PENSOTTI® GRANBY®

BOILERS • PANEL RADIATORS • FURNACES

Instruction Manual

Installer: Affix these instructions adjacent to the boiler
Homeowner: Retain these instructions for future reference

PNCC-32N *(Natural Gas)*

PNCC-32P *(LPG)*

Wall mounted combination space heating & DHW boiler

WARNING

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

- **Do not operate this appliance without the front cover properly secured.**
- **Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.**
- **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**
- **Installation and service be performed by a qualified installer, service agency or the gas supplier.**
- **This appliance REQUIRES an annual maintance, service and inspection by a qualified service technician.**
- **Use of a properly calibrated electronic combustion analyzer MUST be used to install and/or service this appliance.**

Approved in accordance with:
ANSI Z21.13b-2010 / CSA 4.9b (2010) Low Pressure Boiler
Manufactured/Distributed by : Granby Furnaces Inc.
12118 Hwy 209, Parrsboro, NS, Canada

ASME

ETL c US Intertek

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1. GENERAL INFORMATION

1.1 General warnings – Installation

Read all safety warnings in the “Instruction Manual”. The additional safety issues outlined below must also be followed completely when installing this Boiler.

Use of a properly calibrated electronic combustion analyzer **MUST** be used when installing, servicing or converting this Boiler from Natural Gas to LP or from LP to Natural Gas.

Failure to remove or maintain the area free of combustible material, gasoline and other flammable liquids or vapors can result in severe personal injury, death or substantial property damage.

All applicable local, state, national and provincial codes, ordinances, regulations and laws must be observed.

For installations in Massachusetts – code requires the units to be installed by a licensed plumbing or gas fitter.

If the hot water boiler is installed above radiation level or as required by the authority having jurisdiction, must be provided with a low water cutoff device at the time of boiler installation.

Where required by the authority having jurisdiction, the installation must conform to the Standard for controls and safety devices for automatically fired boilers, ANSI/ASME CSD1.

If an external electrical source is utilized, the appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Codes ANSI/NFPA 70 and or the CSA C22.1 Canadian Electrical Code.

Follow all local codes and/or the most recent edition of the National Fuel Gas Code (ANSI Z223.1/NFPA 54) in the USA or the Natural Gas and Propane Installation Code in Canada (CAN/CSA B149.1).

This unit is designed for indoor installations. DO NOT operate this unit without the vent piping connected. Exhaust gases must be completely expelled out of the building.

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

Be sure not to reverse the water and gas connections as this may damage the gas valves.

Water temperatures over 125°F can cause severe burns instantly or death from scalding. If the proposed boiler outlet temperature is above 125°F, a thermostatically controlled mixing valve (or a temperature limiting valve) for reducing point of use water temperature is recommended to reduce the risk of scald injury. Contact a licensed plumber or the local plumbing authority for further information.

The appliance should be located in an area where leakage within the unit or at its connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure. PENSOTTI will not be responsible for any damage resulting from leaking if adequate drainage is not provided. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the appliance.

The flow of ventilation to the boiler must not be obstructed. The boiler area must be kept clear and free from combustible materials, gasoline and other flammable vapors and liquids.

If the water quality is known to be highly acidic and/or extremely hard, water treatments (ie water softeners and filtration) are recommended to maintain full warranty. Consult the local water authority.

DO NOT over-tighten fittings, as pipe and/or fitting damage may occur causing leakage.

DO NOT install boiler where subject to vibrations.

For other than a direct vent appliance, the appliance must be located as close as possible to a chimney or gas vent.

Should overheating occur or the gas supply fails to shut off, turn the manual gas control valve to the appliance. Contact a Service Technician immediately.

Clearance must be in accordance with the local installation codes and the requirements of the gas supplier.

Never operate the heater unless it is vented to the outdoors and has adequate air supply to avoid risks of improper operation, fire, explosion or asphyxiation.

DO NOT install this boiler directly on a carpeted floor. A fire hazard may result. The boiler shall be installed on a metal or wood panel extending beyond the full width and depth of the boiler by at least 3 inches (76.2mm) in any direction or, if the boiler is installed in an alcove or closet, the entire floor shall be covered by the panel.

For safe operation, an ample supply of air must be provided for proper combustion and ventilation in accordance with the National Fuel Gas Code ANSI Z223.1/NFPA 54 National Fuel Gas Code CSA/B149.1 Natural Gas and Propane Installation Codes or applicable provisions of the local building codes. An insufficient supply of air may result in a yellow, luminous burner flame, carboning or sooting of the heat exchanger, or create a risk of asphyxiation. Do not obstruct the flow of combustion and ventilation air.

This unit is not intended to operate at gas supply pressures other than those shown on the rating plate. Exposure to higher gas supply pressure may cause damage to gas valves, which can result in fire or explosion. If over-pressure has occurred, such as through improper testing of gas lines or emergency malfunction of the supply system, the gas valves must be checked for safe operation.

A thermostatic mixing valve must be added to this system to prevent scalding, if regulated by local codes and authorities.

Check the Rating Plate

PENSOTTI units come from the factory configured for use with either LP or Natural Gas. Prior to installation, check the rating plate of the boiler to ensure the unit matches gas type, gas pressure, water pressure and electrical supply. If the unit does not match the requirements, do not install.

Be sure the gas type and electricity voltage match the rating plate.

There is a risk in using fuel burning appliances in rooms or areas where gasoline, other flammable liquids or engine-driven equipment or vehicles are stored, operated or are repaired. Flammable vapors are heavy and travel along the floor and may be ignited by the igniter or main burner flames causing fire or explosion. Some local codes permit operation of gas appliances if installed 18 inches or more above the floor. This may reduce the risk if location in such an area cannot be avoided. Flammable items, pressurized containers or any other potential fire hazardous articles must never be placed on or adjacent to the boiler. Open containers of flammable materials should not be stored or used in the same room with the boiler.

Do not install the PENSOTTI boiler in areas with excessive high humidity.

Do not install the unit in location where there is excessive humidity, such as a bathroom, damp crawl space, and other areas with high levels of humidity. This may cause the unit to malfunction.

To avoid possible electrical shock, DO NOT touch the internal components of the boiler or the power cord with wet hands.

DO NOT splash excessive water on the boiler when cleaning, as they are water resistant, not water proof.

Professionally qualified personnel in accordance with current laws and standards and in line with the manufacturer's instructions must install the appliance.

The commissioning of the boiler and any subsequent work carried out on the appliance must be effected by an appropriately qualified technician.

The appliance must be used solely for the purpose for which it has been designed and manufactured: central heating and domestic hot water production. Any other use is deemed as improper and as such dangerous. Under no circumstances will the manufacturer be held responsible for damage or injury to persons or animals caused by errors in the installation and/or use of the appliance, or through non-compliance with current local and national standards and/or the manufacturer's instructions.

The installation, operation and maintenance manual and forms are an integral and essential part of the product and must be kept with the appliance always.

The warnings contained in this chapter have been written for the appliance user, the installer and the service technician.

The “operating instructions” chapter of this manual must be read carefully as it provides information on the operation and the operating limits of the appliance.

After the removal of all the packaging, check that the appliance has not been damaged. In case of doubt, do not attempt to use the product but refer to the supplier. Packing materials (cardboard box, wooden crate, nails, staples, plastic bags, polystyrene, etc.) must not be left within reach of children in that these items represent a potential hazard and must be disposed of in a responsible manner.

Before carrying out any cleaning or maintenance operations, disconnect the appliance from the main electricity supply by switching off at the main switch and/or any other isolating device.

In the case of a fault and/or malfunction in the appliance, shut down the system. Do not interfere with or attempt any repairs. Call for professionally qualified technical assistance only.

Any warranty repairs to the appliance must be carried out exclusively by the manufacturer’s authorized service dealers using original spare parts. Non-compliance with the above requirements may compromise the safety of the appliance and invalidate the warranty. In order to guarantee the efficiency of the appliance and its correct operation, it must be serviced **annualy** by professionally qualified personnel in line with the manufacturer’s instructions.

Only original accessories or optional extras (including electrical parts) must be used with the appliance.

Should there be a smell of gas present in the room where the appliance is installed, **DO NOT** attempt to activate any electric switches, telephones or any other equipment that may cause sparks. Open doors and windows immediately to create a current of air and ventilate the room. Shut-off the main gas supply valve (at the meter), or on the cylinder in the case of bottled gas, and call an authorized service center or the fuel supplier.

Do not attempt to interfere with the appliance in any way.

As dictated by current legislation, this appliance **must be installed exclusively by qualified personnel.** Before starting the boiler for the first time, make sure that it is connected to a water supply and central heating system compatible with its performance characteristics.

Prior to start-up, the central heating pipes should be flushed to remove any residues that could compromise the operation of the appliance. A FERNOX commisioning kit is supplied with the boiler for this purpose.

The appliance must be connected to a designated electrical circuit only.

The power supply must be checked by a qualified electrician to ensure that it can support the maximum power absorption of the appliance, as indicated on the appliance rating plate (positioned on the casing). In particular, make sure that the cable ratings are adequate for the power absorbed.

Do not use adapters; multiple sockets or extension leads to connect the appliance to the power supply.

The appliance must be connected to the mains power supply through an appropriate electrical isolator in accordance with the current wiring regulations.

If the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified technician.

When the appliance is no longer required for use, switch off the main power supply, to switch all electrical components off (circulating pump, burner etc.).

The thermostats are adjusted at their minimum lowest temperature positions when shipped from the factory.

Caution: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

*Pressures in excess of 14”WC may damage the internal components of this boiler. Pensotti **REQUIRES** replacment of the gas valve if it is subjected to pressures in excess of 14”WC. Faliure to comply could cause dangerous operating conditions, fire, explosion, bodily injury or possible death.*

Follow all local codes and/or the most recent edition of the National Fuel Gas Code (ANSI Z223.1/NFPA 54) in the USA or the Natural Gas and Propane Installation Code in Canada (CAN/CSA B149.1).

The installation and use of flexable appliance connectors is prohibited.

Important: Carbon Monoxide Detectors

Many jurisdictions require the installation of carbon monoxide detectors in building where a side wall vented fuel burning appliance is installed. Installers must abide by local code requirements regarding the installation of CO detectors. The use of a certified carbon monoxide detector is recommended but not required by PENSOTTI.

"In the State of Massachusetts only"

(a)For all horizontally vented gas fuelled equipment installed in every dwelling, building or structure used in whole or in part for residential purposes, including those owned and operated by the Commonwealth and where the side wall exhaust vent termination 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 shall be satisfied:

1. INSTALLATION OF CARBON MONOXIDE DETECTORS. At the time of installation of the side wall horizontal vented gas fuelled equipment, the installing plumber or gas fitter shall 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 and on each additional level of the dwelling, building or structure served by the equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard wired carbon monoxide detectors.

    a. 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.

    b. In the event that the requirements of this subdivision cannot be met at the time of completion of installation, the owner shall have a period of 30 days to comply with the above requirements; provided, however, that during said 30 day period a battery operated carbon monoxide detector with alarm shall be installed.

2. APPROVED CARBON MONOXIDE DETECTORS. Each carbon monoxide detector as required in accordance with the above provisions shall comply with NFPA 720 and be ANSI/UL 2034 listed and IAS certified.

3. SIGNAGE. A metal or plastic identification plate shall 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 fuelled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) inch in size, **"GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS".**

4. INSPECTION. The state or local gas inspector of the side wall horizontally vented gas fuelled equipment shall not approve the installation 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.

FOR YOUR SAFETY READ BEFORE OPERATING

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

A. This appliance does not have a pilot. It is equipped with a direct ignition device, which automatically lights the burner. Do not try to light the burner by hand.

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

C. Use only your hand to operate the remote control keypad. Never use tools. If the remote keypad doesn't work, do not try to repair it, call a qualified service technician. Forced or improper repair may result in a fire or explosion.

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

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.

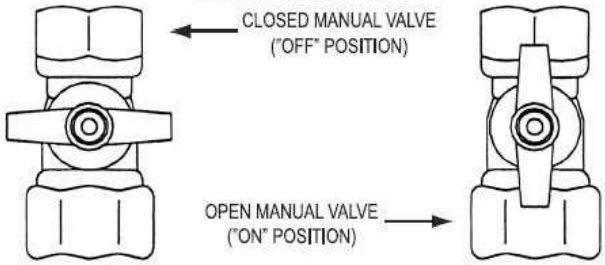
OPERATING INSTRUCTIONS

1. STOP! Read the safety information above before proceeding.
2. Set the thermostat to the lowest setting.
3. Turn off all power to the electrical appliance.
4. This appliance does not have a pilot. It is equipped with a direct ignition device, which automatically lights the burner. Do not try to light the burner by hand.
5. Turn the manual valve located at the gas inlet of the appliance clockwise to "OFF"
6. Wait (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to next step.
7. Turn the manual valve located at the gas inlet of appliance counterclockwise to "ON" (see Figure 47).
8. Turn on all electric power to the appliance.
9. Set the thermostat to desired setting.
10. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

TO TURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to the lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Turn the manual valve at gas inlet of appliance clockwise to "OFF" (see figure 47).

Manual Gas Valve



⚠ WARNING

FIRE AND EXPLOSION HAZARD

Can result in serious injury or death

⚠ Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Storage of or use of gasoline or other inflammable vapors or liquids in the vicinity of this or any other appliance can result in serious injury or death.

Vapors from flammable liquids can 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 this appliance, or any other appliance or any possible ignition source.

Keep flammable products:

1. far from any possible ignition source,
2. in approved containers
3. tightly closed and
4. out of children's reach

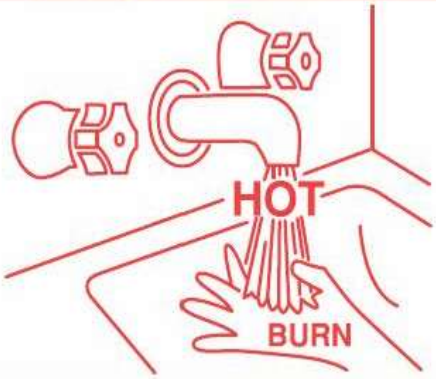
Vapors:

1. cannot be seen,
2. are heavier than air
3. go a long way on the floor
4. can be carried away from other rooms to possible ignition sources by air currents

Water heaters in residential garages must be installed and located, or protected, to avoid physical damage.

Read and follow water heater warnings and instructions. If owner's manual is missing contact the distributor or manufacturer.

⚠ DANGER



The temperature at which injury occurs varies with the person's age and time of exposure.

The slower response time of disabled persons increases the hazards to them. Never allow small children to use a hot water tap, or to draw their own bath water. Never leave a child or disabled person unattended in a bathtub or shower.

The water heater should be located in an area where the general public does not have access to the temperature control.

Lower water temperatures should be used to avoid the risk of scalding. It is further recommended, in all cases, that the water temperature be set for the lowest temperature which satisfies the user's hot water needs. This will also provide the most energy efficient operation of the water heater and minimize scale formation in the heat exchanger, thus prolonging the life of the unit.

Setting the water heater temperature at 120°F will reduce the risk of scalds. Some states require settings at specific lower temperatures. The table below shows the approximate time-to-burn relationship for normal adult skin.

Hot water temperatures required for automatic dishwasher and laundry use can cause scalds and burns resulting in serious personal injury and/or death.

Table - Risk of Scalds

Temperature Setting	Time to Produce, 2nd, 3rd Degree Burns on Adult Skin
Over 170 °F	Nearly instantaneous
160 °F	About 1/2 second
150 °F	About 1-1/2 seconds
140 °F	Less than 5 seconds
130 °F	About 30 seconds
120 °F or less	More than 5 minutes

To protect against injury, you should install a tempering valve in the water system. This valve will reduce point of discharge temperature by mixing cold and hot water in branch supply lines. Such valves are available from the local plumbing supplier.

WARNING

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

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

-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 neighbour's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

-Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Minimum clearances from combustible construction, 0-inches sides, 0-inches back, 0-inches top.

For closet installation, 0-inches front, or for alcove installation.

This water heater is provided with a pressure relief valve. For safe operation of the water heater, the relief valve(s) must not be removed from its designated point of installation or unplugged.

The temperature and pressure relief valve provided by the manufacturer shall be installed at the time of installation of the heater in the location specified by the manufacturer. Local codes shall govern installation of relief devices. For safe operation of the water heater, the relief valve must not be removed or unplugged.

"Warning"

"This appliance must be installed in accordance with the local codes or, in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the CSA B149.1, Natural Gas and Propane Installation Code".

SUITABLE FOR WATER (POTABLE) HEATING AND SPACE HEATING

Toxic chemicals, such as used for boiler treatment, shall not be introduced into potable water heater used for space heating. This water heater may never be connected to any existing heating system or component(s) previously used with a non potable water heating appliance.

"For operation at outlet water temperatures not in excess of 180^{0}F (88^{0}C)"

1.2 Product conformity

All **Granby/Pensotti LLC** boilers are **ETL** certified and possess technical and functional characteristics that comply with the following standards:

Gas fired Low Pressure Hot Water Boiler:

American National Standard/CSA Standard for Gas Fired Low Pressure Steam and Hot Water Boiler. Certifies to ANSI STD Z21.13b, certified to CSA STD 4.9b.

ASME Pressure vessel:

The boiler includes a pressure vessel that is constructed in accordance with ASME and bears the H stamp.

The materials used such as copper, brass, stainless steel, etc. form a compact, uniform, highly functional unit that is easy to install and simple to operate. In its simplicity, the wall-mounted appliance is equipped with all the appropriate accessories required to make it a fully independent boiler capable of satisfying domestic hot water production and central heating needs. This manual must be kept in a safe place and must **accompany the boiler at all times.**

Granby/Pensotti LLC will not be held responsible for any misinterpretation of this manual resulting from the inaccurate translation of same.

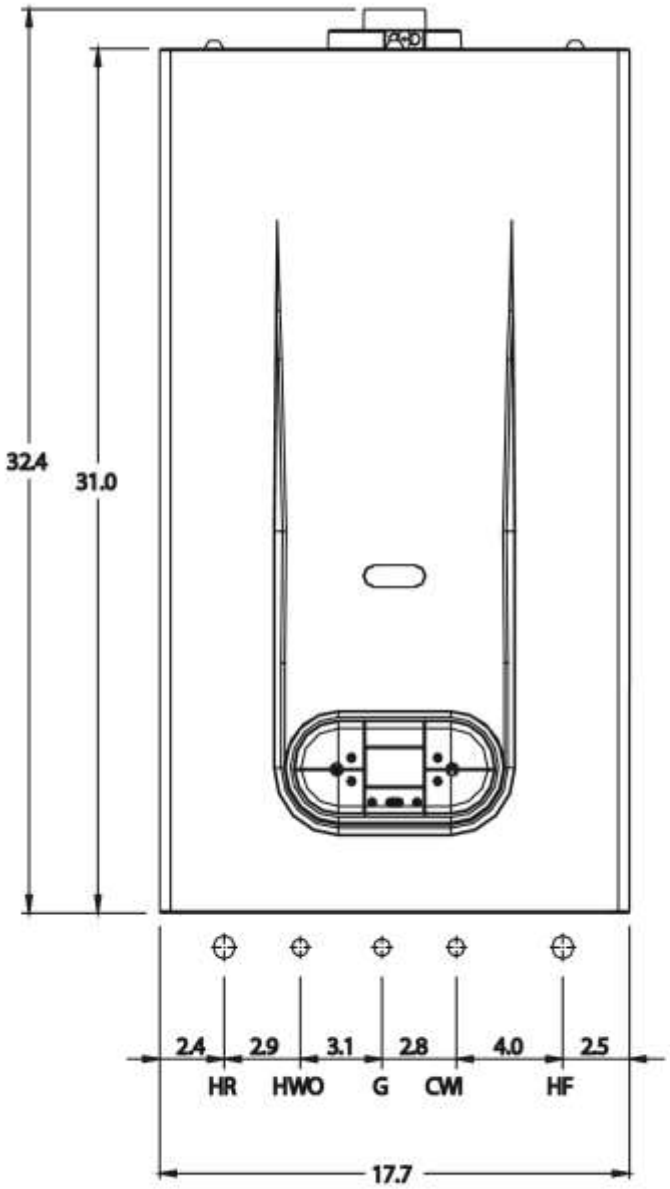
Granby/Pensotti LLC will not be held responsible for the consequences in the case of non-observance of the instructions contained in this manual or in the case where actions not specifically described herein are undertaken.

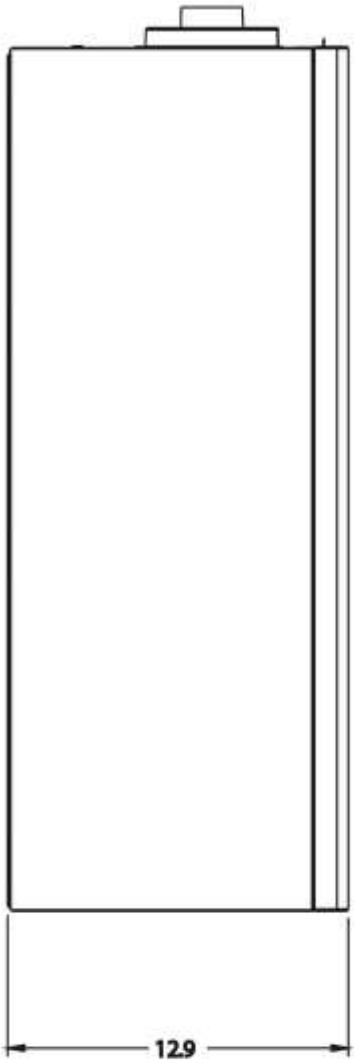
2. TECHNICAL CHARACTERISTICS

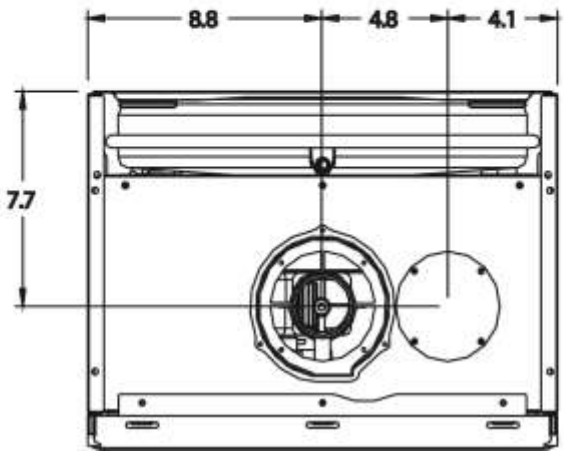
2.1 Technical data

Model		**PNCC-32**
Appliance Type		II2H3+
Appliance Category		C12 - C32 - C42 - C52 - C62 - C82
Heat Input max	BTU/hr NG/LP	110,000 / 100,000
Heat Input min	BTU/hr NG/LP	68,000 / 68,000
Heat Output max	BTU/hr NG/LP	92,400 / 84,000
Heat Output min	BTU/hr NG/LP	57,000 / 57,000
CO_2 value at full load	%	7,5 - 8,5
CO_2 value at minimum load	%	4,4 - 5,4
AFUE	%	84
Central Heating circuit		
Central Heating water temperature setting (min-max)	°F	95-185 / 77-113
Max. heating working temperature	°F	203
Expansion vessel capacity	gal	2.1
Max. working pressure (heating)	psi	30
Min. working pressure (heating)	psi	5
Domestic Hot Water circuit		
D.H.W. capacity @ 63°F temperature rise	gpm	3.1
D.H.W. temperature setting (min-max)	°F	95-167
Max. Hot water working pressure	psi	87
Min. Hot water working pressure	psi	7.2
Dimensions (Boiler casing size)		
Width	in	17.7
Height	in	31
Depth	in	12.9
Weight (net)	lbs	98
Hydraulic connections		
Central Heating Flow connection	Soldier	¾”
Central heating Return connection	Soldier	¾”
D.H.W. Cold Water Inlet	Soldier	½”
D.H.W. Hot Water Outlet	Soldier	½”
Gas connection	NPT	¾”
Flue systems		
Horizontal-Concentric flue system	Ø in	3/5
Max. Flue length	ft	16.4
2 pipes non concentric flue system (flue and air intake)	Ø in	3/3
Max. Flue length (from terminal to terminal – 2 pipes)	ft	72.1
Gas Supply		
Natural gas G 20 – GAS A		
Inlet pressure	“wc	6.0 min – 9.0 max
Propane G31 – GAS E		
Inlet pressure	“wc	11.0 min – 14.0 max
Electrical specifications		
Power supply	V/Hz	120/60
Electrical power consumption	W	220
Electrical protection	IP	X4D

2.2 Dimensions



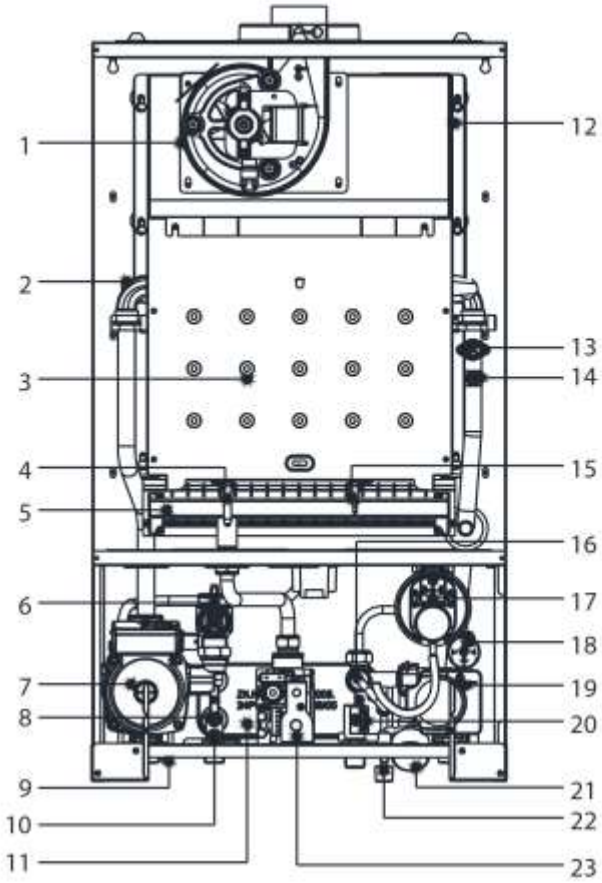




LEGEND

HR	HEATING RETURN	Ø3/4"
HF	HEATING FLOW	Ø3/4"
HWO	HOT WATER OUTLET	Ø 1/2"
CWI	COLD WATER INLET	Ø1/2"
G	GAS	Ø3/4"

2.3 Internal parts of the boiler



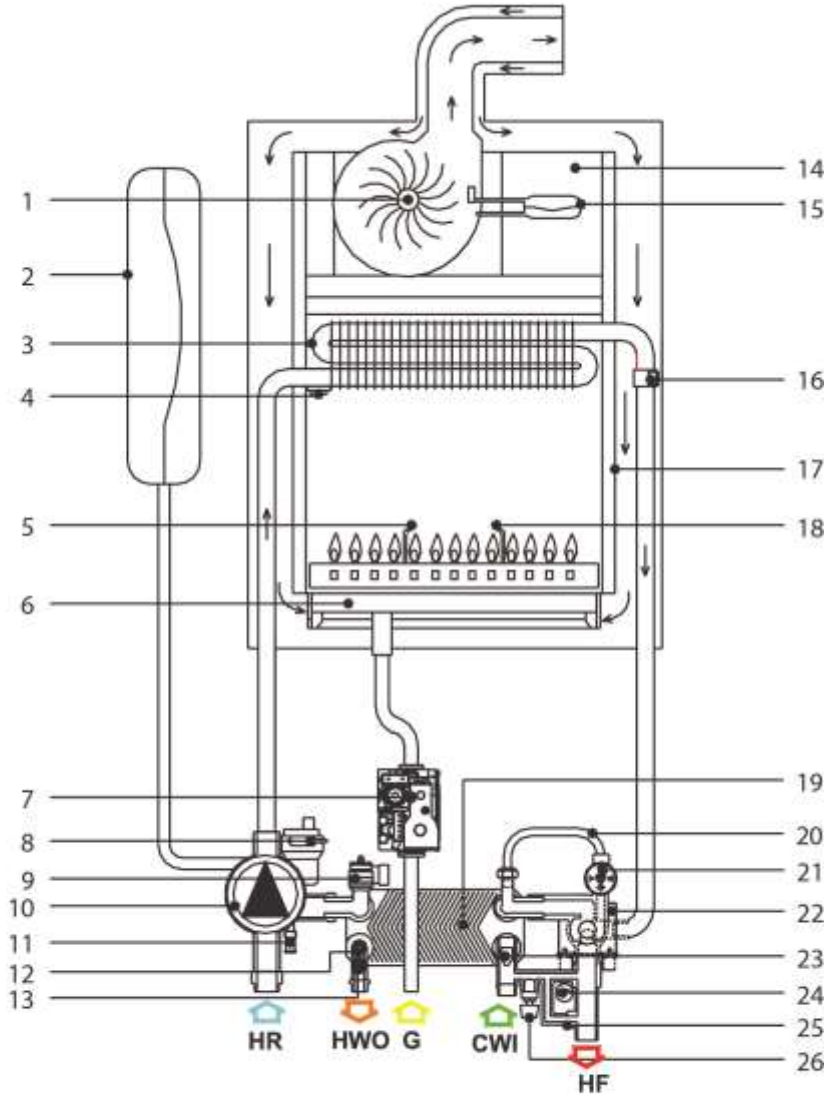
LEGEND

1. FAN
2. HEAT EXCHANGER
3. COMBUSTION CHAMBER
4. IGNITION ELECTROCODE
5. BURNER
6. SAFETY VALVE 30 PSI
7. PUMP
8. D.H.W. SENSOR
9. SISTEM DRAIN VALVE
10. FLOW LIMITER
11. FLAT PLATE TYPE EXCHANGER
12. FLUE HOOD
13. SAFETY THERMOSTAT
14. HEATING SENSOR
15. IONISTATION ELECTROCODE
16. NO-RETURN VALVE
17. AIR PRESSURE SWITCH
18. WATER PRESSURE SWITCH
19. DIVERTER VALVE
20. FLOWSWITCH
21. WATER PRESSURE GAUGE
22. FILLING TAP
23. ELECTRONIC GAS VALVE

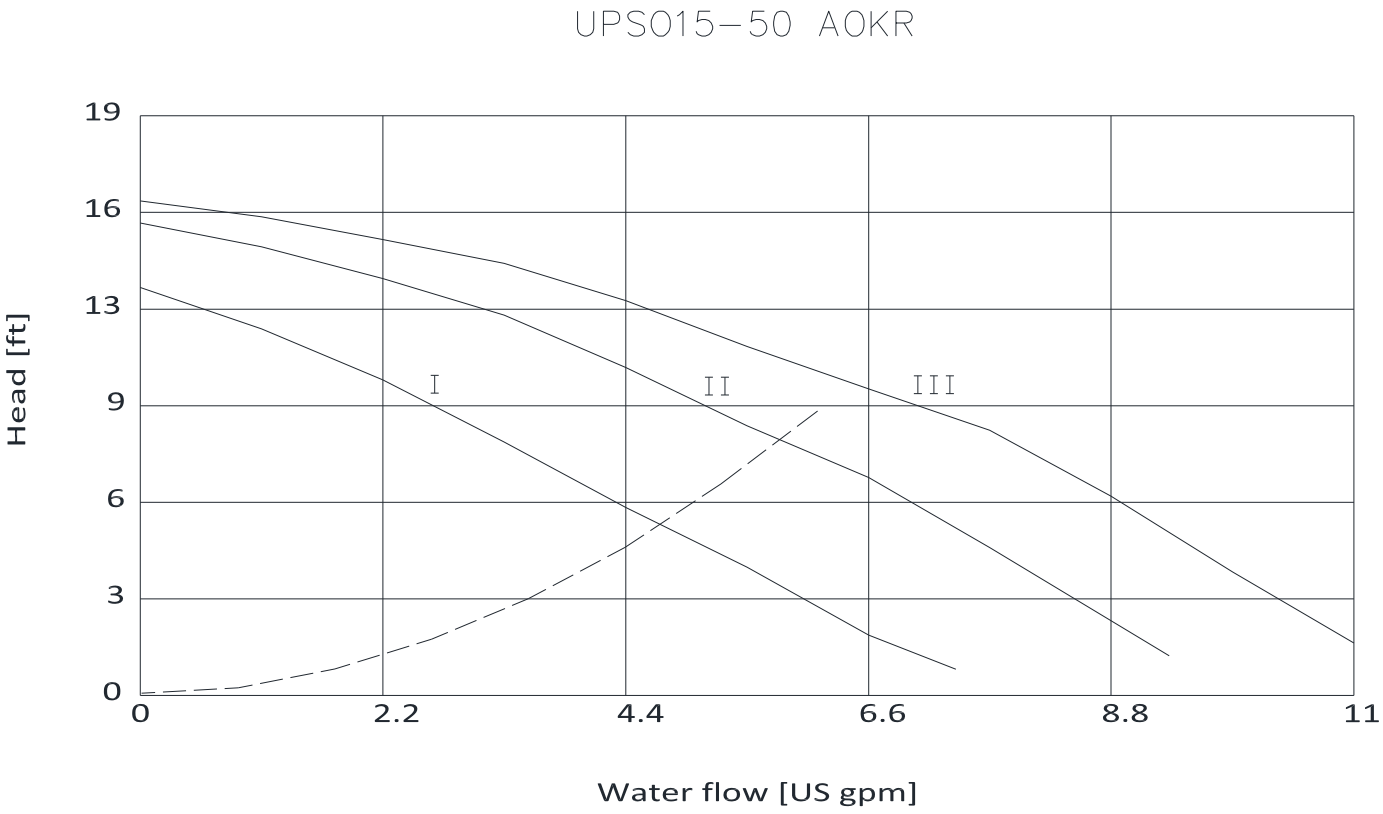
2.5 Water circuit

LEGEND

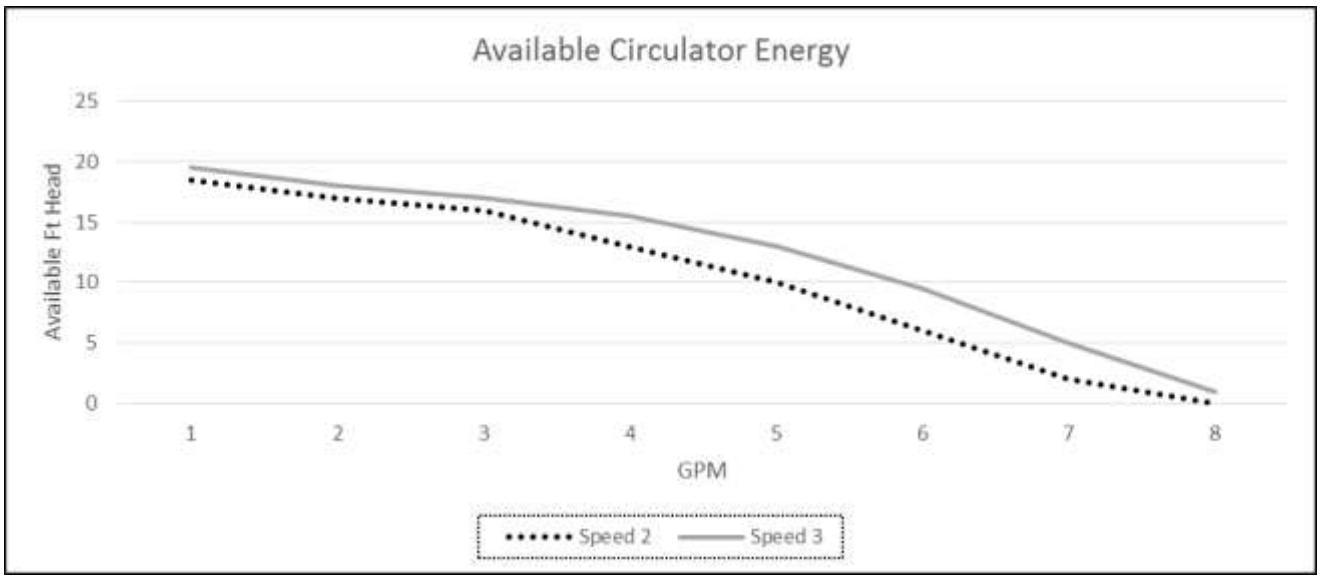
1. FAN
2. EXPANSION VESSEL
3. HEAT EXCHANGER
4. SAFETY THERMOSTAT 90 °C
5. IGNITION ELECTROCODE
6. BURNER
7. ELECTRONIC GAS VALVE
8. AIR VENT VALVE
9. SAFETY VALVE 30 PSI
10. PUMP
11. SISTEM DRAIN VALVE
12. D.H.W. SENSOR
13. FLOW LIMITER
14. FLUE HOOD
15. AIR PRESSURE SWITCH
16. HEATING SENSOR
17. COMBUSTION CHAMBER
18. IONISTATION ELECTROCODE
19. FLAT PLATE TYPE EXCHANGER
20. BY-PASS
21. WATER PRESSURE SWITCH
22. 3-WAY DIVERTER VALVE
23. FLOWSWITCH
24. WATER PRESSURE GAUGE
25. NO-RETURN VALVE
26. FILLING TAP



2.5 Circulation pump head/flow graph



– – – Appliance losses
I - pump speed
II - pump speed
III - pump speed



2.6 DIGITECH®TR Printed Circuit Board (MIAH403)

Technical characteristics

Adjustments for service personnel only

- Standard (95-185°F) / reduced (77-113°F) central heating temperature
- Water hammer delay function
- Central Heating timer - (adjustable from 0 to 7.5 minutes)
- Central Heating pump overrun timer
- Domestic Hot Water pump overrun timer
- Minimum Gas pressure setting
- Maximum Heating Load
- Heating output rising time
- Central heating maximum and minimum Set Point adjustment
- Domestic Hot Water maximum Set Point Adjustment

User settings

- Heating Temperature setting (95-185°F) – (77-113°F)
- D.H.W. temperature setting (95-167°F)
- Summer only mode / Winter only mode / Summer + Winter mode selection

Operation/Functions display

- Lock-Out
- Water low pressure
- Temperature display
- Flame presence ON (3 power steps)
- Error History display (last 5 errors)

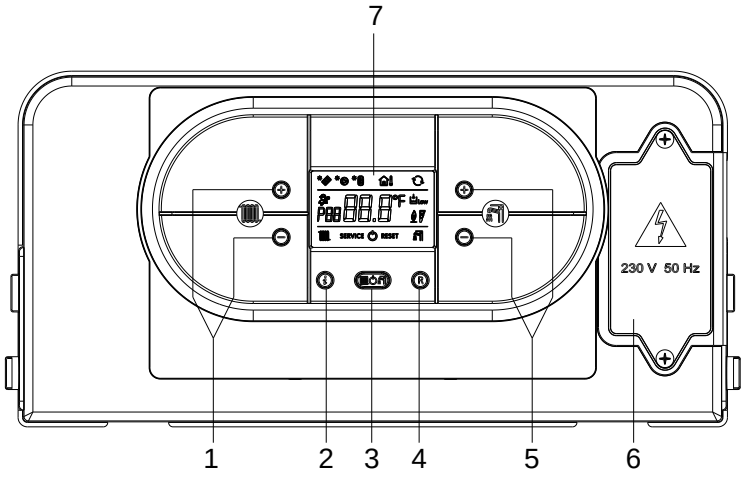
➔ ***To switch the boiler OFF, press INFO button, the symbol appears on the display. The central heating frost protection system, the circulating pump inactivity protection and 3-way valve inactivity protection functions remain enabled.***

➔ ***If the boiler was previously ON, it is switched OFF and the fan overrun and pump overrun functions are enabled.***

2.7 Control panel

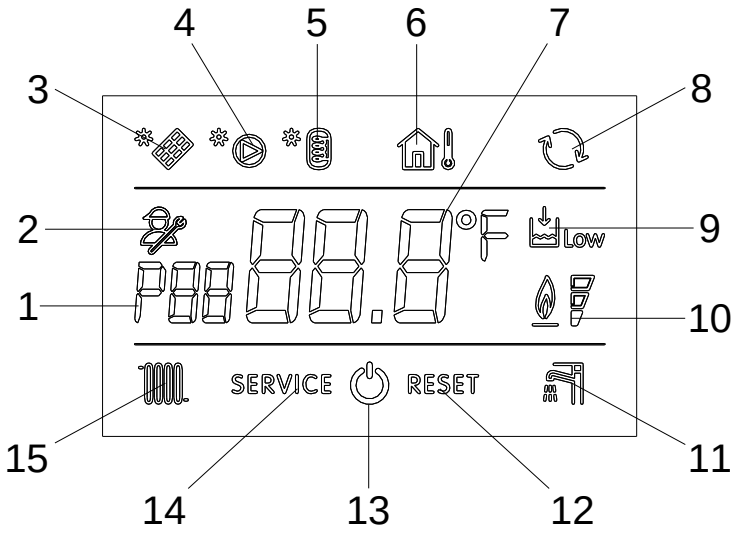
Control panel Key

1. **HEATING TEMPERATURE SETTING BUTTONS**
2. **INFO BUTTON:** PRESS ONCE TO DISPLAY TEMPERATURES AND INFO (see 2.8 INFO menu display). KEEP INFO BUTTON PRESSED FOR 5 SECONDS (in OFF MODE) TO DISPLAY THE LAST 5 ERRORS.
3. **MODE SELECTION BUTTON** DHW ONLY / HEAT ONLY / HEAT & DHW / OFF.
4. **RESET BUTTON:** ERROR RESET – FLUE TEST FUNCTION ACTIVATION (CHIMNEY-SWEEPER - KEEP IT PRESSED FOR 7 SECONDS).
5. **DOMESTIC HOT WATER TEMPERATURE SETTING BUTTONS.** KEEP BUTTONS '+' AND '-'PRESSED FOR 5 SECONDS TO ACTIVATE THE DISPLAY BACKLIT MODE FOR A CONTINUOUS PERIOD OF 10 MINUTES.
6. TERMINAL BLOCK FOR EXTERNAL WIRING.
7. LCD DISPLAY.

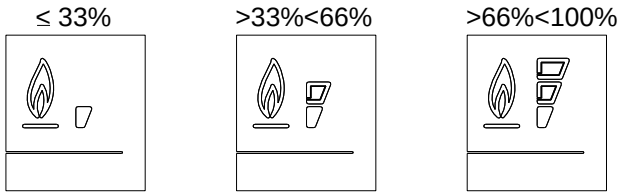


LCD DISPLAY ICONS' KEY

1. PARAMETER NUMBER INFORMATION
2. PARAMETERS PROGRAMMING MODE ON
3. SOLAR PCB CONNECTION INFORMATION / SOLAR PANEL TEMPERATURE DISPLAY (d6)
4. SOLAR PUMP ON
5. SOLAR STORAGE CYLINDER LOW LEVEL TEMPERATURE VISUALIZATION (d7) / STORAGE CYLINDER HIGH LEVEL TEMPERATURE VISUALIZATION (d8)
6. OUTDOOR TEMPERATURE SENSOR CONNECTED
7. TEMPERATURE / SET POINT / PARAMETER VALUE INFORMATION
8. OPEN THERM COMPONENTS COMMUNICATION CONNECTED (REMOTE CONTROL / ZONE MANAGEMENT CONTROL BOX)
9. WATER LOW PRESSURE INFORMATION
10. (*) FLAME PRESENCE ON (3 POWER STEPS)
11. D.H.W. MODE ENABLED
12. RESETTABLE ERROR DISPLAY
13. OFF MODE
14. NOT RESETTABLE ERROR DISPLAY
15. HEATING MODE ENABLED



10 (*) - During the boiler operation the display can show 3 different power levels according to the flame modulation of the boiler. (See flame icon/power % images)



2.8 INFO Menu display

Press the ' ⓘ ' INFO Button to display the boiler data. Once pressed, the parameter number will appear on the left side of the display and the associated parameter value will appear on the centre of the display. Use ' ⊕ ' and ' ⊖ ' buttons of Heating Temperature setting to scroll the list of available data.

Press the ' ⓘ ' INFO button to exit the display mode.

The list of available display data is the following:

Parameter	Icon	Description
d00		DHW sensor temperature
d01		Outdoor sensor temperature (only with sensor temperature connected)
d02		Fan speed
d03		Low temperature circuit sensor (only with Zone PCB connected)
d04		Heating return sensor temperature (only with modulating pump connected)
d05		Solar panel sensor temperature (only with Solar PCB connected)
d06		Solar storage cylinder temperature (low level) (only with Solar PCB connected)
d07		Solar storage cylinder temperature (high level) (only with Solar PCB connected)
d08		Solar panel sensor temperature 2 [only with Solar PCB connected] (SCS2)
d09		Extra Solar storage cylinder temperature [only with Solar PCB connected] (SBS3)

3. INSTALLATION (authorized personnel)

3.1 Reference standard

Install in accordance with local building and electrical codes.

Failure to install a gas appliance correctly and in accordance with the above codes could lead to prosecution. It is in the best interest of the installer and for safety reasons that all applicable codes are complied with.

The manufacturer's instructions form an integral part of the installation and should be left with the appliance but do not override in anyway statutory obligations.

Installation requirements

Please refer to local and national standards.

3.2 Unpacking

- **The materials (cardboard) used for packing the appliance are fully recyclable.**
- **It is recommended that the packing material is only removed prior to installing the boiler. The manufacturer will not be held responsible for damage caused by incorrect storage of the product.**
- **Packing materials (plastic bags, polystyrene, nails, etc.) must not be left within reach of children, in that these items represent a potential hazard.**

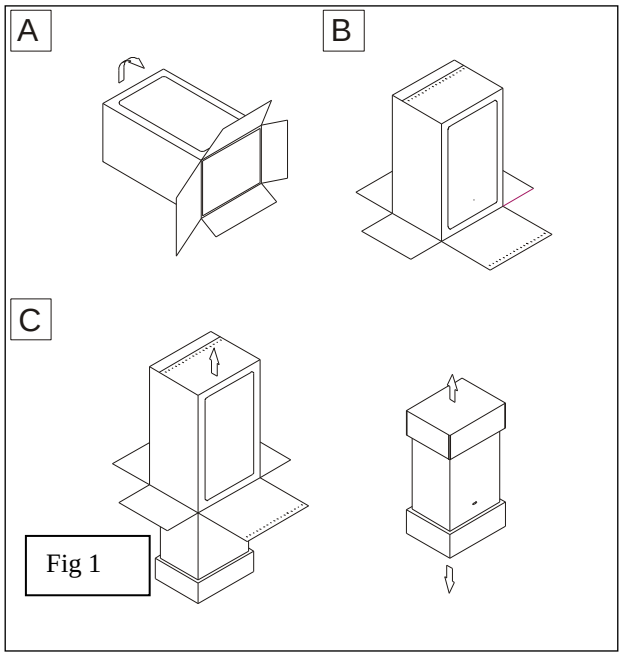


Fig 1

A. Place the packed appliance on the floor (see fig. 1) Remove the staples and open the four flaps of the box.

B. Rotate the boiler 90° while supporting it from underneath

C. Lift the box and remove the packing material. Lift the boiler by grasping it from the back part and proceed with the installation.

D. Boiler package includes:

- Boiler
- Hydronic Valve Kit
- Outdoor Reset Sensor
- Mounting Bracket

(Be sure to secure all of these items before discarding any packing material)

STORAGE & HANDLING
Please note that prior to installation the Pensotti LLC boilers should be stored in the horizontal position with no more than three boilers to a stack;
Ensure that the boilers are stored in dry conditions and be aware that the carton is a two-man lift;

3.3 Installing the boiler

⚠ The appliance must be installed exclusively on a plumb, vertical solid wall capable of supporting its weight.

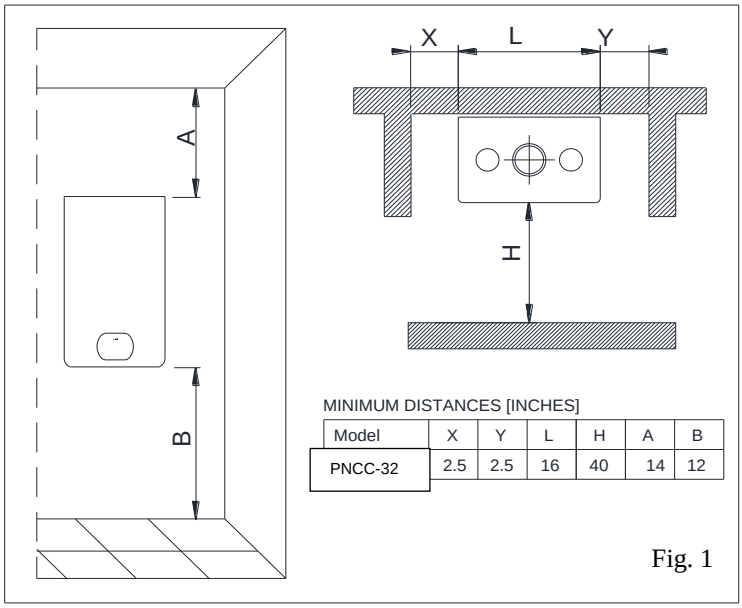
- The boiler should be fitted within the building unless otherwise protected by a suitable heated enclosure i.e. garage or outhouse. (The boiler may be fitted inside a cupboard)
- It is recommended to always leave the ON/OFF switch always in ON position to give frost protection.
- If the boiler is installed in a room containing a bath or shower reference must be made to the relevant requirements.
- Appliance is approved for installation on combustible walls.

In order to allow access to the interior of the boiler for maintenance purposes, it is important that the minimum distances indicated in figure 1 are respected. To make the installation easier, the boiler is supplied with a template to enable the pipe connections to be positioned prior to fixing the appliance to the wall.

To install the appliance, proceed as follows (see fig. 2):

a. Use a level (of not less than 24" long) to mark a horizontal line on the wall where the appliance is to be fitted.
b. Position the top of the template along the line drawn with the level, respecting the distances indicated. Then mark the center position of the two wall screws or anchors. Finally, mark the positions of the water and gas pipes. Position the boiler with consideration of the venting requirements.
c. Remove the template and install the domestic hot and cold water pipes, the gas supply pipe and the central heating pipes using the fittings supplied with the unit.

Fix the boiler to the wall using the bracket and connect the pipes.



MINIMUM DISTANCES [INCHES]

Model	X	Y	L	H	A	B
PNCC-32	2.5	2.5	16	40	14	12

Fig. 1

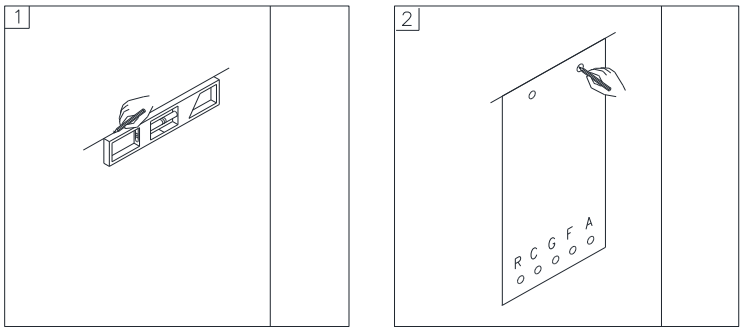
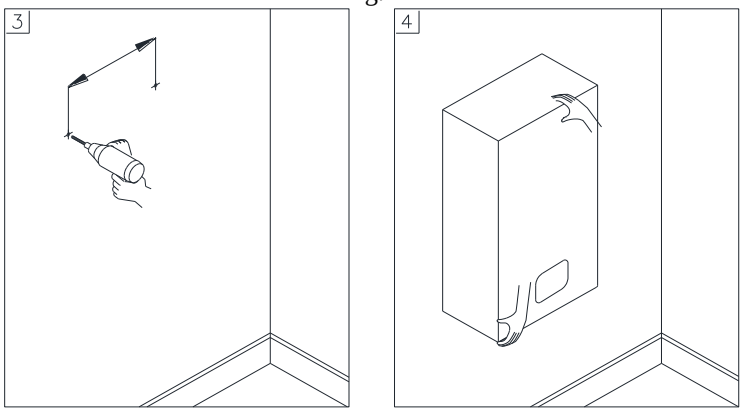


Fig. 2



3.4 Water connections

⚠ **In order to safeguard the heat exchanger and circulation pump, especially in case of appliance replacement, it is recommended that the system is hot-flushed to remove any impurities (especially oil and grease) from the pipes and radiators.**

⚠ **In order to safeguard all waterside components the supplied Fernox Commissioning Kit MUST be used in its entirety.**

⚠ **Make sure that the domestic water and central heating pipes are not used to earth the electrical system. The pipes are totally unsuitable for this purpose.**

⚠ **Isolation Valves must be installed on the heating and D.H.W circuits. This will facilitate all maintenance and service operations when the appliance needs to be drained.**

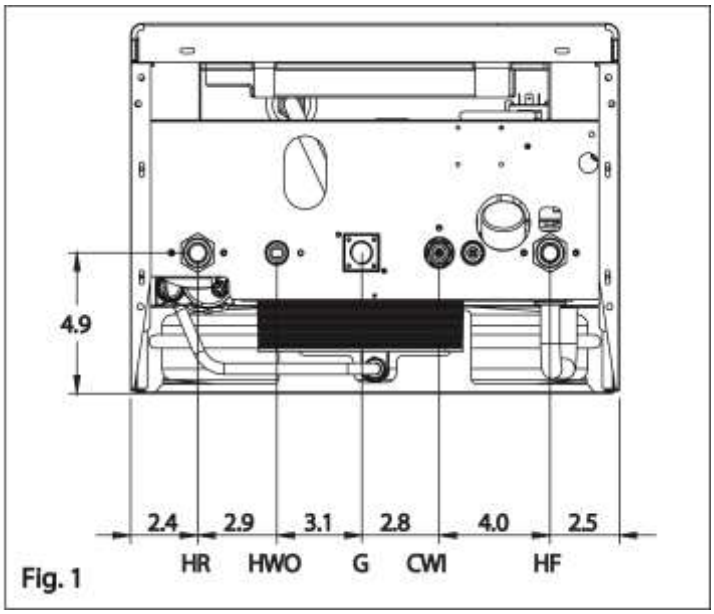


Fig. 1

- To prevent vibration and noise coming from the system, do not use pipes of reduced diameter, short radius elbows or severe reductions in the cross sections of the water passages.
- In order to guarantee the reliability of the boiler a pressure reducing valve and backflow preventer must be installed.
- To facilitate the installation, the boiler is supplied with a hydraulic connection kit (see fig.2).

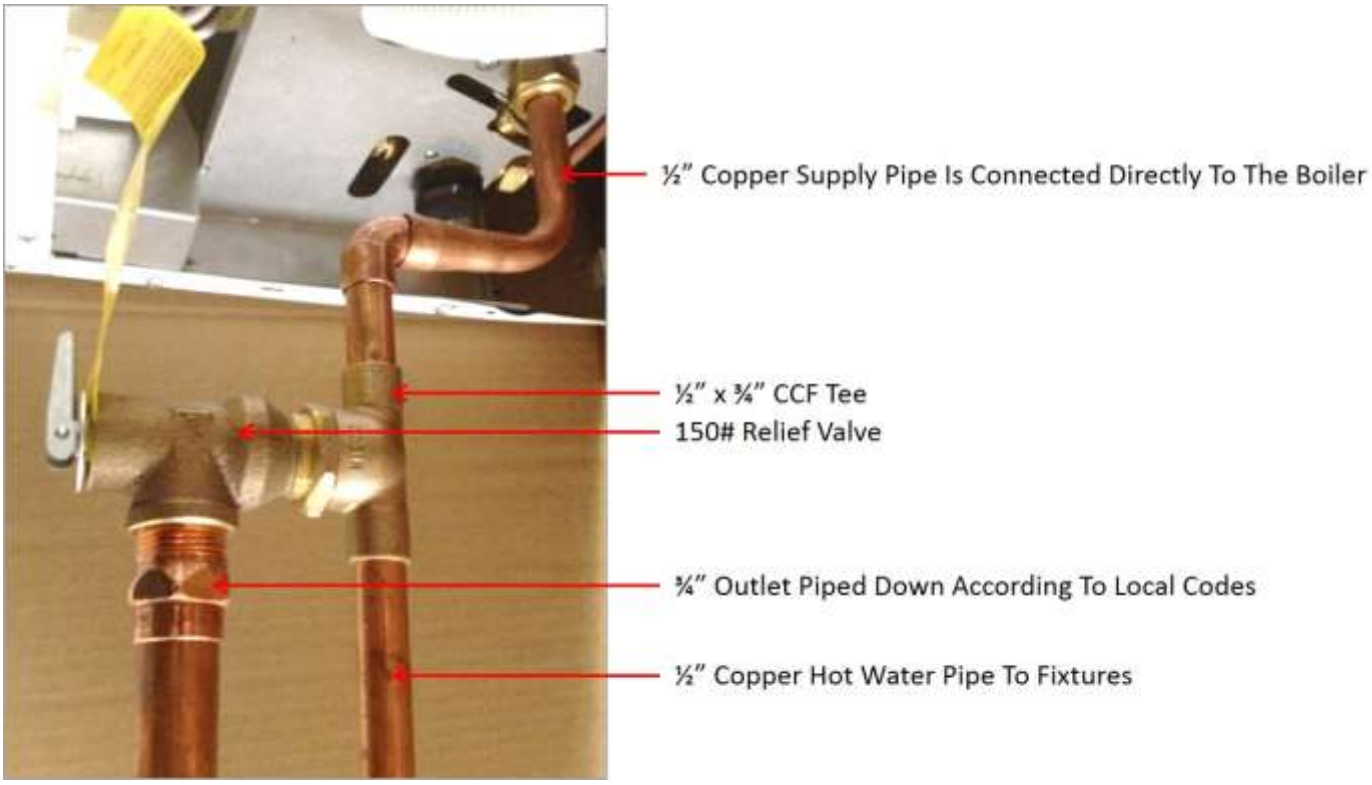
A pressure relief valve is installed in this dual purpose boiler that is rated in accordance with and complying with either The Standard for relief Valves and Automatic Shutoff Devices for Hot Water Supply Systems, AINSI Z21.22 or The ANSI/ASME Boiler and Pressure Vessel Code, Section IV (Heating Boilers).The relief valve must be installed such that the discharge will be conducted to a suitable place for disposal when relief occurs. The discharge line must be installed to allow complete drainage of both the valve and the line. If this unit is installed with a separate storage vessel, the separate vessel must have its own temperature and pressure relief valve. This valve must also comply with The Standard for Relief Valves and Automatic Shutoff Devices for Hot Water Supply Systems. AINSI Z21.22 (in the U.S. only). A temperature relief valve is not required but if one is used, do not install the valve with the probe directly in the flow of water. This may cause unwarranted discharge of the valve.

LEGEND

HR	HEATING RETURN	Ø 3/4"
HF	HEATING SUPPLY	Ø 3/4"
G	GAS	Ø 1/2"
HWO	HOT WATER OUTLET	Ø 1/2"
CWI	COLD WATER INLET	Ø 1/2"

Domestic Hot Water Relief Valve (If Required by code)

Jurisdictions may require the installation of a 150# pressure relief valve on the domestic hot water piping of this boiler. If so, the picture below is a suggested method of installation. Always refer to and follow all applicable federal, state and local codes along with the relief valve manufacturers' instructions.



Domestic Hot Water Mixing Valve (If Required by code)

Jurisdictions may require the installation of a temperature mixing valve on the domestic hot water piping of this boiler. Always refer to and follow all applicable federal, state and local codes along with the mixing valve manufacturers' instructions.

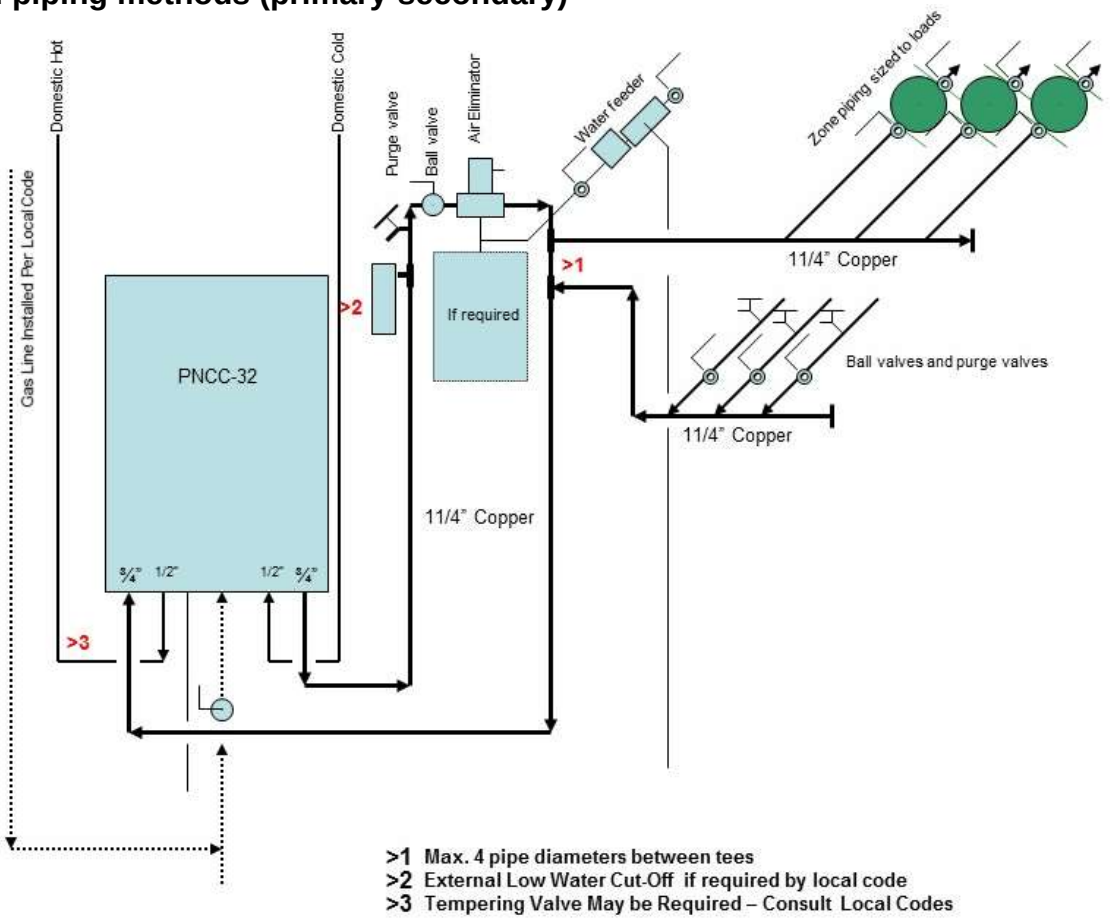
Internal Boiler Relief Valve

This boiler is equipmed with an intregal 30 psi relief valve. It is **imperitive** that this relief valve be piped out of the boiler cabinet to a safe location as defined by local code.

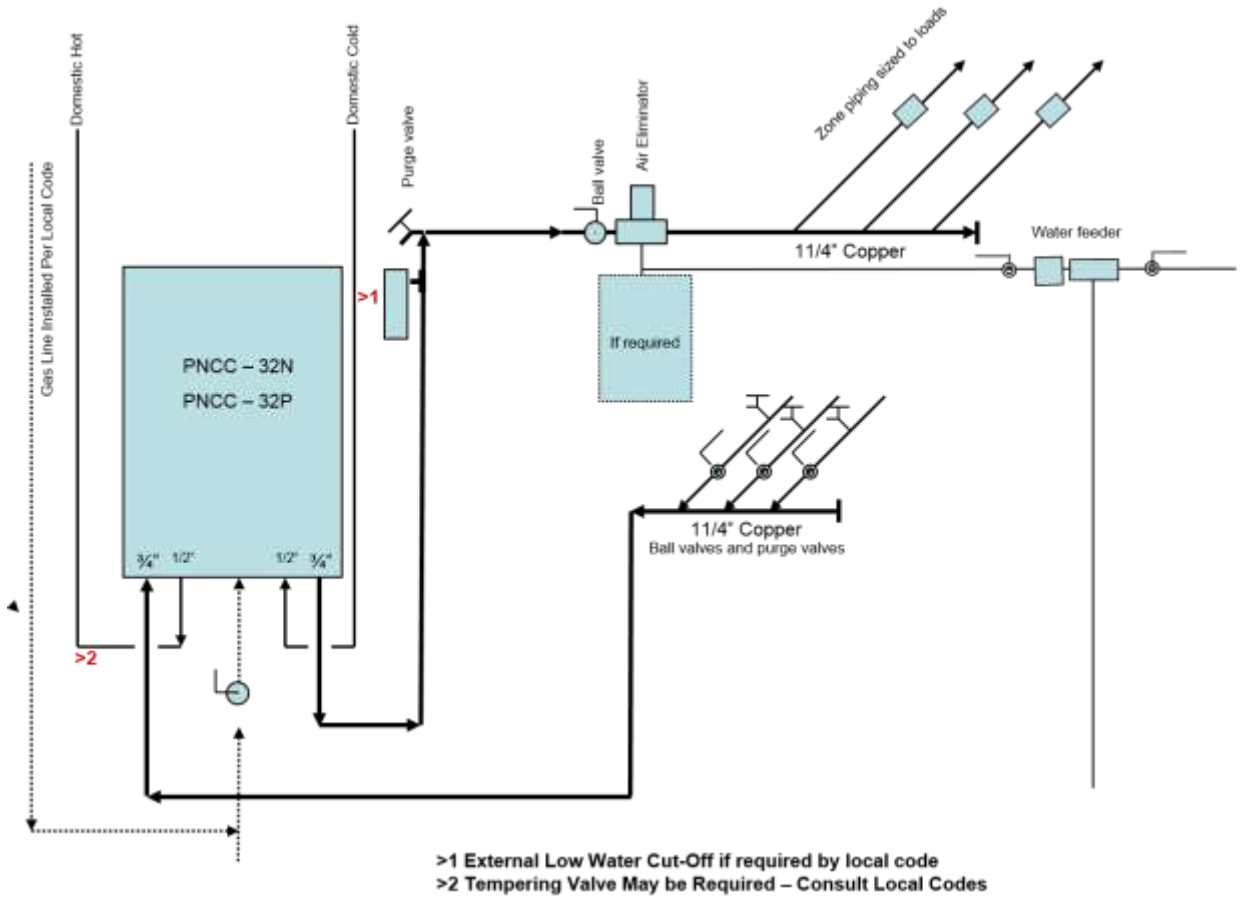
Any water damage incurred to this boiler by the release of water from an improperly or nonexistent relief valve drain pipe will NOT be covered under the warranty.

3.5 Piping Diagrams

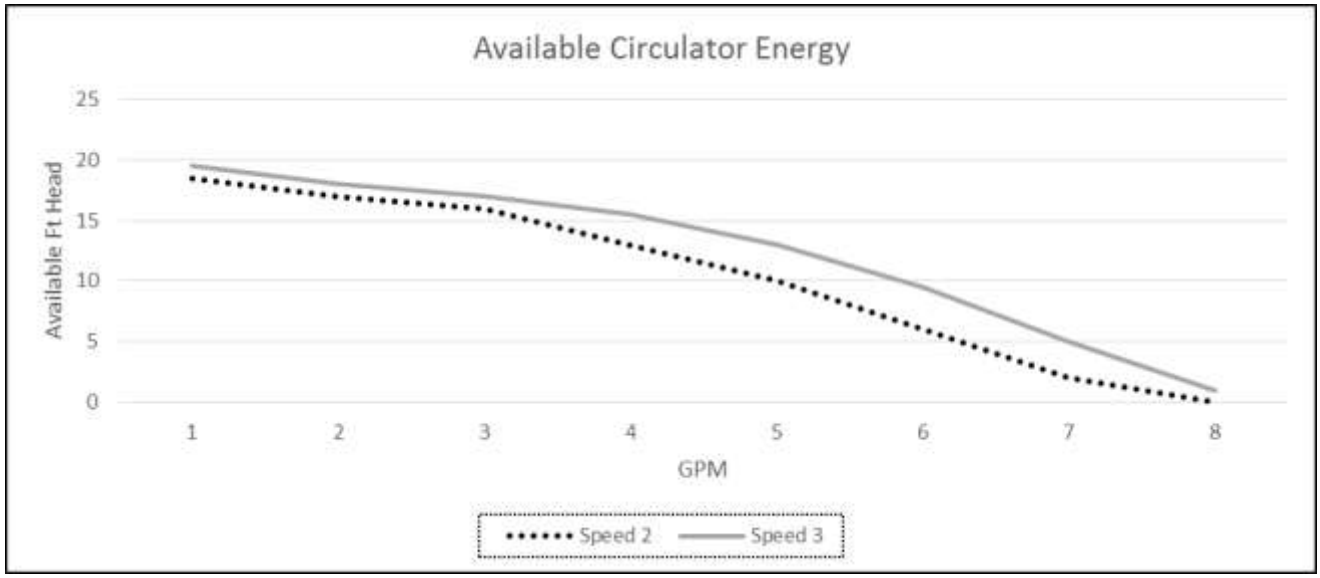
Preferred piping methods (primary-secondary)



Alternate piping method



Alternative piping method cont.



The above graph details the circulator energy available for the heating system piping and accessories. (Between the supply and return taps of the boiler).

CAUTION:
Detailed heating system design is required to determine if the available circulator energy is adequate for proper/safe system performance. If you are unfamiliar with heating system design, piping pressure drops and the use of pump curves **Pensotti recommends you contact your boiler distributor for assistance.**

When using the alternative piping agrrangment be sure the Maximum temperature across the boiler (Detlta T) does **not exceed 30°F**

When zoning using the alternative piping arangment Pensotti recommends the use of low pressure drop zone valves (contact your boiler distributor for assistance).

Dirt / Scale Seperation

Along with the application of our Fernox commisioning kit Pensotti **highly recommends** the installation of a dirt seperator in the return piping of all Solenne Series boiler models. Follow the manufacturers instructions when installing these devices.

Central heating circuit

Pensotti requires the installation of a pressure reducing valve & backflow preventor with all Solenne Series boilers.

In order to prevent scaling or deposits in the primary heat exchanger, the main supply water to the heating circuit must be treated according to the requirements of local standards.
This treatment is indispensable in the case where the circuit is frequently topped-up or when the system is often either partially or fully drained.

In order to safeguard all waterside components and ensure warranty coverage the supplied Fernox Commissioning Kit MUST be used in its entirety.

Expansion Tank Capacity

This boiler is equiped with an internal heat circuit expansion tank. You **must** check the system water capacity to determine if it is of adequate size for the heating system. An external expansion tank may be added if necessary.

Before filling the system the internal expansion tank pressure **must** be checked and adjusted if necessary. The pressure must match they system's minimum cold water fill pressure as determined by the installer.

It is required that the air pressure in the expansion tank be checked on an annual basis.

Max. System Operating Temperature (°F)	Maximum System Water Content (Gals.)*
100	114
110	85
120	65
130	52
140	43
150	36
160	30
170	26
180	24

Internal Boiler Relief Valve

This boiler is equipmed with an intregal 30 psi relief valve. It is **imperitive** that this relief valve be piped out of the boiler cabinet to a safe location as defined by local code.

Any water damage incurred to this boiler by the release of water from an improperly or nonexistent relief valve drain pipe will NOT be covered under the warranty.

3.6 Gas Connection

3.6.1 Gas Piping Guidelines

Pressures in excess of 14"WC may damage the internal components of this boiler. Pensotti ***REQUIRES*** *replacment of the gas valve if it is subjected to pressures in excess of 14"WC. Faliure to comply could cause dangerous operating conditions, fire, explosion, bodily injury or possible death.*

Follow all local codes and/or the most recent edition of the National Fuel Gas Code (ANSI Z223.1/NFPA 54) in the USA or the Natural Gas and Propane Installation Code in Canada (CAN/CSA B149.1).

The installation and use of flexable appliance connectors is prohibited.

3.6.2 Gas Supply Lines Pressures

The minimum and maximum inlet gas pressures are *Natural Gas Min. 6.00"WC – Max. 14.00"WC. and Propane Gas Min. 11.00"WC – Max. 14.00"WC.*

Gas pressures over and above the specified range will result in adverse performance and dangerous operating conditions; any damage resulting from extreme gas supply pressures will not be covered by the limited warranty.

Until pressure testing of the main gas supply line is completed, ensure the gas line to the PENSOTTI Boiler is disconnected to avoid any damage to the boiler.

The appliance and its individual shut off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 0.5 psi (14"wc).

The appliance must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply system at test pressures equal to or less then 0.5 psi (14"wc).

The gas appliance and its gas connections must be leak tested before placing the appliance in operation. Leaks can be found by using a gas leak detection device or by applying soapy water to all gas fittings. Should bubbles occur, tighten those connections and re-test.

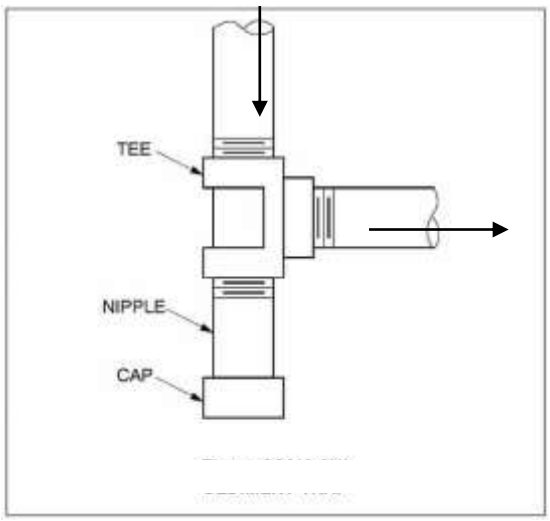
Always purge the gas line for any debris before connecting to the boiler gas inlet.

Never use an open flame to test for gas leaks as property damage, personal injury or death could result.

The maximum inlet gas pressure must not exceed 14"wc

The connection to the gas supply must be carried out by professionally qualified personnel in accordance with the relevant standards.

- ***Check the internal and external seals of the gas supply system.***
- A gas shut-off valve and sediment trap must be installed upstream of the appliance .
- Before starting up the boiler, make sure that the type of gas corresponds to that for which the appliance has been set-up.
- The gas supply pressure must be between the values reported on the rating plate.
- Conversion of the appliance from natural gas to LPG or vice versa must be carried out by qualified personnel.
- The power supply cable must be replaced by a qualified electrician. If the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified electrician.



When using an electrical appliance, a few fundamental rules must be observed: Do not touch the appliance with damp or wet parts of the body or when barefoot. Do not pull on the electric wires.

Do not allow the appliance to be used by children or anyone unfamiliar with its operation.

Natural Gas Pipe Sizing Chart

Length of Pipe In Feet	Size of Schd. 40 Black Iron Pipe in Inches					
	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
10	108	230	387	793	1237	2259
20	75	160	280	569	877	1610
30	61	129	224	471	719	1335
40	52	110	196	401	635	1143
50	46	98	177	364	560	1041
60	42	89	159	336	513	957
70	38	82	149	317	476	896
80	36	76	140	239	443	840
90	33	71	133	275	420	793
100	32	68	126	266	411	775
125	28	60	117	243	369	700

Natural Gas flow is given in thousands of BTU/hr. - One cubic foot of natural gas = 1000 BTU
Nominal pressure at the burner for Natural Gas is 3.5" of water column. (Typical machine supply 5"-7")
Pipe length must include additional length for all fittings. Add approximately 5 feet of pipe per fitting
Natural Gas Example: A machine with a burner that requires 440,000 BTU would need a 1 -1/4" pipe for a 20' long run.

Liquid Propane Gas Pipe Sizing Chart

Length of Pipe in Feet	Size of Schd. 40 Black Iron Pipe in Inches					
	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
10	275	567	1071	2205	3307	6221
20	189	393	732	1496	2299	4331
30	152	315	590	1212	1858	3465
40	129	267	504	1039	1559	2992
50	114	237	448	913	1417	2646
60	103	217	409	834	1275	2394
80	89	185	346	724	1086	2047
100	78	162	307	630	976	1811
125	69	146	275	567	866	1606
150	63	132	252	511	787	1496

LP Gas flow is given in thousands of BTU/hr. - One cubic foot of LP gas - 2516 BTU
This chart refers to low pressure LP, after regulation Standard nominal pressure at the burner for Liquid Propane Gas is 11" of water column.
Pipe length must include additional length for all fittings. Add approximately 5 feet of pipe per fitting
LP Example: A machine with a burner that requires 440,000 BTU would need a 1" pipe for a 20' long run.

3.7 Electrical connections

3.7.1 General warnings

Follow the electrical code requirements of the local authority having jurisdiction. In the absence of such requirements, follow the latest edition of the National Electrical Code (NFPA 70) in the U.S. or the latest edition of CGA C22.1 Canadian Electrical Code – Part 1 in Canada.

3.7.2 Electric Wiring: Ground and Surges

All units come with factory installed 3-pronged (grounded) plug end. The boiler must be plugged into a dedicated electrical outlet and circuit. The use of extension cords are prohibited.

If the local jurisdiction requires the unit to be wired directly, remove and discard the factory installed plug. An ON/OFF switch controlling the main power between the breaker and the Boiler should be provided to facilitate end-user maintenance and servicing. This should be done by a qualified electrician.

The boiler must be electrically grounded. Ensure the electrical receptacle, in which the boiler will be plugged into, is properly grounded; if wiring directly, do not attach the ground wire to either the gas or the water piping as plastic pipe or dielectric unions may isolate the boiler electrically.

The use of a surge protector, surge capacitor, line conditioner or equivalent is recommended to protect the appliance from power surges.

If a generator is to be used as “backup” power a line conditioner **must** be installed to protect the appliance from erratic voltage and Hz.

If the boiler is to be installed in a structure utilizing a emergency stand-by generator, the installation of a surge capacitor, surge protector, line conditioner or equivalent is required.

If the boiler is to be installed in a structure where frequent power outages are experienced the installation of a surge capacitor, surge protector, line conditioner or equivalent is required.

Do not energize electric power to the unit until all plumbing and gas piping is complete and the boiler has been filled with water and all air has been properly purged for the boiler and heating system.

The electrical supply required by the boiler is 120VAC at 60Hz with a maximum 4A rating with proper grounding. Protection must be in place to prevent the Boiler from being exposed to voltage in excess of 130VAC Max or 95VAC Min.

Damage caused by excessive voltage is not covered under warranty.

DO NOT connect 220-240VAC to this PENSOTTI Boiler. This will damage the boiler and void the warranty.

Do not disconnect the power supply when the unit is in normal operation.

If there is a power failure in cold weather areas, the freeze prevention system in the boiler will not operate and may result in freezing of the heat exchanger; in cold weather areas where power failures are common, you must completely drain the unit to prevent damage if the power will be off for any extended period of time.

Damage caused by freezing is not covered under warranty.

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

The connection to the main power supply must be carried out by professionally qualified electrical personnel, registered in accordance with current legislation and local authorities.

Always check to make sure that the appliance has an efficient earth ground system. This requirement is only satisfied if it has been properly connected to an efficient ground system installed in accordance with the requirements of current safety standards and carried out by professionally qualified personnel.

This basic safety measure must be checked, verified and carried out by professionally qualified personnel. Have the electrical system checked by a qualified electrician. The manufacturer will not be held liable for any damage or injury caused as a result of an inefficient or faulty earth ground system.

- Ensure the domestic power supply is checked by a qualified electrician to ensure that it can support the maximum power absorption of the appliance, as indicated on the rating plate. In particular, make sure that the cable sizes are adequate for the power absorbed by the appliance;

- The power supply cable must be replaced by a qualified electrician. If the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified electrician;

When using an electrical appliance, a few fundamental rules must be observed:

Do not touch the appliance with damp or wet parts of the body or when barefoot.

Do not pull on the electric wires.

Do not allow the appliance to be used by children or anyone unfamiliar with its operation;

If the unit fails to re-start after any fault and you have already pressed the reset "R" button, unplug the unit for 30 seconds, then re-plug in the unit and try to restart with the on/off switch. If the unit fails to restart, call a qualified Technician for service. DO NOT ATTEMPT ANY REPAIRS ON YOUR OWN.

Electrical Connections

Connect the power supply to the terminal board inside the control panel as follows:

a. Switch off the power supply at service switch or breaker.

b. Remove the front case panel of the boiler.

c. Loosen the screws and remove plate A (see fig. 1).

d. With the plate removed, connect the wires to the terminal board B as follows:

- Connect the earth wire (normally coloured green/yellow) to the terminal marked with the earth symbol " ⏚ ".
- Connect the neutral wire (normally coloured white) to the terminal marked with the letter "N".
- Connect the live wire (normally coloured black) to the terminal marked with the letter "L".
- Terminals identified by the letters: Ta ⇒ Room thermostat or End Switch
  Se ⇒ Outside temperature sensor

Ta terminals are 24V DC. Only a non-power robbing, battery operated thermostat or dry set of contacts can be installed on the Ta terminals.

When the wires have been connected, place plate "A" back to position. Switch the power supply back on.

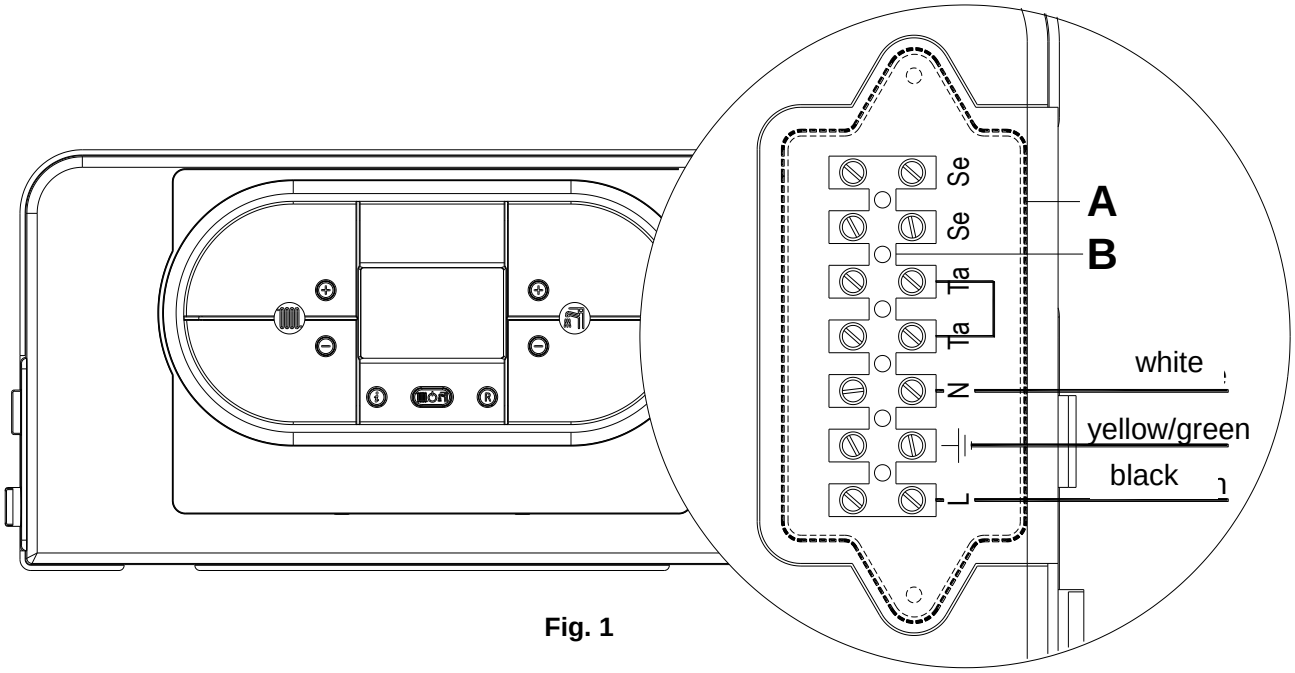


Fig. 1

3.8 Venting connections

Concentric

***Before* connecting the venting system to the boiler, be sure to install the correct Flue Diaphragm into the boiler exhaust outlet. (see section 3.10 on page 45).**

APPLICATIONS
M&G DuraVent's Concentric Stainless (CVS) vent pipe is listed to UL1738 as a double-wall vent system for Category II, III, and IV gas Appliances.

CVS is pressure rated to 10 in-w.c. for the inner pipe. CVS can also be used as a direct vent system, where the inner pipe is the exhaust vent; the outer pipe supplies the combustion air for the appliance. When installing CVS with direct vent appliances, the vent is considered a component of the appliance, and is listed in conjunction with the appliance to the corresponding appliance standard. Check with your appliance manufacturer or look in the appliance installation instructions to verify that M&G DuraVent's CVS has been listed as a direct vent for use with your appliance.

CLEARANCES
CVS is listed to 0" clearance as a doublewall vent system for Category II, III, and IV appliances, for flue temperature of up to 400-degrees F for horizontal enclosures, and up to 480-degrees F for vertical enclosures.

When CVS is used as a concentric/direct vent system on gas and installed on a Pensotti Solenne CLASSIC boiler, **clearance to combustibles is 0" .** Never fill any required clearance space with insulation or any other materials. Combustible materials include, but are not limited to, lumber, plywood, sheetrock, plaster and lath, furniture, curtains, electrical wiring, and building insulation.

PERMITS
Before installation, check with your local Building Official, Fire Official, or other authority having jurisdiction regarding permits, restrictions, and installation inspections in your area.

GENERAL INSTALLATION NOTES
Read through these installation instructions before beginning your installation. Proper planning for your Concentric Stainless Vent system installation will result in greater safety, efficiency, and convenience, as well as saving time and money. You must use only authorized M&G DuraVent parts, or other parts specifically authorized and listed by the appliance manufacturer in order to maintain a safe, approved system. Do not mix parts or try to match with other products or use improvised solutions. Do not install damaged or modified parts. Practice good workmanship. Sloppy work could jeopardize your vent's safety. Keep electrical wiring and building insulation away from all chimneys and vents. When deciding the location of your installation, try to avoid modifications to structural components of the building. If you have any questions, contact either your dealer or M&G DuraVent directly. Check with the appliance manufacturer for the maximum and minimum allowed vent runs for your specific appliance model, including maximum number elbows allowed in the system. The total vent length from the appliance to the termination shall not be greater than what is specified by the appliance manufacturer. For condensing appliances, always follow the appliance manufacturer's recommendation for handling condensate drainage.

Plan the layout of the vent system:

• Consider the length of horizontal runs, elbows, clearance requirements, and location of terminations.

• For horizontal vent runs, maintain at least a ¼" rise per foot away from the appliance to prevent collection of condensate or buildup of heat in the vent.

• Consider condensate drainage, if needed for your appliance. Refer to the appliance manufacturer's installation instructions for requirements of condensate drainage.

• The CVS system must not be routed into, through, or within any other vent or chimney, with the exception of running the vent through an otherwise unused masonry chimney.

• The vent system must terminate in accordance with local code requirements and appropriate National Codes:

o For the US (Gas): NFPA 54 / ANSI Z223.1 National Fuel Gas Code or the International Fuel Gas Code

o For the US (Pellet): NFPA 211 Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances

o For Canada: CAN/GGA-B149.1 Natural Gas Installation Code or CAN/CGA-149.2 Propane Installation Code.

JOINT CONNECTIONS

M&G DuraVent's Concentric Vent is connected together by aligning the Alignment Dimples on the male and female vent sections, sliding together and twist locking in either direction ***(Fig 1)***. The joints will only connect and come apart at the point where the Alignment Dimples are aligned. The CVS joint section can rotate 360-degrees to allow elbows to point in the desired direction. The vent pipe sections cannot be cut. Telescoping Adjustable lengths are available to accommodate specific installation length requirements. Screws are not required for joint connection, except as where indicated for Telescoping Adjustable lengths and Horizontal Termination Caps.

APPLIANCE CONNECTION

Connect CVS vent pipe to the appliance adapter Pensotti Part #: PA50-00137 via the DuraVent Part #: 35CVS-AD-PS.

CONDENSATE DRAINS- GAS FUEL

CVS has an available Condensate Drain if required by the appliance, and has a 5/8" ID outlet which can be attached to an appropriate size plastic tube for drainage. The Condensate Drain can be used in either horizontal or vertical orientation. When installing the Condensate Drain, always create a siphon loop in the plastic tube to prevent the leakage of exhaust gases. Follow all local and national codes for draining acidic condensate.

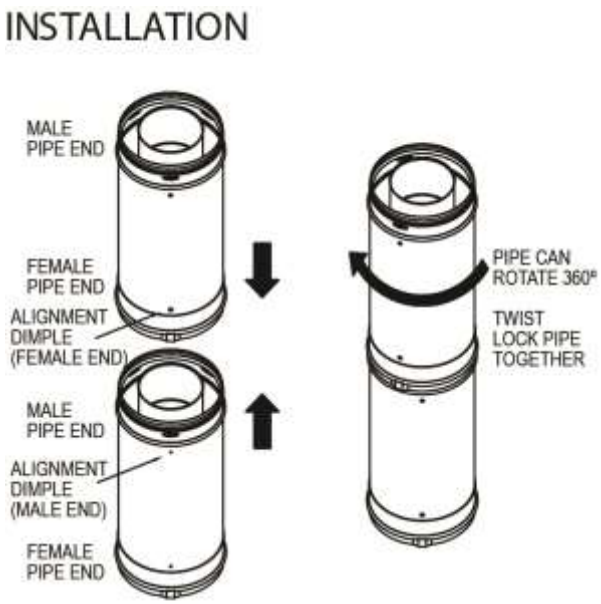


Figure 1

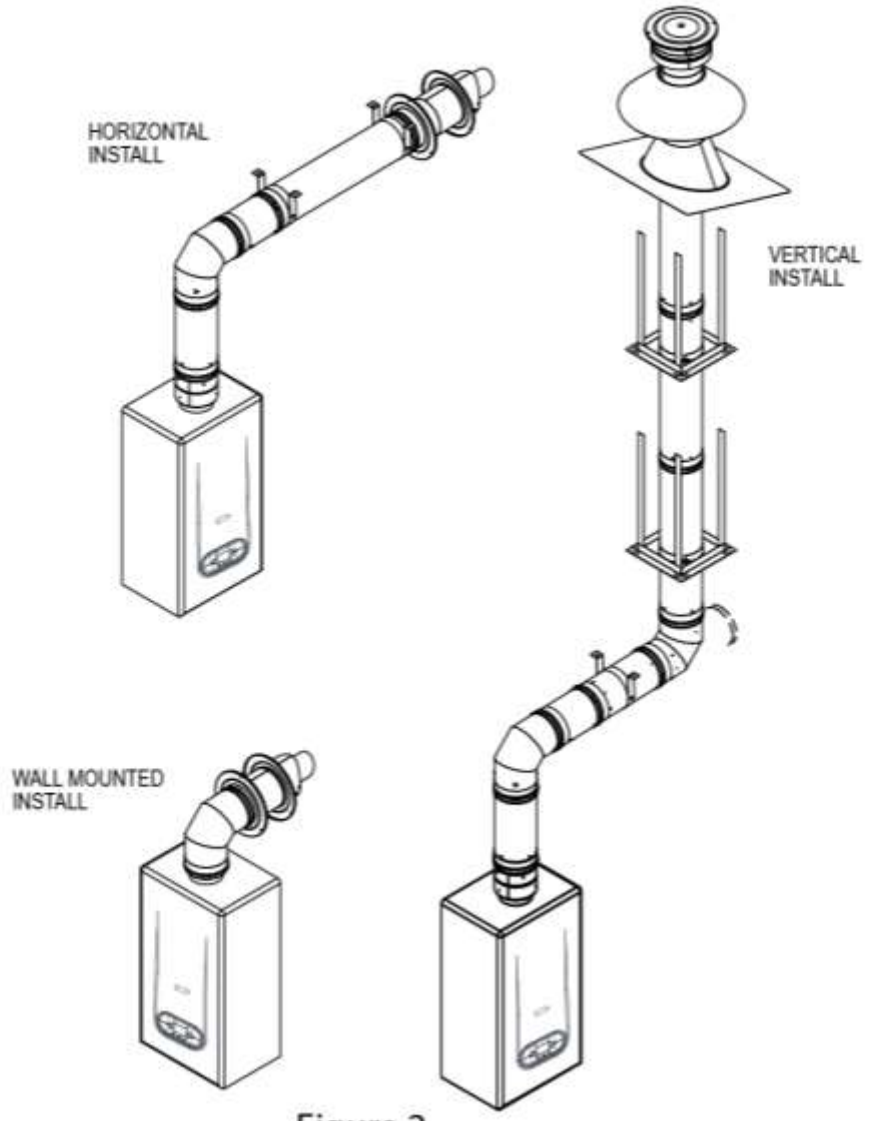


Figure 2

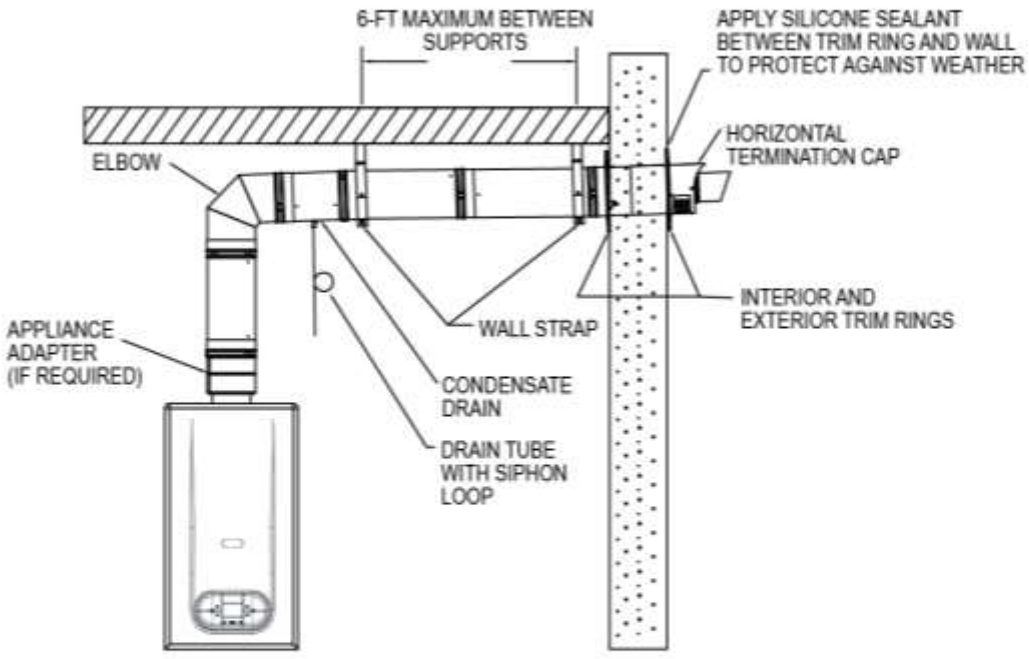


Figure 3

Determine the venting path required for your installation. There are two general types of installations: Horizontal Installations, and Vertical Installations.
Refer to ***Figure 2*** for some typical installations. Always check with the appliance manufacturer for requirements or restrictions with the venting. To determine the installed length of vent pipe, subtract 1-1/4" for each joint due to the joint overlap.

Horizontal Installations

1. Install Appliance. Determine where your appliance will be installed and follow the Appliance manufacturer's installation instructions accordingly.

2. Determine location of wall penetration. Identify where you want the vent to penetrate through the wall to the outside. Consider the restrictions and requirements for the location of the Horizontal Vent Cap, listed below. When determining the location of the wall penetration, be sure to account for the height of the Appliance Adapter (if needed) and the radius/height of the Elbow. For horizontal vent runs, always maintain at least a ¼" rise per foot away from the appliance ***(Fig 3)*** to prevent collection of condensate or buildup of heat in the vent. Also make sure you have accommodated any minimum vent height, if any, that the appliance manufacturer may require.
The Horizontal Termination Cap must meet the following requirements:
(a) Clearance above the ground, veranda, porch, deck, balcony and anticpated snow level: **12 inches minimum.**
(b) Clearance to a window (operable or fixed closed) or door: **12 inches minimum**.
(c) Vertical clearance to a ventilated soffit located above the Termination Cap (if soffit extends a horizontal distance of **2 feet out over** the centerline of the termination): **24 inches minimum**.
(d) Clearance to an unventilated soffit: **24 inches minimum**.
(e) Clearance to an outside corner: **12 inches minimum**
(f) Clearance to an inside corner: **36 inches minimum**
(g) Not to be installed above a meter/regulator assembly within **4 feet** horizontally from the centerline of the regulator.
(h) Clearance to a gas service regulator vent outlet: 6 feet minimum.
(i) Clearance to non-mechanical air supply inlet to a building or the combustion air inlet to any other appliance: 12 inches minimum (US), 6 ft (Canada)
(j) Clearance to a mechanical air supply inlet: 6 feet minimum.
(k) Clearance above a paved sidewalk or paved driveway located on public property: **7 feet minimum** and/or refer to local code.

(l) Terminate above the snowline for the area.

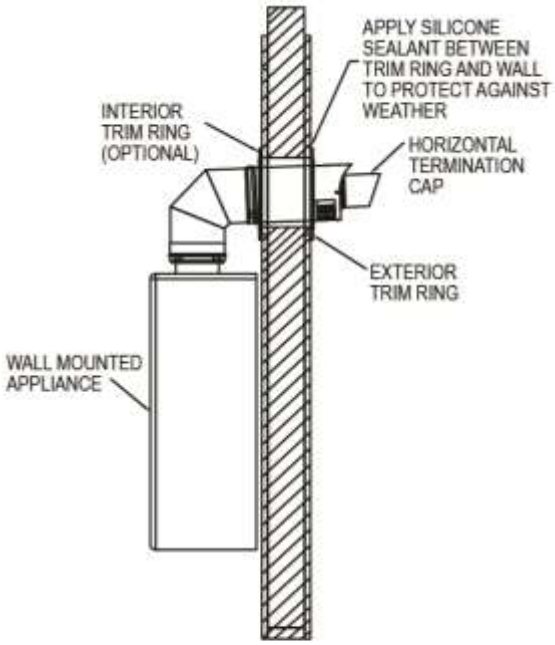


Figure 4

3. Cut wall penetration. Refer to the appliance manufacturer for clearance to combustible requirements from the vent. To accommodate the flared end of the vent pipe, the minimum hole size should be 5-3/8" x 5-3/8" for a square cut, or 5-3/8" diameter for a round cut ***(Fig 5)***. Always check with the appliance manufacturer for any additional clearance to combustibles (if any) from the venting that may be required. For reference, the Outside Trim Ring provided with the Horizontal Termination Cap measures a maximum of 8-1/2" diameter, and has a hole pattern of 7" diameter. For pellet fuel installs, a wall thimble is required.

4. Layout the Vent. Verify which CVS vent lengths and components you will need for your installation. Note that the Horizontal Termination Cap must fit at a **minimum 6 inch** distance outside of the exterior wall ***(Figs 3 & 4)***. This distance is needed to ensure proper airflow and pressure within the CVS vent system. To ensure this distance, the Horizontal Termination Cap is adjustable. Also, Telescoping Adjustable lengths are available.

5. Install Vent. Once the vent path and components have been determined, install the vent. Align the male and female pipe ends as described in the Joint Connection section, push together and twist lock ***(Fig 2)***. Note the direction of the pipe is important. The outer wall female end must face downward/towards the appliance; and the outer wall male end must face upward/away from the appliance. The direction is to ensure correct condensate drainage and weatherization.

If Telescoping Adjustables are used, secure them at the desired length by using (3) ½" screws provided.

6. Support Vent. Wall Straps are required every 8-ft of horizontal run in order to properly support the vent system ***(Fig 3)***. If the installation extends through the wall in less than 8-ft of vent pipe, a wall strap is not required. Wall Straps are designed to provide a 1" standoff from nearby walls or ceilings. Use (2) 1-1/2" wood screws to secure each Wall Strap.

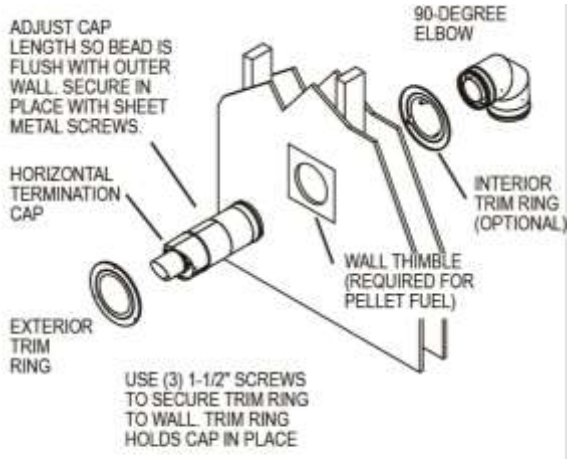


Figure 5

7. Install Wall Termination. If the optional Interior Trim Ring will be installed, bend the three tabs and slip the ring onto the pipe section previous to the Horizontal Termination Cap. Adjust the length of the Horizontal Termination Cap so that the inside edge of the bead of the black-painted exterior portion is flush with the outer wall. This bead is used in combination with the Outer Trim Ring (supplied with the cap) to hold the cap in place at the wall. Once the Horizontal Termination Cap has been adjusted to the correct length, secure it in place with (3) ½" sheet metal screws *(Fig 5)*. Then twist-lock on the Horizontal Termination Cap, and align the cap so the air inlet openings are downward ***(Figs 3 & 4)***.

Install the Outer Trim Ring over the Horizontal Termination Cap and secure in place with the (3) 1-1/2" wood screws ***(Fig 5)***. Seal the Outer Trim Ring against the exterior wall using weatherizing silicone sealant.
If the Interior Trim Ring is installed, slide the Trim Ring against the interior wall and secure in place with (3) 1-1/2" wood screws. Secure the Interior Trim Ring to the CVS pipe by using (3) ½" sheet metal screws through the tabs in the Trim Ring. Be sure you do not drill through the gasket in the outer wall of the CVS vent pipe.

Vertical Installation:
If the vent pipe is to pass through a cold attic space. Vent pipe MUST be insulated with the proper insulation material.

1. Install Appliance. Determine where your appliance will be installed and follow the Appliance manufacturer's installation instructions accordingly.

2. Determine the location of your ceiling and/or roof penetration. Avoid cutting floor or roof supporting members. Always make sure to follow the appliance manufacturer's required minimum clearance to combustibles.

3. Cut and frame floor penetration openings. Cut and frame 7-1/2" x 7-1/2" openings at each floor level through which the CVS vent system will penetrate. The opening at the roof does not require framing. Vertical installations of the CVS vent need to be supported. A Firestop Support is required where the vent system passes through the first floor, and additional Firestops are required at each floor opening, except the roof. Follow the appliance manufacturer's requirements for minimum clearance to combustibles

4. Install Firestop Support(s). At each framed floor opening, install a Firestop Support. The Firestop Support is listed to support up to 40-ft of CVS vent pipe. The Firestop Support is installed from underneath the opening, held in place by (4) 1-1/2" wood screws in the corners (Fig 6). From the other side, extend the straps of the Firestop Support and secure them to nearby framing members with additional 1-1/2" wood screws. As the vent passes through the Firestop Support, install the clamp around the vent and tighten withthe screws provided, so the weight of the vent is supported by the Firestop Support ***(Fig 6).***

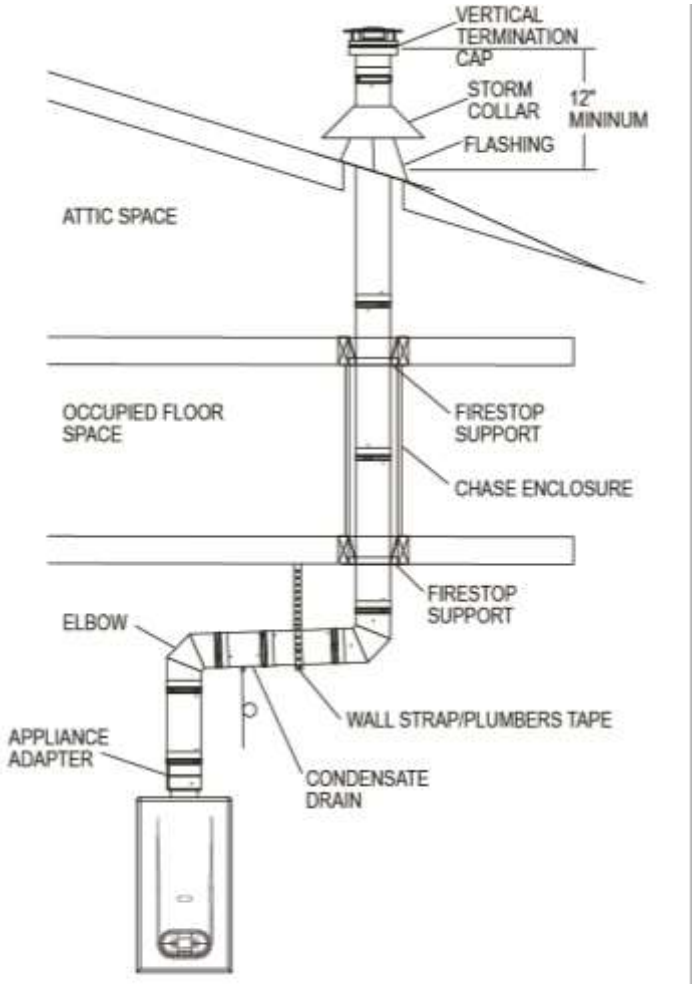


Figure 6

5. Install CVS Vent Pipe. If your appliance requires an Appliance Adapter, install it onto the appliance. Twist-lock on the first section of CVS vent pipe and continue to add vent pipe sections for your installation. As the vent passes through Firestop Supports, tighten the supporting clamp around the vent pipe.
Any elbow offsets must be supported by Wall Straps. Wall Straps must be used to support any horizontal or inclined sections longer than 8-ft. Plumbers tape is allowed to be used to support the vent pipe for interior offsets only, if nearby walls/ceilings/framing members are not close enough to use the Wall Straps. As the CVS vent passes through the roof, install a Roof Support at the roof level to hold the vent in place, if there are no Wall Straps within 8-ft ***(Fig 7)***. The Roof Support is clamped around the vent pipe and is secured to the topside or underside of the roof with at least (4) nails or wood screws.

6. Enclosures. Check with your local authority for enclosure requirements when penetrating a vent through an occupied area. Except for the installation in one and two family dwellings, a venting system that extends through any zone above where the connected appliance is located shall have an enclosure with a fire resistance rating equal or greater than that of the floor or roof assembly through which it passes.
For exterior mounted systems, it is recommended that the vent system be enclosed below the roofline to limit condensation and protect against possible incidental damage that may occur to the vent pipe.

7. Install Flashing and Vertical Termination. Install enough vent pipe through the roof penetration to allow the Adjustable Flashing to fit over the pipe. The Adjustable Flashing will fit roofs from 0/12-12/12 pitch. Slide the Flashing over the vent pipe and secure to the roof.
The upper edge of the flashing should slide under the uphill shingles/roofing material, if applicable. Use appropriate roofing sealant to weatherize the flashing to the roof, and secure the flashing in place using at least (4) roofing nails/screws per side of the flashing ***(Fig 7***).

After the Flashing is installed, wrap the Storm Collar around the vent pipe, inserting the tab and folding it back to secure the collar tightly against the pipe. A sheet metal screw may be used to secure the tab in place. Slide the Storm Collar down on top of the Flashing. Use a bead of sealant where the Storm Collar sits on the Flashing to prevent any rain infiltration.

The vent pipe must extend above the roof a minimum of 12”, but the installation must also meet any additional height requirements as specified in the appliance manufacturer’s installation instructions. Once the required vent height has been reached, twist-lock the Vertical Termination Cap onto the top section of CVS vent pipe to complete the Vertical Installation ***(Fig 7)***. If more than 4 feet of CVS extends above the roof, then the vent pipe will need to be supported.

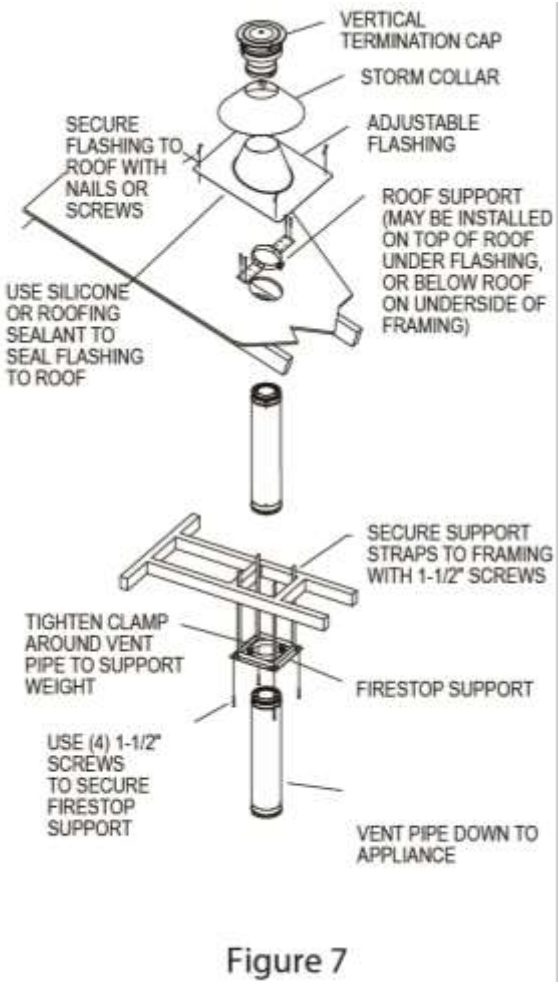


Figure 7

MAINTENANCE

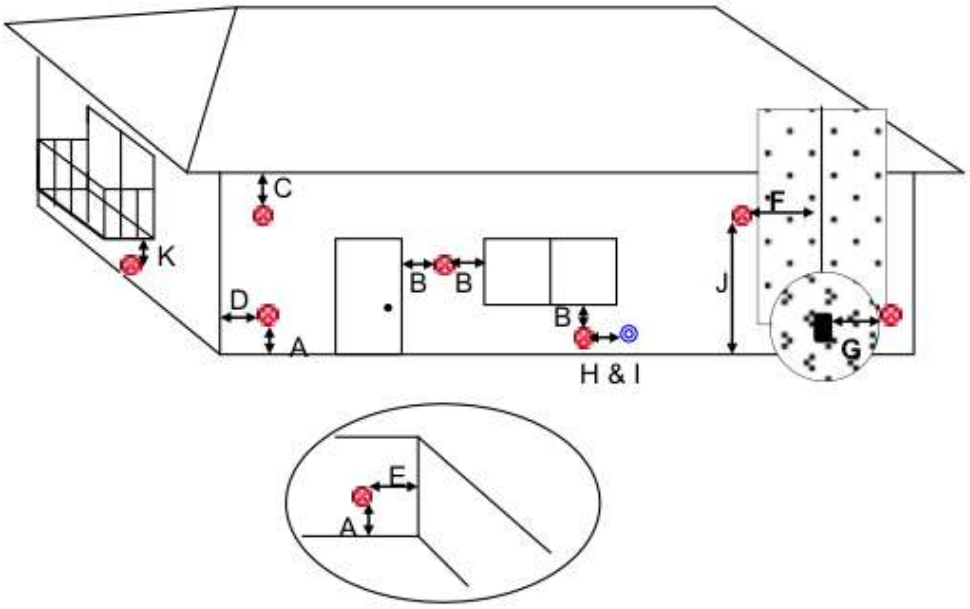
Conduct an inspection of the venting system semiannually. Recommended areas to inspect are as follows:

1. Check areas of the Venting System which are exposed to the elements for corrosion. These will appear as rust spots or streaks, and in extreme cases, holes. These components should immediately be replaced.

2. Remove the Termination Cap, and shine a flashlight down the Vent. Clean and remove any deposited or foreign material.

3. Check for evidence of excessive condensation, such as water droplets forming in the inner liner, and subsequently dripping out at joints. Continuous condensate can cause corrosion of caps, pipe, and fittings. It may be caused by having excessive lateral runs, too many elbows, and exterior portions of the system being exposed to cold weather.

4. Inspect joints, to verify that no Pipe Sections or Fittings have been disturbed, and consequently loosened. Also check mechanical supports such as Wall Straps, or plumbers' tape for rigidity.



Direct Vent Termination Minimum Clearances	
A = 12"	Clearance above grade, snowline, deck, porch or balcony
B = 12"	Clearance to window or door that may be opened
C = 24"	Vertical clearance to ventilated and unventilated soffit within a 2' distance horizontally from center line of DV termination
D = 12"	Minimum distance to outside corner
E = 36"	Minimum distance to inside corner, included walls and fences.
F = 48"	Not to be installed above a gas meter/regulator within F from the center line of the meter/regulator
G = 48"	Minimum clearance to service regulator vent outlet, gas meter or electrical meter
H = 12"	Clearance to non-mechanical inlet air opening into the building
I = 36"	Clearance to a mechanical air inlet into the building
J = 84"	Minimum distance above a paved sidewalk or driveway located on public property. If terminal is located between two single family residences with a sidewalk or driveway between; the same 84" clearance applies.
K = 24"	Minimum clearance beneath porch, deck, veranda or balcony, only if the area below is completely open on at least two sides.

State and local codes may require different clearances, consult the local authority having jurisdiction in each area for details.

The vent hood must be installed on the leeward side of the structure. Avoid installing the vent hood on the side of the structure receiving normal prevailing winds.

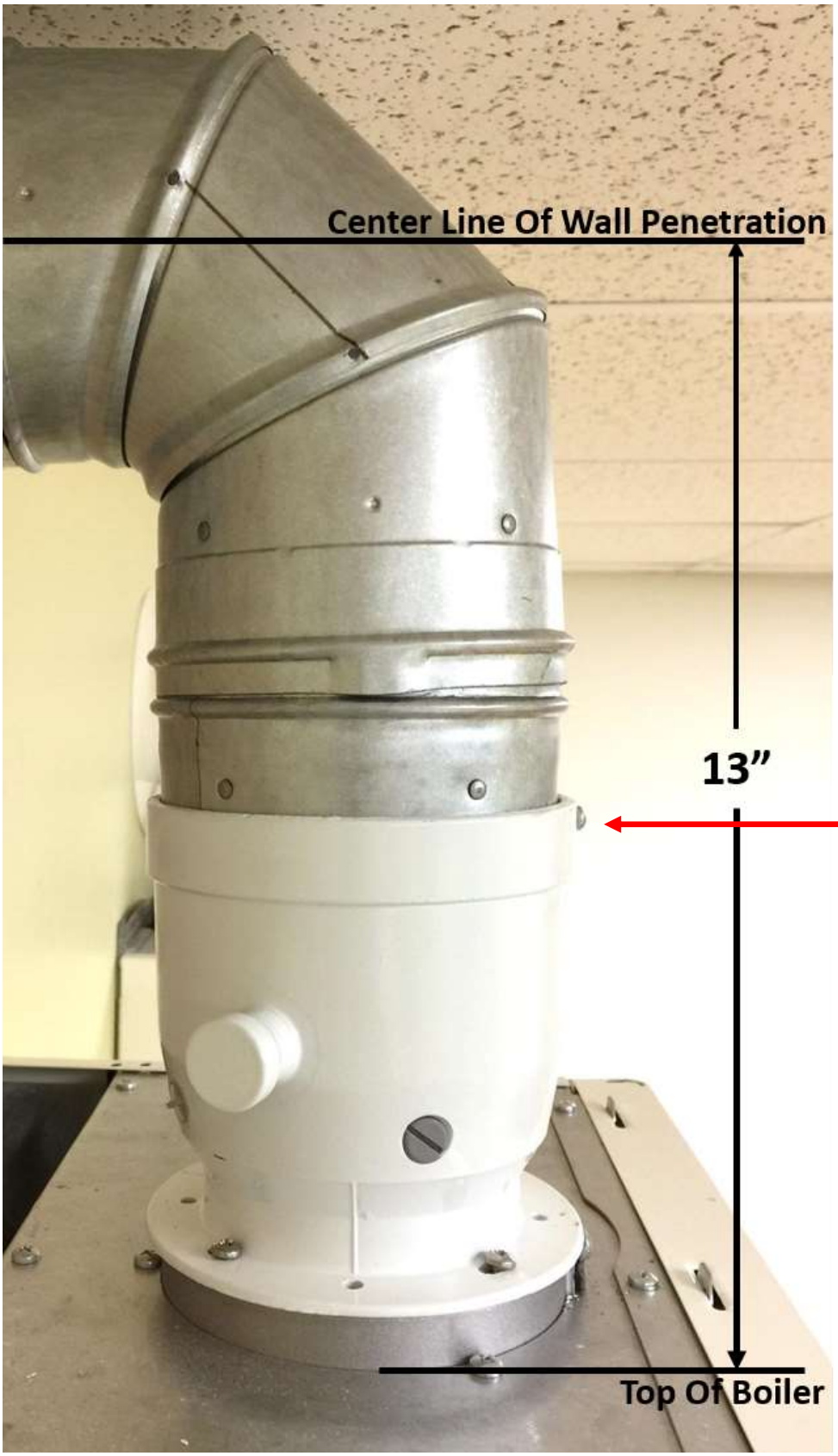
The termination shall be located so that flue gasses, or condensate from the flues gasses, are not directed as to jeopardize people, building materials, building construction, siding or soffits. Flue gasses from the termination shall not be allowed to enter any type of structure.

Ref	Description	Order No.
A	Exhaust Flue Diaphrams	1.51 & 1.61” FLUE DIAPHRAM
B	Boiler Vent Adapter w/ Test Ports	PA50-00137
C	CVS Adapter	PA35CVS-AD-PS
D	90° Elbow	PACVS-E90
E	12” Vent Pipe	PACVS-12
F	8-13” Horizontal Termination	PACVS-HCR
G	Wind Guard	PACVS-HG
H	Inner Trim Ring	PACVS-TRI
I	OutterTrim Ring	PACVS-TRO


PACVS-HV Horizontal Vent Kit
With 1' Pipe Omitted
Minimum Vent Length 15"
Maximum Vent Length 21"
With 6" Outside Exposure
Minimum
Termination
Exposure 6"
Measured From
Exterior Siding


PACVS-HV Horizontal Vent Kit
With 1' Pipe Used
Minimum Vent Length 25"
Maximum Vent Length 31.5"
With 6" Outside Exposure
Minimum
Termination
Exposure 6"
Measured From
Exterior Siding

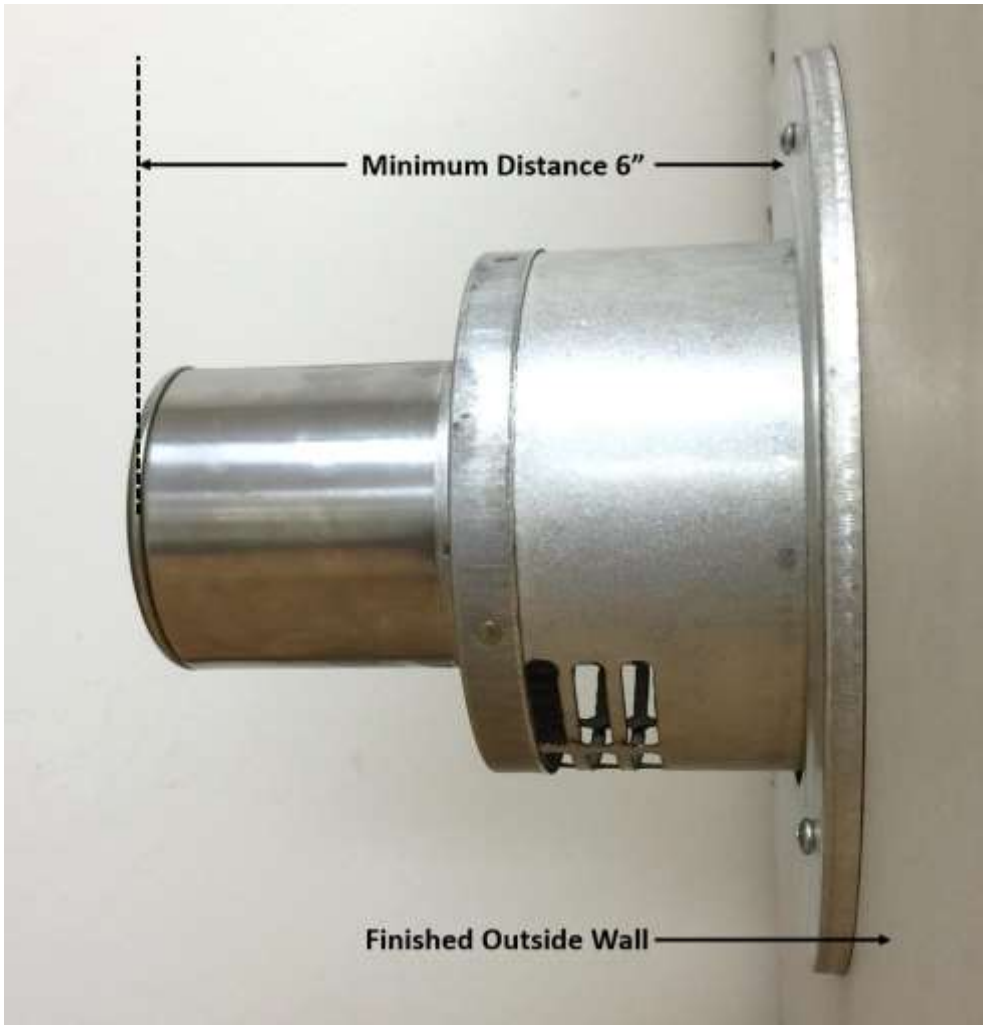

3 1/2"
Termination Wind Guard

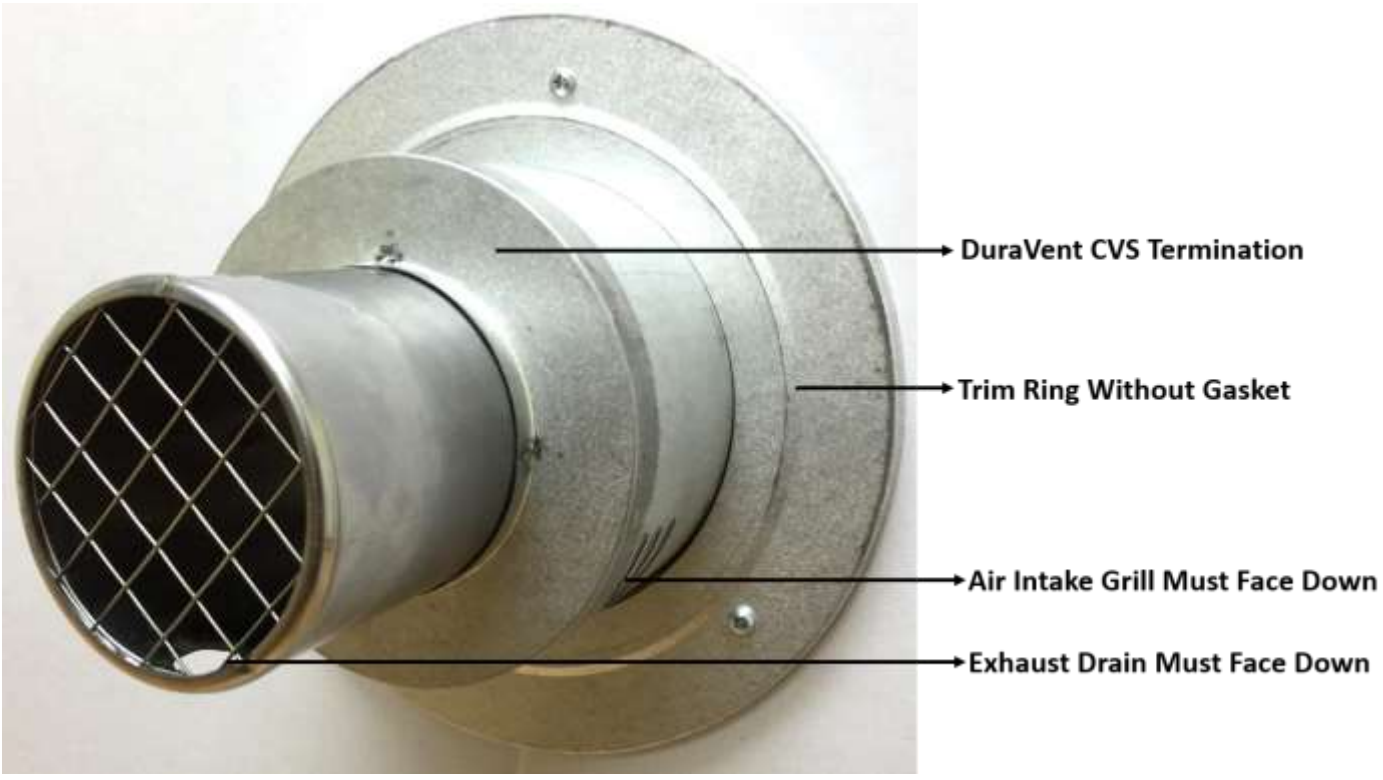


IMPORTANT

Secure boiler adapter to the DuraVent CVS adapter with 2 qty - ½” screws. (not provided).

Rough in dimension of coaxial vent pipe is approx. 13” from the top of the boiler to the center line of the CVS vent pipe.


Minimum Distance 6”
Finished Outside Wall


DuraVent CVS Termination
Trim Ring Without Gasket
Air Intake Grill Must Face Down
Exhaust Drain Must Face Down

Exhaust flue pipe condensate drain

The Pensotti boiler adapter is supplied with a ½" Male IPS condensate drain attachment.

Some flue pipe installations such as those of extended lengths or installed in cold environments may produce excessive amounts of condensate. In these cases it is a requirment that the condensate be removed from the vent system by virtue of this condensate drain attachment. (refer to the pictures on this and the next page).

Please follow all applicable local, state and national codes in regards to condensate disposal.

Required fittings:

1 qty – ½" IPS PVC Coupling
1 qty – 5/8" Male hose barb X ½" Male adapter
1 piece – Necessary length 5/8" vinyl tubing
Miscelanous tubing supports
Nylon wire ties

Important!

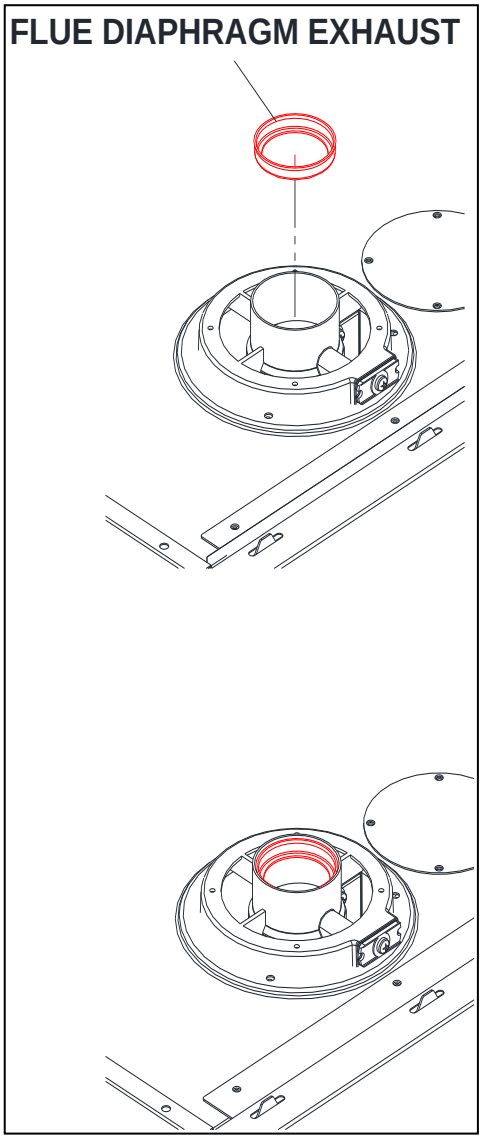
Creat a condensate trap as pictured above by making a minimum 8” diameter loop in the tubing.
This condensate loop trap is required to eliminate the possibility of flue gases entering the home. Before firing the boiler fill the trap with water.

Please folow all applicable local, state and national codes in regards to condensate disposal.

3.10 Diaphragms system setting

- **Horizontal-Concentric flue system with intake / exhaust pipes Ø3/5in**

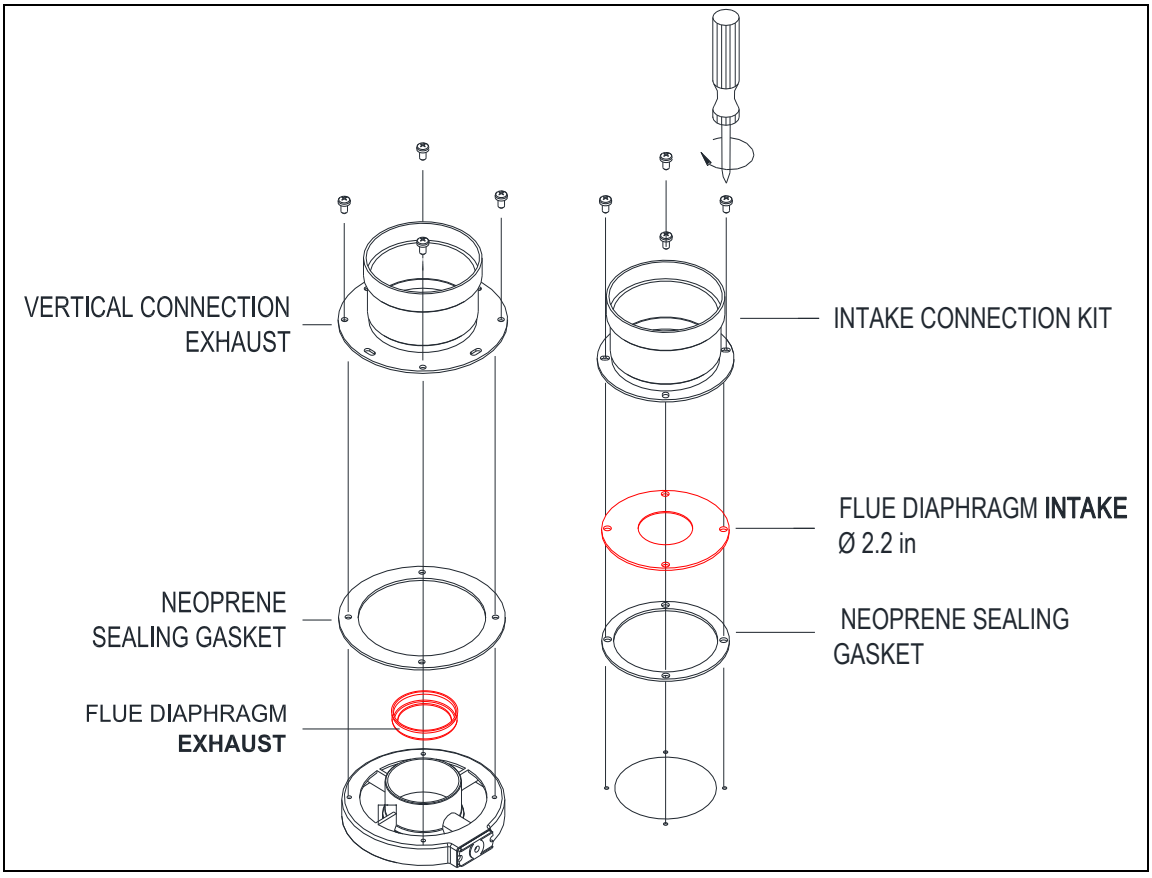
MAXIMUM FLUE LENGTH (linear length)	**FLUE DIAPHRAGM EXHAUST**
from **3.2** to **6.5 ft**	INSTALL THE FLUE DIAPHRAGM Ø 1.51 in ON THE FLUE EXHAUST HOLE
from **6.5** to **16.4 ft**	INSTALL THE FLUE DIAPHRAGM Ø 1.61 in ON THE FLUE EXHAUST HOLE
MAXIMUM FLUE LENGTH	**16.4 ft**



Refer to twin pipe venting instruction supplied with DuraVent twin pipe venting material.

- **2 pipes non concentric flue system (flue and air intake) Ø3/3in**

MAXIMUM FLUE LENGTH (linear length)	**FLUE DIAPHRAGM INTAKE**	**FLUE DIAPHRAGM EXHAUST**
from **3.2 + 3.2** to **13.1 + 13.1 ft**	INSTALL THE FLUE DIAPHRAGM Ø 2.2 in ON THE AIR INTAKE	INSTALL THE FLUE DIAPHRAGM Ø 1.61 in ON THE FLUE EXHAUST HOLE
from **13.1 + 13.1** to **36 + 36 ft**	INSTALL THE FLUE DIAPHRAGM Ø 2.2 in ON THE AIR INTAKE	INSTALL THE FLUE DIAPHRAGM Ø 1.61 in ON THE FLUE EXHAUST HOLE
MAXIMUM COMBINED FLUE LENGTH	**72.1 ft**	



4. COMMISSIONING THE APPLIANCE

4.1 General warnings

The following operations must be carried out by professionally qualified personnel, registered in accordance with current legislation.

Use of a properly calibrated electronic combustion analyzer MUST be used when installing, servicing or converting this Boiler from Natural Gas to LP or from LP to Natural Gas.

The boiler leaves the factory pre-set and tested for burning either Natural Gas or LPG. Nevertheless, when starting the boiler for the first time, make sure that the information on the rating plate corresponds to the type of gas being supplied to the boiler.

Once the system has been filled and the necessary adjustments made, remember to tighten the screws of the gas valve test point and make sure that there are no gas leaks from the test point or from any gas pipe fittings within the boiler.

■ Preliminary operations

Switching the boiler on for the first time means checking that the installation, regulation and operation of the appliance are correct:

Check that the rating on the rating plate corresponds to that of the main supply networks (gas, electricity, water);

Check that the power supply voltage to the boiler complies with the rating plate (120 V – 60 Hz) and that the live, neutral and earth ground wires are connected properly. Also make sure that the earth ground connection is sound;

Check that the gas supply line is correctly sized for the flow rate required by the boiler and that it is fitted with all the safety and control devices stipulated by current regulations;

Check that the supply of combustion air is functioning correctly and in line with current law and national and local standards;

Check for the presence of permanent aeration/ventilation openings as required by current law for the type of appliances are installed;

Check that the exhaust vent and its connections to the termination comply with the requirements of current law and national and local standards for the type of appliances installed;

Check that all venting is installed, supported and secured as per the vent manufactures instructions;

Make sure that any central heating shut-off valves are open;

Check that there are no flammable materials or liquids in the immediate vicinity of the boiler.

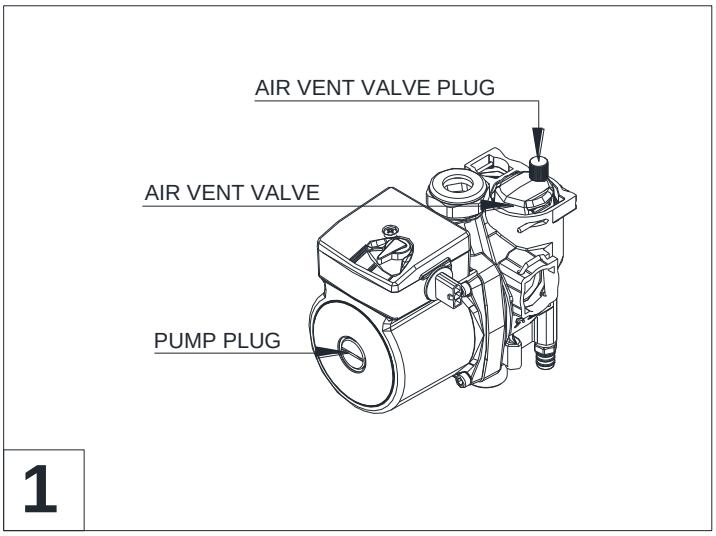
Flush out both primary and domestic hot water circuits (see 4.3 “Flushing the system”).

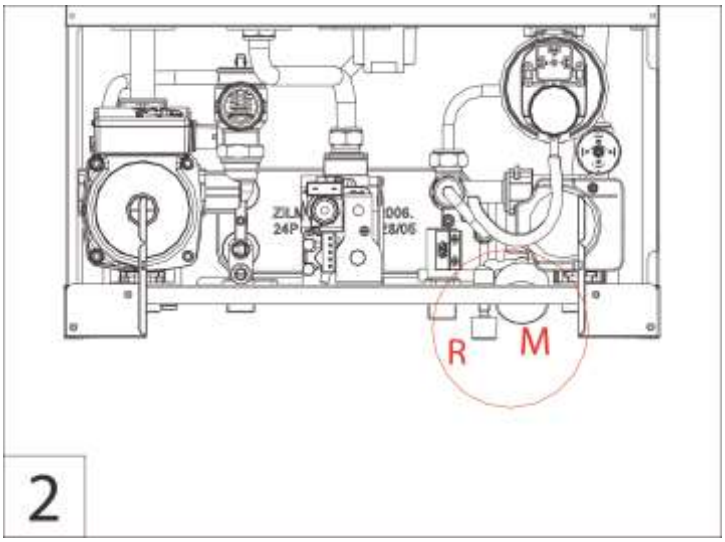
4.2 Filling the system

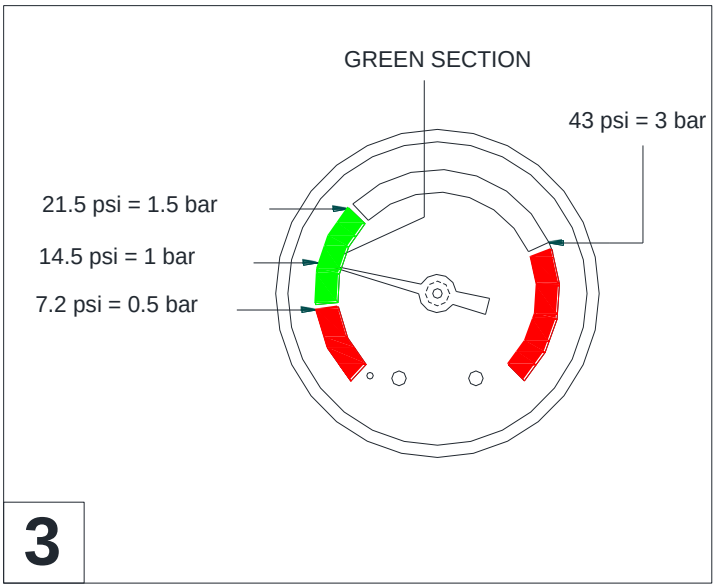
Use only clean tap water to fill the system.

Once the water pipes have been connected, close the gas feed valve and fill the system as follows:

- Check that the circulation pump runs freely by removing the “PUMP PLUG” and manual spinning the rotor using a small slotted screwdriver.
- Check that the cap of the air vent valve has been loosened slightly to allow air to escape from the system (fig.1).
- Open the filling tap **R** (fig. 2) or utilizing an external pressure reducing valve and backflow preventer, use the pressure gauge **M** (fig.2) to check that the systems pressure reaches the middle of the green area (equal to 14.5 psi, see fig. 3).
- **On completion, make sure that the filling tap R is closed.**
- Once again unscrew the plug on the pump to remove any trapped air, check that the pump is free then re-tighten it when water starts to flow out.
- Properly purge the heating systems of all air.
- If, after the above operations, there is a reduction in the pressure refill this system as directed above.
- Pensotti recommends the installation of an automatic pressure reducing valve with backflow preventer installed in the proper location within the heating system. Adjust it to maintain a minimum water pressure of 14.5 psi or as required by the heating system design.







4.3 Flushing the system

Failure to flush and add inhibitor to the system will invalidate the appliance warranty.
All systems must be thoroughly drained and flushed using additives – corrosion inhibitors and flushing agents/descalers.

Pensotti <u>requires</u> the use of the supplied Fernox Commissioning Kit or individual containers of Fernox F3 or F5 cleaner and F1 protector. Follow Fernox installation instructions. Failure to use Fernox F3 or F5 cleaner and F1 protector will void the warranty for all waterside components.
To flush out the primary side of this unit

a. Fill the boiler as per the filling instructions.
b. Using a drain off cock on the lowest point of the system allow the water to drain from the system and boiler.
c. In order to flush the system correctly turn off all radiators open the filling loop and drain cock simultaneously and allow the water to flow through the boiler.
d. Open each individual radiator allowing water to flow through then turn that radiator off and repeat for all radiators on the system.
e. Turn off the filling loop and close the drain cock open all radiators and open the filling to fill the system.
f. Continue to fill the system until the pressure gauge reads in the Green section of the gauge (14.5 psi).

To flush out domestic hot water circuit
a. Open all hot water outlets.
b. Turn on inlet group supply so water enters the boiler; leave to fill until water is released from the hot water outlets. Turn off all hot water outlets.
c. Connect a hosepipe to the cylinder drain cock and open the drain cock.
d. Allow water to flow through the boiler and out of the drain cock.
e. Turn off water supply, disconnect the hosepipe, close the drain cock and refill the boiler.

4.4 Starting up the boiler – Requires a Gas Manometer & Electronic Combustion Analyzer

Once the system has been filled, purged of air, the gas line checked for leaks and venting system inspected proceed as follows:

- Check that the exhaust duct is free from obstructions and correctly connected to the flue exhaust system.
- Remove the front panel (see 6.3 'Accessing the boiler');
- Loosen the screw of the gas pressure point no. 3 (fig. 1), and insert a Gas Manometer
- Switch on the power supply to the boiler;
- Open the gas feed valve;
- Use button to select the HEATING ONLY mode. The symbol will light up (solid light) to indicate the selected operation mode;
- Turn on all available heating zones. The closure of the room thermostat(s) contact will then light the burner. symbol will begin to blink.
- In case of flame failure, the ignition system repeats the ignition procedure after the fan-overrun cycle (20 sec). It may be necessary to repeat the operation in order to remove all the air from the pipes. To repeat the operation, wait approximately 15 seconds from the last ignition attempt before resetting the error code **E01** (by pressing the reset button ' ® ');
- To check the inlet gas pressure value allow the boiler to fire;

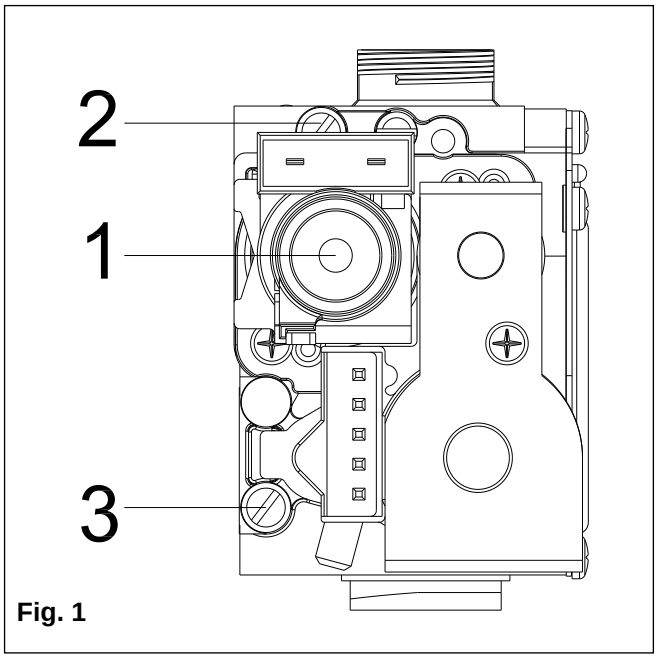


Fig. 1

KEY:

1. MODULATOR
2. GAS PRESSURE POINT - OUTLET
3. GAS PRESSURE POINT – INLET

- Press and hold the (reset button) ® for several seconds until "F07" appears on the screen (indicating high fire mode);
- Observe inlet gas pressure on the manometer. Adjust inlet pressure (6-7" wc Natural Gas or 11" wc LPG) if necessary at the gas supply service regulator;
- Turn boiler off using the button so that only the symbol is displayed.
- Close the gas feed valve and remove the gas manometer. Tighten the screw of the pressure port no. 3.

Checking Maximum and Minimum fire gas pressure values.

Check Maximum and Minimum gas pressure setting values. Make sure they comply with those stated on the Gas Data Table below;

Gas Data Table		NATURAL GAS		LIQUID PROPANE GAS	
Boiler Fan Speed		min	max	min	max
Gas Pressure	Inches WC	1.74	4	4.04	10.2

Maximum fire gas pressure

1) After completion of inlet gas pressure test (see above procedure) with the gas feed valve in the closed position loosen the screw of pressure port no. 2 (fig 1.) and insert a gas manometer. Re-open the gas feed valve;

2) Use button to select the HEATING ONLY mode. The symbol will light up (solid light) to indicate the selected operation mode;

3) Turn on all available heating zones. The closure of the room thermostat(s) contact will then light the burner. symbol will begin to blink.

4) Allow the boiler to fire. Press and hold the (reset button) ® for several seconds until “F07” appears on the screen (indicating high fire mode);

5) If gas pressure setting value is not the same as stated on the above Gas Data Table, adjust by removing the modulator plastic cap A (fig 2) and screw in the nut C to adjust the maximum gas pressure. Use a 10mm wrench.

Minimum fire gas pressure

6) With the boiler still operating disconnect 1 of the 2 modulator power supply cables from the modulator E (fig 2). The gas manometer will now indicate the minimum mechanical gas pressure. Refer to Gas Data Table above for minimum pressure.

7) If the pressure value is different from that of the Gas Data Table turn screw D (fig.2) until the gas manometer indicates the correct value. (Clockwise to increase pressure. Counter-clockwise to decrease pressure).

8) Re-connect the modulator power supply cable back to its original position.

9) Re-install the modulator plastic cap A to ensure the correct operation of the modulator.

10) Once the calibration procedure has been completed, use button to select the OFF mode indicated by symbol , close the gas feed valve and remove the pressure gauge from the gas pressure point (fig.1). **Tighten the screw making sure there are no gas leaks.**

11) To starting up the boiler, open the gas feed valve and use button to select function mode required.

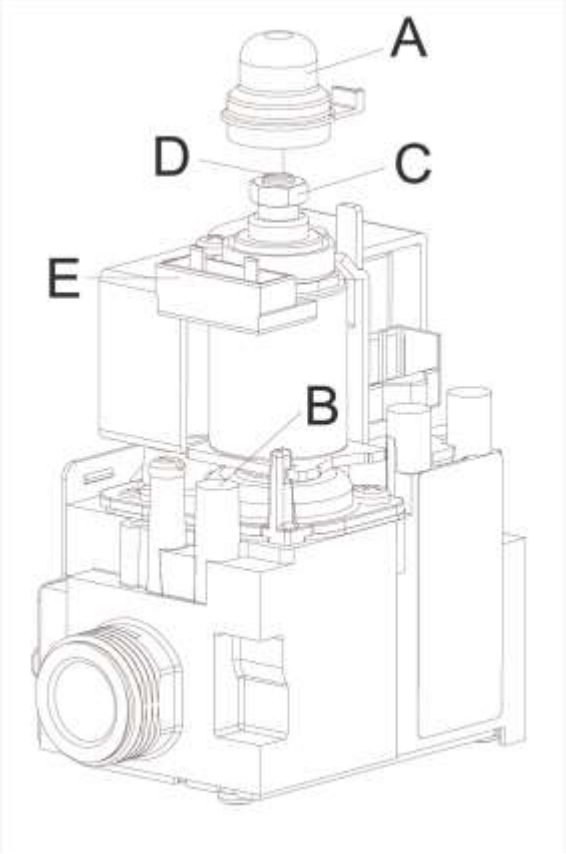


FIG 2.

*Pressures in excess of 14”WC may damage the internal components of this boiler. Pensotti **REQUIRES** replacment of the gas valve if it is subjected to pressures in excess of 14”WC. Faliure to comply could cause dangerous operating conditions, fire, explosion, bodily injury or possible death.*

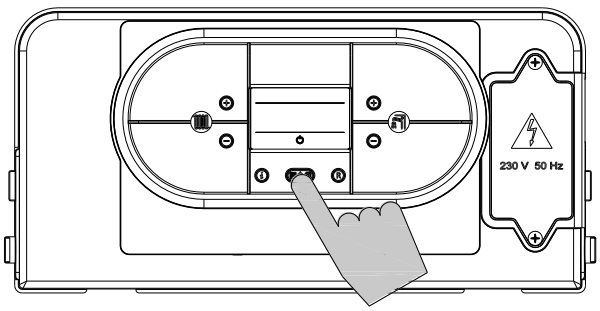
5. REGULATING THE BOILER

5.1 Parameters table

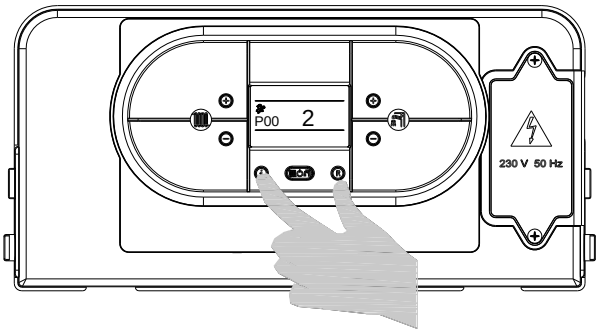
PARAMETER N°	TYPE OF OPERATION	PARAMETER VALUE	FUNCTION
P00	Selects the type of boiler	00-05	00 = NA 01 = PNCC 02 = PNCH 03 = NA 04 = NA 05 = PNCH -NO Indrect Water Heater
P01	Selects the type of gas supply	00 01	Natural gas LPG
P02	Sets the central heating temperature	00 01	Standard (95-185°F) Reduced (77-113°F)
P03	Water hammer delay function ***(Not applicable to only heating boilers)***	0 - 20	Displayed in Seconds Defalt = 0
P04	Central heating timer	00-90	Displayed in multiples of 5 seconds (default value 36 x 5 = 180”)
P05	Central heating pump overrun timer	00-90	Displayed in multiples of 5 seconds (default value 36 x 5 = 180”)
P06	D.H.W./ storage cylinder pump overrun timer ***(Not applicable to instantaneous boilers w/dual circuit exchanger and only heating boilers)***	00-90	Displayed in multiples of 5 seconds (default value 18 x 5 = 90”)
P07	Minimum BTU output	00 - Max (P08)	Displayed in %
P08	Maximum BTU output	Min (P07) - 99	Displayed in %
P09	Sets the ignition sequence	00-99 (default = 50)	Displayed in %
P10	D.H.W. priority function ***(Not applicable to instantaneous boilers w/dual circuit exchanger and only heating boilers)***	00 01	Off On
P11	Legionella prevention function ***(For storage boilers only)***	00 01	Off On
P12	Sets the climatic compensation curve ***(w/outdoor temperature sensor only installation)***	00-30	See the graph in the parameter setting explanation
P13	Central heating minimum Set Point	68 - 104	Displayed in °F
P14	Central heating maximum Set Point	104 - 185	Displayed in °F
P15	D.H.W maximum Set Point ***(Not applicable to only heating boilers)***	113 - 167	Displayed in °F
P16	Post ventilation ***(Not applicable for open chamber models)***	00 - 10	Displayed in minutes

5.2 Accessing the parameters menu

To modify the pre-set values of the parameters reported in the previous table, open the parameter settings menu as follows:

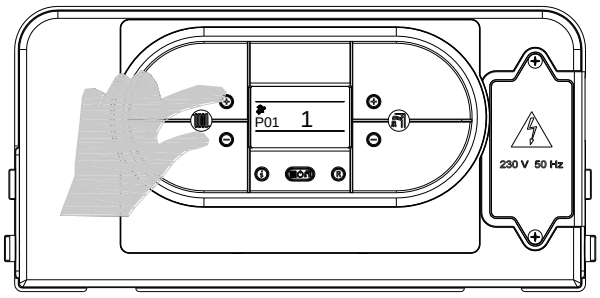


1. Place mode selection button ‘ ’ in OFF position, indicated by ⏻ symbol;



2. Keep pressed ‘ ⓘ ’ and ‘ Ⓡ ’ buttons simultaneously and wait for symbol and ‘P00’, to appear on the display.

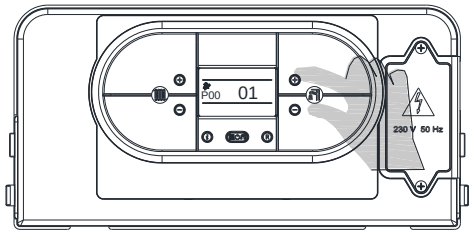
3. Release buttons ‘ ⓘ ’ and ‘ Ⓡ ’;

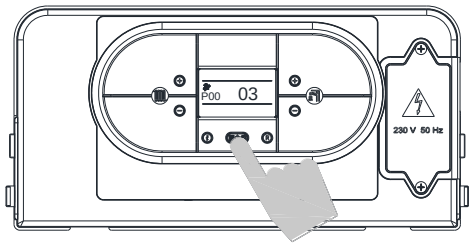


4. Use ‘ ⊕ ’ and ‘ ⊖ ’ buttons of heating temperature setting to select the parameter to modify;

5. Adjust the value of the parameter using the procedure described in the following pages.

5.3 Setting the parameters





PARAMETER P00 – SELECTS THE TYPE OF BOILER

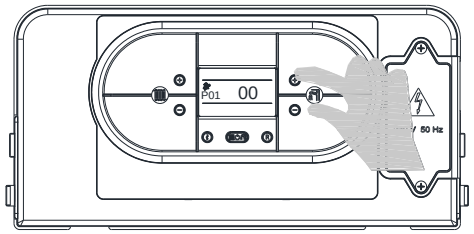
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

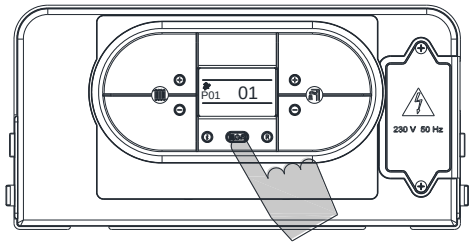
6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter:

00 = NA
01 = PNCC
02 = PNCH with Indirect Water Heater
03 = NA
04 = NA
05 = PNCH – **NO** Indirect Water Heater

7. Press mode selection button ' ' to confirm and to render the new adjustment operative. The parameter number (P00) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P01 - SELECTS THE TYPE OF GAS SUPPLY

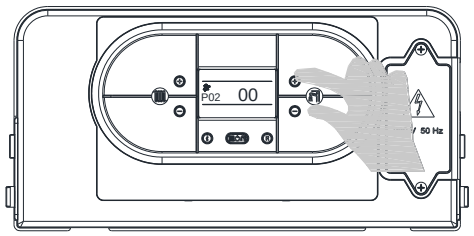
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

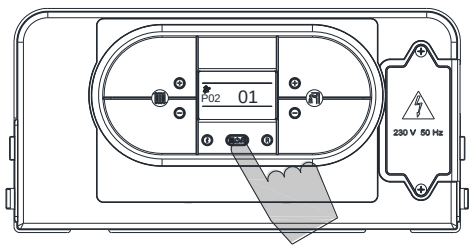
6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter

00 = Natural Gas
01 = LPG

7. Press mode selection button ' ' to confirm and to render the new adjustment operative. The parameter number (P01) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P02 - SETS THE CENTRAL HEATING TEMPERATURE

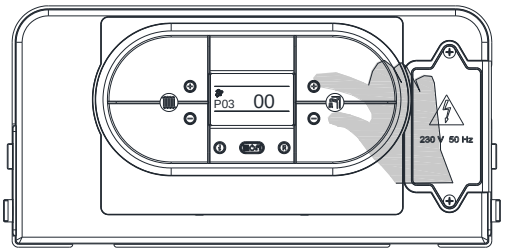
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

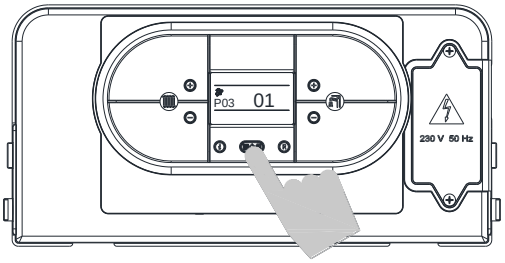
6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter:

00 = standard (86-185°F)
01 = reduced (77-113°F) for under-floor heating

7. Press mode selection button ' ' to confirm and to render the new adjustment operative. The parameter number (P02) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P03 - WATER HAMMER PREVENTION FUNCTION

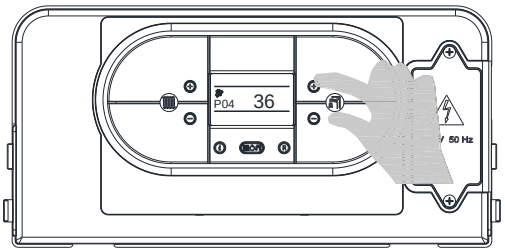
Activating this function, the D.H.W contact is delayed.
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

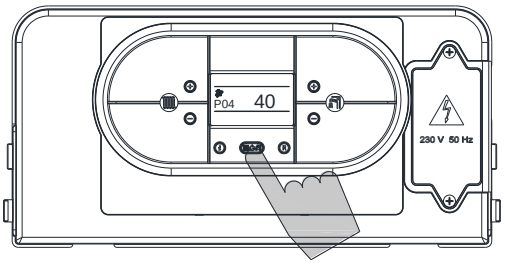
6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter:

min = 0 Seconds
max = 20 Seconds

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P03) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





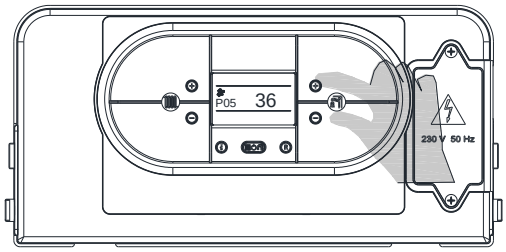
PARAMETER P04 - CENTRAL HEATING TIMER (DIFFERENTIAL)

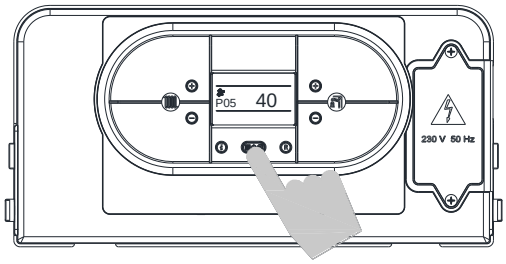
This parameter is used to set the minimum time in which the burner is kept switched off, once the heating flow temperature has exceeded the temperature set by the user.
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in multiples of 5 seconds):
min = 00
max = 90
For ex.: 90 = 90 x 5 = 450 seconds (7.5 min)
The default value is 36 = 180 seconds (3 min)

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P04) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





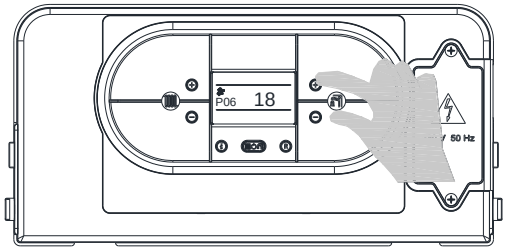
PARAMETER P05 - CENTRAL HEATING PUMP OVERRUN TIMER

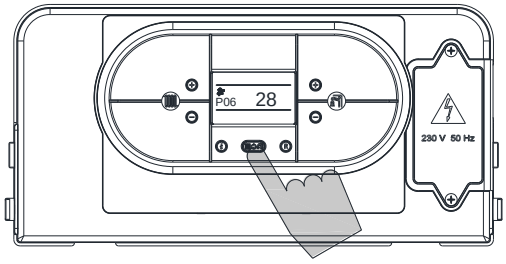
This parameter is used to set the pump functioning time, in heating mode, after switching off the main burner for the intervention of the room thermostat.
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in multiples of 5 seconds):
min = 00
max = 90
For ex.: 90 = 90 x 5 = 450 seconds (7.5 min)
The default value is 36 = 180 seconds (3 min)

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P05) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





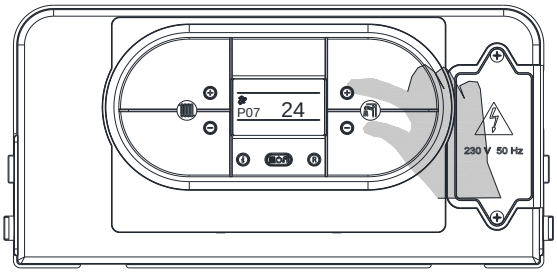
PARAMETER P06 – D.H.W./STORAGE CYLINDER PUMP OVERRUN TIMER *(Not applicable to instantaneous boilers* w/dual circuit exchanger)

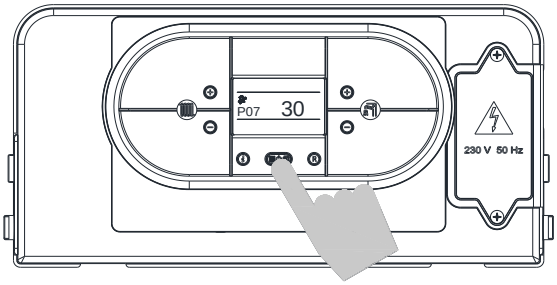
This parameter is used to set the pump functioning time, in D.H.W mode, after closing the water tap.
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits:
(Displayed in multiples of 5 seconds):
min = 00
max = 90
For ex.: 90 = 90 x 5 = 450 seconds (7.5 min)
The default value is 18 = 90 seconds (1.5 min**)**

7. Press mode selection button '' ' ' to confirm and to render the new adjustment operative. The parameter number (P06) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





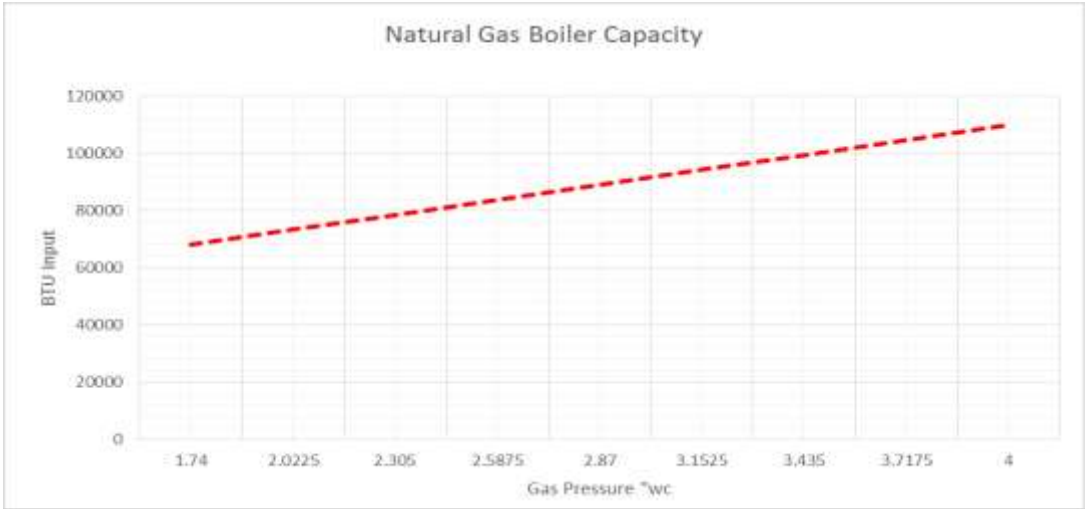
PARAMETER P07 - MINIMUM BTU OUTPUT

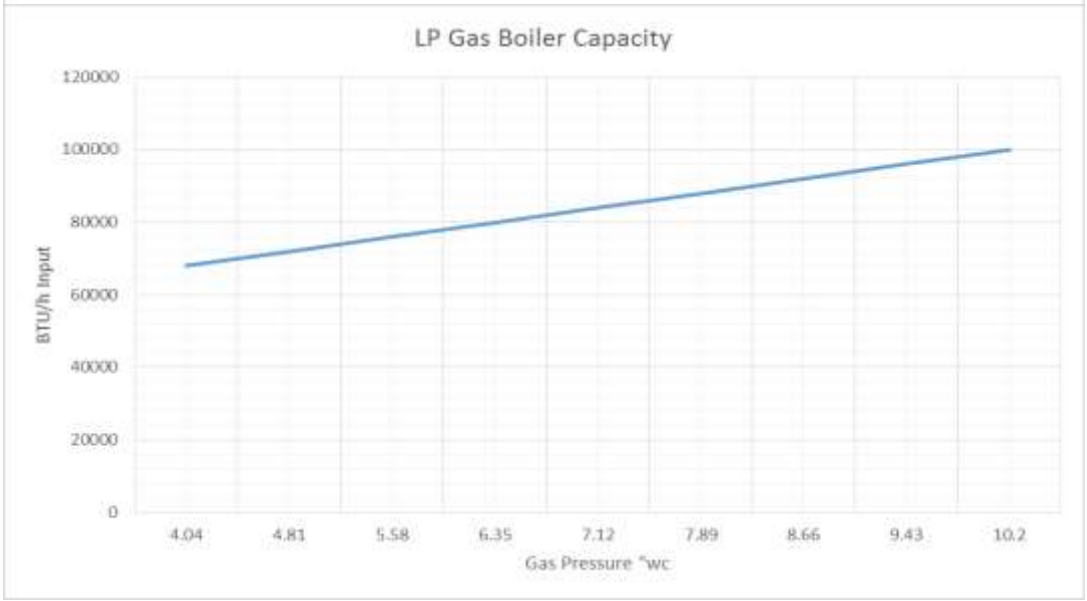
12. Enter the parameters menu and select parameter P07. The pressure gauge will indicate the gas pressure. If this pressure value is different to that on the rating plate of the boiler (*see paragraph **5.5 'Gas Data'***), use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter. The range of settings is 00 - 80.

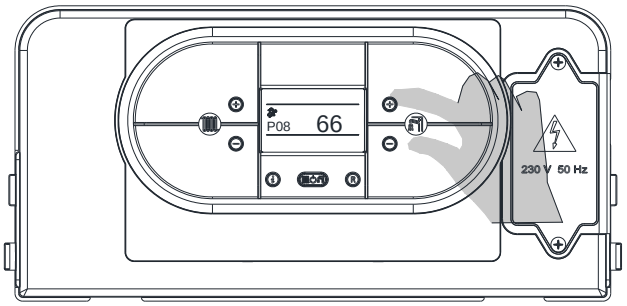
13. Press mode selection button '⏻' to confirm and to render the new adjustment operative. The parameter number (P07) will appear on the display.

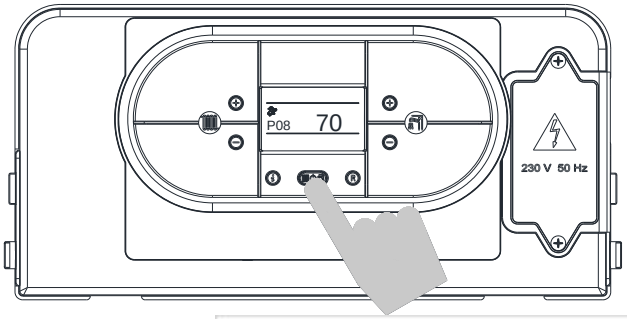
14. Press simultaneously ' ⓘ ' and ' Ⓡ buttons until **OFF** appears on the display.

15. *Disconnect the manometer from the pressure test port '**B**' on the gas valve and carefully tighten the screw making sure there are no gas leaks.*









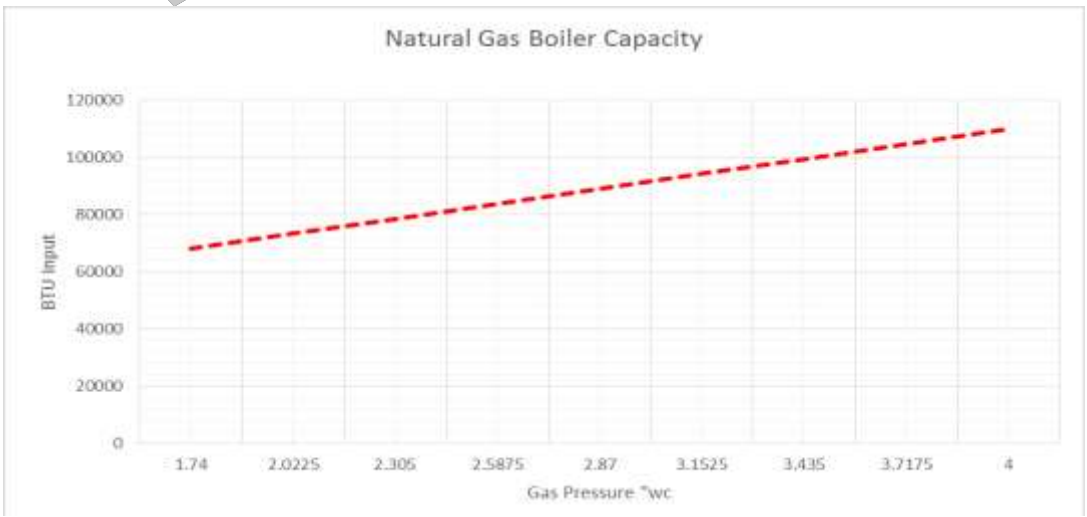
PARAMETER P08 - MAXIMUM BTU OUTPUT

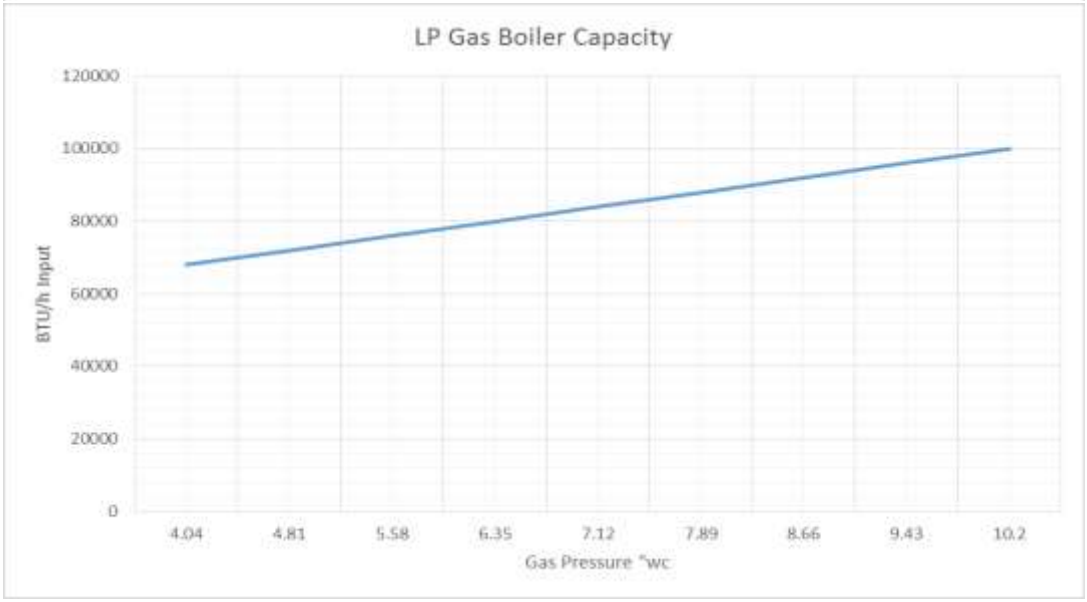
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5). Select parameter P08.

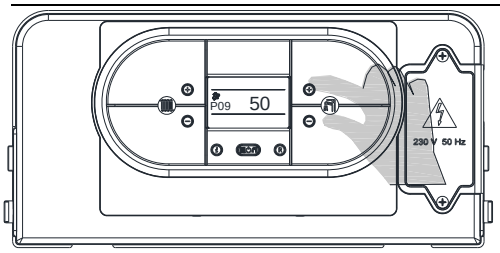
6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) and adjust the value of the parameter from '99' (maximum value of default) to the required value.

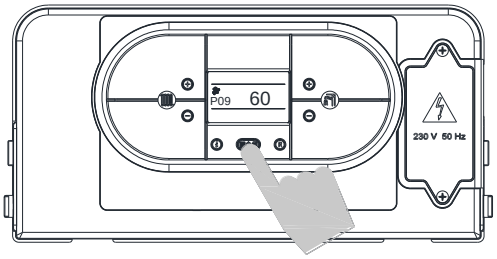
7. Press mode selection button '⏻' to confirm and to render the new adjustment operative. The parameter number (P08) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.









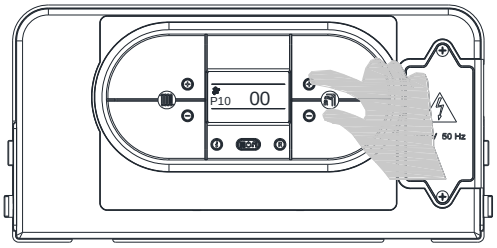
PARAMETER P09 – SETS THE IGNITION SEQUENCE

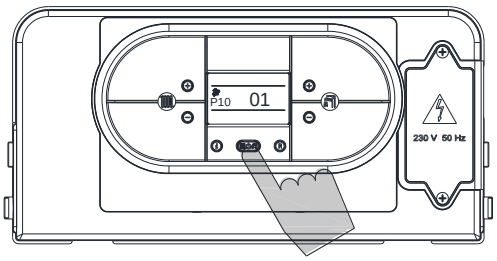
This parameter is used to set the gas pressure during the starting up of the boiler.
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits:
00 = minimum mechanical gas pressure set at the gas valve;
99 = maximum allowed pressure, depending on the chimney length and the type of gas used.
The default value is 50.

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P09) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





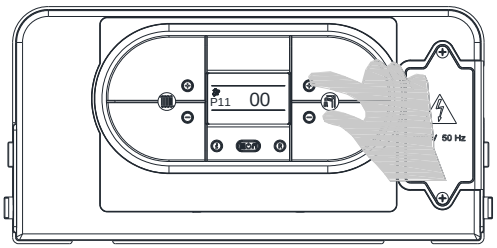
PARAMETER P10 – D.H.W. PRIORITY FUNCTION
***(Not applicable to instantaneous boilers* w/dual circuit exchanger)**

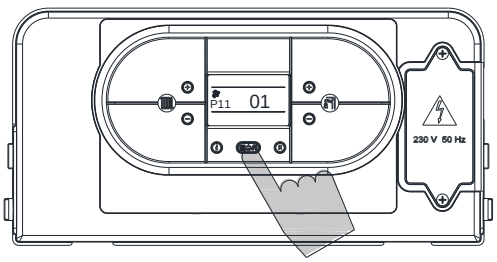
This parameter allows to maintain the diverter valve on D.H.W mode for a time equal to the post-circulation, keeping hot the secondary heat exchanger.
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter:
00 = Off
01 = On

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P10) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





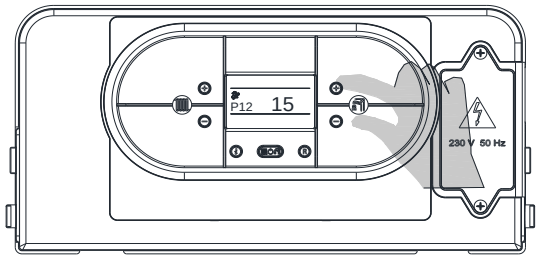
PARAMETER 11 – LEGIONELLA PREVENTION FUNCTION
(For storage boilers only)

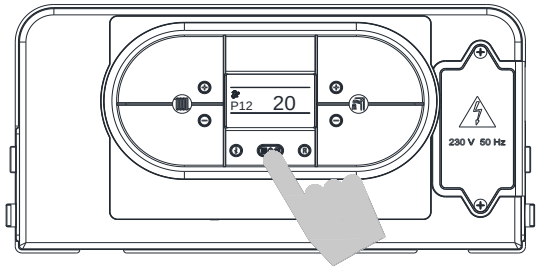
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter:
00 = Off
01= on (default value in storage boilers)

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P11) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P12 – SETS THE CLIMATIC COMPENSATION CURVE

(w/outdoor temperature sensor only installation)

The installation of an outdoor temperature sensor (*see paragraph **6.7 'Electrical connections')*** allows to automatically modify the flow temperature in accordance to the outdoor temperature.
The factor governing the correction is the **Kd** thermoregulation value, indicating the flow temperature range selected (fig. 1).

The selection of the compensation curve is determined by the maximum flow temperature **Tm** and the minimum outdoor temperature **Te** taking into consideration the house insulation degree.

The values of the flow temperature Tm, refer to standard 86-176 °F appliances or 77-113 °F for under-floor heating systems. The type of appliance can be set using parameter P02.

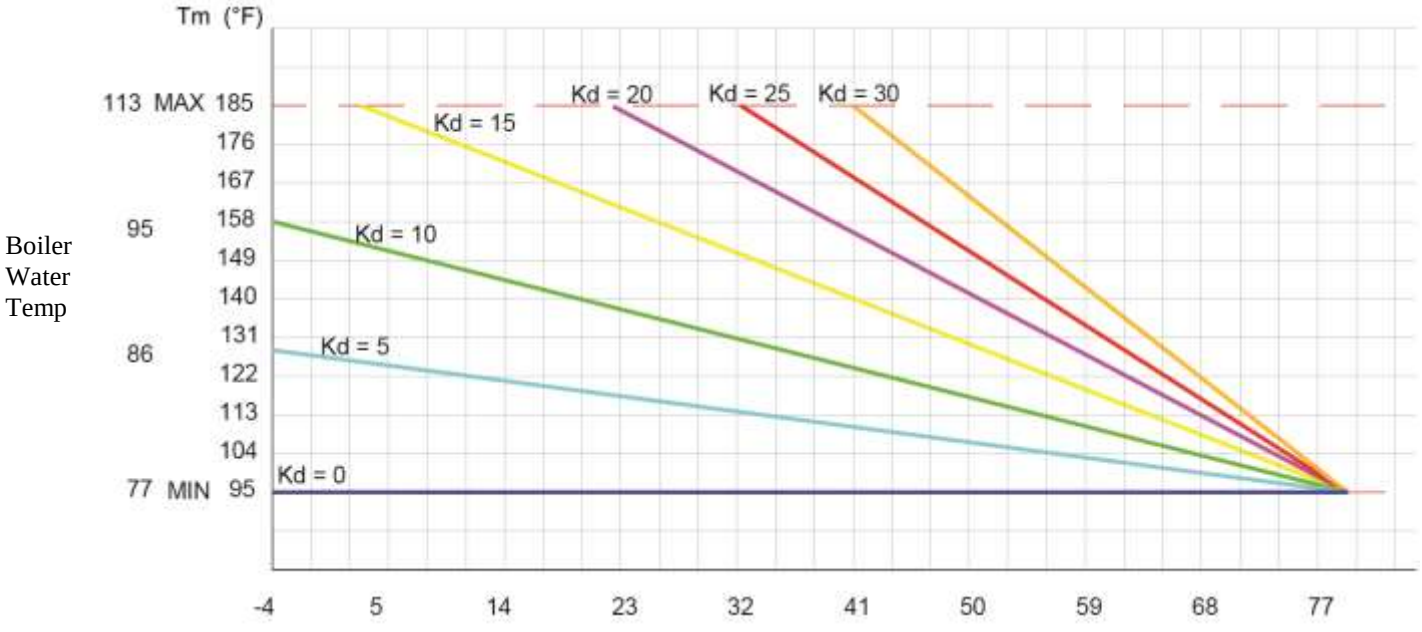
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5) and select parameter P12.

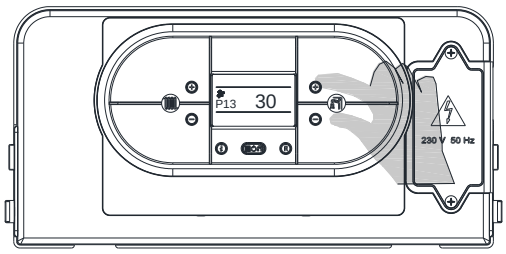
6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter within the range of setting from 00 to 30.
The value corresponds to the graph curves in figure n.1.

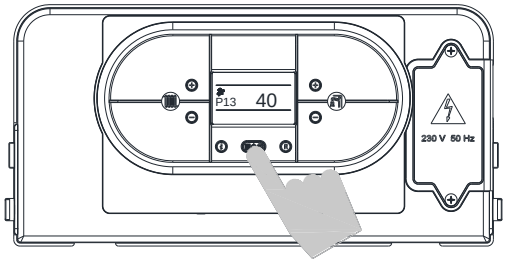
7. Press mode selection button ' ', to confirm and to render the new adjustment operative. The parameter number (P12) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.

Fig. 1







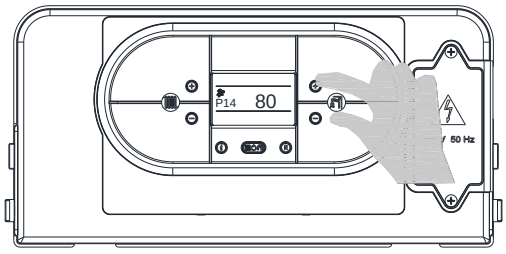
PARAMETER P13 – CENTRAL HEATING MINIMUM SET POINT

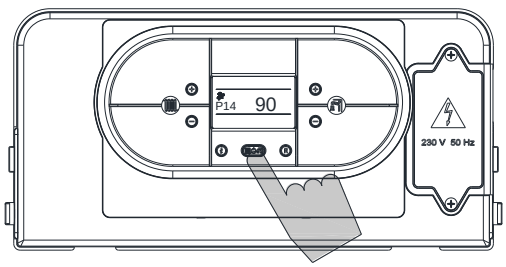
This parameter is used to set the central heating minimum user set point.
To enter the parameters menu, follow the previously described procedure (*see paragraph* ***5.2 'Accessing the parameters menu'*** - steps 1-5).

6. Use '⊕' and '⊖' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in Fahrenheit degrees):
68 – 104 (standard appliances)
68 - 86 (reduced for under-floor heating)

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P13) will appear on the display.

8. To exit from the parameters menu, press simultaneously 'ⓘ' and 'Ⓡ' buttons.





PARAMETER P14 – CENTRAL HEATING MAXIMUM SET POINT

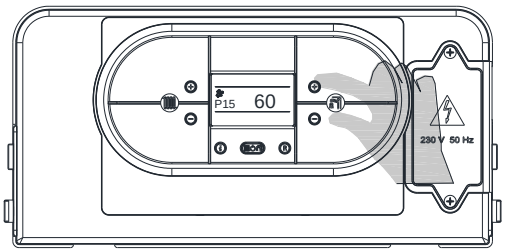
This parameter is used to set the central heating maximum user set point.
To enter the parameters menu, follow the previously described procedure (*see paragraph* ***5.2 'Accessing the parameters menu'*** - steps 1-5).

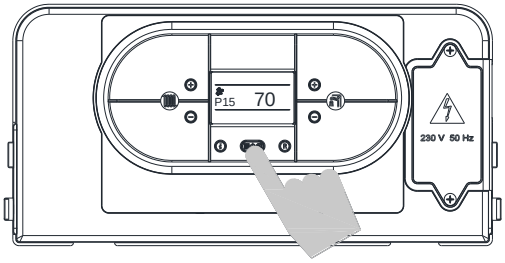
6. Use '⊕' and '⊖' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):

104 – 185°F (standard appliances)
104 – 125°F (reduced for under-floor heating)

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P14) will appear on the display.

8. To exit from the parameters menu, press simultaneously 'ⓘ' and 'Ⓡ' buttons.





PARAMETER P15 – D.H.W. MAXIMUM SET POINT

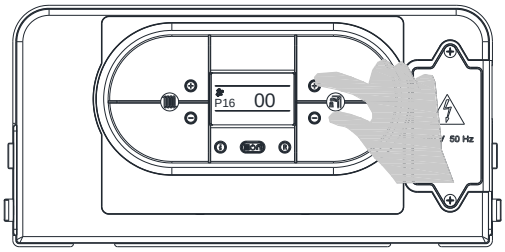
This parameter is used to set the D.H.W maximum user set point.
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5).

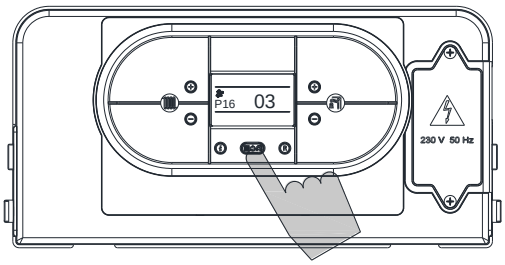
6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in Fahrenheit degrees):

113 – 167°F

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P15) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.





PARAMETER P16 – POST VENTILATION

This parameter is used to set the fan functioning time, after switching off the burner.
To enter the parameters menu, follow the previously described procedure (*see paragraph **5.2 'Accessing the parameters menu'*** - steps 1-5.

6. Use ' ⊕ ' and ' ⊖ ' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in minutes):
00 - 10

7. Press mode selection button '' to confirm and to render the new adjustment operative. The parameter number (P16) will appear on the display.

8. To exit from the parameters menu, press simultaneously ' ⓘ ' and ' Ⓡ ' buttons.

5.4 Gas Data

Technical data tables

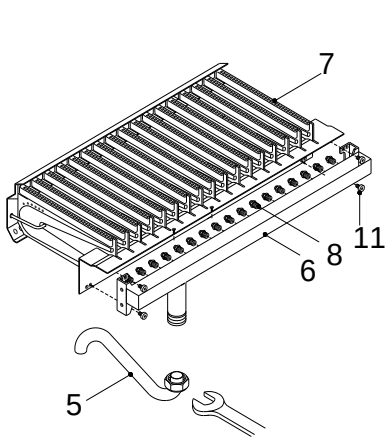
		NATURAL GAS – GAS A	LIQUID PROPANE GAS – GAS E
Heating Value (BTU/Cubic Feet)	BTU/FT³	1000	2516
Nominal supply gas pressure	“wc	7	11
Main burner jets:	n° x Ø (mm)	17 x 1.20	17 x 0.75
Consumption (15°C; 1013 mbar)	m³/h	3.39	-
Consumption (15°C; 1013 mbar)	kg/h	-	2.49

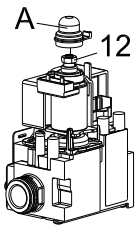
Gas pressure adjustment table

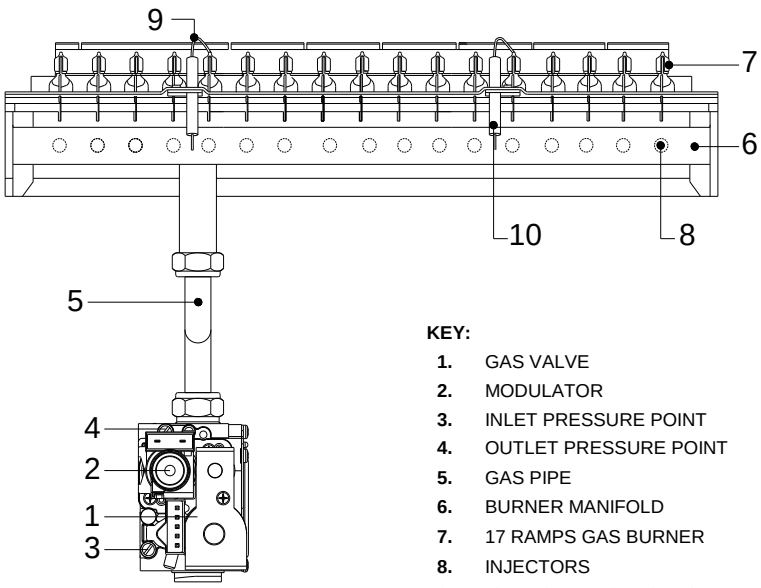
		NATURAL GAS – GAS A		LIQUID PROPANE GAS – GAS E	
		min	max	min	max
Boiler Power Rating	Inches WC	1.74	4	4.04	10.2

*Pressures in excess of 14”WC may damage the internal components of this boiler. Pensotti **REQUIRES** replacment of the gas valve if it is subjected to pressures in excess of 14”WC. Faliure to comply could cause dangerous operating conditions, fire, explosion, bodily injury or possible death.*

5.5 Converting the boiler to a different gas type







KEY:

1. GAS VALVE
2. MODULATOR
3. INLET PRESSURE POINT
4. OUTLET PRESSURE POINT
5. GAS PIPE
6. BURNER MANIFOLD
7. 17 RAMPS GAS BURNER
8. INJECTORS
9. IGNITION ELECTRODES
10. FLAME IONISATION ELECTRODES
11. MANIFOLD FIXING SCREWS
12. MODULATOR NUT

Fig. 1

⚠ **The conversion of a boiler from burning natural gas to LPG, or vice versa, must be carried out exclusively by professionally qualified personnel, registered in accordance with current legislation.**

⚠ **Check that the gas supply pipe is suitable for the new fuel type.**

Conversion is performed as follows (see fig.1):

1. turn off the main power switch;

2. close the gas cock;

3. substitute the jets on the main burner as follows: undo the gas pipe (5 fig.1) from the burner manifold using the proper sized wrench, separate the burner manifold (6) from the burner ramps (7) by undoing the 4 screws (11);

4. using a 7mm wrench remove the burner jets '8' from the burner manifold '6'. Be sure the replacement burner jets are suitable for the type of gas the boiler will operate on. **The jets must be fitted with new gaskets;**

5. reassemble the entire burner unit. Use the soapy water method to check for gas leaks each time gas connections are dismantled and reassembled;

6. select the new gas type by changing parameter **P01** (see ***'Parameters table' 5.1***);

7. to convert the appliance from L.P.G. to Natural Gas proceed with the min. and max. gas pressure adjustment (see '***Gas Valve adjustment' 5.4***);

8. to convert the appliance from Natural Gas to L.P.G. proceed as follows: remove the modulator plastic cap **A** (fig. 1) and screw in the nut 12 using a 10mm. spanner; measure the gas valve inlet pressure '3' with burner ON; adjust the system pressure regulator according to the 'Gas Data' Table 5.5 (Nominal Supply pressure). To adjust the minimum mechanical gas pressure see '***Gas Valve adjustment' paragraph 5.4***;

9. When converting the boiler to work with a different type of gas, remove the existing data plate and replace it with the new one supplied in the conversion kit.

6. MAINTENANCE (authorized personnel)

6.1 General Warnings

⚠ **All maintenance operations must be carried out by professionally qualified personnel, authorised by Granby/Pensotti LLC.**

⚠ **The frequency of boiler maintenance must comply with current law and, nevertheless, should be carried out once a year.**

⚠ **In order to guarantee the long life of the appliance and in accordance with the current gas safety regulations, only use original spare parts**

⚠ **Before carrying out any type of maintenance operation, disconnect the appliance from the mains electricity supply and close the gas valve.**

6.2 Boiler inspection

In order to ensure that the boiler operates efficiently and safely, it is **required** that the appliance is inspected by a suitably competent technician at least once a year.

The following is a **minimum** recommendation of service that should be carried out **annually**

- Check the condition of the gas seals and replace where necessary.
- Check the condition of the water seals and replace where necessary.
- Visually inspect the condition of the combustion chamber and flame.
- Remove and clean any oxidation from the burner.
- Check that the seal of the room-sealed chamber is undamaged and positioned correctly.
- Check the primary heat exchanger and clean if necessary using a soft nylon brush and subitle vacum
- Check the condition and operation of the ignition and gas safety systems.
- Remove and clean the scaling from the ignition and flame detection electrodes, paying particular attention to place them at the correct distance from the burner. Fig 1.
- Check the pre-fill pressure of the integral expansion tank
- Check the presence of air intake/permanent ventilation openings correctly sized according to the boiler installed and in respect with current law.
- Check the integrity and operation of the flue gas exhaust system.
- Check the integrity of the gas piping system.
- Check that the connection to the electricity supply complies with that reported in the boiler's instruction manual.
- Check the electrical connections inside the control panel.
- Check Fernox inhibitor integrity
- Check and clean if necessary the dirt separator
- Check for and remove any combustible or flammable materials that are in the vicinity of the boiler
- Lubricate the 3-way valve using a TPFE aersol lubricant. Fig 2
- Check Relief Valve or proper operation
- Check the maximum and minimum modulation pressures and the modulation itself.
- Check that the combustion is correctly regulated and if necessary make adjustments according to section 4.4 "Starting the boiler".
- Check all heating safety systems. Ex; termpeature saeftly limit, air pressure switch, flame failure, etc.

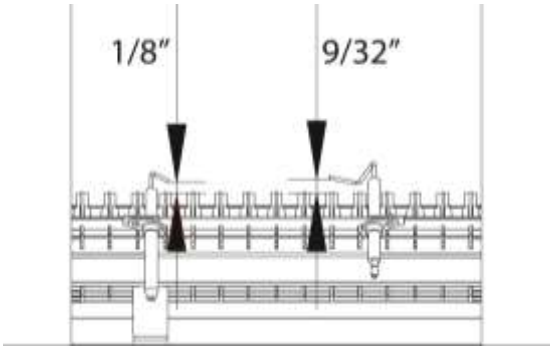


Fig 1.

Fig 2.

6.3 Accessing the boiler

All maintenance operations require one or more of the boiler casing panels to be removed.

The side panels can only be removed after the front panel has been removed.

Front panel:

- Remove the fixing screws at the lower edge of the front panel.
- Grasp the lower part of the panel and pull it outwards (see fig. 1) and then up (see fig. 2).

Left and right side panel:

- Remove the fixing screws at the front and lower edge of the side panel to remove.
- Grasp the bottom of the panel, move it sideways and then upwards to remove it.

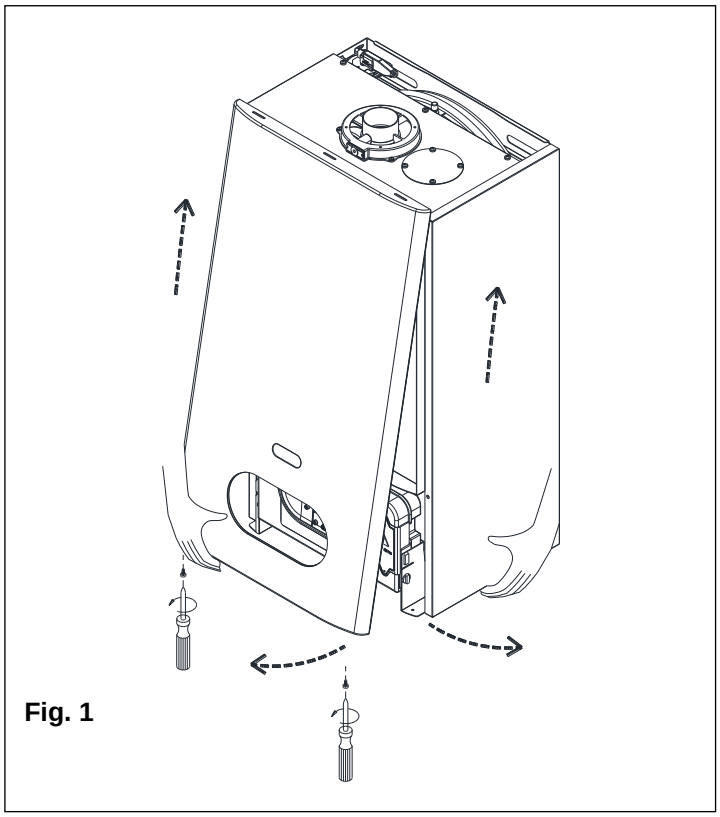


Fig. 1

To access the electrical connections of the control panel, proceed as follows:

- ⚠ Switch off the power supply at the main switch.
- Remove the front panel (see fig. 1 and fig. 2).
- Grasp the left and right control panel support brackets (see fig. 5) and pull them outwards, at the same time rotating the panel downwards.
- Unscrew the four fixing screws (see fig. 6) and remove the panel back piece.

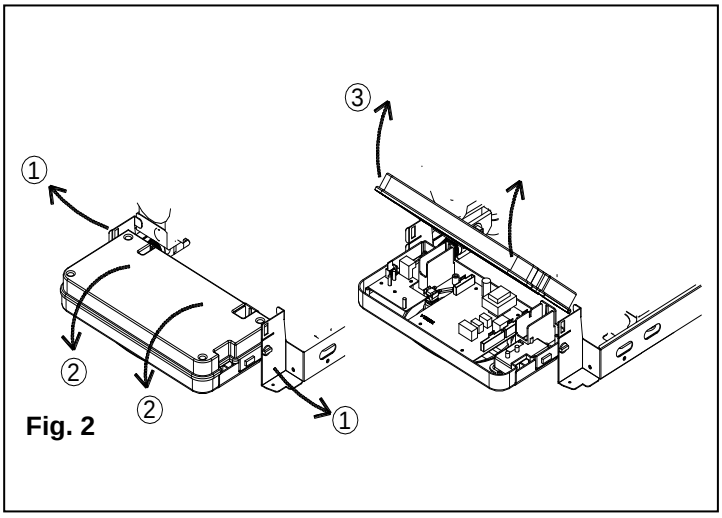


Fig. 2

6.4 Flushing out the primary side

Fill the boiler as per the filling instructions.

Using a drain off cock on the lowest point of the system allow the water to drain from the system and boiler.

In order to flush the system correctly, turn off all radiators or fan coils. Open the filling loop and drain cock simultaneously and allow the water to flow through the boiler.

Open each individual radiator or fan coil, allowing water to flow through. Then turn that radiator or fan coil off and repeat for all radiators or fan coil on the system.

Turn off the filling loop and close the drain cock open all radiators and open the filling valve to fill the system. Continue to fill the system until the pressure gauge reads in the Green section of the gauge 14.5 psi.

In order to safeguard all waterside components the supplied Fernox Commissioning Kit must be used in its entirety.

6.5 Draining the central heating system

If the need arises to drain the system, this can be done as follows:

- Switch the system to “HEAT” mode and ignite the boiler.
- Switch off the power supply to the boiler.
- Wait for the appliance to cool down.
- Connect a hose to the system drain point **R** and locate the other end of the hose in a suitable drainage system.
- Open the system drain valve (fig. 1).
- Open the air vents on the radiators, starting with the highest and moving down the system to the lowest.
- When the system has been drained, close the radiator air vents and the drain valve.

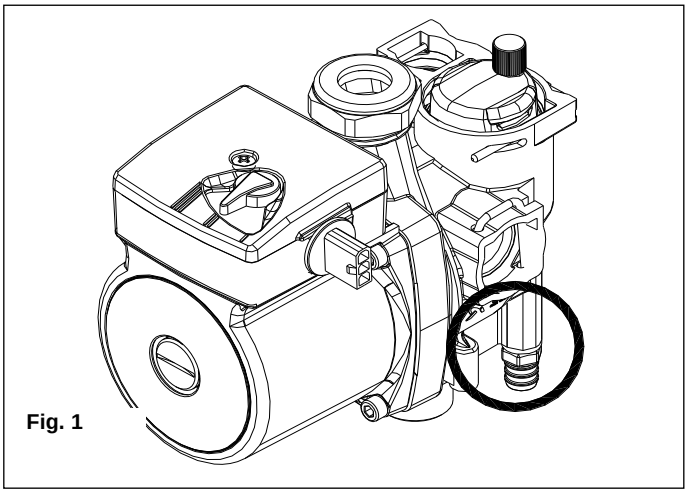


Fig. 1

Draining the domestic hot water system

If there is a danger of freezing, the domestic hot water system should be drained. This can be done as follows:

- Close the main water supply valve.
- Open all the hot and cold water taps.
- Drain the water from the system. Used compressed air to evacuate the pipes of any remaining water.
- Use non-toxic antifreeze to protect the DHW system.
- On completion, close all the previously opened taps.

Freeze Protection

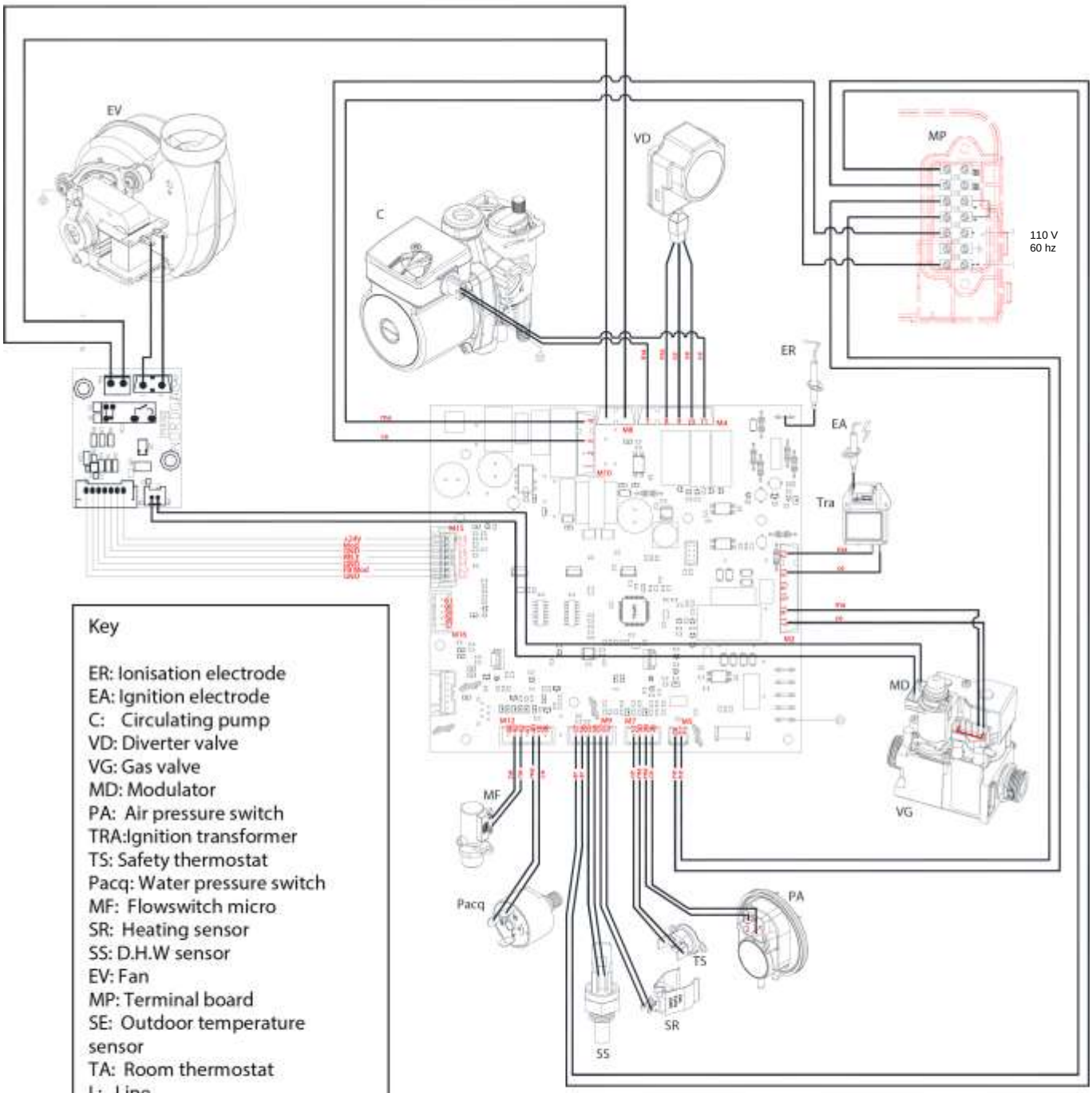
⚠ **Glycol must not be used in Domestic Hot Water applications.**

System winterization (non-operative system)
Because it may be impossible to completely drain the boilers heating circuit, D.H.W circuit and distribution system. Pensotti recommends the introduction of the proper type antifreeze to protect these systems from freezing damage.

System winterization (operating system)

Pensotti boilers are certified for indoor use ONLY. Proper precautions for freeze protection are recommended for boilers and associated piping in areas where the danger of freezing exists. Do not use automotive antifreeze. Pensotti recommends the use of inhibited glycol concentrations between 20-35% glycol. Glycol products must be maintained properly so they do not become inactive or corrosive, consult glycol specifications for more information.

6.6 Wiring diagrams – DIGITECH®TR Printed Circuit Board (MIAH403)



Key

ER: Ionisation electrode
EA: Ignition electrode
C: Circulating pump
VD: Diverter valve
VG: Gas valve
MD: Modulator
PA: Air pressure switch
TRA:Ignition transformer
TS: Safety thermostat
Pacq: Water pressure switch
MF: Flowswitch micro
SR: Heating sensor
SS: D.H.W sensor
EV: Fan
MP: Terminal board
SE: Outdoor temperature sensor
TA: Room thermostat
L: Line
N: Neutral
ne: Black
ce: Blue
ma: Brown
ar: Orange
gi: Yellow
bi: White
gr: Grey
ve: Green

6.7 Electrical connections (Option)

Connect the power supply to the terminal board located on the control panel as follows:

a. switch off the power supply at the main switch;
b. remove the front case panel of the boiler. (see paragraph '6.3 Accessing the boiler');
c. remove the screws and remove plate A from the control panel (see fig. 1). With the plate removed, proceed with the following wires connection:
- install the outdoor temperature sensor on contacts marked as **Se-Se** on the terminal board "**B**";
- install the room thermostat or end switch by removing the jumper **Ta-Ta** from the terminal board "**B**" first, and then connecting the room thermostat or end switch wires (24 DC at these terminals);

d. When wires have been connected, place plate "**A**" back to position and then the front case panel.

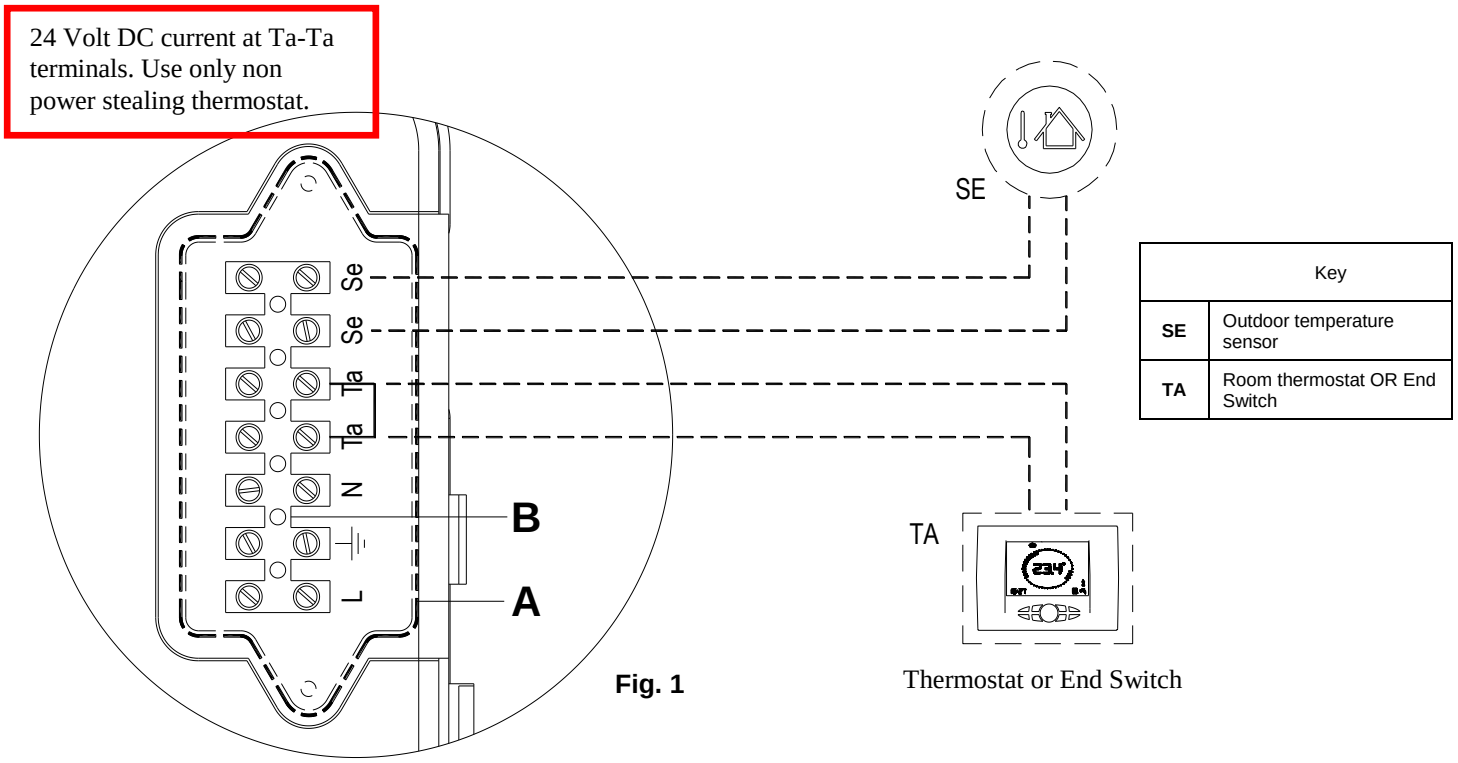


Fig. 1

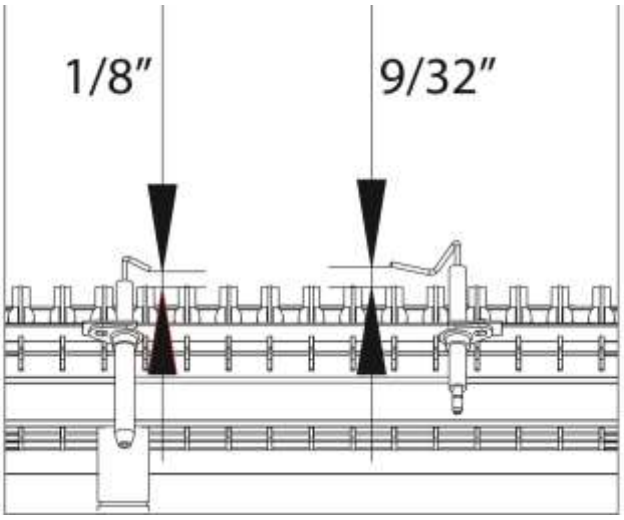
Thermostat or End Switch

6.8 Troubleshooting - To display the last 5 errors, keep pressed the ' ⓘ ' INFO button, in OFF mode position, for 5 seconds. The errors number will appear in chronological order (-1- = first fault… -5- = last fault). Use ' ⊕ ' and ' ⊖ ' buttons of Heating Temperature setting, to scroll the list of saved errors. To reset the errors list press the' Ⓡ ' RESET button. Press the ' ⓘ ' INFO button to exit the errors display mode.

ERROR CODE	PROBLEM	POSSIBLE CAUSE	REMEDY	RESET
E01	IONISATION PROBLEM	*WITHOUT FLAME IGNITION* **a.** NO GAS. **b.** IGNITION ELECTRODE BROKEN OR EARTHED. **c.** GAS VALVE MALFUNCTION. **d.** MECHANICAL MINIMUM ADJUSTMENT (ON GAS VALVE) SET TOO LOW OR IGNITION SEQUENCE SET TOO LOW. **e.** GAS VALVE INLET PRESSURE TOO HIGH (FOR LPG BOILERS ONLY). *WITH FLAME IGNITION* **f.** IONISATION ELECTRODE MALFUNCTION. **g.** IONISATION ELECTRODE CABLE DISCONNECTED.	**a.** CHECK GAS SUPPLY. **b.** REPLACE PART. **c.** REPLACE PART. **d.** REGULATE MECHANICAL MINIMUM OR SLOW IGNITION. **e.** CHECK THE MAXIMUM PRESSURE SETTING. **f.** REPLACE PART. **g.** CONNECT THE IONISATION ELECTRODE CABLE.	Manual Reset (press the ' Ⓡ ' Reset button)
E02	SAFETY THERMOSTAT TRIPPED	**h.** THERMOSTAT MALFUNCTION OR OUT OF CALIBRATION. **i.** THERMOSTAT CABLE DISCONNECTED.	**h.** REPLACE PART. **i.** CHECK THE WIRING.	Manual Reset (press the ' Ⓡ ' Reset button)
E03	AIR PRESSURE SWITCH	**j.** SWITCH OUT OF ORDER. **k.** INLET OR OUTLET FLUE PIPES OBSTRUCTED. **l.** SWITCH CABLE NOT STABLE.	**j.** REPLACE PART. **k.** CHECK FLUE PIPES **l.** CHECK CABLE.	Manual Reset (press the ' Ⓡ ' Reset button)
E04	NO WATER IN THE SYSTEM	**m.** INSUFFICIENT WATER PRESSURE IN THE SYSTEM (OPENS ELECTRICALLY AT 7.2 psi). **n.** WATER PRESSURE SWITCH CABLE DISCONNECTED. **o.** WATER PRESSURE SWITCH MALFUNCTION.	**m.** FILL THE SYSTEM. **n.** CHECK THE WIRING. **o.** REPLACE PART.	Automatic
E05	HEATING SENSOR	**p.** SENSOR MALFUNCTION OR OUT OF CALIBRATION (RESISTANCE VALUE 10 kOhms AT 77°F). **q.** SENSOR CABLE DISCONNECTED OR WET.	**p.** REPLACE PART. **q.** CHECK THE POWER SUPPLY CONNECTION;	Automatic
E06	D.H.W. SENSOR	**r.** SENSOR MALFUNCTION OR INCORRECT (RESISTANCE VALUE 10 kOhms AT 77°F). **s.** SENSOR CABLE DISCONNECTED OR WET.	**r.** REPLACE PART. **s.** CHECK THE POWER SUPPLY CONNECTION .	Automatic
E17	MODULATOR	**t.** GAS VALVE MODULATOR OUT OF ORDER	**t.** REPLACE PART.	Manual Reset (Switch off the power supply)
E18	INADEQUATE CIRCULATION	**u.** PRIMARY OR SECONDARY HEAT EXCHANGER OBSTRUCTED. **v.** PUMP MALFUNCTION OR PUMP IMPELLER DIRTY.	**u.** CLEAN OR REPLACE PART. **v.** CLEAN OR REPLACE PART.	Manual Reset (Switch off the power supply)

ERROR CODE	PROBLEM	POSSIBLE CAUSE	REMEDY	RESET
E21	GENERAL PCB MALFUNCTION	**y.** MICROPROCESSOR MALFUNCTION: IT DETECTS A WRONG SIGNAL .	**u.** THE PCB RESETS THE ERROR AUTOMATICALLY	Automatic
E22	PARAMETER PROGRAMMING REQUEST	**w.** LOSS OF MICROPROCESSOR MEMORY.	**w.** REPROGRAM PARAMETERS.	Manual Reset (Switch off the power supply)
E35	FLAME DETECTION MALFUNCTION	**x.** IONISATION ELECTRODE MALFUNCTION **y.** IONISATION ELECTRODE CABLE MALFUNCTION **z.** PRINTED CIRCUIT BOARD MALFUNCTION	**x.** REPLACE OR CLEAN PART **y.** REPLACE PART **z.** REPLACE PART	Manual Reset (press the ' ® ' Reset button)
E40	ELECTRIC POWER SUPPLY	**aa.** ELECTRIC POWER SUPPLY OUT OF THE OPERATION RANGE (≤95 /≥130 volts)	**aa.** CHECK THE POWER SUPPLY NETWORK (THE ERROR DISAPPEARS AUTOMATICALLY WHEN THE POWER SUPPLY IS BACK WITHIN THE REQUIRED RANGE)	Automatic

Burner Electrode & Ionization Specifications



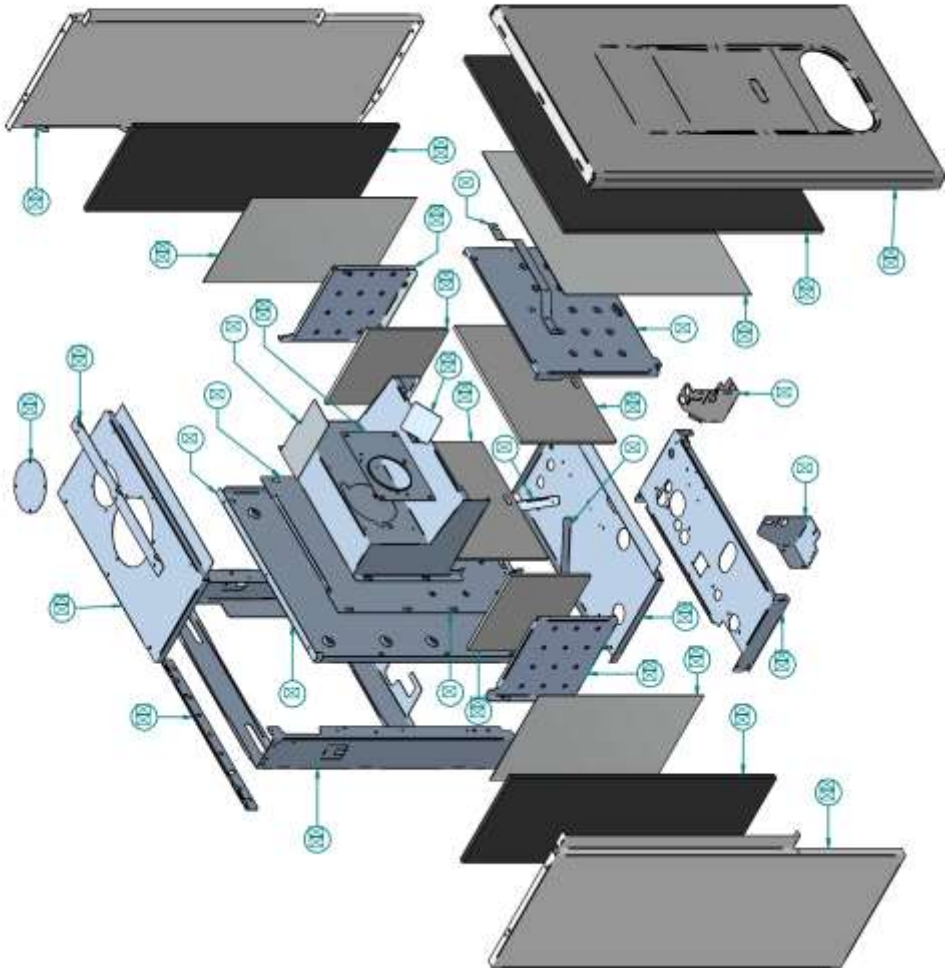
Pressures in excess of 14"WC may damage the internal components of this boiler. Pensotti **REQUIRES** replacment of the gas valve if it is subjected to pressures in excess of 14"WC. Faliure to comply could cause dangerous operating conditions, fire, explosion, bodily injury or possible death.

6.9 Function codes

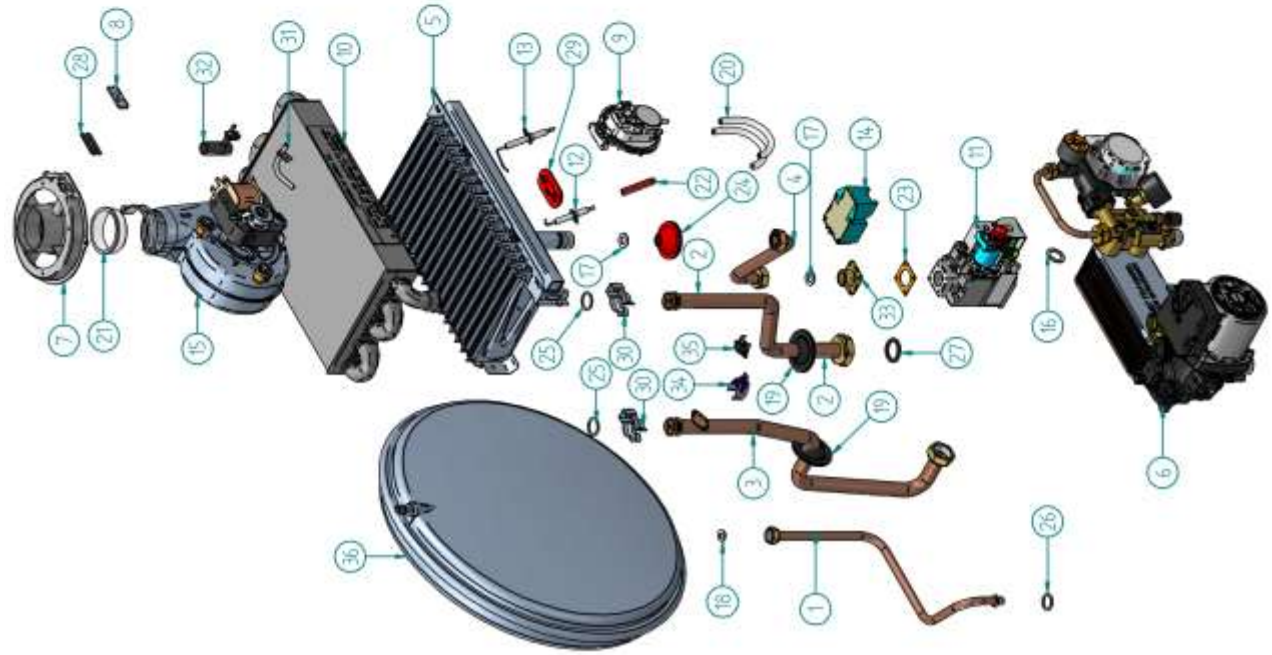
Code	Function	Description
F07	Flue test function enabled (Chimney-Sweeper)	Pressing ‘ ® ’ button for 7 seconds the Flue test function is enabled. Pressing the boiler Off button the function is disabled. The Flue test function operates the boiler at the maximum heating pressure for 15 minutes without any modulation. The function is useful for combustion testing.
F08	Frost Protection function (Central heating circuit)	The function is automatically enabled when the heating sensor detects a temperature of 41°F. The boiler operates at minimum gas pressure with the diverter valve in the winter position. The function is disabled when the temperature detected by the sensor reaches 86°F.
F09	Frost Protection function (D.H.W circuit)	The function is automatically enabled when the D.H.W sensor detects a temperature of 39°F. The boiler operates at minimum gas pressure with the diverter valve in the ‘summer’ position. The function is disabled when the temperature detected by the sensor is 46°F.
F28	Legionella Prevention Function	Function active for storage boilers only. It comes into operation every 7 days. It brings the hot water temperature of the storage cylinder up to 140°F regardless of the DHW temperature setting.

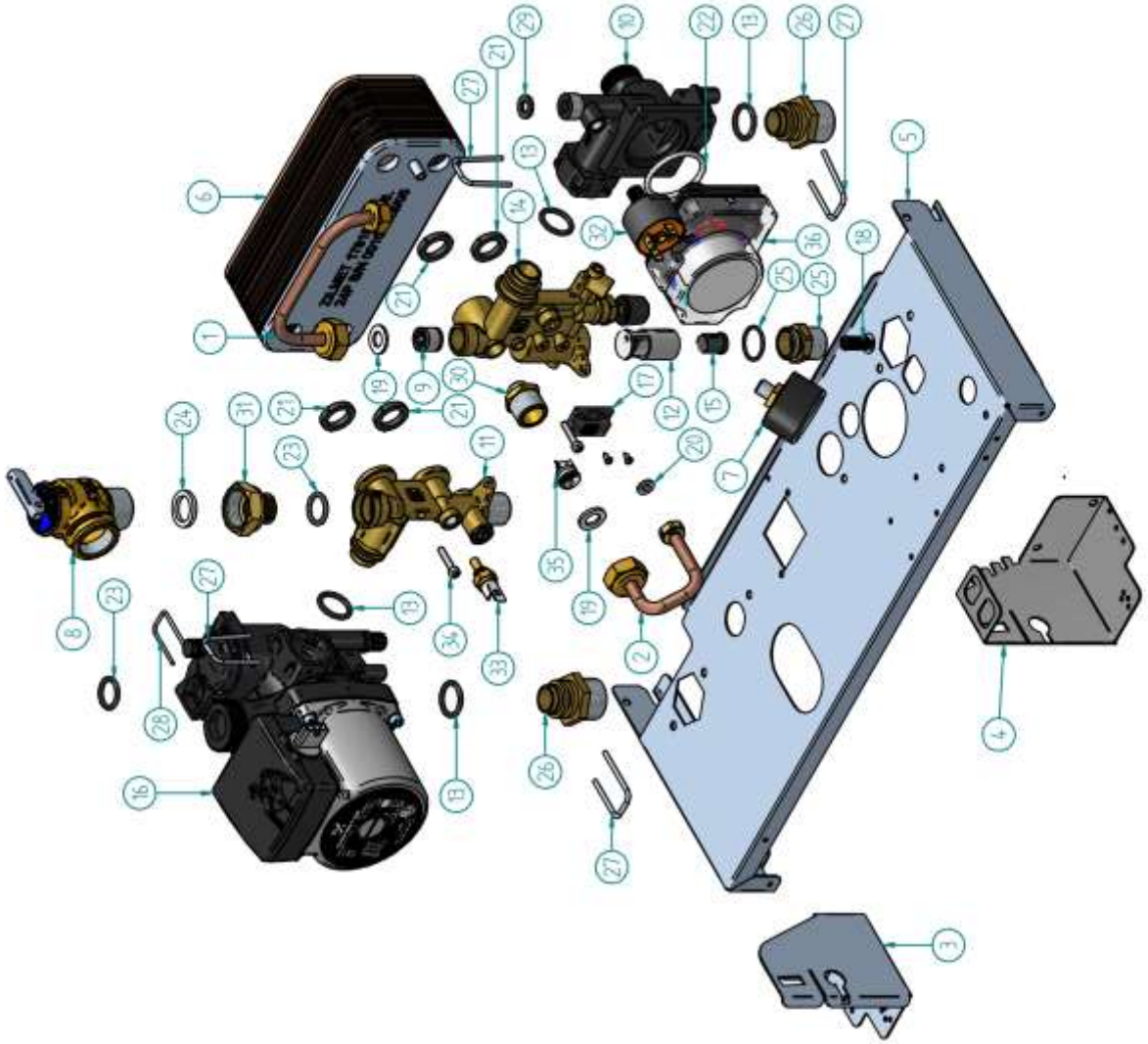
6.10 Exploded Drawings

N.	Code	Description	Qty
1	12-01289	FLUE HOOD COMPLETE	1
2	15-00475	CASING FRONT PANEL VIBRATION PREVENTION BRACKET	1
3	15-00843	ROOM-SEALED CHAMBER BOTTOM LEFT DEFLECTOR	1
4	15-00844	ROOM-SEALED CHAMBER BOTTOM RIGHT DEFLECTOR	1
5	15-00861	CONTROL PANEL LEFT SIDE BRACKET	1
6	15-00950	CONTROL PANEL RIGHT SIDE BRACKET	1
7	15-01025	COMBUSTION CHAMBER FRONT PANEL	1
8	15-01026	CASING BACK SIDE PANEL	1
9	15-01027	COMBUSTION CHAMBER BACK SIDE PANEL	1
10	15-01050	COMBUSTION CHAMBER LEFT SIDE PANEL	1
11	15-01055	ROOM-SEALED CHAMBER BOTTOM PLATE	1
12	15-01059	COMBUSTION CHAMBER RIGHT SIDE PANEL	1
13	15-01061	ROOM-SEALED CHAMBER TOP	1
14	15-01064	BOTTOM BOILER PLATE	1
15	30-00025	CERAMIC FIBRE DX/SX	2
16	30-00143	CERAMIC FIBRE FRONT-BACK PANEL	2
17	34542LP	FLUE HOOD LEFT DEFLECTOR	1
18	35-00088	CASING FRONT PANEL	1
19	40047LP	EXHAUST FAN D.85 FLANGE	1
20	43251LA	INSULATION LEFT/RIGHT SIDE PANEL - SC 3S	2
21	43253LA	ALUMINIUM ADHESIVE RIGHT/LEFTSIDE - SC 3S	2
22	43287LA	INSULATION FRONT PANEL SC	1
23	43288LA	ALUMINIUM ADHESIVE FRONT PANEL 420x370	1
24	52285LA	CASING LEFT SIDE PANELSC 3S - 11/06	1
25	52286LA	CASING RIGHT SIDE PANELSC 3S - 11/06	1
26	62011LP	HOLES CLOSING PLATE D.100 FORR/S CHAMBER TOP	1
27	74247LP	WALL HANGING BRACKET RSF30	1
28	74307LP	FIXING CASING BRACKET RH-RHR-RHA28_100	1
29	79086LP	FRAME SLIMCODE - 2006	1



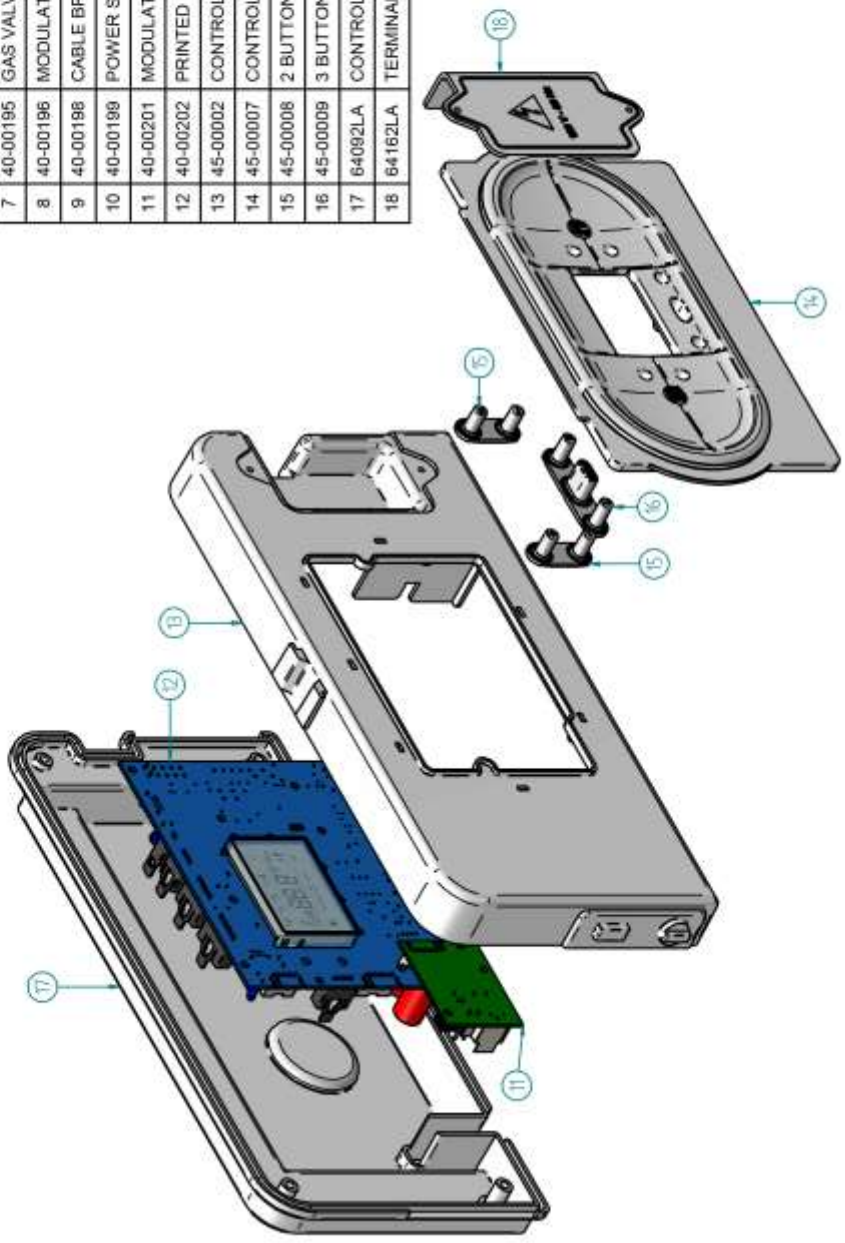
N.	Codice	Descrizione	Qt.	N.	Codice	Descrizione	Qt.
1	12-01097	TUBO Ø10 VASO ESPANSIONE	1	28	43229LA	GUARNIZIONE IN GOMMA EPDM	1
2	12-01299	TUBO Ø18 RITORNO	1	29	43352LA	FB12/1 GUARNSILIROSSO OVALE	1
3	12-01300	TUBO Ø18 MANDATA	1	30	54020LA	MOLLA FISSAGGIO PACCO LAMELLARE	2
4	12-01301	TUBO Ø14 VALVOLA GAS	1	31	57501LP	PRESA DI PRESSIONE ARIA Ø6	1
5	21032LA	BRUCIATORE 17 RAMPE 1.20 METANO	1	32	57525LA	PRESA DI DEPRESSIONE VENTURI 2005	1
6	26-00251	GRUPPO IDRAULICO	1	33	68013LP	RACCORDO 1/2" ENTRATA VALVOLA GAS	1
7	27006LA	ISPEZIONE FUMI	1	34	73518LA	SENSORE A CLIP BLU PER TUBI Ø17 Ø18	1
8	27068LA	PIASTRINO CHIUSURA ISPEZIONE FUMI	1	35	86006LA	TERMOSTATO SICUREZZA 95C°	1
9	30-00024	PRESSOSTATO ARIA 3.28 - 2.98	1	36	95018LA	VASO ESPANSIONE L.10 TONDO	1
10	30-00140	SCAMBIATORE MONOTERMICO PR751 A/A 301 mm	1				
11	30-00150	VALVOLA GAS SIT 845 SIGMA	1				
12	35007LA	ELETTRODO ACCENSIONE	1				
13	35009LA	ELETTRODO RIVELAZIONE	1				
14	40-00124	TRASFORMATORE UL/CS ZAG 2 XV	1				
15	40-00211	ELETTROVENTILATORE E.S 30-108 USA	1				
16	43001LA	GUARNIZIONE 3/4"	1				
17	43002LA	GUARNIZIONE 1/2"	2				
18	43003LA	GUARNIZIONE 3/8"	1				
19	43009LA	GUARNIZIONE IN SILICONE ROSSO TUBO Ø18	2				
20	43016LA	TUBO SILICONE TRASPARENTE Ø 8	2				
21	43031LA	MANICOTTO Ø 54 ELETTROVENTILATORE	1				
22	43040LA	CAPPUCCIO ELETTRODO SILIROSSO	1				
23	43045LA	GUARNIZIONE 33x33x1,5 Ø 19	1				
24	43047LA	GUARNIZIONE CONICA SILICONE TRASPARENTE	1				
25	43118LA	OR Ø17.86x2.62 EPDM SCAMBIATORE BITERMICO	2				
26	43150LA	OR MULTIPLEX EPDM OR9M 14X30	1				
27	43208LA	GUARNIZIONE 23x30x3ep. EPDM 80 Sh. 1°	1				





N.	Code	Description	Qty
1	12-00910	PIPE D.8 BY-PASS	1
2	12-01032	PIPE D.8 N.RET.VALVE	1
3	15-00861	CONTROL PANEL LEFT SIDE BRACKET	1
4	15-00950	CONTROL PANEL RIGHT SIDE BRACKET	1
5	15-01064	BOTTOM BOILER PLATE	1
6	20046LA	PLATE EXCHANGER 24 P. - PP24FK6F01	1
7	25-00196	WATER PRESSURE GAUGE	1
8	25-00247	SAFETY VALVE 3/4"M-3/4"F 3BPSI - 1040705	1
9	25-00256	BY-PASS D.15	1
10	25-00257	DIVERTER VALVE PLASTIC BODY	1
11	25-00258	PUMP CONNECTION BODY MULTIPLEX	1
12	25-00260	FLOWSWITCH PISTON DRIVER	1
13	25-00269	PUMP/PUMP CONNECTION BODY OR 18,64x3,53 EPDM	4
14	25-00281	FLOWSWITCH GROUP	1
15	25-00289	FLOWSWITCH PISTON	1
16	25-00331	PUMP AQKR GRUNFOS UPS 15-58	1
17	31083LA	FLOWSWITCH MICRO LEAD ID9401/L	1
18	41016LA	FLOWSWITCH FILTERPLASTIC - 2844	1
19	43002LA	WASHER Ø 18.5x10.2x2 1/2" -AFM34	2
20	43007LA	WASHER D.11.5x6x2 1/8"-AFM34	1
21	43139LA	PLATE EXCHANGER O-RING EPDM 70SH PEROX BL.-M.PLEX	4
22	43145LA	DIVERTER VALVE O-RING M.PLEX	1
23	43150LA	EPDM O-RING 14X30 FOR BRASS CONNECTIONS M.PLEX	2
24	43179LA	WASHER 23.5x17x3 3/4" AFM34	1
25	55-00190	NIPPLES 1/2" w/O-RING	1
26	55-00191	NIPPLES 3/4" w/O-RING	2
27	55-00215	FIXING CLIP - STAINLESS STEEL	4
28	55-00227	EXPANSION VESSEL PIPE FIXING CLIP	1
29	55-00229	WASHER 3/8" Ø15x8x2	1
30	56087LA	CL 2510 1/4"-1/2" CONNECTION	1
31	56091LA	NIPPLES 3/4"SAFETY VALVE CONN.	1
32	59015LA	WATER PRESSURE SWITCH	1
33	73507LA	D.H.W.-HEATING 1/8" WHITE SENSOR S011001	1
34	89134NA	SCREW 5x20	1
35	96018LA	NON-RETURN VALVE	1
36	96073LA	DIVERTER VALVE ACTUATOR UL/CSA	1

N°	Code	Description	Qty
1	31385LA	POWER SUPPLY CABLE UL/CSA	1
2	31388LA	FRAME-PRINTED CIRCUIT BOARD CABLE UL/CSA	1
3	31392LA	D.H.W./HEATING SENSOR CABLE UL/CSA	1
4	31428LA	FLOWSWITCH MICRO LEAD UL/CSA	1
5	40-00152	WATER PRESSURE SWITCH CABLE	1
6	40-00154	PUMP/7DIVERTER VALVE CABLE	1
7	40-00195	GAS VALVE CABLE	1
8	40-00196	MODULATOR CABLE SIT GAS VALVE MIAH4 - ATM/USA	1
9	40-00198	CABLE BRIDGE MIAH4 ATM-SK MOD. - USA	1
10	40-00199	POWER SUPPLY CABLE MIAH4	1
11	40-00201	MODULATOR PCB ATM-USA -KAAB000	1
12	40-00202	PRINTED CIRCUIT BOARD ATM/USA - MIAH403	1
13	45-00002	CONTROL PANEL R1	1
14	45-00007	CONTROL PANEL FRONT COVER R2	1
15	45-00008	2 BUTTONS GROUP R2 PANEL	2
16	45-00009	3 BUTTONS GROUP R2 PANEL	1
17	64092LA	CONTROL PANEL BACK PLATE OBLO' - 138006	1
18	64162LA	TERMINAL BLOCK COVER 120V-60HZ	1



WARRANTY

FOR PENSOTTI SOLENNE CLASSIC GAS BOILERS

This warranty extends only to the original retail purchaser of the boiler and only for a boiler that has not been moved from it's' original installation location.

LIMITED TWO (2) YEAR WARRANTY: Pensotti LLC warrants that all parts of the Solenne gas condensing boilers to be free from manufacturing defects in material and workmanship for a period of two years from the date of installation.

LIMITED TEN (10) YEAR WARRANTY FOR THE PRIMARY HEAT EXCHANGER: Pensotti LLC warrants the primary heat exchanger to be free from manufacturing defects in material and workmanship for ten years from the date of installation.

LIMITED LIFETIME WARRANTY FOR THE PRIMARY HEAT EXCHANGER FROM THE ELEVENTH (11th) YEAR: The proportionate charge will be equal to the percentage of the **list price** of the primary heat exchanger at the time the warranty claim is made. 11th year - 30%; 12th year - 50%; 13th year - 55%; 14th year - 65%; 15 year and beyond - 75%.

REDUCTION OF THE LIFETIME WARRANTY: The Lifetime warranty is reduced to a ten (10) year warranty, from the date of installation, under the following conditions: Boiler is installed in a non-residential, multi-family residential, residential rental property, commercial, institutional or industrial application. If a single family residence is converted to a multi-family residential building the warranty reduction will take place immediately upon conversion.

EXCLUSIONS: The liability of Pensotti LLC shall not exceed the repair or replacement of defective parts and does not include any cost for labor to remove and reinstall the alleged defective part, transportation to or from the factory, or any other materials required to make the repair.

The warranty does not cover failures or malfunctions resulting from;

1. Failure to properly transport, install, adjust, operate or maintain the boiler in accordance with all published information.
2. Installer workmanship
3. Abuse, alteration, accident, flood, fire, negligence or act of god.
4. Sediment or lime build up (both heating and domestic water passages).
5. Improper system cleansing and flushing
6. Improper or non-existent water treatment
7. Freezing
8. Inadequate water flow
9. High velocity water flow in excess of published heat exchanger flow rates
10. Improper voltage
11. Use of non-factory authorized parts or accessories in conjunction with the boiler
12. Components that are part of the heating system, but not supplied by Pensotti Boilers as part of the boiler.
13. Contamination of the combustion air including dust, dirt, environmental particles and construction particles.
14. The repair or replacement of parts or components without the proper approval form Pensotti Boilers.
15. Proper elimination of the condensate from the venting system

PURCHASER'S RESPONSIBILITIES

The following are the responsibilities of the retail purchaser;

1. Pensotti LLC requires that the boiler be maintained in accordance with the owners' and installation manuals to avoid premature failures and to keep the boiler operating efficiently.
2. All system components must be kept in good working order.
3. Vent terminations must be free and clear of all obstructions including snow, plants, shrubs leaves and yard debris.
4. The Warranty card provided must be completed and returned to Pensotti Boilers upon completion of the boiler installation.

LIMITATIONS OF WARRANTY:

This is the only warranty given by Pensotti Boilers. No one is authorized to make any other warranties on Pensotti LLC behalf. This warranty is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranties of fitness for a particular purpose and merchantability. Pensotti LLC expressly disclaims and excludes any liability for consequential, incidental, indirect or punitive damages for breach of any express or implied warranty. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state and by province.

WARRANTY CLAIMS:

For proper warranty claims, contact you installer with the following information:

1. Model number
2. Serial number
3. Date of installation

The installer will notify the wholesaler from whom the boiler was purchased for instructions regarding claim. All alleged defective parts must be returned through trade channels and replacement parts will, if warranty conditions are met, be provided by Pensotti Boilers through the wholesaler. If there are any questions about the coverage of this warranty, please contact Pensotti LLC at the address below.

Pensotti LLC
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P. 207-942-3636 F. 207-942-3737
www.pensottiboiler.com