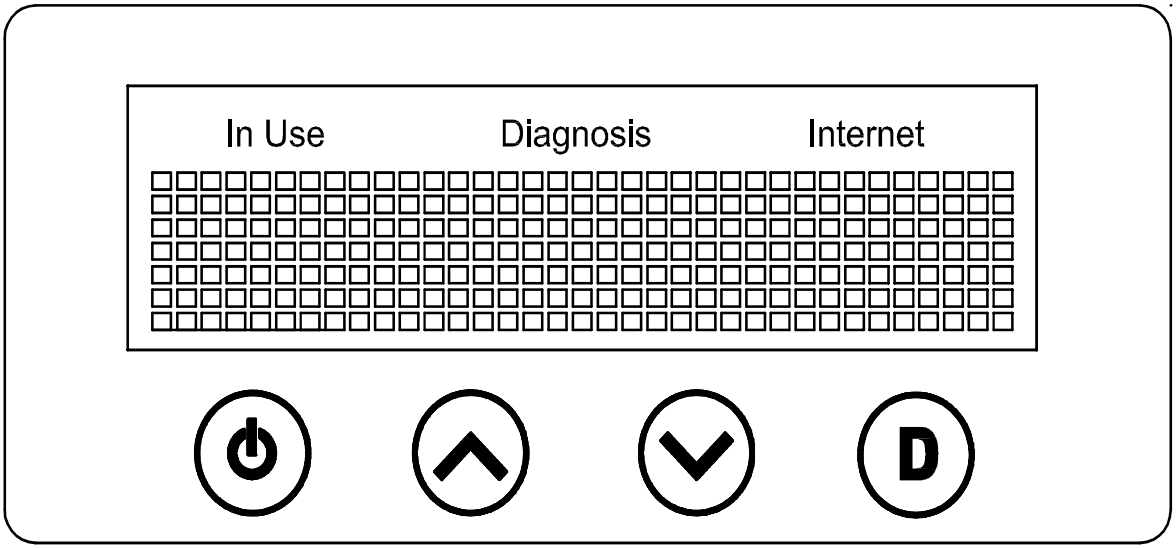
WARNING

☐ Water Temperature above 120˚F can cause serious injury. Mixing valve temperature settings should be done by a licensed contractor per local requirements. To ensure correct temperature control, use water thermometer at faucet outlet.

NOTICE

It is recommended once a year, the sring inside the tempering valve to be relaxed, to ensure proper temperature delivered.
Contact a licensed professional for maintenance.

How To Use The Front Control Interface



1. To switch the water heater ON from OFF condition, press the Power Button, then ETERNAL WATER will be displayed on LCD Monitor.

☐ NORMAL, HOTTER and HIGH OUTPUT will display on the LCD monitor. This indicates the water heater is stored hot water selection.

2. When tank water temperature is lower than setting temperature, the water heater will start the burner automatically and LCD monitor will show the IN USE display.
3. To switch the water heater OFF Press the Power Button.

☐ The temperature selected on the LCD monitor doesn't control the output temperature of the water heater, it only controls the stored hot and temperature of the tank.

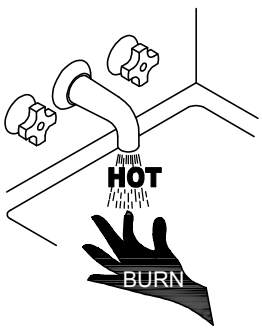
4. To adjust hot water output temperature please see page 30.

CAUTION

☐ Per some state codes – water temperature should not be set higher than 120°F. Please check with your local codes to ensure temperature is set properly.

DANGER

☐ Hot water heater temperature over 125°F can cause severe burns instantly or death from scalding.
☐ Children, disabled and elderly are at the highest risk of being scalded.
☐ Feel water temperature before bathing or showering.
☐ Temperature limiting valves are available; please ask a certified professional.



Water Temperature	Time to Produce a Serious Burn
120°F	More than 5 minutes
125°F	1.5 to 2 minutes
130°F	About 30 seconds
135°F	About 10 seconds
140°F	Less than 5 seconds
145°F	Less than 3 seconds
150°F	About 1.5 seconds
155°F	About 1 seconds

Maintenance and Service

WARNING

Turn off the electrical power supply, the manual gas control valve, and the manual water control valve before servicing.

Systems and Parts Check

The unit should be checked once a year or as necessary by a certified and trained licensed technician. If repairs are needed, the repairs should be done by a certified and trained licensed technician.

The following systems and parts should be checked at least once a year.

☐ **Temperature pressure relief valve:** Manual operation of the pressure relief valve to ensure correct operation.

☐ **Thermistor:** Remove the thermistors from unit and check for mineral coating - A mineral coating on the thermistor requires cleaning

☐ **Physical Damage:** If the water heater has been subjected to fire, flood, or physical damage, turn off the manual gas shutoff valve and do not operate the water heater again until it has been checked by qualified personnel.

☐ **Temperature Setting:** Hotter water increases the risk of scalding injury.

☐ **Venting System Inspection:** A visual inspection should be made on the venting system at least once a year.

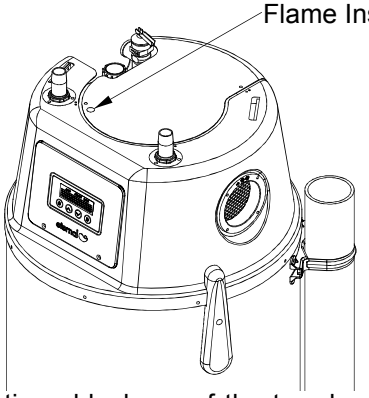
- Be sure the venting is properly connected to prevent escape of dangerous flue gases which could cause deadly asphyxiation.
- Obstructions could cause improper venting. The combustion and ventilation air flow must not be obstructed.
- Damage or deterioration which could cause improper venting or leakage of combustion byproducts.

☐ **Clean Up:** The air intake hole on the right side of the water heater should be checked.
Clean as needed to prevent the entry of water, insects, rodents or other foreign materials such as fallen leaves and dust that could cause blockages. Do not obstruct the flow of combustion air and exhaust air flow.

☐ **Water Strainer:** The water strainer should be checked once a year. It protects valve from dirt and pipe scale. Self-clean by opening valve or hose connected to a blow-off outlet.

☐ **Sediment Buildup:** Over time, sediments from water supply could settle inside the tank and caused water heater to lose water holding capacity. It is recommended that the water heater to be drained down completely once every other year to flush out the sediments. Buildup of sediment in faucet aerators, showers heads and screens could also impair water flow and cause the water heater to deliver less than its full output, or to shut down completely. Check any of these screens or shower heads on your faucets periodically and clean as necessary.

☐ **Burner Ignition:** Water heater has an automatic ignition system. Once you open a hot water tap, the system electronically ignites the burners. You can see the burner flame via flame inspection hole.



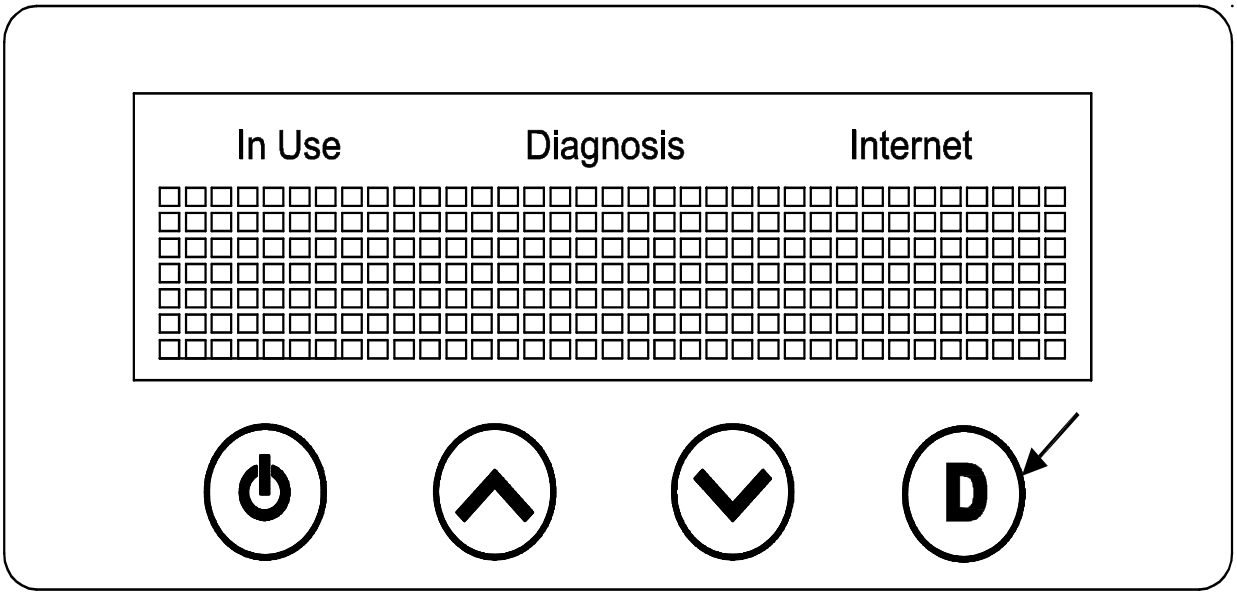
☐ **Clean Out of Condensate Trap:** Over time, blockage of the trap by debris may occur when the condensate cannot be released, causing the unit to go into error and shut down. When this occurs, the condensate trap must be cleaned. Please refer to procedures on page 14.

☐ **Service & Cleaning of the Burner:** Only specially trained and authorized personnel are permitted to service the burner.

"D" Button Diagnostic Function

Applicable Model:
GU125T / 518(11,12)1125
GU160T / 518(11,12)1160

Description:
Enhanced diagnostic functions are now available with the touch of a button. Simply press the “D” button on the front LCD monitor to access features such as: Hot water stored / tank and outlet temperatures, fan motor RPMs, error code history and more!



Press the ″ D ″ Button

Diagnostic Contents	**Example**	**Explanation**
Outlet temperature - Ot	Ot : 134	Outlet temperature is 134˚F
Hot water stored / tank temperature - Ht	Ht : 145	Tank temperature is 145˚F
Fan RPM - Rp	Rp 4500	Fan is spinning at 4500 RPMs
Error Code History - E1~E9	E4	4th error stored in memory
Burn time minutes and secods	10m 14s	Total burn time is 2 hours 10 minutes 14 secnod
Burn time hours - h	2h	
Ignition cycles - T	7T	Total Ignition cycles is 7 times
Main CPU software Version - Ver	Ver : 1	Version of software running on PCB

DIAGNOSTICS

Self Monitoring

This unit has the ability to check its own operation continuously. If an error occurs, a message will flash on the digital monitor of the front panel.

This assists with diagnosing the error, and may enable you to overcome a problem without a service call. Please quote the code displayed when inquiring about service.

Code display	Message	Cause	Remedy
E1	Abnormal flame detected	Remaining flame detected	1. Call service center and replace the main controller
E2	Ignition Failure	Ignition failure - doesn't detect flame signal	1. Check gas line, ignitor, flame rod
			2. Check wire connection of 22p wire and ignitor wire
			3. Check ignition noise
			4. Check gas type and manifold pressure
E3	Lost a Flame	Abnormal combustion - after detection of flame signal, system lose the signal	1. Check the gas supply in enough
			2. Check the gas valve
			3. Check wire connection of 22p wire and ignitor wire
			4. Check gas type and pressure are correct
			5. Check power supply for proper voltage
E4	Outlet Thermistor Open	A Outlet thermistor open	1. Check the Outlet thermistor
			2. Check wire connection of 22p wire and thermistor wire
E5	Outlet Thermistor Short	A Outlet thermistor short	1. Check the Outlet thermistor
			2. Check wire connection of 22p wire and thermistor wire
E6	Hex Thermistor Open	A H/E thermistor open	1. Check the H/E thermistor
			2. Check wire connection of 22p wire and thermistor wire
E7	Hex Thermistor Short	A H/E thermistor short	1. Check the H/E thermistor
			2. Check wire connection of 22p wire and thermistor wire
E11	Motor does not Spin	A DC motor failure	1. Check DC motor
			2. Check wire connection of 22p wire
E28	Gas Valve Power Problem	Power line of main gas valve is open	1. Check the thermostat
			2. Check the air pressure switc
			3. Check wire connection of gas valve, thermostat,
			and air pressure switch
E30	RPM is Too High	Rotation of a DC fan is too high	1. Call service center and replace the DC fan
E31	RPM is Too Low	Rotation of a DC fan is too low	1. Call service center and replace the DC fan
E36	Relay has Problem	A controller failure concerning gas valve	1. Call service center and replace the main controller
E37	Comm Problem with Sub	Communication failure with SUB CPU	1. Call service center and replace the main controller
E38	Sub RAM Failure	Subsidiary RAM failure	1. Call service center and replace the main controller
E39	Sub CPU Hardware Problem	A controller failure concerning Subsidiary flame signal	1. Call service center and replace the main controller
E40	Main RAM Failure	Main RAM failure	1. Call service center and replace the main controller
E41	Different Flame Sign	A controller failure concerning flame signal	1. Call service center and replace the main controller
E42	Main ROM Failure	Main ROM failure	1. Call service center and replace the main controller
E43	Main AD MUX Failure	Main ROM failure	1. Call service center and replace the main controller

NOTE: In all cases, you may be able to clear the Error Message simply by turning the hot water tap OFF, then ON again. If this does not clear the Error Message, try pushing the ON/OFF button OFF, then ON again. If the Error Message still remains, contact our service center or your nearest service agent and arrange for a service call.

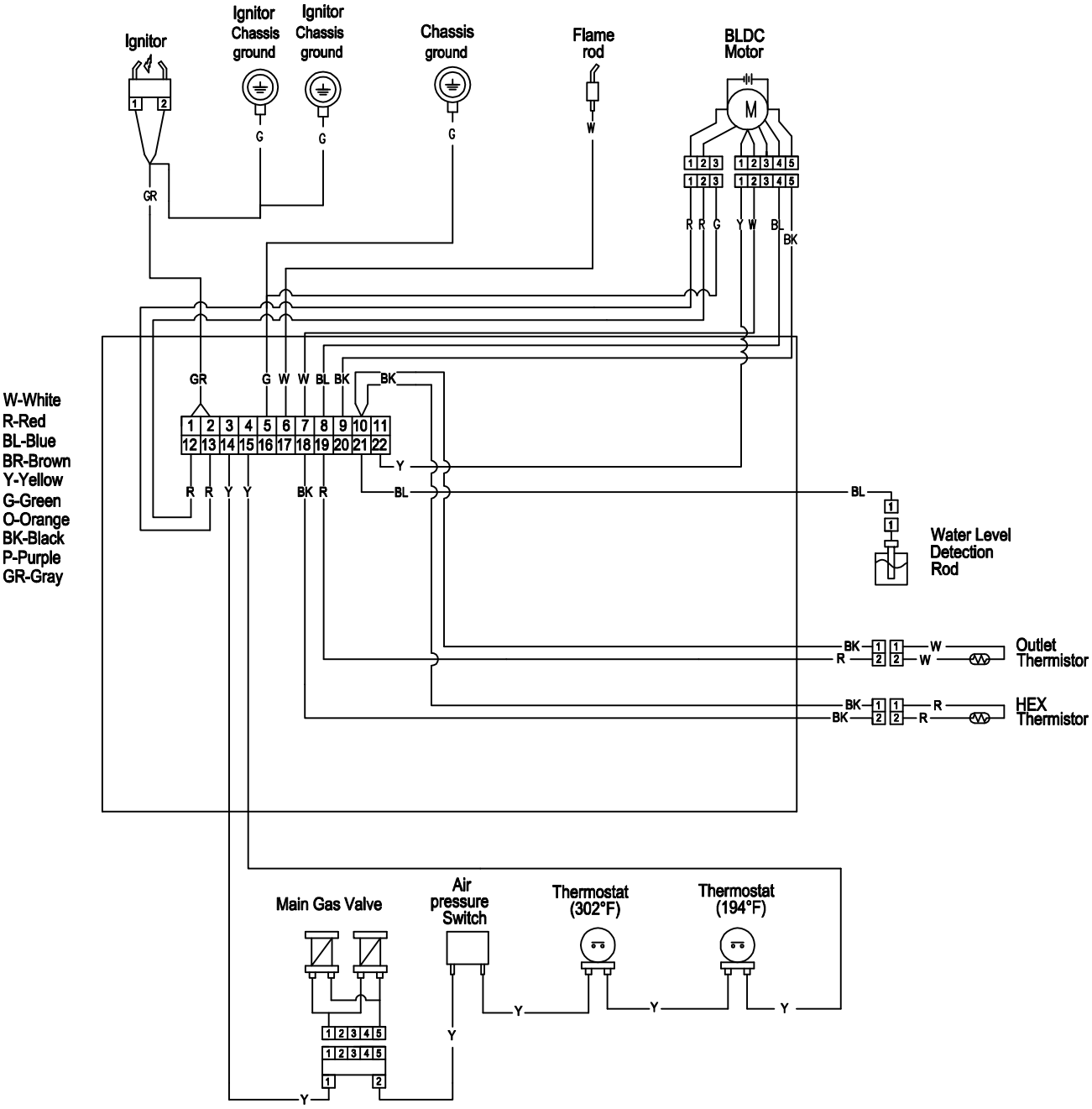
1-866-946-1096

8:00am-4:30pm CST, Monday through Friday

Wiring and Connection Diagram

Wiring Diagram MODEL : GU125T / 518(11,12)1125

GU160T / 518(11,12)1160



Grand Hall Limited Warranty

Product Line
GU125T & GU160T
Note: GU125T/GU160T models are solely for Residential Application* and the warranty is voided if used for any use other than Residential Application*. *See **DEFINITIONS** below.

General Terms of Limited Warranty for Product
Grand Hall will warrant to the purchaser of this gas water heater (the "Product") at the original installed location for Residential Application* that it will be free of defects in material, workmanship and performance when used with Potable Water* and non-Hard Water* and when installed and used in strict compliance with Grand Hall's specifications, for the applicable period shown in Warranty Periods below. *See **DEFINITIONS** below.

Warranty Exclusions
This Product warranty does not apply in the event of Product failure, operating difficulties or damage to the Product due to a failure to follow the instructions in the Installation Operation Manual ("Manual") or as a result of abuse, misuse, Misapplication*, Product modification, faulty ancillary equipment, improper voltage or current, lightning or other acts of God, Non-Residential Application, use of non-Potable Water*, use of Hard Water*, normal wear and tear, Improper Installation*, vandalism, or lack of maintenance or service, severe weather or exposure to chemicals, either directly or in the atmosphere (defined collectively as "Damage"). *See **DEFINITIONS** below.

This warranty only applies to the original installation of the Product by a licensed contractor. This warranty does not apply if the Product is relocated, or re-installed. This warranty does not apply if the Product is purchased over the internet. This warranty does not apply if the Product is used outside of the United States of America.

Damage caused by environmental conditions outside of normal Product specifications such as gas pressure, water quality, piping materials, pump sizing, wind level, and operating noise complaints are not covered by this warranty. See the Manual for additional details.

This Warranty does not apply when the Product is used with recirculation system for hot water on demand is installed unless external aquastat, or timer controls and a thermal expansion tank are installed and properly and properly used.

Exclusive Remedy
Your exclusive remedy under this Warranty is replacement or repair of the Product at Grand Hall's sole option. Replacement Products shall be installed by a licensed contractor and the replacement Product shall carry out the remainder of the warranty from the originally installed Product.

Proof of Purchase
Grand Hall will require reasonable proof of your purchase. Save your dated receipt in case it is required as proof of purchase. You may also show proof of purchase by registering within 30 days of purchasing the product at www.eternalwaterheater.com. Registration constitutes proof of purchase, but registration is not required in order to validate this warranty.

Limitation of Damages
Grand Hall's entire liability under this warranty shall in no event exceed the purchase price for the Product, excluding any charges for installation.

No Consequential or Other Damages
Notwithstanding anything else in this warranty or otherwise, Grand Hall will not be liable with respect to the product under any legal theory, including without limitation contract, negligence, strict liability or other legal or equitable theory (i) for any amount in excess of the purchase price for the defective product, or (ii) for any general, consequential, punitive, incidental or special damages. These include damages from interruption of use, lost profits, the cost of the installation or removal of any products, the cost of installation of replacement products, and any costs of inspection, testing, or redesign caused by any defect, or caused by the repair or replacement of other products arising from a defect in any this product. This section does not limit liability for bodily injury of a person. **In the United States, some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.**

Grand Hall Limited Warranty

Limitation on Implied Warranties

There are no warranties which extend beyond the face of this Grand Hall Limited Warranty. Grand Hall disclaims all other warranties expressed or implied, regarding the Product, including any implied warranties of merchantability, fitness for a particular purpose or non-infringement. **In the United States, some states do not allow the exclusion of the implied warranties so the above exclusion may not apply to you. Some states do not allow limitations on how long an implied warranty lasts, so any such limitation may not apply to you.**

Warranty Periods

Warranty Periods for Heat Exchanger or Tank

The warranty period for the Heat Exchanger or Tank expires upon the first of the following events to occur:1.
1. 7 years from purchase;
2. 12,500 total burner hours*
* No more than 6 hours of daily usage can be exceeded.

Warranty Periods for other Components

Parts Warranty: The maximum term of the limited warranty on parts, other than the Heat Exchanger and Tank, is six (6) years from date of purchase.

Disclaimers

1. **Improper Installation** – Product not installed in accordance with the instructions set forth in the Manual, including but not limited to usage of non-approved materials or plumbing connections, use of dielectric/ galvanized unions, improper venting, failure to follow local codes, or improper gas supply.

2. **Misapplication** – Product installed for any purpose other than supplying sufficient non-Hard, Potable domestic hot water that is delivered through a faucet, or fixture, or failure to conform with the factory performance and installation specifications set forth in the Manual shall be considered Misapplication, including but not limited to: undersized system where Product cannot meet peak demand, disregarding Grand Hall sizing recommendations, power or direct venting with air intake exposed to contaminated environment, solely closed-loop space heating applications, and uncontrolled or improperly sized recirculation that causes excessive run times not in accordance with Product lifecycle specifications.

3. **Residential Application** – Product installed in a single family residence where no more than one family utilizes the installed Product for domestic hot water supply under 140°F.

4. **Hard Water** – Hard Water shall mean any water that contains a water hardness of greater than 15 grains per gallon (250ppm).

5. **Potable Water** – Public utility or well supplied drinkable water in compliance with EPA secondary maximum contaminant levels (40 CFR part 143.3)http://water.epa.gov/drink/contaminants/secondarystandards.cfm

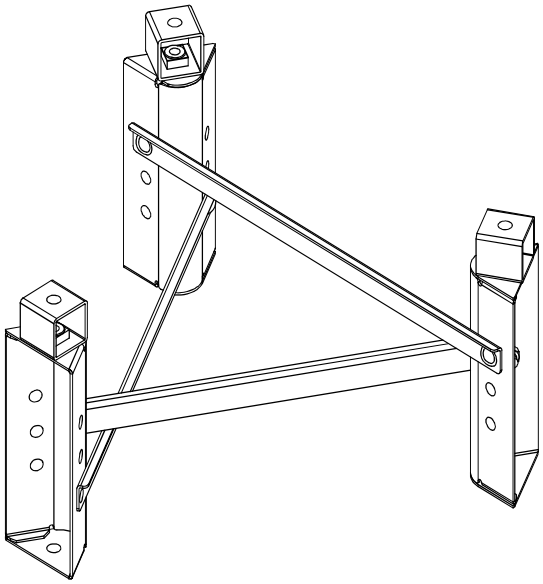
How to Obtain Warranty Service

Please contact your licensed, authorized Eternal contractor to learn how to obtain diagnostics and warranty service for your water heater. You can find authorized contractors at www.eternalwaterheater.com. Simply enter your zip code for a listing of nearby authorized contractors. Be sure to have your model number, serial number and the error code displayed on the front of the unit available for your contractor so that he/she may arrive at your location with the necessary tools and parts to remedy the situation. The contractor may contact our technical support department 24/7 toll-free at **1-866-946-1096** and we will help troubleshoot through the process. The labor and service stated in this section are excluded from this Warranty and Grand Hall has no express or implied duty to provide, pay or subsidize any labor or service performed.

US Contact:
Grand Hall USA, Inc.
3838 W. Miller Rd.,
Garland, TX 75041
Toll-Free: 866-946-1096

Manufacturer:
Grand Hall Enterprise Co., Ltd.
9th Floor, No 298, Rueiguang Rd.
Neihu, Taipei Taiwan (114)

GU125T/GU160T
Stand Assembly/Installation Manual



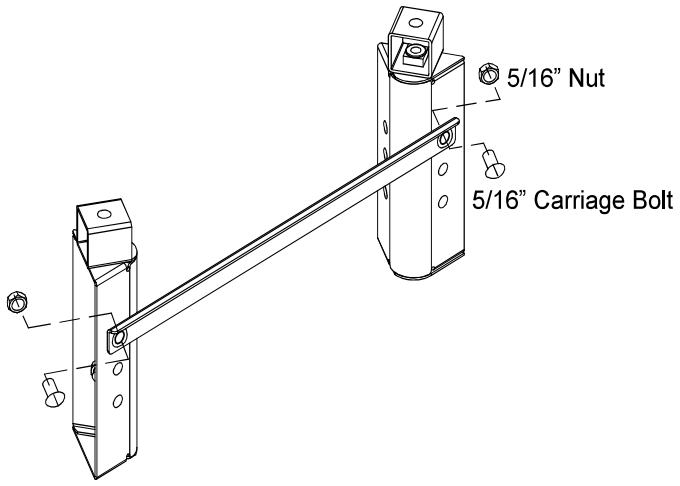
5/16” Carriage Bolt x 6 pcs

5/16” Nut x 6 pcs

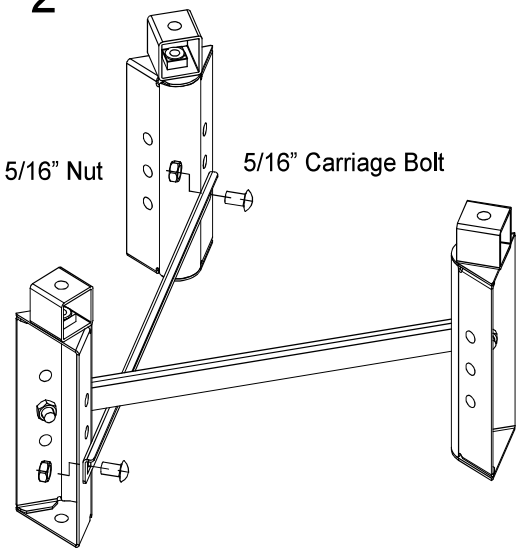
eternal
the world's first hybrid water heater

The stand assembly / installation manual

STEP 1



STEP 2



STEP 3