

BWCAAG000120 - BWCAAG000150 BWAAG000120 - BWAAG000150

INSTALLATION & OPERATING INSTRUCTIONS FOR CONTRACTORS

⚠ WARNING: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

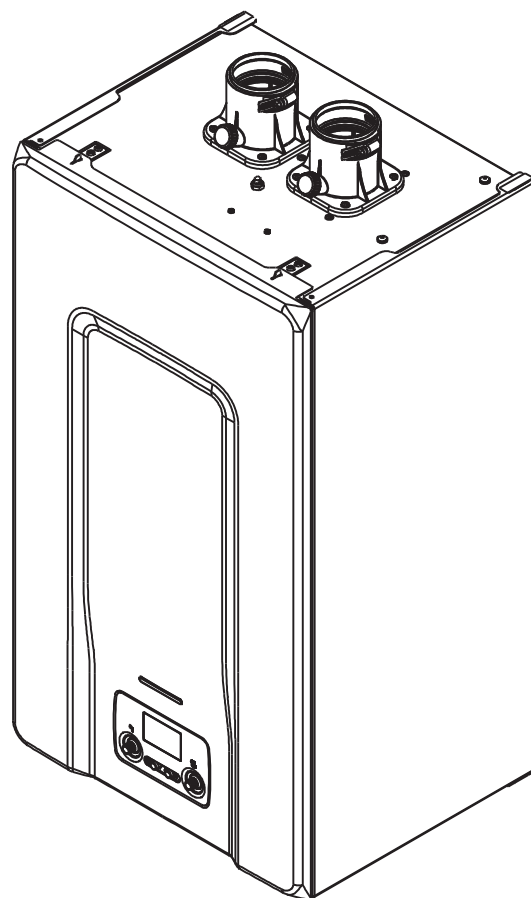
Do not store or use gasoline or other flammable vapors and liquids or other combustible materials in the vicinity of this or any other appliance. To do so may result in an explosion or fire.

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

This manual should be maintained in legible condition and kept adjacent to the boiler or in a safe place for future reference.



CAC/BDP


7310 West Morris St
Indianapolis - IN 46231
USA

CONTENTS

1 KEY TO SYMBOLS	3	(Air-inlet only) and CPVC Plastic Venting	26
2 WARNINGS.	3	8.4 General Venting Rules and Guidelines	26
2.1 Ratings and Certifications	3	8.5 Combustion Air and Ventilation Openings	28
2.2 Regulations and guidelines	3	8.5.1 NearBoiler Vent/Air-inlet Piping	33
2.3 General warnings.	3	8.6 Connecting flue gas accessories	33
3 SAFETY	4	8.6.1 Installing of the exhaust and air intake system	33
3.1 General safety	4	8.7 Vent and combustion air pipe length	33
3.2 Scalding time/temperature relationships	4	8.8 Approved configurations of horizontal and vertical venting installation	33
4 PRODUCT RECEIPT	5	8.9 Multi Family boiler installation	38
4.1 Model Identification	5	9 WIRING DIAGRAM	39
4.2 Boiler box content	5	9.1 Electrical diagram	39
4.3 Installation at elevation	5	9.2 Ladder diagram	41
5 INTRODUCTION	5	10 LIGHTING INSTRUCTIONS.	43
5.1 Structure	6	11 COMMISSIONING	44
5.2 Boiler front control	8	11.1 Preliminary checks.	44
5.3 Technical data	9	11.2 Instructing the user	44
5.4 Hydraulic circuit	13	11.3 Initial flushing of the system.	44
5.5 Dimensions and connections.	15	11.4 Bleeding and Releasing of Circulator Shaft.	44
6 BEFORE INSTALLATION	16	11.5 Programming the boiler	44
6.1 Installations must comply with:	16	11.6 First commissioning.	45
6.2 Before locating the boiler.	16	11.7 Adjusting the heating water temperature without an outdoor temperature sensor connected.	46
6.3 Clearances for service access.	16	11.8 Adjusting the heating water temperature with an outdoor temperature sensor connected.	46
6.3.1 Exhaust vent and intake air vent	16	11.9 Adjustment of the domestic hot water temperature	46
6.4 Prevent combustion air contamination.	17	11.10 Access to the INFO menu	47
6.5 When removing an existing boiler from an existing common vent system.	17	11.11 Access to the PARAMETER menu	47
6.6 Prepare the boiler	17	11.11.1 Hydraulic configuration.	49
7 INSTALLATION	17	11.11.2 Sliding outlet (heating only boiler)	49
7.1 Wall mounting information	17	11.11.3 Heating timer	49
7.1.1 Placing the wall-mounted boiler.	17	11.11.4 Domestic hot water thermostat (combi boiler only)	49
7.2 Boiler template.	18	11.11.5 System	49
7.2.1 Installation steps	18	11.11.6 Preheating (combi boiler only)	49
7.3 ASME pressure relief valve	19	11.11.7 Minimum CH setpoint.	49
7.4 Installing the condensate check valve.	19	11.11.8 Maximum CH setpoint	49
7.5 Loose flow regulators	20	11.11.9 Minimum DHW setpoint	49
7.6 General piping information.	20	11.11.10 Maximum DHW setpoint.	50
7.6.1 Separate low water cutoff	20	11.11.11 Reset flue hour counter	50
7.6.2 Backflow preventer (heating only model).	20	11.11.12 Auxiliary output.	50
7.6.3 Fitting the heating circuit supply and return pipes	20	11.11.13 Night Setback and Outdoor Reset Correction	50
7.6.4 Sizing space heat system piping	20	11.11.14 CALL FOR SERVICE	50
7.6.5 Available Pump Head (ft. hd.)	20	11.12 Setting the outdoor reset curve with an outdoor sensor.	50
7.7 Making the gas connection	21	11.13 Checks during and after the first commissioning.	51
7.7.1 Electrical supply.	21	11.14 Converting the boiler gas type	51
7.8 External wiring limitations	22	11.15 Combustion analysis	52
7.9 Electrical connections	22	11.16 Lights and faults/Reset procedure.	52
7.9.1 OT and Room Thermostat connection to the boiler.	23	11.17 Temporary switch-off	54
7.10 Outdoor temperature sensor	23	11.18 Switching off for long periods.	54
7.11 KBAIR0101BE9/ pump card management (BE09)	23	11.19 Replacing of the PCB board	54
7.12 Other devices.	23	11.20 Remote devices presence	54
7.13 Check/control water chemistry.	24	12 SERVICING INSTRUCTIONS	55
7.14 Freeze protection (when used)	24	12.1 General	55
7.15 Casing removal	24	12.2 Maintenance	55
7.16 Initial filling of the system and air purge.	24	12.3 Maintenance program	55
7.17 Refill of the system	25	12.4 Maintenance of the combustion control system	56
7.18 Draining the heating circuit of the boiler	25	12.4.1 Flame sensor.	56
7.19 Emptying the domestic hot water system	25	12.4.2 Gas valve.	57
8 GENERAL VENTING.	26	12.4.3 Burner	57
8.1 Combustion Air-inlet Contamination	26	12.4.4 Burner door	57
8.2 Flammable Solvents and Plastic Piping.	26	12.4.5 Heat exchanger	57
8.3 Mandatory Pre-commissioning Procedure for PVC (Air-inlet only) and CPVC Plastic Venting	26	12.5 Annual servicing check list.	59

Document Specific Type	Model Number	Language	New Literature Number
Installation	BWC - BWH	English	BWC-H-01SI
Owner's Manual	BWC - BWH	English	OG-BWC-H-01
Warranty	BWC - BWH	English	39004DP565
Installation	BWC - BWH	French-Canadian	BWC-H-01SIFR
Owner's Manual	BWC - BWH	French-Canadian	OG-BWC-H-01FR
Warranty	BWC - BWH	French-Canadian	39004DP565FR

1 KEY TO SYMBOLS

This  is the safety-alert symbol. When you see this symbol on the appliance and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety-alert symbol.

DANGER identifies the most serious hazards which will result in severe personal injury or death.

WARNING signifies a hazard which could result in personal injury or death.


CAUTION is used to identify hazards which may result in minor personal injury or product and property damage.

NOTE and **NOTICE** are used to highlight suggestions which will result in enhanced installation, reliability, or operation.

2 WARNINGS

2.1 Ratings and Certifications

- Gas fired hot water boiler for either direct vent installation. Design according to: ANSI Z21.13-2017 • CSA 4.9-2017 – Gas-Fired low pressure hot water boilers. Direct vent boiler, Category IV.
- SCAQMD Rule 1146.2

 **WARNING:** Altering any pressure vessel by installing replacement heat exchangers, or any ASME parts not manufactured and/or approved by the manufacturer will instantly void the ASME and CSA ratings and any warranty on the vessel. Altering the ASME or CSA ratings of the vessel also violates national, state, and local approval codes.

Combi models are certified to NSF/ANSI 372-2016 - Low lead content certification program - plumbing products and conform to the requirements for "lead free" plumbing products.


2.2 Regulations and guidelines


The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the latest edition of the National Fuel Gas Code, ANSI Z223.1/NFPA 54. In Canada, installation must be in accordance with the requirements of CAN/CSA B149.1, Natural Gas and Propane Installation Code. 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 CSD-1.


Install CO detectors per local regulations. The use of a carbon monoxide detector in conjunction with the manufacturer heating products is required. When installing a carbon monoxide detector, the manufacturer's instructions of the carbon monoxide detector must be followed in their entirety. It is recommended to use a carbon monoxide detector in compliance with a nationally recognized standard such as ANSI/UL 2034-2002 in the United States and CSA 6.19-01 in Canada.


Boilers require yearly maintenance, see chapter "12.2 Maintenance" page 55".

2.3 General warnings


 **DANGER:** Make sure the gas on which the boiler will operate is the same type as that specified on the boiler rating plate and on the colored sticker near the boiler gas connection.


 **WARNING:** This product is a gas appliance that emits poisonous gases; such as CO (Carbon Monoxide). For this reason, it is required that CO detectors be installed in buildings where the boiler is installed. Failure to do so may result in severe injury or death.


 **WARNING:** Should overheating occur or the gas supply valve fail to shut off, turn off the manual gas control valve to the appliance.

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


Legend model terminology:
BWC = combi boiler
BWH = heating only boiler


 **WARNING:** Chlorine and chloramine concentration in domestic water must be less than 50 ppm.


 **WARNING:** Automatic filling systems are not recommended with this product as they will continually add fresh water to the system if there is a leak resulting in the addition of new contaminants that could reduce the lifespan of the boiler.


 **WARNING:** To minimize the possibility of improper operation, serious personal injury, fire, or damage to the boiler:


- Always keep the area around the boiler free of combustible materials, gasoline, and other flammable liquids and vapors.
- Boiler should never be covered or have any blockage to the flow of fresh air to the boiler.

 **WARNING:** Risk of electrical shock. More than one disconnect switch may be required to de-energize the equipment before servicing. Failure to comply with the above could result in severe personal injury, death or substantial property damage.

 **WARNING:** Failure to adhere to the guidelines on this page can result in severe personal injury, death or substantial property damage.

 **WARNING:** Installation and service must be performed by a gas supplier or a licensed qualified installer/service Technician.

 **WARNING - CALIFORNIA PROPOSITION 65:** This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

 **CAUTION:** This boiler requires forced water circulation when the burner is operating. See minimum and maximum flow rates. Severe damage will occur if the boiler is operated without proper water flow circulation.

NOTICE: Minimum 20 AWG, 194°F (90°C), solid thermostat wire must be used for all low voltage (less than 30 volts) external connections to the unit. Install conduit as appropriate.

NOTICE: When the boiler has been filled for the first time or the system has been drained and refilled, it will be necessary to release any air that may have become trapped within the appliance heat exchanger. Loosen the bleed screw until water is released and then close. **IMPORTANT, THERE ARE NO OTHER MANUAL AIR RELEASE VALVES LOCATED ON THE APPLIANCE.**

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the appliance.

This product is approved for construction use provided they are installed in accordance with this manual, the requirements of the authority having jurisdiction as well as either the National Fuel Gas Code, ANSI Z223.1/NFPA 54 in the United States or CAN/CSA B149.1, Natural Gas and Propane Installation Code in Canada.

The product must be installed indoors and be protected from environmental elements. The building envelope must be sealed completely and have a finished roof. Unfinished openings, such as windows and doors, must be temporarily sealed with plastic sheeting material as a minimum.

The following instructions must be observed

- The boiler must only be used for its designated purpose, observing the Installation Instructions.
- Only use the boiler in combinations and with the accessories and spare parts listed.
- Other combinations, accessories and consumables must only be used if they are specifically designed for the intended application and do not affect the system performance and the safety requirements.
- Maintenance and repairs must only be carried out by authorized professionals.
- You are only allowed to operate the condensing gas boiler with the combustion air/flue gas system that has been specifically designed and approved for this type of boiler.
- Please note that local permission for the flue system and the condensate water connection to the public sewer system may be required.
- The hot water distribution system must comply with all applicable codes

and regulations. When replacing an existing boiler, it is important to check the condition of the entire hot water distribution system to ensure safe operation.

You must also observe:

- The local building regulations stipulating the installation rules.
- The local building regulations concerning the air intake and outlet systems and the chimney connection.
- The regulations for the power supply connection.
- The technical rules laid down by the gas utility company concerning the connection of the gas connection to the local gas main.
- The instructions and standards concerning the safety equipment for the water/space heating system.
- The Installation instructions for building heating systems.
- The boiler must be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the boiler or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the boiler. The pan must not restrict combustion air flow.
- The boiler must be installed such that the gas ignition system components are protected from water (dripping, spraying, rain etc.) during boiler operation and service (circulator replacement, condensate trap, control replacement, etc.).
- The boiler must not be installed on carpeting.
- The boiler must only be installed on a wall.
- Do not restrict or seal any air intake or outlet openings.
- If you find any defects, you must inform the owner of the system of the defect and the associated hazard in writing.

⚠ DANGER: Flammable gas explodes. Beware if you smell gas: there may be an explosion hazard.

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

⚠ WARNING: Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other boiler. Doing so may result in an explosion or fire.

Observe these instructions as general warnings:

- Chemicals used to clean the system and/or inhibit corrosion must be pH neutral, i.e. they should ensure that the level of the pH in the system water remains neutral. Premature failure of certain components can occur if the pH level in the system water is out of normal range.
- The manufacturer recommends that an inhibitor - suitable for use with stainless steel heat exchangers - is used to protect the boiler and system from the effects of corrosion and/or electrolytic action. The inhibitor must be administered in strict accordance with the manufacturers instructions.
- When the boiler has been filled for the first time or the system has been drained and refilled, it will be necessary to purge any air that may have become trapped within the appliance heat exchanger.

NOTICE: Propylene glycol in the system must not exceed 40%.

Boiler water

- If you have an old system with cast iron radiators, thoroughly flush the system (without the boiler connected) to remove sediment. The high-efficiency heat exchanger can be damaged by build-up or corrosion due to sediment.
- Do not use petroleum-based cleaning or sealing compounds in the boiler system. Gaskets and seals in the system may be damaged. This can result in substantial property damage.
- Do not use "homemade cures" or "boiler patent medicines." Substantial property damage, damage to boiler, and/ or serious personal injury may result.
- Continual fresh make-up water will reduce boiler life. Mineral build up in heat exchanger reduces heat transfer, overheats the stainless steel heat exchanger, and causes failure. Addition of oxygen carried in by make-up water can cause internal corrosion in system components. Leaks in the boiler or piping must be repaired at once to prevent make-up water.
- We recommend the use of water treatment additives to prolong the life of the boiler and prevent against corrosion and contaminant build ups in the heating system.
- Ensure piping in the heating system has an oxygen barrier.

Observe these instructions for space heating water:

- Thoroughly flush the system prior to filling. Only use untreated potable water to fill and top off the system.
- Do not use water softeners in the system.
- The maximum permissible flow rate of the 120k BTU/h is 3.7 gallons per minute (GPM) and of the 150k BTU/h is 3.96 gallons per minute (GPM).
- When using oxygen-permeable pipes, e.g. for floor heating systems, you

must separate the system using heat exchangers. Unsuitable heating system water promotes the formation of sludge and corrosion. This may damage the heat exchanger or affect its operation.

Tools, materials and additional equipment

For the installation and maintenance of the boiler you will need the standard tools for space heating, gas and water connection. In addition, a handtruck with a fastening belt is very useful.

Disposal:

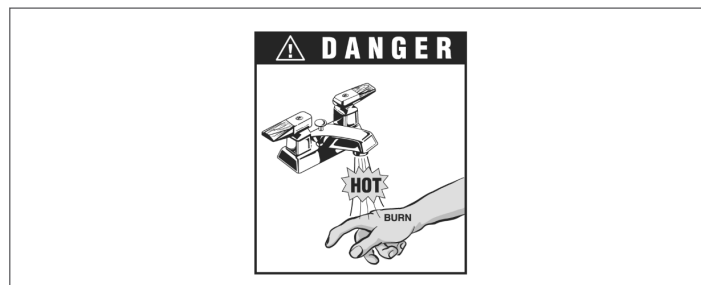
- Dispose of the boiler packaging in an environmentally sound manner.
- Dispose of components of the heating system (e. g. boiler or control device), that must be replaced, by taking them in to an authorized recycling facility.

3 SAFETY

3.1 General safety

To meet domestic hot water use needs, the high limit safety control on this boiler is adjustable up to 140°F (60°C). Water temperatures over 125°F (52°C) can cause instant severe burns or death from scalds. When supplying general purpose hot water, the recommended initial setting for the temperature control is 120°F (49°C). Safety and energy conservation are factors to be considered when setting the water temperature on the thermostat. The most energy-efficient operation will result when the temperature setting is the lowest that satisfies the needs of the application. Children, disabled and elderly are at highest risk of being scalded.

- Feel water before bathing or showering.
- Temperature limiting valves are available.



NOTICE (for heating only model): When this boiler is supplying general purpose hot water for use by individuals, a thermostatically controlled mixing 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.

Maximum water temperatures occur just after the boiler's burner has shut off. To determine the water temperature being delivered, turn on a hot water faucet and place a thermometer in the hot water stream and read the thermometer.

⚠ Only for heating only model

WARNING: This boiler cannot supply hot water for use by individuals directly. A heat exchanger must be used in conjunction with this boiler to meet DHW needs.

3.2 Scalding time/temperature relationships

The following chart details the relationship of water temperature and time with regard to scald injury and may be used as a guide in determining the safest water temperature for your applications.

Water Temperature	Time to Produce Serious Burn
120°F (49°C)	More than 5 minutes
125°F (52°C)	1-1/2 to 2 minutes
130°F (54°C)	About 30 seconds
135°F (57°C)	About 10 seconds
140°F (60°C)	Less than 5 seconds
145°F (63°C)	Less than 3 seconds
150°F (66°C)	About 1-1/2 seconds
155°F (68°C)	About 1 second

Table courtesy of The Shriners Burn Institute.

The temperature of the water in the boiler can be regulated by using the boiler front control. To comply with safety regulations, the control is set to a lower temperature when shipped from the factory. **CAUTION:** Hotter water increases the risk of scalding! There is a hot water scald potential if the thermostat is set too high.

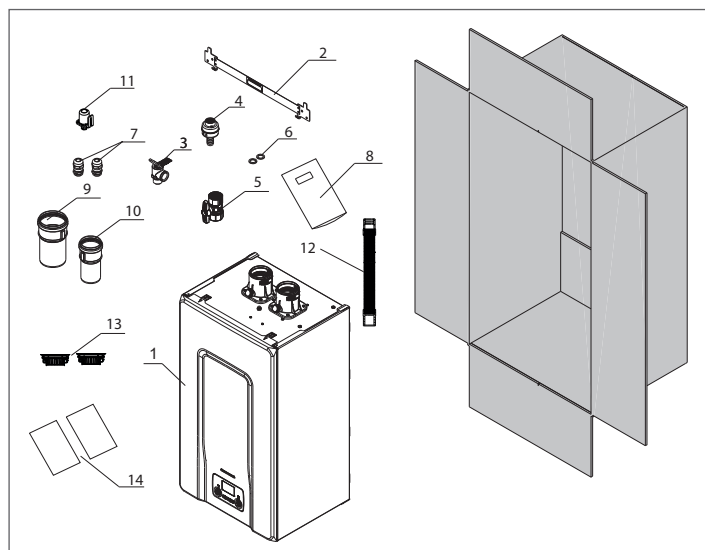
4 PRODUCT RECEIPT

4.1 Model Identification

The model identification number and boiler serial number are found on the boiler rating plate located on the bottom side of the unit. Also the boiler serial number can be found on the front of the boiler casing.

4.2 Boiler box content

Component	Qty	
1	Condensing gas boiler	1
2	Wall bracket	1
3	Pressure relief valve ASME	1
4	Condensate check valve	1
5	Gas cock	1
6	Condensate check valve gasket	1
	Pressure relief valve gasket	1
	Spare modulating gas valve gasket	1
7	Strain relief for secondary high voltage connexion: - BWCAAG000120-150	1
	- BWHAAG000120-150	2
8	Set of documents for appliance	1
9	Vent adaptor Ø 3" (80 mm), L=6" (155 mm) for concentric Ø 3/5" (80/125 mm) - see section 8.8 fig.4	1
10	Vent adaptor Ø 2" (60 mm), L= 5 5/16" (135 mm) for concentric Ø 2/4" (60/100mm) - see section 8.8 fig.1	1
11	Outdoor temperature sensor	1
12	Flexible tube for condensate drain (external) all models	1
13	Additional (loose) flow regulators: for 150 combi Olive Green 13.0 l/min and Gray 18.0 l/min	2
	for 120 combi Blue 10.0 l/min and Dark blue 16.0 l/min	2
14	Paper template (see "7.2 Boiler template")	1
	Lighting Instructions (see Section "10 LIGHTING INSTRUCTIONS" page 43)	1
	Warning Label (see Section "10 LIGHTING INSTRUCTIONS" page 43)	1
	LP Gas Conversion Sticker	1



4.3 Installation at elevation

Rated inputs are suitable for up to 10,000 ft (3048 m) elevation (see technical data table).

No hardware changes are required to the boilers for installations up to 10,000 ft (3048 m) (adjustments are required).

For additional settings on high altitude installations refer to your local distributor.

5 INTRODUCTION

The boilers have a new automatic combustion control system.

This new control system ensures functionality, efficiency and low emissions under any conditions.

This system uses an ionization sensor (flame sensor) immersed in the burner flame, whose information allows the control board to operate the gas valve that regulates the fuel.

This sophisticated control system provides the auto-regulation of the combustion, so there is no need for an initial calibration; however, it is recommended (required in some jurisdictions) that a combustion analysis is performed during initial start-up and annual maintenance.

This system is able to adapt the boiler to operate with different gas compositions, different air inlet and exhaust vent lengths and different altitudes (within the specified design limits).

This system can also perform an auto-diagnostic operation that locks out the burner before the permitted upper emission limit is exceeded.

BWC and **BWH** are wall hung fan assisted room-sealed condensing boilers.

The **BWC** combi is a direct vent, CAT IV wall mounted boiler for heating and production domestic hot water.

The **BWH** heating only is a direct vent, CAT IV wall mounted boiler that is able to operate as follows:

- **CASE A:** heating only with tank thermostat: in this condition, the boiler delivers hot water to the water tank whenever a demand is made by the relative thermostat.
- **CASE B:** heating only with tank sensor and sliding outlet: in this case, the outlet setpoint in a DHW request is no fixed at 120°F (49°C) but variable (default for BWH model)
- **CASE C:** heating only with tank sensor and fixed outlet: this setting performs a modulation to a fixed outlet value of 120°F (49°C) when there is a DHW request.

The water heater is not supplied by our company, make sure that the relative indirect tank sensor (NTC sensor) has the following characteristics: 10 kOhm at 77°F (25°C), B 3435 ±1%. The kit KBANT0101111 is available for purchase.

These appliances are designed for use with a sealed system only; consequently they are not intended for use on power vented systems.

This manual is an integral part of the appliance. It is therefore necessary to ensure that the manual is handed to the person responsible for the property in which the appliance is located/installed. Additional copy can be obtained from your local distributor.

IMPORTANT

It is required that all gas appliances are installed by a competent person.

It is in your own interest and that of safety to ensure that the law is complied with.

- The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1/NFPA 54. 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 CSD-1.
- The installation should conform with CAN/CSA B149.1 INSTALLATION CODE and/or local installation Code, plumbing or waste water codes and other codes as applicable.
- Clearances from combustible material must be strictly adhered to.
- Manufacturers instructions must NOT be interpreted in anyway as overriding local regulations.

Massachusetts:

Boiler installation must conform to Commonwealth of Massachusetts code 248 CMR which includes but is not limited to:

- Installation by licensed plumber or gas fitter.

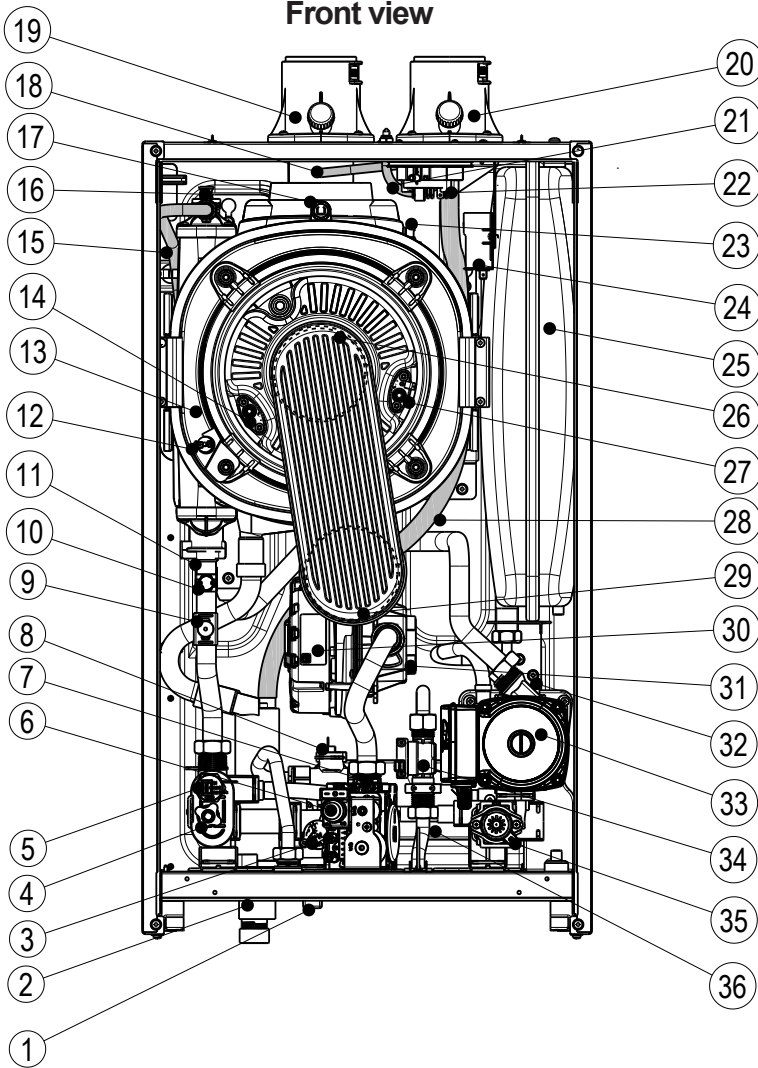
In the state of Massachusetts:

- This product must be installed by a licensed plumber or gas fitter.
- When flexible connectors are used, the maximum length shall not exceed 36 in. (914 mm).
- When lever type gas shutoffs are used they shall be T-handle type.
- The use of copper tubing for gas piping is not approved by the state of Massachusetts.

Gas furnaces manufactured on or after May 1, 2017 are not permitted to be used in Canada for heating of buildings or structures under construction.

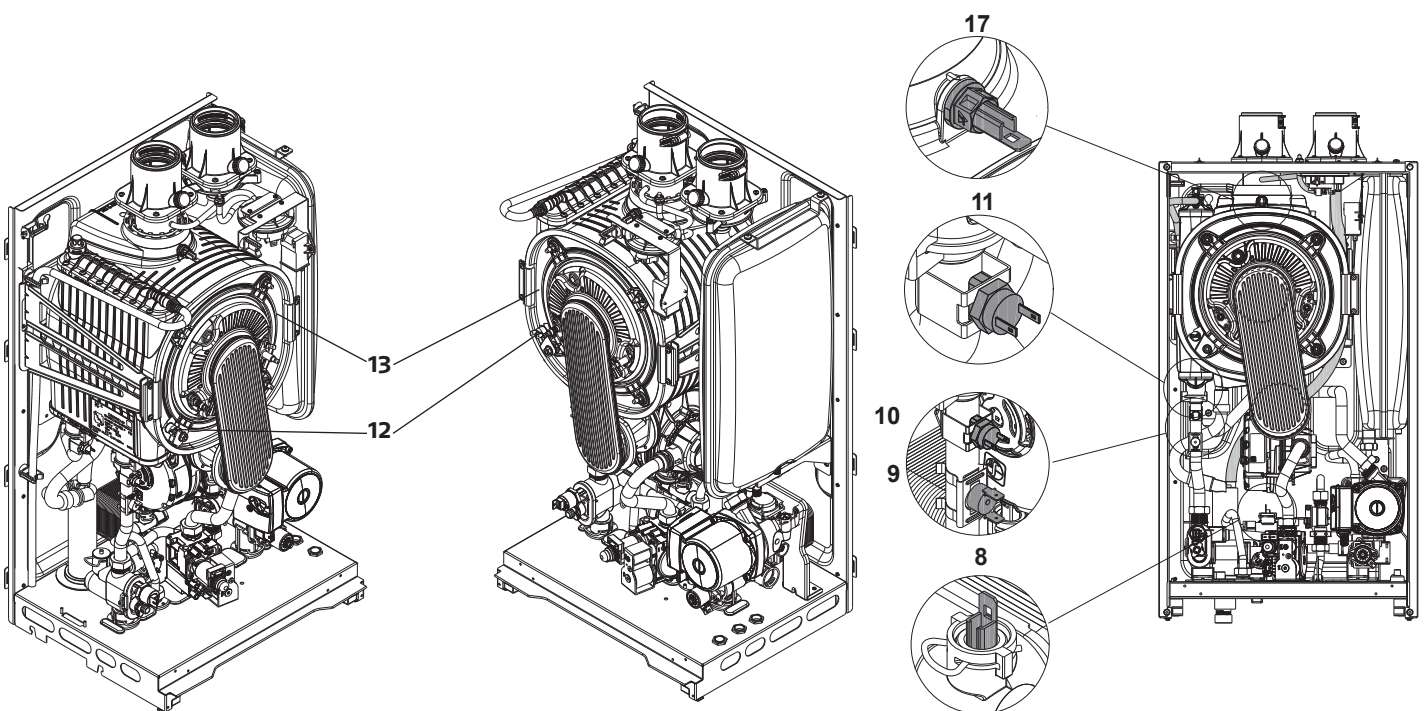
BWCAAG000120 - BWCAAG000150

Front view

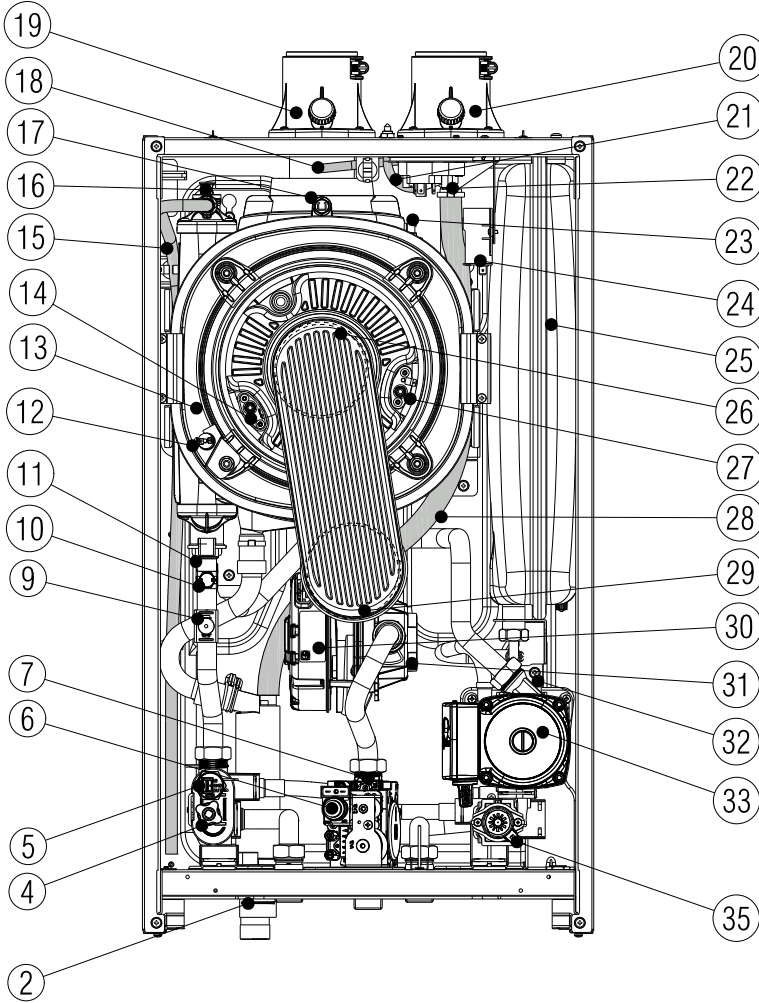


- 1 Filling tap
- 2 Condensate Trap
- 3 Backflow preventer valve
- 4 Drain valve
- 5 Low Water Cutoff
- 6 Gas valve
- 7 Injector
- 8 DHW sensor
- 9 Water Temperature High Limit
- 10 Supply sensor
- 11 Return sensor
- 12 Exchanger thermostat
- 13 Primary Heat exchanger
- 14 Flame sensor
- 15 Manual air vent hose
- 16 Manual upper air vent valve
- 17 Flue temperature sensor
- 18 Positive air pressure tube
- 19 Flue outlet
- 20 Air intake
- 21 Negative air pressure tube
- 22 Air pressure switch
- 23 Thermal fuse
- 24 Ignition transformer
- 25 Expansion tank
- 26 Burner
- 27 Ignition electrode
- 28 Water discharge hose
- 29 Clapet
- 30 Fan
- 31 Mixer
- 32 Lower air vent valve
- 33 Pump
- 34 Flow sensor
- 35 Three way valve
- 36 DHW heat exchanger

Side views

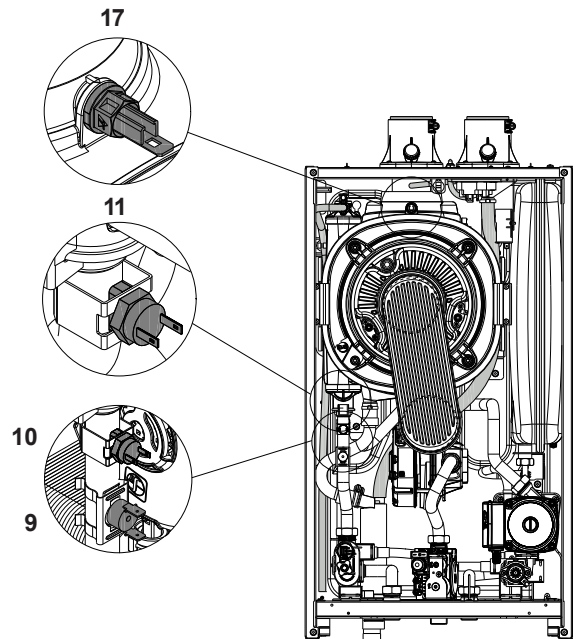
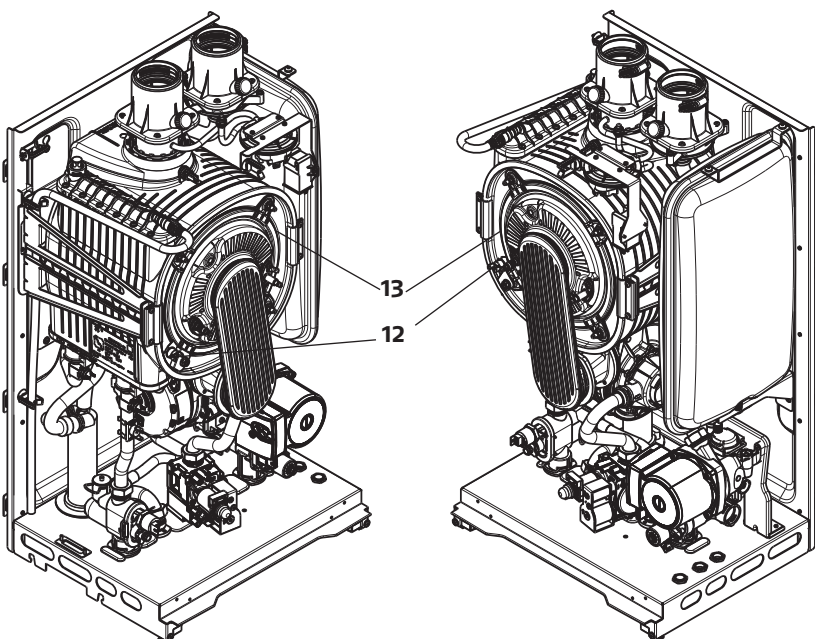


Front view

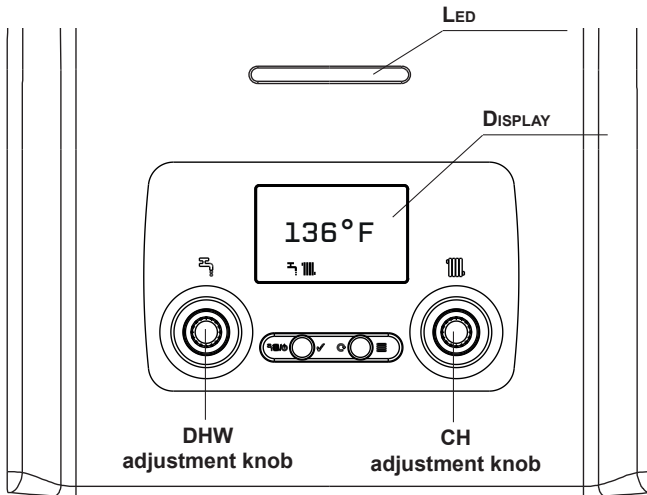


- 2 Condensate Trap
- 4 Drain valve
- 5 Low Water Cutoff
- 6 Gas valve
- 7 Injector
- 9 Water Temperature High Limit
- 10 Supply sensor
- 11 Return sensor
- 12 Exchanger thermostat
- 13 Primary Heat exchanger
- 14 Flame sensor
- 15 Manual air vent hose
- 16 Manual upper air vent valve
- 17 Flue temperature sensor
- 18 Positive air pressure tube
- 19 Flue outlet
- 20 Air intake
- 21 Negative air pressure tube
- 22 Air pressure switch
- 23 Thermal fuse
- 24 Ignition transformer
- 25 Expansion tank
- 26 Burner
- 27 Ignition electrode
- 28 Water discharge hose
- 29 Clapet
- 30 Fan
- 31 Mixer
- 32 Lower air vent valve
- 33 Pump
- 35 Three way valve

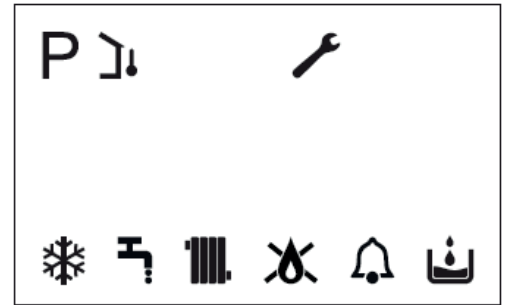
Side views



5.2 Boiler front control



ICONS



SOME OF THE ICONS SHOWN ON THE CONTROL DEVICE SCREEN AT THE START-UP PHASE MIGHT NOT BE AVAILABLE DURING FUNCTIONNING.

THIS DEPENDS ON YOUR BOILER CONFIGURATIONS

		Light signal indicating the operating status of the boiler. Can be as follows			
		STATUS	RED LED	GREEN LED	RED AND GREEN
LED		Definitive alarm		see "11.16 Lights and faults/Reset procedure"	
		Transitional alarm		see "11.16 Lights and faults/Reset procedure"	
		Initial automatic air purge cycle			flashing 0.5 sec on/1.0 sec off
		Stand-by		flashing 0.5 sec on/3.5 sec off	
		Flame presence		ON	
		Call for Service – Service expire			flashing 0.1 sec on/0.1 sec off
		Reset flue hour counter			flashing 0.5 sec on/1.0 sec off
		Combustion analysis with flame		ON	
	DHW adjustment left knob	The left knob allows for the domestic hot water setpoint adjustment. It also allows you to switch from one step to another and change the value of the selected parameter within the PROGRAMMING menu.			
	CH adjustment right knob	The right knob allows for the central heating setpoint adjustment. The CH setpoint is displayed while turning the CH knob. It also allows you to switch from one step to another and change the value of the selected parameter within the PROGRAMMING menu.			
	MODE/OK left button	MODE/OK (left) button allows you to change the BOILER STATUS. You can also: - navigate through the INFO menu - select parameters inside the PROGRAMMING menu and confirm the setting of the corresponding parameter value			
	MENU/RESET right button	MENU/RESET (right) button allows you to reset the boiler and enter in the INFO and PROGRAMMING menu. You can also: - exit from the INFO and PROGRAMMING menu - reset some error codes			
	This icon indicates that boiler is in the OFF mode (anti-freeze system active). If the icon is not present the boiler is in the ON mode.				
	This icon indicates the status of the boiler. If ON, boiler is in heating mode, if blinking there is a heating request.				
	This icon indicates the status of the boiler. If ON, boiler is in the DHW mode, if blinking there is a domestic hot water request.				
	DHW pre-heating (only for combi models): indicates that a pre-heating cycle has been activated.				
	Error: indicates any operating irregularities, together with an error code message.				
	This icon indicates the servicing operation. If ON, there is a system servicing operation in progress.				
	This icon indicates that the system is detecting the presence of a flame.				
	This icon indicates that the system is detecting the absence of a flame.				
	Water pressure low: these icons are present when the water pressure is low and needs to be re-pressurized.				
	External sensor connected				

5.3 Technical data

Description		BWCAAG000120 ⁽¹⁾	BWHAAG000120 ⁽²⁾	BWCAAG000150 ⁽¹⁾	BWHAAG000150 ⁽²⁾	
Country destination		US/CAN	US/CAN	US/CAN	US/CAN	
Input - Output						
Maximum CH input rate (0 - 2,000 ft / 0 - 610 m)	Btu/hr	85,000	85,000	119,000	119,000	
	kW	24.91	24.91	34.88	34.88	
Maximum DHW input rate (0 - 2,000 ft / 0 - 610 m)	Btu/hr	120,000	120,000	151,000	151,000	
	kW	35.17	35.17	44.25	44.25	
Maximum CH input rate (2,001 - 5,000 ft / 610 - 1,524 m)	Btu/hr	85,000	85,000	119,000	119,000	
	kW	24.91	24.91	34.88	34.88	
Maximum DHW input rate (2,001 - 5,000 ft / 610 - 1,524m)	Btu/hr	102,000	102,000	125,000	125,000	
	kW	29.89	29.89	36.63	36.63	
Maximum CH input rate (5,001 - 7,500 ft / 1,524- 2,286 m)	Btu/hr	85,000	85,000	114,000	114,000	
	kW	24.91	24.91	33.41	33.41	
Maximum DHW input rate (5,001 - 7,500 ft / 1,524- 2,286 m)	Btu/hr	91,000	91,000	114,000	114,000	
	kW	26.67	26.67	33.41	33.41	
Maximum CH input rate (7,501 - 10,000 ft / 2,286 - 3,048 m)	Btu/hr	83,000	83,000	105,000	105,000	
	kW	24.32	24.32	30.77	30.77	
Maximum DHW input rate (7,501 - 10,000 ft / 2,286 - 3,048 m)	Btu/hr	83,000	83,000	105,000	105,000	
	kW	24.32	24.32	30.77	30.77	
Minimum input rate (0 - 2,000 ft / 0 - 610 m)	Btu/hr	17,000	17,000	20,400	20,400	
	kW	4.98	4.98	5.98	5.98	
Minimum input rate (2,001 - 5,000 ft / 610 - 1,524m)	Btu/hr	17,500	17,500	19,600	19,600	
	kW	5.13	5.13	5.74	5.74	
Minimum input rate (5,001 - 7,500 ft / 1,524- 2,286 m)	Btu/hr	15,500	15,500	17,500	17,500	
	kW	4.54	4.54	5.13	5.13	
Minimum input rate (7,501 - 10,000 ft / 2,286 - 3,048 m)	Btu/hr	14,000	14,000	15,500	15,500	
	kW	4.10	4.10	4.54	4.54	
CH output rating (0 - 2,000 ft / 0 - 610 m)	Btu/hr	80,000	80,000	111,000	111,000	
	kW	23.45	23.45	32.53	32.53	
CH output rating (2,001 - 5,000 ft / 610 - 1,524 m)	Btu/hr	80,000	80,000	111,000	111,000	
	kW	23.45	23.45	32.53	32.53	
CH output rating (5,001 - 7,500 ft / 1,524 - 2,286 m)	Btu/hr	80,000	80,000	106,487	106,487	
	kW	23.45	23.45	32.21	32.21	
CH output rating (7,501 - 10,000 ft / 2,286 - 3,048 m)	Btu/hr	77,911	77,911	98,081	98,081	
	kW	22.83	22.83	28.74	28.74	
Energy guide						
AFUE	%	95.0	95.0	95.0	95.0	
Gas						
Gas supply pressure Natural Gas (A)	in. W. C.	7.0	7.0	7.0	7.0	
	KPa	1.7	1.7	1.7	1.7	
Min. gas supply pressure Natural Gas (A)	in. W. C.	3.5	3.5	3.5	3.5	
	KPa	0.9	0.9	0.9	0.9	
Max. gas supply pressure Natural Gas (A)**	in. W. C.	10.5	10.5	10.5	10.5	
	KPa	2.6	2.6	2.6	2.6	
Gas supply pressure LPG (E)	in. W. C.	11.0	11.0	11.0	11.0	
	KPa	2.7	2.7	2.7	2.7	
Min. gas supply pressure LPG (E)	in. W. C.	8.0	8.0	8.0	8.0	
	KPa	2.0	2.0	2.0	2.0	
Max. gas supply pressure LPG (E)**	in. W. C.	13.0	13.0	13.0	13.0	
	KPa	3.23	3.23	3.23	3.23	
CH max gas rate natural gas (A)	(0 - 2,000 ft / 0 - 610 m)	ft ³ /hr	79.07	79.07	110.70	110.70
		m ³ /hr	2.24	2.24	3.13	3.13
	(2,001 - 5,000 ft / 610 - 1,524m)	ft ³ /hr	79.07	79.07	110.70	110.70
		m ³ /hr	2.24	2.24	3.13	3.13
	(5,001 - 7,500 ft / 1,524- 2,286 m)	ft ³ /hr	79.07	79.07	106.05	106.05
		m ³ /hr	2.24	2.24	3.00	3.00
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	ft ³ /hr	77.21	77.21	97.67	97.67
		m ³ /hr	2.18	2.18	2.76	2.76

Description			BWCAAG000120 ⁽¹⁾	BWHAAG000120 ⁽²⁾	BWCAAG000150 ⁽¹⁾	BWHAAG000150 ⁽²⁾	
DHW max Gas Rate natural gas (A)	(0 - 2,000 ft / 0 - 610 m)	ft ³ /hr	111.63	111.63	140.47	140.47	
		m ³ /hr	3.16	3.16	3.97	3.97	
	(2,001 - 5,000 ft / 610 - 1,524m)	ft ³ /hr	94.88	94.88	116.28	116.28	
		m ³ /hr	2.68	2.68	3.29	3.29	
	(5,001 - 7,500 ft / 1,524- 2,286 m)	ft ³ /hr	84.65	84.65	106.05	106.05	
		m ³ /hr	2.39	2.39	3.00	3.00	
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	ft ³ /hr	77.21	77.21	97.67	97.67	
		m ³ /hr	2.18	2.18	2.76	2.76	
	Min gas rate natural gas (A)	(0 - 2,000 ft / 0 - 610 m)	ft ³ /hr	15.81	15.81	18.98	18.98
			m ³ /hr	0.45	0.45	0.54	0.54
(2,001 - 5,000 ft / 610 - 1,524m)		ft ³ /hr	16.28	16.28	18.23	18.23	
		m ³ /hr	0.46	0.46	0.52	0.52	
(5,001 - 7,500 ft / 1,524- 2,286 m)		ft ³ /hr	14.42	14.42	16.28	16.28	
		m ³ /hr	0.41	0.41	0.46	0.46	
(7,501 - 10,000 ft / 2,286 - 3,048 m)		ft ³ /hr	13.02	13.02	14.42	14.42	
		m ³ /hr	0.37	0.37	0.41	0.41	
CH max gas rate LPG (E)		(0 - 2,000 ft / 0 - 610 m)	ft ³ /hr	34.00	34.00	47.60	47.60
			m ³ /hr	0.96	0.96	1.35	1.35
	(2,001 - 5,000 ft / 610 - 1,524m)	ft ³ /hr	34.00	34.00	47.60	47.60	
		m ³ /hr	0.96	0.96	1.35	1.35	
	(5,001 - 7,500 ft / 1,524- 2,286 m)	ft ³ /hr	34.00	34.00	45.20	45.20	
		m ³ /hr	0.96	0.96	1.28	1.28	
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	ft ³ /hr	30.40	30.40	39.20	39.20	
		m ³ /hr	0.86	0.86	1.11	1.11	
	DHW max gas rate LPG (E)	(0 - 2,000 ft / 0 - 610 m)	ft ³ /hr	48.00	48.00	60.40	60.40
			m ³ /hr	1.36	1.36	1.71	1.71
(2,001 - 5,000 ft / 610 - 1,524m)		ft ³ /hr	38.40	38.40	48.40	48.40	
		m ³ /hr	1.09	1.09	1.37	1.37	
(5,001 - 7,500 ft / 1,524- 2,286 m)		ft ³ /hr	35.00	35.00	45.20	45.20	
		m ³ /hr	0.99	0.99	1.28	1.28	
(7,501 - 10,000 ft / 2,286 - 3,048 m)		ft ³ /hr	30.40	30.40	39.20	39.20	
		m ³ /hr	0.86	0.86	1.11	1.11	
Min gas rate LPG (E)		(0 - 2,000 ft / 0 - 610 m)	ft ³ /hr	6.80	6.80	8.16	8.16
			m ³ /hr	0.19	0.19	0.23	0.23
	(2,001 - 5,000 ft / 610 - 1,524m)	ft ³ /hr	6.60	6.60	7.60	7.60	
		m ³ /hr	0.19	0.19	0.22	0.22	
	(5,001 - 7,500 ft / 1,524- 2,286 m)	ft ³ /hr	7.04	7.04	7.20	7.20	
		m ³ /hr	0.20	0.20	0.20	0.20	
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	ft ³ /hr	6.00	6.00	6.60	6.60	
		m ³ /hr	0.17	0.17	0.19	0.19	
	Number of fan rotations with Start up/Ignition RPM (A)	(0 - 2,000 ft / 0 - 610 m)	rpm	5,000	5,000	4,000	4,000
		(2,001 - 5,000 ft / 610 - 1,524m)	rpm	5,000	5,000	4,000	4,000
(5,001 - 7,500 ft / 1,524- 2,286 m)		rpm	5,000	5,000	4,000	4,000	
(7,501 - 10,000 ft / 2,286 - 3,048 m)		rpm	5,000	5,000	4,000	4,000	
Number of fan rotations max CH (A)	(0 - 2,000 ft / 0 - 610 m)	rpm	7,100	7,100	7,700	7,700	
	(2,001 - 5,000 ft / 610 - 1,524m)	rpm	8,300	8,300	9,000	9,000	
	(5,001 - 7,500 ft / 1,524- 2,286 m)	rpm	9,200	9,200	9,400	9,400	
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	rpm	9,800	9,800	9,400	9,400	
Number of fan rotations max DHW (A)	(0 - 2,000 ft / 0 - 610 m)	rpm	9,800	9,800	9,800	9,800	
	(2,001 - 5,000 ft / 610 - 1,524m)	rpm	9,800	9,800	9,400	9,400	
	(5,001 - 7,500 ft / 1,524- 2,286 m)	rpm	9,800	9,800	9,400	9,400	
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	rpm	9,800	9,800	9,400	9,400	
Number of fan rotations min CH-DHW (A)	(0 - 2,000 ft / 0 - 610 m)	rpm	2,000	2,000	1,800	1,800	
	(2,001 - 5,000 ft / 610 - 1,524m)	rpm	2,400	2,400	2,200	2,200	
	(5,001 - 7,500 ft / 1,524- 2,286 m)	rpm	2,400	2,400	2,200	2,200	
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	rpm	2,400	2,400	2,200	2,200	
Number of fan rotations with Start up/Ignition (E)	(0 - 2,000 ft / 0 - 610 m)	rpm	5,000	5,000	4,000	4,000	
	(2,001 - 5,000 ft / 610 - 1,524m)	rpm	5,000	5,000	4,000	4,000	
	(5,001 - 7,500 ft / 1,524- 2,286 m)	rpm	5,000	5,000	4,000	4,000	
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	rpm	5,000	5,000	4,000	4,000	
Number of fan rotations max CH (E)	(0 - 2,000 ft / 0 - 610 m)	rpm	6,750	6,750	7,500	7,500	
	(2,001 - 5,000 ft / 610 - 1,524m)	rpm	8,750	8,750	9,250	9,250	
	(5,001 - 7,500 ft / 1,524- 2,286 m)	rpm	9,550	9,550	9,400	9,400	
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	rpm	9,400	9,400	9,400	9,400	

Description			BWCAAG000120 ⁽¹⁾	BWHAAG000120 ⁽²⁾	BWCAAG000150 ⁽¹⁾	BWHAAG000150 ⁽²⁾
Number of fan rotations max DHW (E)	(0 - 2,000 ft / 0 - 610 m)	rpm	9,150	9,150	9,350	9,350
	(2,001 - 5,000 ft / 610 - 1,524m)	rpm	9,800	9,800	9,400	9,400
	(5,001 - 7,500 ft / 1,524- 2,286 m)	rpm	9,800	9,800	9,400	9,400
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	rpm	9,400	9,400	9,000	9,000
Number of fan rotations min CH-DHW (E)	(0 - 2,000 ft / 0 - 610 m)	rpm	1,850	1,850	1,800	1,800
	(2,001 - 5,000 ft / 610 - 1,524m)	rpm	2,350	2,350	2,200	2,200
	(5,001 - 7,500 ft / 1,524- 2,286 m)	rpm	2,500	2,500	2,200	2,200
	(7,501 - 10,000 ft / 2,286 - 3,048 m)	rpm	2,500	2,500	2,200	2,200
CH system data						
Minimum relief valve capacity	lbs/hr		510	510	510	510
	g/s		64	64	64	64
Maximum operating pressure	p.s.i.		30	30	30	30
	bar		2.07	2.07	2.07	2.07
Minimum operating pressure	p.s.i.		4.5	4.5	4.5	4.5
	bar		0.3	0.3	0.3	0.3
Pump residual head at max flow rate	ft. hd		4.38	4.38	5	5
	mbar		130	130	150	150
At system capacity	gpm		4.4	4.4	4.4	4.4
	l/h		1,000	1,000	1,000	1,000
Maximum temperature	°F		194	194	194	194
	°C		90	90	90	90
Selectable range of heating water temperature (high temperature)	°F		68-180	68-180	68-180	68-180
	°C		20-82	20-82	20-82	20-82
Selectable range of heating water temperature (low temperature)	°F		68-113	68-113	68-113	68-113
	°C		20-45	20-45	20-45	20-45
Expansion tank charge and initial system pressure	psi		14.5	14.5	14.5	14.5
	bar		1	1	1	1
Total water content of system using 2.3 gal/9.0 l capacity expansion tank supplied with appliance	gal		29.1	29.1	31.7	31.7
	l		110	110	120	120
DHW system data						
Maximum operating pressure	p.s.i.		116	-	116	-
	bar		8	-	8	-
Minimum operating pressure	p.s.i.		2.9	-	2.9	-
	bar		0.2	-	0.2	-
Selection field of domestic hot water temperature	°F		100-140 (120 max default)	-	100-140 (120 max default)	-
	°C		37-60 (49 max default)	-	37-60 (49 max default)	-
Minimum DHW flow rate	gal/min		0.52	-	0.52	-
	l/min		2.0	-	2.0	-
Flow regulator (factory fitted)	gal/min		3.2	-	4.0	-
	l/min		12	-	15	-
DHW flow rate at 70 °F (39°C) temperature rise (tested according 10 CFR Appendix E to Subpart B of Part 430 with the flow regulator factory fitted)	gal/min		3.1	-	3.8	-
	l/min		11.8	-	14.2	-
Electric data						
Electric rate voltage	VAC - Hz		120 - 60	120 - 60	120 - 60	120 - 60
Current less than	A		0.89	0.89	0.99	0.99
Electric consumption (pump included)	W		107	107	119	119
Max Overcurrent Protection (***)	A		4	4	4	4
Min Wire Size (***)	AWG		18	18	18	18
Min Wire Size 14 AWG						
CO ₂ setting natural gas (A)	high-fire	%	8.8 ± 1%	8.8 ± 1%	8.8 ± 1%	8.8 ± 1%
	low-fire	%	9.4 ± 1%	9.4 ± 1%	9.4 ± 1%	9.4 ± 1%
CO ₂ setting LPG (E)	high-fire	%	9.8 ± 1%	9.8 ± 1%	9.8 ± 1%	9.8 ± 1%
	low-fire	%	10.4 ± 1%	10.4 ± 1%	10.4 ± 1%	10.4 ± 1%
NO _x natural gas (A)	max air free	ppm	≤ 40	≤ 40	≤ 40	≤ 40
	min air free	ppm	≤ 40	≤ 40	≤ 30	≤ 30
NO _x LPG (E)	max air free	ppm	≤ 60	≤ 60	≤ 40	≤ 40
	min air free	ppm	≤ 70	≤ 70	≤ 40	≤ 40

Description			BWCAAG000120 ⁽¹⁾	BWHAAG000120 ⁽²⁾	BWCAAG000150 ⁽¹⁾	BWHAAG000150 ⁽²⁾
CO natural gas (A)	max air free	ppm	≤ 120	≤ 120	≤ 90	≤ 90
	min air free	ppm	≤ 20	≤ 20	≤ 15	≤ 15
CO LPG (E)	max air free	ppm	≤ 170	≤ 170	≤ 150	≤ 150
	min air free	ppm	≤ 30	≤ 30	≤ 15	≤ 15
Max CH rate flue temperature (A) at boiler return temp. 140°F/60°C		°F	144	144	157	157
		°C	62	62	69	69
Max CH rate flue temperature (E) at boiler return temp. 140°F/60°C		°F	144	144	158	158
		°C	62	62	70	70
Min CH rate flue temperature (A) at boiler return temp. 140°F/60°C		°F	151	151	133	133
		°C	66	66	56	56
Min CH rate flue temperature (E) at boiler return temp. 140°F/60°C		°F	141	141	140	140
		°C	61	61	60	60
Boiler dimensions and weight						
Boiler dimensions (height - width - depth)	in.		29.13 x 13.7 x 16.5	29.13 x 13.7 x 16.5	29.13 x 13.7 x 16.5	29.13 x 13.7 x 16.5
	mm		740x348x 420	740x348x 420	740x348x 420	740x348x 420
Weight net	lb		89	87	97	94
	kg		40.5	39.5	44	43
Components						
Burner			Sermeta 54485		Sermeta 54486	
Main heat exchanger			Sermeta 3+1+1 Afue 95		Sermeta 4+1+1 Afue 95	
Gas valve			Sit 849			
Pump			Grundfos UPS 15-58			
Pressure relief valve			Watts			
3-Way valve for DHW			Eltek			

(1) = combi boiler

(2) = heating only

** The maximum inlet gas pressure must not exceed the value specified by the manufacturer and the minimum value listed is for purposes of input adjustment.

(A) Natural gas

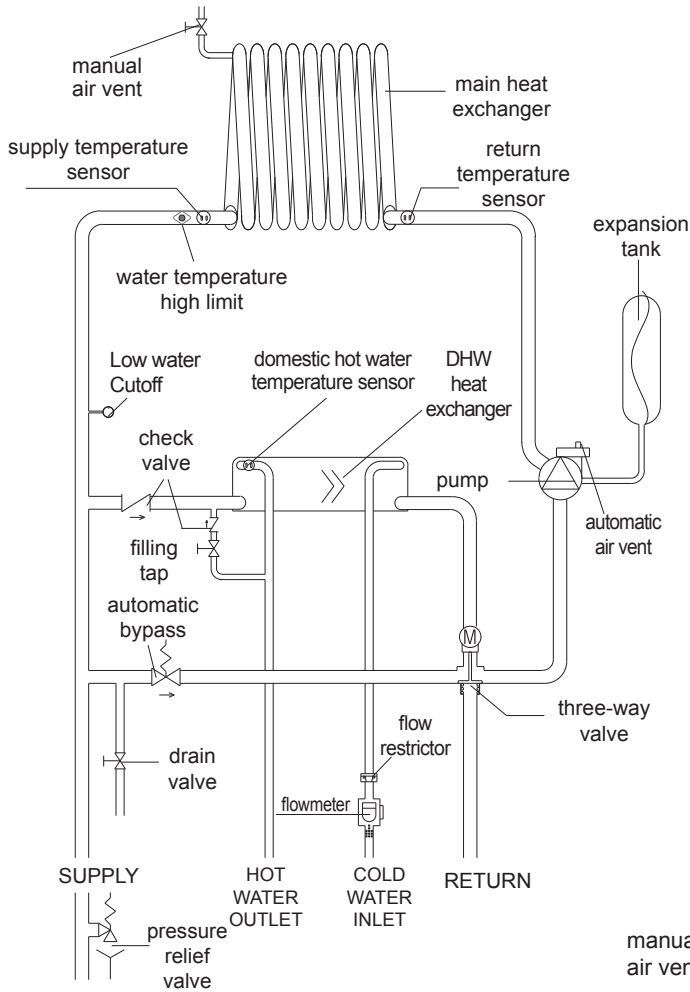
(E) LPG

(***) Boiler is equipped with a standard NEMA 5-15 grounded plug connection. Receptacle outlet Max Overcurrent Protection and Min Wire Size should conform to the codes listed in Section "7.7.1 Electrical supply" page 21 "

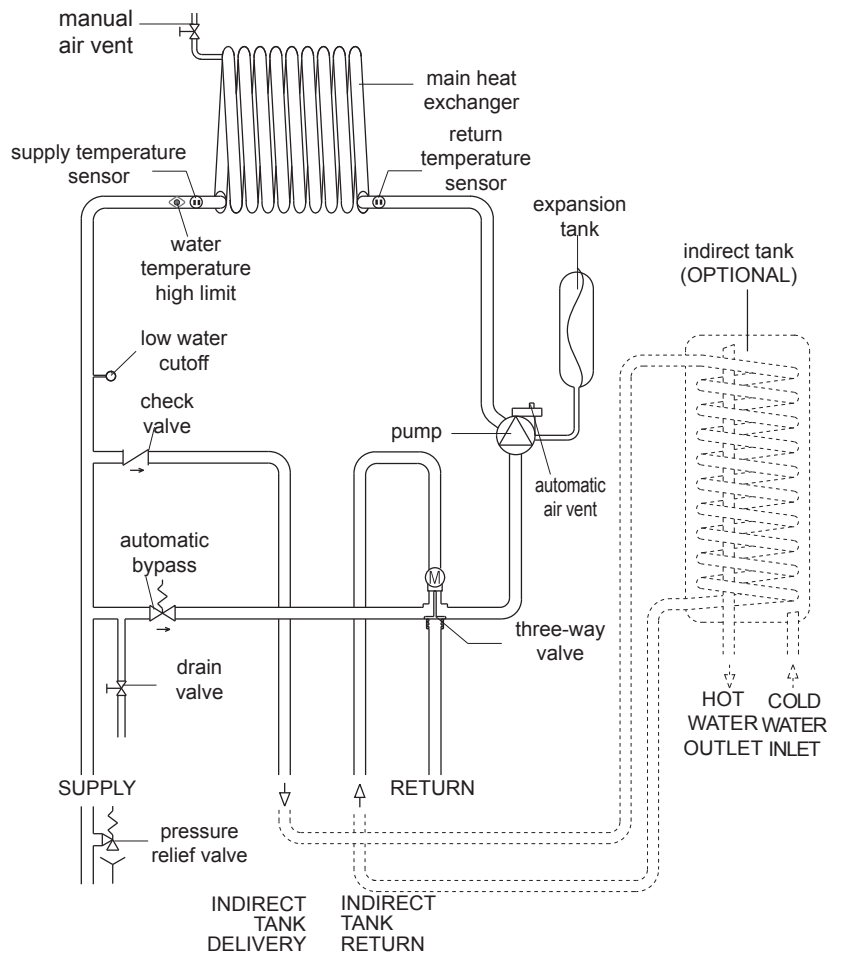
BWHAAG000120 - BWHAAG000150: DHW data must be considered only if an indirect tank is connected to the boiler.

5.4 Hydraulic circuit

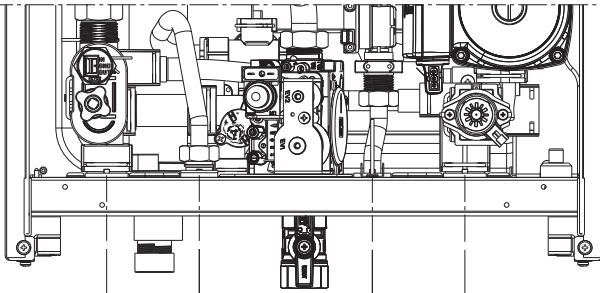
BWCAAG000120 - BWCAAG000150



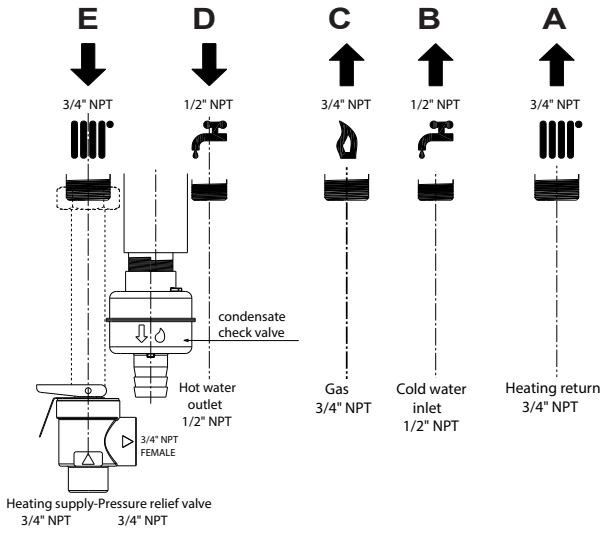
BWHAAG000120 - BWHAAG000150



BWCAAG000120 - BWCAAG000150

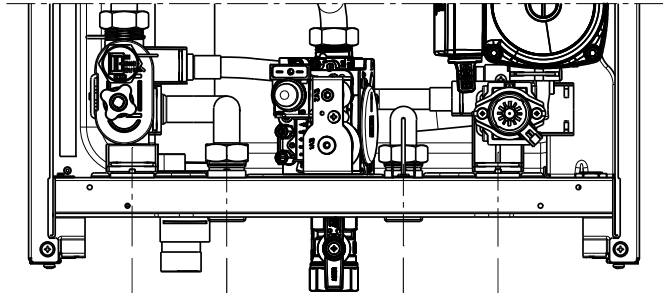


2 9/16" 4 3/4" 2 9/16"

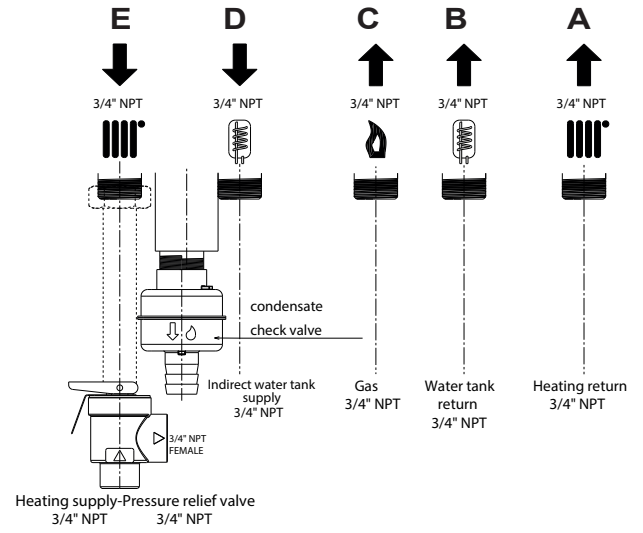


Legend	
A Heating return	3/4" NPT
B Cold water inlet	1/2" NPT
C Gas	3/4" NPT
D Hot water outlet	1/2" NPT
E Heating supply	3/4" NPT
Pressure relief valve	3/4" NPT
Drain condensate outlet Ø (rubber flexible)	7/8" (21 mm)

BWHAAG000120 - BWHAAG000150

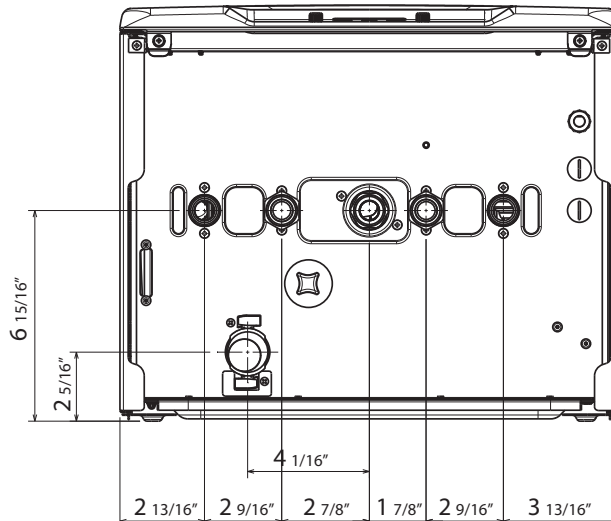


2 9/16" 4 3/4" 2 9/16"

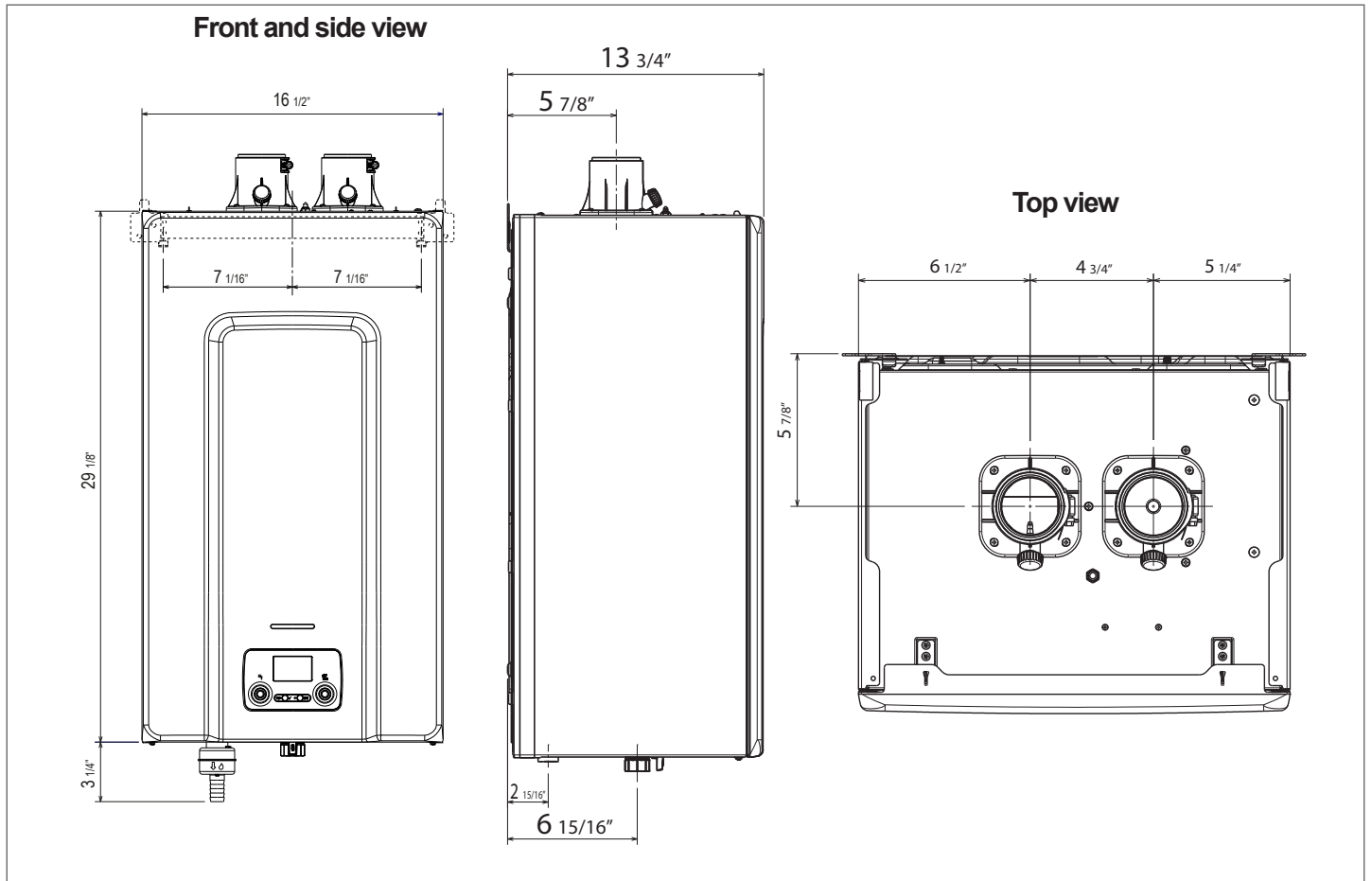


Legend	
A Heating return	3/4" NPT
B Water tank return	3/4" NPT
C Gas	3/4" NPT
D Indirect tank supply	3/4" NPT
E Heating supply	3/4" NPT
Pressure relief valve	3/4" NPT
Drain condensate outlet Ø (rubber flexible)	7/8" (21 mm)

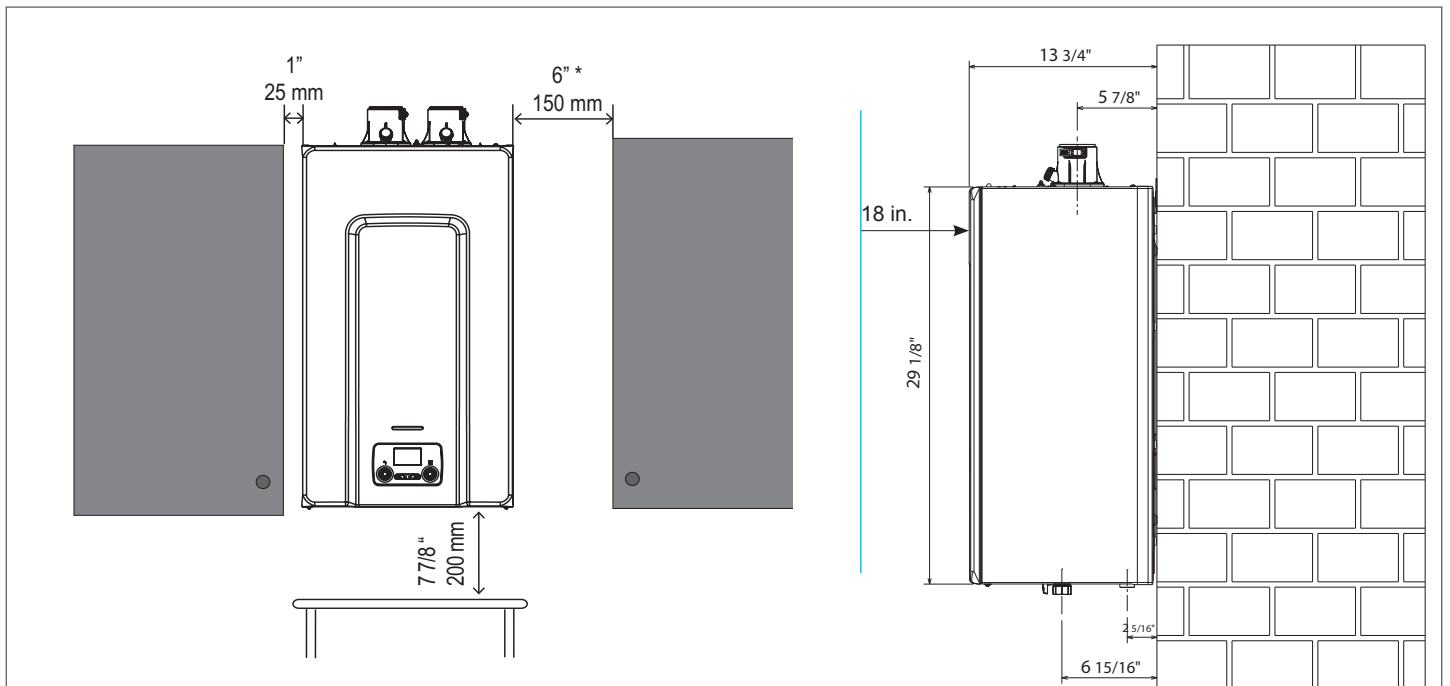
Lower view



5.5 Dimensions and connections



Recommended Minimum service clearances



* Service clearances on the right side of the boiler can be decreased up to $1''$ (25 mm) if the provided Warning Label and Lighting Instructions are applied to the front of the boiler casing

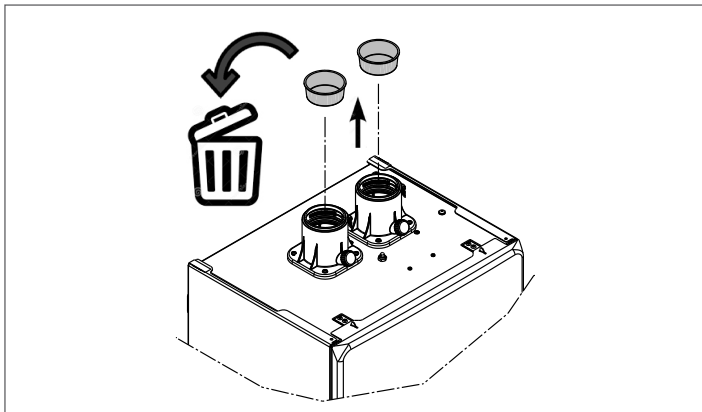
6 BEFORE INSTALLATION

The manufacturer strongly recommends that this manual be reviewed thoroughly before installing your boiler.

Please review "3 Safety" page 4 before installing the boiler. Factory warranty does not apply to boilers that have been improperly installed or operated.

Installation and service must be performed by a qualified installer, service agency or gas supplier. If, after reviewing this manual, you still have questions which this manual does not answer, please contact your local distributor. Thank you for purchasing this product. We hope you will be satisfied with the high quality and durability of our equipment.

⚠ WARNING: Remove the two caps in the vent adaptors before installing the vent terminations



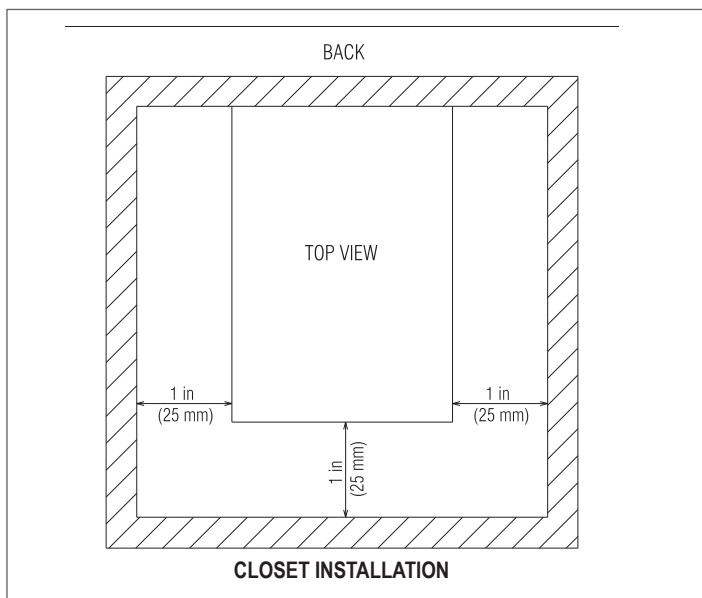
6.1 Installations must comply with:

- Local, state, provincial, and national codes, laws, regulations and ordinances.
- National Fuel Gas Code, ANSI Z223.1/NFPA 54 – latest edition.
- National Electrical Code.
- For Canada only: CAN/CSA B149.1 Installation Code, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.

The boiler must be installed indoors in a dry location where the ambient temperature must be maintained above freezing and below 100°F [38°C]. All boiler components must be protected from dripping, spraying water, or rain during operation and servicing. Consider the proximity of system piping, gas and electrical supply, condensate disposal drain, and proximity to vent termination when determining the best boiler location.

The boiler is both for closet and alcove installation.

Closet Installations



0 in./0 mm between the back of the unit and the wall.

Alcove Installations

Alcove installations have the same minimum clearances as closet installations, except the front must be completely open to the room at a distance no greater than 18 in. [457 mm] from the front of the boiler and the room is at least three (3) times the size of the alcove. Provided these conditions are met, the boiler requires no extra ventilation air openings to the space.

⚠ CAUTION Apply the provided Warning Label and Lighting Instructions to the front of the boiler casing if the closet or alcove sides are less than 6" (150 mm) from the boiler right side. Doing so will make the Lighting Instruction and Warning Label visible for the appliance in an Alcove or Closet

Residential Garage Installation

When installed in a residential garage, mount the boiler a minimum of 18 in. [457 mm] above the floor. Locate or protect the boiler so it cannot be damaged by a moving vehicle. Check with your local authorities for other possible regulations pertaining to the installation of a boiler in a garage.

6.2 Before locating the boiler

Check for nearby connections to:

- System water piping
- Venting connections
- Gas supply piping
- Electrical power.

Check area around boiler. Remove any combustible materials, gasoline and other flammable liquids.

Check water quality.

⚠ WARNING: Failure to keep boiler area clear and free of combustible materials, gasoline and other flammable liquids and vapors can result in severe personal injury, death or substantial property damage.

The boiler must be installed so that gas control system components are protected from dripping or spraying water or rain during operation or service.

If the new boiler is to replace an existing boiler, check for and correct any existing system problems such as:

- System leaks
- Incorrectly-sized expansion tank
- Lack of freeze protection in the heating system causing the system and boiler to freeze and leak
- Excessive glycol which will affect the boiler system operation.

6.3 Clearances for service access

See "5.5 Dimensions and connections" page 15 for recommended service clearances. If you do not provide the minimum clearances shown, it might not be possible to service the boiler without removing it from the space.

⚠ WARNING: The space must be provided with combustion/ventilation air openings correctly sized for all other appliances located in the same space as the boiler. The boiler front cover must be securely fastened to the boiler to prevent the boiler from drawing air from inside the boiler room in a sealed combustion application. This is particularly important if the boiler is located in the same room as other appliances. Failure to comply with the above warnings could result in severe personal injury, death or substantial property damage.

6.3.1 Exhaust vent and intake air vent

The boiler are certified to the ANSI Z21.13-2017 • CSA 4.9-2017 – Gas-Fired low pressure steam and hot water boilers. Direct vent, Category IV (pressurized vent, likely to condense in the vent) appliances.

NOTICE: To prevent combustion air contamination when considering the exhaust vent and intake air vent termination, intake

and exhaust may be vented vertically through the roof or out a side wall.

The intake and exhaust venting methods are detailed in the General venting Section. Do not attempt to install the boiler using any other means. Be sure to locate the boiler such that the air intake and exhaust vent piping can be routed through the building and properly terminated. The air intake and exhaust vent piping lengths, routing and termination method must all comply with the methods and limits given within the Venting section.

6.4 Prevent combustion air contamination

Install intake air piping for this boiler as described in the Venting section. Do not terminate exhaust in locations that can allow for contamination of the intake air.

⚠ WARNING: You must pipe outside air to the boiler air intake for sealed combustion operation. Ensure that the intake air will not contain any of the contaminants below. Contaminated air will damage the boiler, resulting in possible severe personal injury, death or substantial property damage. For example, do not pipe the intake air vent near a swimming pool. Also avoid areas subject to exhaust fumes from laundry facilities. These areas may contain contaminants.

6.5 When removing an existing boiler from an existing common vent system

Do not install the boiler into a common vent with any other appliance. This will cause flue gas spillage or appliance malfunction, resulting in possible severe personal injury, death or substantial property damage.

⚠ WARNING: Failure to follow all instructions can result in flue gas spillage and carbon monoxide emissions, causing severe personal injury or death.

When an existing boiler is removed from a common venting system, the common venting system is likely to be too large for proper venting of the appliances remaining connected to it.

At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

- A** Seal any unused openings in the common venting system.
- B** Visually inspect the venting system for proper size and horizontal pitch and to determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
- C** Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building, so long as it is practical to do so. Turn on clothes dryers and any appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
- D** Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so the appliance will operate continuously.
- E** Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar or pipe.
- F** After it has been determined that each boiler remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas burning boiler to their previous condition of use.
- G** Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 — latest edition. Correct by resizing to approach the minimum size as determined using the appropriate tables in ANSI Z223.1/NFPA 54 of that code. Canadian installations must comply with CAN/CSA B149.1 Installation Code.

⚠ WARNING: Verify proper operation after servicing.

6.6 Prepare the boiler

⚠ CAUTION: Cold weather handling — If boiler has been stored in a very cold location (below 0°F (-18°C)) before installation, handle with care until the plastic components come to room temperature.

7 INSTALLATION

7.1 Wall mounting information

The boiler comes with a template, which allows you to easily mark the location of the screws for the mounting bracket and the location of the flue gas pipe on the wall.

The gas connection must be made on site, a 3/4" gas cock is supplied with the boiler.

⚠ WARNING: This boiler is heavy and awkward to lift. It is recommended and safer to install the boiler with two people. Use caution as to not drop the boiler which could cause personal injury. Verify that the boiler is securely mounted before leaving the boiler unsupervised.

The wall must be vertically plumb and capable of carrying the weight of the boiler and its related components.

⚠ CAUTION: If the boiler is not vertically plumb, improper and unsatisfactory operation may occur. This will cause excessive condensation build-up resulting in unnecessary maintenance and nuisance fault codes.

NOTICE: The mounting bracket is shown for installation of the combi and heating only boiler.

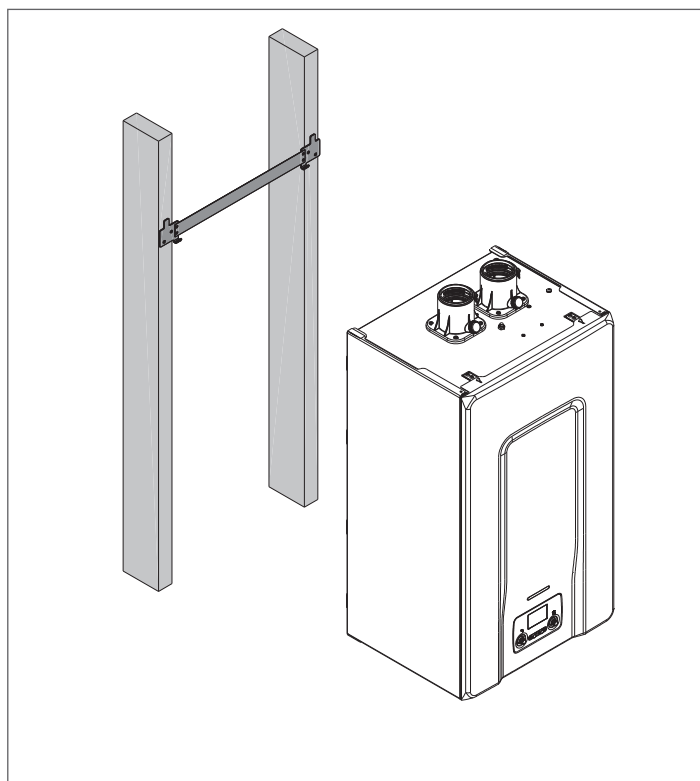
7.1.1 Placing the wall-mounted boiler

The boilers are wall mounted. Use only the combi and heating only boiler wall mounting instructions included in the box.

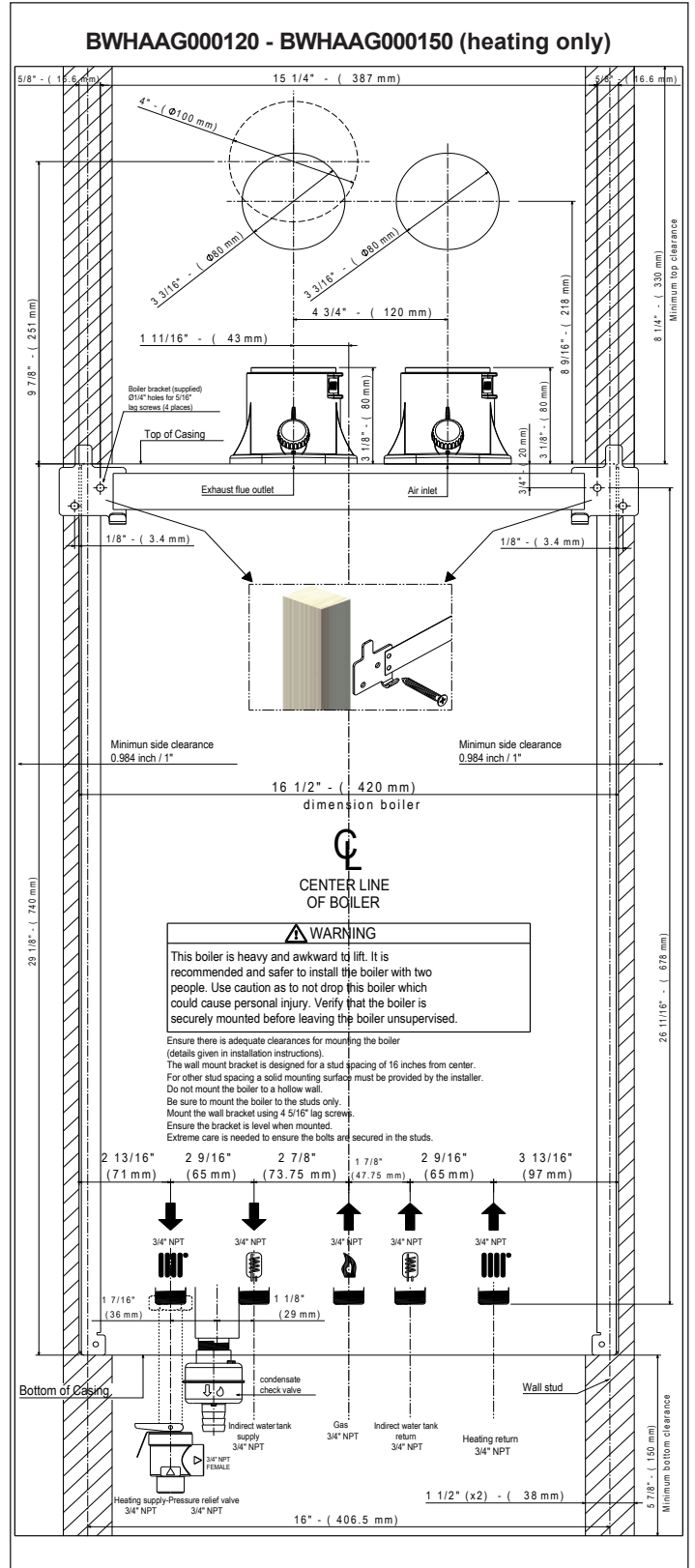
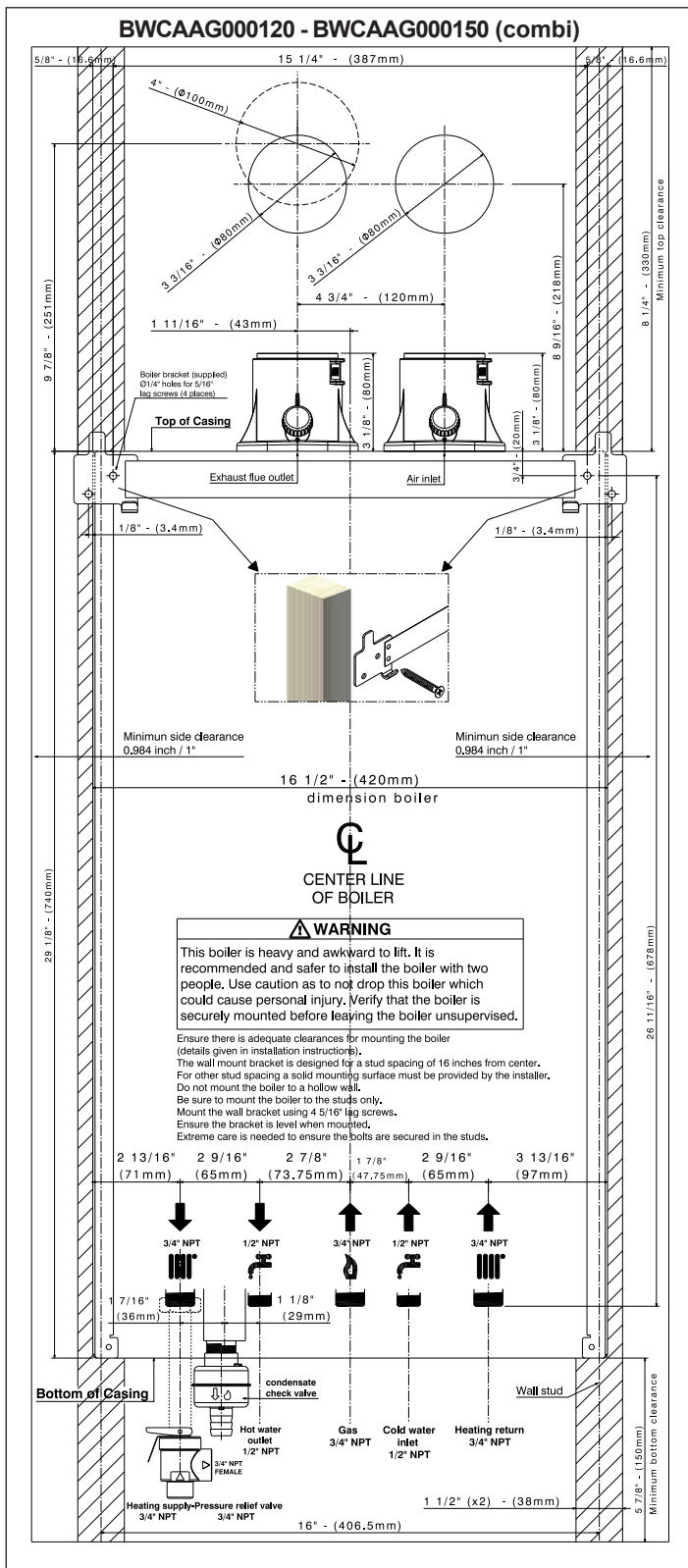
⚠ WARNING: The wall must be capable of carrying the weight of the boiler and its related components. The shipping weights of the boiler are approximately:

- BWCAAG000120 - combi** = 89 lb (40.5 kg)
- BWHAAG000120 - only heating** = 87 lb (39.5 kg)
- BWCAAG000150 - combi** = 97 lb (44 kg)
- BWHAAG000150 - only heating** = 94 lb (43 kg)

Failure to comply with above could result in severe personal injury, death or substantial property damage.



7.2 Boiler template



7.2.1 Installation steps

Prior to lifting the boiler onto the wall, use the enclosed template to level and locate the wall bracket.

- Fasten the boiler support plate to the wall and use a spirit level to make sure it is perfectly horizontal.
- Mark the placement of the 2 holes for securing the boiler support plate make sure that all measurements are exact, then drill the wall using drill tips with the diameters indicated on the wall template.
- Fix the plate, using the wall template, to the wall.
- Hang the boiler.
- Fix the pressure relief valve (PRV) as described on the wall template.
- Install the condensate check valve dispositive.
- Install the hydraulic connections.

- Install the gas valve main supply.
- Install the exhaust flue and intake air piping.
- Carry out the electrical connection according to local code rules.

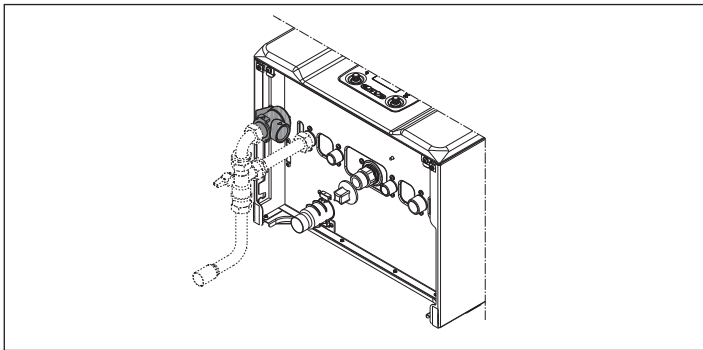
7.3 ASME pressure relief valve

The boiler has a pressure relief valve supplied with the boiler. Connect the valve hydraulically on the heating supply connection and in vertical position (see reference picture).

This device is designed for emergency safety relief and shall not be used as an operating control.

⚠ WARNING: To avoid water damage or scalding due to relief valve operation:

- The discharge line must be connected to relief valve outlet and run to a safe place of disposal. Terminate the discharge line in a manner that will prevent possibility of severe burns or property damage.
- The discharge line must be as short as possible and be the same size as the valve discharge connection throughout its entire length.
- The discharge line must pitch downward from the valve and terminate at least 6" (152 mm) above the floor drain where any discharge will be clearly visible.
- The discharge line shall terminate through plain (unthreaded) pipe. The discharge line material must conform to local plumbing code or A.S.M.E. requirements.
- No shutoff valve shall be installed between the relief valve and the boiler, or in the discharge line.
- Do not pipe the discharge to any place where freezing could occur.
- Do not plug or place any obstruction in the discharge line.
- Test the operation of the valve after filling and pressurizing system by lifting the lever. Make sure the valve discharges freely. If the valve fails to operate correctly, replace it with a new relief valve.
- For boilers installed with only a pressure relief valve, the indirect storage tank (if used) must have a temperature and pressure relief valve installed. This relief valve shall comply with the standard for Relief Valves for Hot Water Supply Systems, ANSI Z21.22/CSA4.4.
- Failure to comply with the above guidelines could result in the failure of the relief valve to operate, resulting in the possibility of severe personal injury, death or substantial property damage.
- For safe operation of the appliance, the relief valve must not be removed or plugged.



Maintenance of the relief valve

⚠ CAUTION: The valve lever must be operated at least once a year by qualified personnel during annual maintenance to insure that water-ways are clear.

Certain natural occurring mineral deposits may adhere to the valve, rendering it inoperative. When manually operating the lever, water will discharge and precautions must be taken to avoid contact with hot water and to avoid water damage. Before operating the lever, check to see that a discharge line is connected to this valve directing the flow of hot water from the valve to a proper place of disposal, otherwise personal injury may result. If no water flows, the valve is inoperative.

Call a qualified plumber immediately.

Pressure relief valve should be inspected at least once every three years by a licensed plumbing contractor or authorized inspection agency, to insure that the product has not been affected by corrosive water conditions and to insure that the valve and discharge line have not been altered or tampered with illegally. Certain naturally occurring conditions may corrode the valve or its components over time, rendering the valve inoperative. Such conditions are not detectable unless the valve and its components are physically

removed and inspected. Do not attempt to conduct this inspection on your own. Contact your plumbing contractor for a reinspection to assure continuing safety.

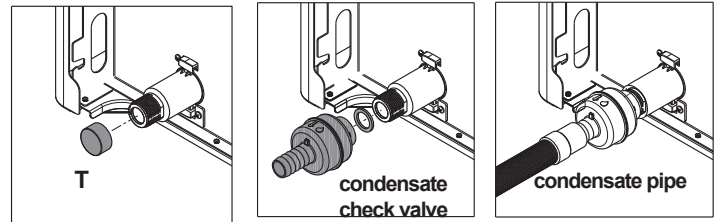
⚠ WARNING: Failure to reinspect this valve as directed could result in unsafe pressure buildup which can result in serious injury or death and/or severe property damage.

7.4 Installing the condensate check valve

It is mandatory, before starting the boiler, even just temporarily, to install the condensate check valve supplied as standard.

For the installation proceed as follows:

- remove the plug (T) from the condensate trap
- carefully secure the condensate check valve, screwing it on tight and checking its seal
- connect a pipe for draining the condensate to a suitable collection and evacuation system in the white water outlet and in compliance with current legislation.



⚠ WARNING: The manufacturer is NOT responsible for any damage caused by the installation of the boiler without the condensate check valve being correctly positioned. An improperly installed or damaged condensate check valve may result in substantial property damage, severe personal injury or death.

Install the flexible condensate drain pipe (Ø 7/8" - 21 mm flexible rubber female connection) with a suitable gradient to avoid condensate stagnation.

Discharge condensate from the boiler into the drainage system, either directly or (if required) via a neutralizer kit (not supplied).

The condensate drain of the boiler is equipped with a built-in condensate trap in order to keep flue gases from being discharged via the condensate drain.

The condensate formed both in the condensing boiler and in the flue gas pipe must be discharged into the public sewage system in accordance with all applicable local regulations.

The condensate produced by a gas-fired heating system has a pH value between 3 and 4.

Some local codes may require the use of a separate neutralizer kit to treat the condensate.

With a neutralizer kit installed, all condensate from the boiler and the flue gas pipe enters into the neutralizer kit where it is treated and released into the public sewage system with a safe pH value of above 6.5.

The use of neutralization granulate (performing the neutralizing process) is dependent on the operation of the heating system.

To determine the required refill amount, check granulate level several times during the first year of operation. In some cases one granulate fill may last an entire year.

The condensate discharge outlet to the drainage system connection must be clearly visible. It must be installed with a suitable gradient and provided with a stench trap.

If the condensate outlet of the boiler is lower than the drain, a condensate pump must be used.

Only corrosion-resistant materials may be used for condensate drainage purposes. Do not use galvanized materials or materials containing copper for piping, couplings etc.

Please note that other requirements may apply depending on local regulations and/or project-specific details.

It is advisable to contact your local waterworks office (authority responsible for waste water regulations) well before commencing with the installation of the neutralizer kit in order to establish details of local regulations that apply.

NOTICE: Pipe ventilation must take place between the condensate trap and the neutralizer kit (if applicable).

7.5 Loose flow regulators

The boiler includes additional flow regulators to be used depending on the area where the product is installed.

BWC150 - fitted	Lemon green	15.0 l/min	4.0 gal/min
BWC150 - spares	Olive Green	13.0 l/min	3.4 gal/min
	Gray	18.0 l/min	4.8 gal/min
BWC120 - fitted	Red	12.0 l/min	3.2 gal/min
BWC120 - spares	Blue	10.0 l/min	2.6 gal/min
	Dark blue	16.0 l/min	4.2 gal/min

DHW FLOW RATE

Entering Water	Leaving Water	BWC150 Large Combi	BWC120 Small Combi	Notes:
°F	°F	GPM	GPM	
58	125	3.9	3.30	10 CFR Appendix E to Subpart B of Part 430 – tested with the factory fitted flow restrictor.

How to select the flow restrictor to be used inside the boiler.

The selection must be done according the average ground temperature in the area of boiler installation (entering water temperature) and the minimum required leaving temperature (outlet temperature of domestic hot water).

Select the flow restrictor according the below formula [the first one with value less or equal to the calculated value]

$K/(X-Y) = \text{DHW FLOW RATE}$ according 10 CFR Appendix E to Subpart B of Part 430

$K = 3.9 \times (125 - 58) = 261.3$ for BWC150

$K = 3.3 \times (125 - 58) = 221.1$ for BWC120

X= Minimum leaving temperature required

Y= Entering temperature of your area (from the map below)

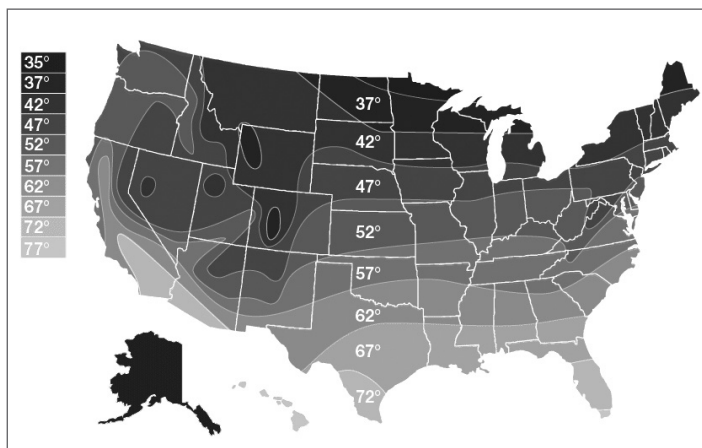
Example:

Entering temperature of your area (from the map below) = 42°F

Minimum leaving temperature required = 115 °F

Boiler model: BWC150

$261.3 / (115 - 42) = 3.6 \text{ GPM} \Rightarrow$ Select 3.4 GPM flow restrictor [the first one with value less or equal to the calculated value]



7.6 General piping information

CAUTION: Use two wrenches when tightening water piping at the boiler, using one wrench to prevent the boiler return line or supply line from turning. Failure to support the boiler piping connections to prevent them from turning could cause damage to boiler components.

NOTICE: The boiler control module uses temperature sensors to provide both high limit protection and modulating temperature control. The PCB also provides low water protection using a water pressure sensor (minimum 6.5 psi (0.45 bar)). Some codes/jurisdictions may require additional external controls for high limit and/or low water cutoff protection.

7.6.1 Separate low water cutoff

A low water cutoff may be required by state local code or some insurance companies. Check code requirements before installation of the boiler. If required:

- Use a low water cutoff designed for hydronic installations
- Follow low water cutoff manufacturer's instructions.

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

NOTICE: The electronic low water cutoff located internally in the boiler is below the lowest safe permissible water level established by the boiler manufacturer.

7.6.2 Backflow preventer (heating only model)

Use a backflow preventer specifically designed for hydronic boiler installations. This valve should be installed on the cold water fill supply line per local codes.

7.6.3 Fitting the heating circuit supply and return pipes

NOTICE: To protect the entire heating system the manufacturer recommends installing a Y-Strainer in the return circuit. When connecting the boiler to an existing heating system this device is recommended to be installed.

- Install shut-off valves immediately before and after the Y-Strainer to enable the Y-Strainer to be cleaned.
- Install a fill valve and drain valve in the heating system supply pipe if required.
- Also plumb the pressure relief valve to the drain system.

NOTICE: When using oxygen-permeable pipes, e. g. for floor heating systems, you must separate the system using heat exchangers.

- Thoroughly flush all pipes and radiators.
- Refer to the installation wall template for the pipe connection dimensions.
- Connect the pipes so that they are free from strain.

7.6.4 Sizing space heat system piping

Size the piping and components in the space heating system using recognized design methods.

Verify the 2.3 gal (9l) expansion tank is large enough for the application. Some applications, such as base-board heating, may require an additional expansion tank.

NOTICE: The boiler, when used in connection with a refrigeration system, must be installed so the chilled medium is piped in parallel with the boiler and with appropriate valves to prevent the chilled medium from entering the boiler.

NOTICE: The boiler piping system of a hot water boiler connected to heating coils, located in air handling units, where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

7.6.5 Available Pump Head (ft. hd.)

The boiler is designed for closed loop, forced circulation hot water heating systems only.

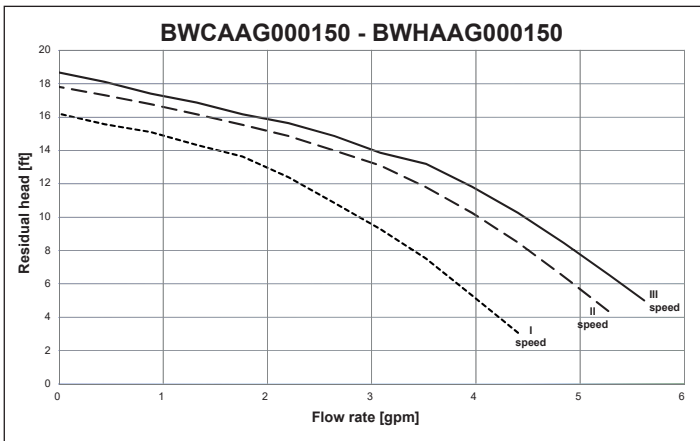
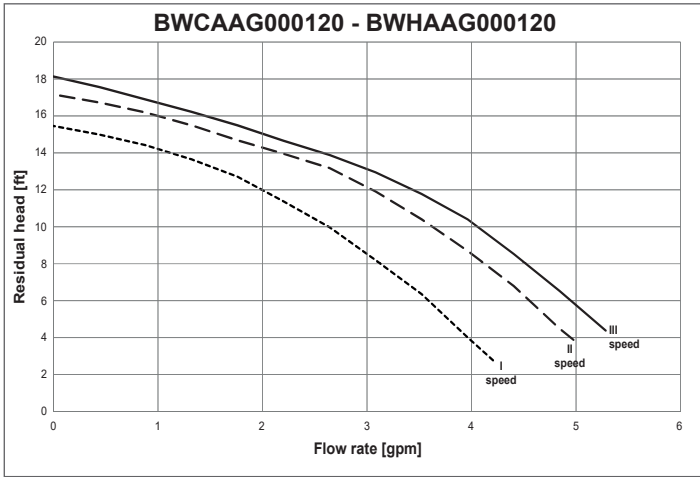
The boiler is equipped with an internal pump.

PUMP DUTY

Residual head of circulator

The residual head for the heating system is represented in the graph, according to the flow rate. The piping on the heating system must be sized taking into account the available residual head value. Bear in mind that the boiler will operate correctly if there is sufficient water circulation in the heat exchanger, as the boiler is equipped with an automatic internal by-pass which is designed to ensure water flow rate into the heat exchanger is correct under any installation conditions.

CAUTION: BWHAAG000120 and BWHAAG000150 must not be operated as a potable Hot Water Boiler. BWCAAG000120 and BWCAAG000150 must not be operated in an open system.



An external CH/System pump and additional bypass (or hydraulic separator) is required for heating systems outside the flow requirements of the internal circulator pump. It is recommended to have a Primary and Secondary loop configuration with closely spaced Tee's. Use the KBAIR0101BE9 2nd pump card accessory if your application requires system pump to be off during a DHW call.

7.7 Making the gas connection

⚠ DANGER: Only carry out work on gas piping and connections if you are licensed for such work.

- Determine proper size gas pipe for the installation according to the general and local rules.
- Do not forget the pipe connection losses and observe proper size of the fittings.
- Install the furnished 3/4" female gas cock on the gas connection (3/4" male on the boiler).
- Connect the gas pipe to the gas cock so that it is free from any strain.

⚠ WARNING: Failure to keep boiler area clear and free of combustible materials, gasoline and other flammable liquids and vapors can result in severe personal injury, death or substantial property damage.

⚠ WARNING: Before carrying out the connection, check that the type of gas is that for which the appliance is set up.

⚠ WARNING: Remove any combustible materials, gasoline and other flammable liquids away from the hot water pipes.

⚠ WARNING: The boiler and its gas connections must be leak tested before placing the boiler in operation.

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

⚠ WARNING: Before starting the boiler, and during initial operation, smell near the floor and around the boiler for gas or

any unusual odor. Do not proceed with start-up if there is any indication of a gas leak. Repair any leak at once.

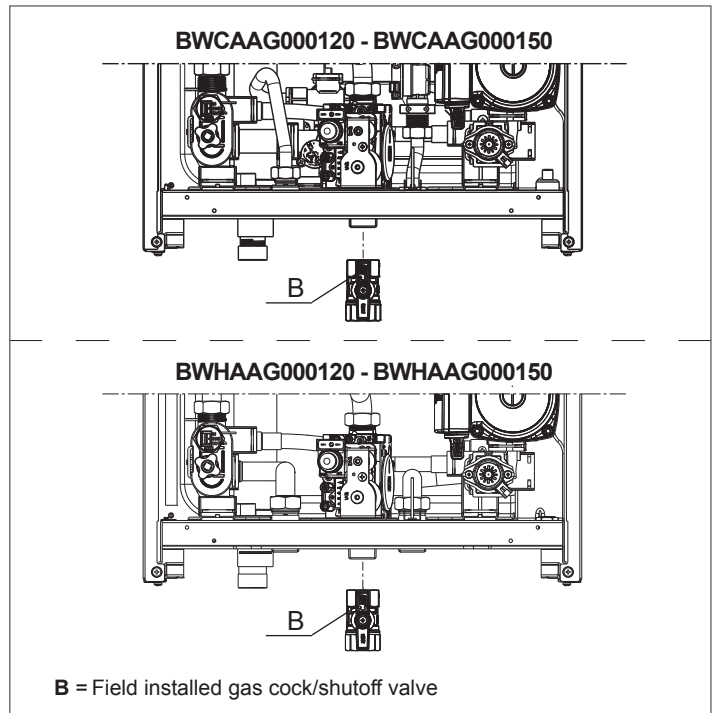
⚠ WARNING: for LPG boilers only — Your propane supplier mixes an odorant with the gas to make its presence detectable. In some instances, the odorant can fade, and the gas may no longer have an odor. Before start-up (and periodically thereafter), have the LPG supplier verify the correct odorant level in the gas.

⚠ WARNING:

- Cover control board section.
- Cover cables, plugs, and electrical connections.
- Cover endangered positions before leak testing.
- Do not spray the leak testing agent onto cables, plugs or electrical connection lines.
- Do not allow it to drip onto them either.

⚠ DANGER: Leaks may be caused to pipes and threaded connections during commissioning and maintenance activities.

- Carry out a proper leak test.
 - Only use approved leak detection agents for leak detection.
 - Disconnect the heating system from the power supply.
- Check the exterior tightness of new pipe sections up to and including the direct sealing point on the gas burner connection.



NOTICE: When installing the gas supply connection, it must comply with local regulations or, if such regulations do not exist, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 in the United States. In Canada, the gas supply connection must comply with local regulations or, if such regulations do not exist, with CAN/CSA B149.1, Natural Gas and Propane Installation Code. A sediment trap must be provided upstream of the gas controls.

NOTICE: The boiler must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psi (3.5 kPa).

7.7.1 Electrical supply

High voltage connections

The appliance works with alternating current at 120 Volt/60 Hz, and is in compliance with requirements of National Electrical Code and any additional national, state, or local code requirements having jurisdiction. Boiler must be electrically grounded in accordance with the National Electrical Code, ANSI/NFPA No. 70 - latest edition. In Canada, installation must conform to CSA C22.1 Canadian Electrical Code Part 1 and any local codes. It is obligatory to make the connection with a safe ground/earth, in compliance with current directives.

⚠ CAUTION: To ensure the tightness of the boiler, use a self-locking wire connector and tighten it on the wire.

⚠ WARNING: It is the responsibility of the installer to provide suitable grounding for the appliance; the manufacturer will not be liable for any damage resulting from an incorrect or absent ground connection.

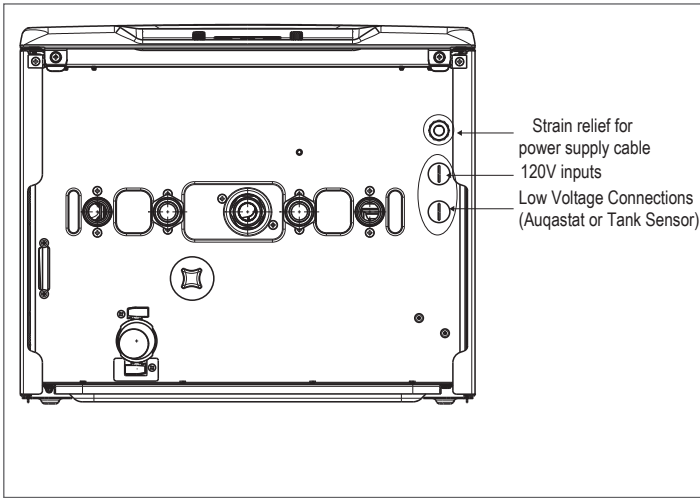
It is forbidden to use gas and/or water pipes as a ground to electrical appliances.

Use the power cable supplied to connect the boiler to the main power supply. If the power cable is replaced, use factory authorized parts as a replacement.

MAIN SUPPLY CONNECTION

The power supply cable must pass through the strain relief provided in the casing (see figure below).

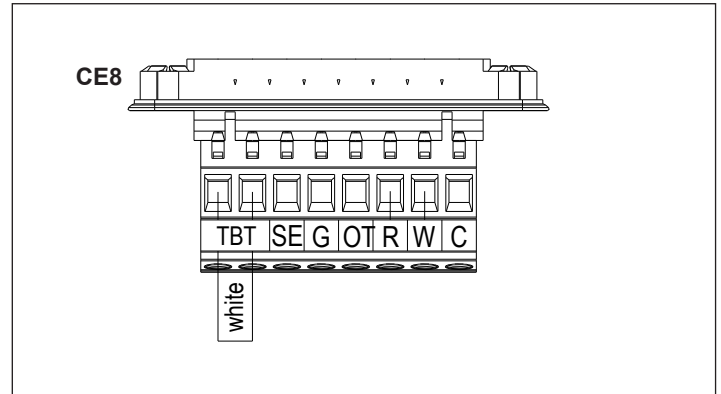
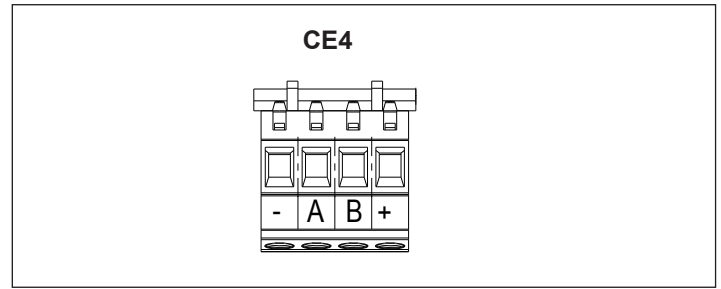
⚠ CAUTION: The electrical receptacle can be mounted to the left or right of the boiler. **It cannot be mounted to the boiler casing or located under the boiler.**



Low voltage connections

Carry out the low voltage connections as follows:

- 4 poles connector for BUS 485 (- A B +) signal (reserved for future accessories)
- 8 poles connector for W -R - TBT - C - SE - OT+signal



7.8 External wiring limitations

Any external wiring must remain within the limits as detailed in the table below.

Connection	Maximum length	
	ft	meters
Outdoor temperature sensor	100	30
Room thermostat	100	30
OT connection	100	30

Connector	Label	Description
CE4	(- A B +)	Bus 485
CE8	TBT	Low Temperature Thermostat
	OT - G	Open therm (OTBus)
	SE - G	Outdoor Temperature Sensor
	R	Room Thermostat (24V)
	W	Room Thermostat - Heating
M4a	T.BOLL.	DHW Aquastat
	S.BOLL.	DHW 10kOhm NTC

7.9 Electrical connections

The front control is connected to the main PCB of the boiler from which it also receives power; for electrical connections please refer to the section "9 wiring diagram" page 39.

A qualified electrician has to connect the electrical supply to the appliance. If controls – external to the appliance – are required, a competent person must undertake the design of any external electrical circuits.

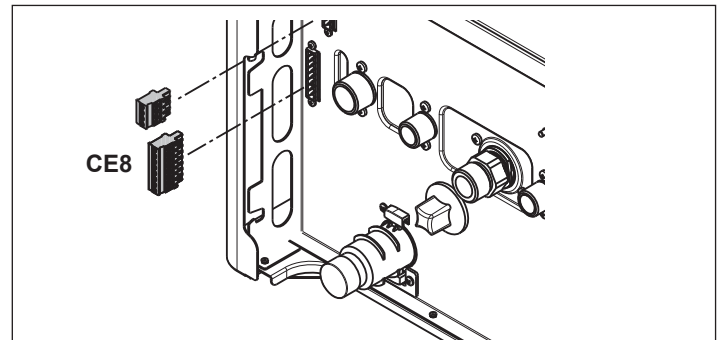
Wiring to the appliance must be rated for operation in contact with surfaces up to 194°F (90°C).

⚠ WARNING: If an external electrical source is utilized, the boiler, when installed, must be electrically bonded to ground in accordance with the requirements of the authority having jurisdiction or, in the absence of such requirements, with the National Electrical Code, ANSI/NFPA 70 and/or the Canadian Electrical Code Part 1, CSA C22.1, Electrical Code.

⚠ WARNING: ELECTRICAL SHOCK HAZARD — For your safety, turn off the electrical power supply at service entrance panel before making any electrical connections to avoid possible electric shock hazard. Failure to do so can cause severe personal injury or death.

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

- carry out electric connections using the desired connector



⚠ CAUTION: It is recommended to use wires not exceeding 20 AWG (0.5 mm²). All wiring must be in accordance with local codes and the National Electrical Code ANSI/NFPA 70 - latest edition. In Canada, the installation must conform to CSA C22.1 Canadian Electrical Code Part 1 and any local codes.

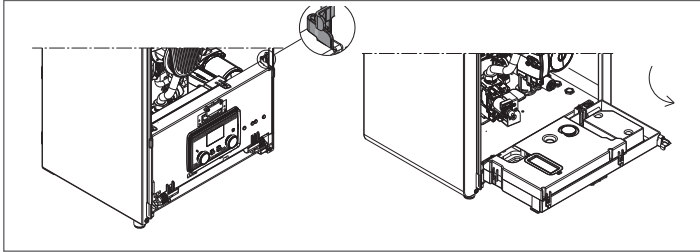
NOTICE: In case of TBT connection, remove the respective jumpers.

TBoil Aquastat or Sboil KBANT010111 Sensor connection

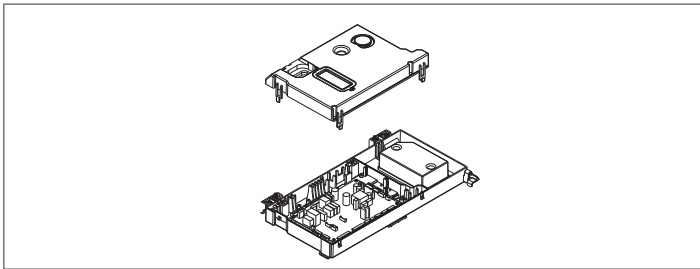
To connect water tank thermostat and water tank probe access the boiler

board as follows:

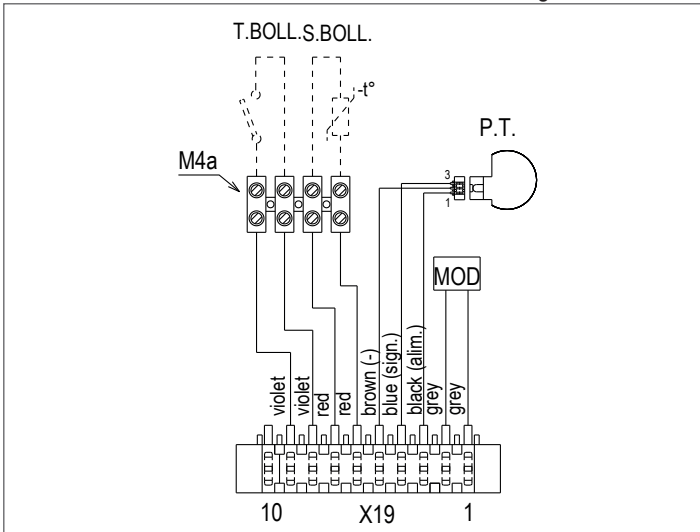
- remove the casing
- gently lift and turn the control panel to free it from the side hooks.



- remove the electrical parts cover as shown in the figure below



- connect TBOLL and SBOLL to M4a as shown in the figure



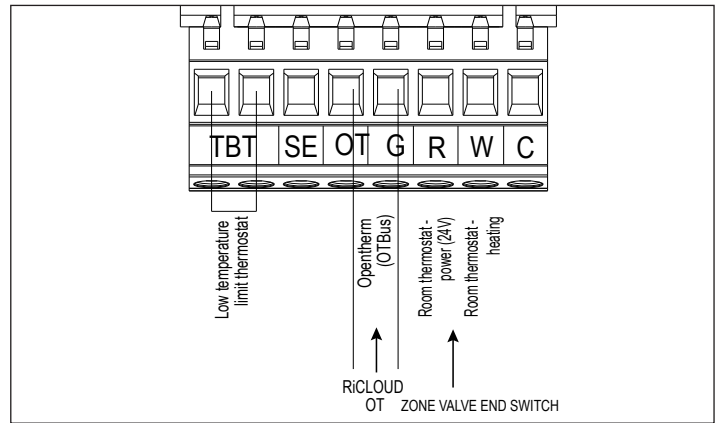
NOTICE: In case of boiler+external indirect tank with sensor (CASE C - see description on page 5) add a jumper on the TBOLL input of M4 terminal board.

Remote control OTBus (OTBus - Communication protocol system)

In case the boiler is connected to a remote control OTBus, the boiler display shows the "OT+" message. This message is displayed for 4 minutes.

7.9.1 OT and Room Thermostat connection to the boiler

On/Off dry contact thermostats and 3rd party zone boards can be connected to R and W to operate the boiler. Powered thermostats can be connected to R, W and C to power the thermostat. Note: the VA rating for the transformer is 1.5 VA, with 0.05 A fuse protection. The boilers also have the ability to communicate with OT (OpenTherm) thermostats, which are not that common in North America.



The central heating set point selected on the boiler display is used when a heating request is made at the room thermostat connection (W-R).

Presence of an outdoor temperature sensor connected to the boiler will influence the CH set point and therefore the supply temperature in the above situation.

The included outdoor temperature sensor provides an automatic means to regulate supply temperature based on outdoor temperature. Installation of this sensor is a Department of Energy requirement for space heating

7.10 Outdoor temperature sensor

The outdoor temperature sensor supplied as standard inside the boiler box must be connected at terminals SE-G terminals of CE8. Once the sensor is connected the boiler automatically adjusts to operate with the sensor. See Section "11.12 Setting the outdoor reset curve with an outdoor sensor" page 50.

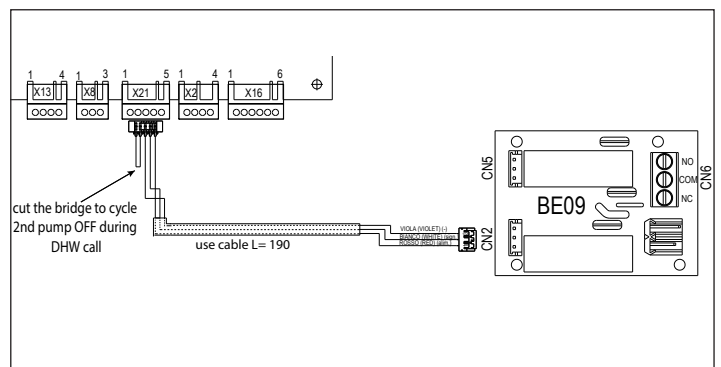
7.11 KBAIR0101BE9/ pump card management (BE09)

A pump card (BE09) is available as an accessory for the BWC-BWH boilers. This card under normal circumstances allows the boiler to close a relay on the card to activate a device such as a pump when there is a call for heat.

The card will turn off the system pump during a DHW call, as DHW is the priority. The kit part number for this card is KBAIR0101BE9

Working mode BE09

- If the jumper is cut, the CN2 relay is used to activate a second pump on the circuit – the second pump runs when the primary pump runs (the second pump will shutdown if there is instantaneous DHW request)



7.12 Other devices

Contact technical department should you require additional specific information on the suitability of a particular control. Further guidance on the recommended practice for the installation of external controls, can be found below.

CAUTION

- The boiler must always be supplied with a permanent 120V - 60Hz electrical supply.
- Do not connect any controls or auxiliary equipment to the

24V terminal strip, other than those approved/supplied by the manufacturer.

7.13 Check/control water chemistry

⚠ WARNING: Do not use petroleum-based cleaning or sealing compounds in heating system. Damage to elastomer seals and gaskets in the system could occur, resulting in substantial property damage.

Water pH between 7.0 and 8.0

- Maintain a water pH over 7.0 for a stainless steel heat exchanger and below 8.0 if there are aluminium components in the heating system. Check with litmus paper (swimming pool test strip) or have the system chemically analyzed by water treatment company.
- If pH differs from above, consult the local water treatment company for treatment needed.

Hardness less than 9 grains

- It is recommended that water hardness be below 9 grains.
- Consult the local water treatment companies for unusually hard water areas (above 9 grains hardness).

Chlorine concentration less than 50 ppm

- Do not fill boiler or operate with water containing chlorine in excess of 50 ppm.
- Do not use the boiler to directly heat a swimming pool or spa water.

Clean system to remove sediment

- During installation, especially when replacing existing equipment, it is recommended to thoroughly flush the system (without the boiler connected) to remove sediment. The high-efficiency heat exchanger can be damaged by build up or corrosion due to sediment.
- Flush system until water runs clean and you are sure piping is free of sediment.

7.14 Freeze protection (when used)

⚠ WARNING: NEVER use automotive or standard glycol antifreeze, even ethylene glycol made for hydronic systems. Use only glycol fluids certified by a glycol manufacturer as suitable for use with stainless steel, verified in glycol manufacturer's literature.

Test/replace glycol fluid

- For systems using glycol fluids, follow glycol manufacturer's instructions to verify the inhibitor level and that other fluid characteristics are satisfactory.
- Do not exceed 40 % of the system volume with glycol fluids.

NOTICE: Glycol must be replaced periodically due to degradation of inhibitors over time. Follow all glycol manufacturer's instructions.

⚠ Thoroughly clean and flush any system that has used glycol before installing the new boiler. Provide the boiler owner with a material safety data sheet (MSDS) on the glycol used (if requested).

- Determine glycol fluid quantity using total system water content, following the glycol manufacturer's instructions. Remember to include expansion tank water content.

NOTICE: Boiler capacities can be reduced up to 20% when glycol is used.

- Local codes may require a backflow preventer or actual disconnect from city water supply.

7.15 Casing removal

To access the components inside, remove the casing as indicated below:

- locate and unscrew the 2 screws (A - figure beside) that attach the door to the casing
- push the two tabs in the lower corners (C) to disengage the door from the casing
- lift the door upwards to remove it from the top tabs (B), set door aside.

Removal of the side panels

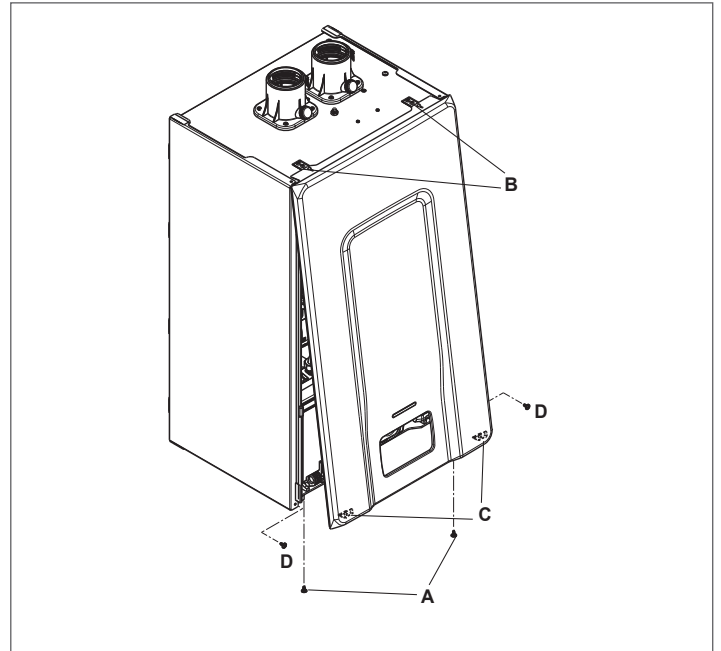
- Locate and remove the 2 screws (D) that secure the side panel to the appliance.
- Gently prise the side panel forward to release it from the securing tabs on the appliance rear.

NOTICE: If the side panels have been removed, reassemble them in the original position by referring to the adhesive labels on the side walls.

NOTICE: If the front panel is missing, it must be replaced.

NOTICE: The noise absorbing panels inside the front and side walls ensure an airtight seal for the air supply duct.

NOTICE: It is ESSENTIAL to correctly reposition the panels after reassembly to ensure limited air leakage.



7.16 Initial filling of the system and air purge

NOTICE: The initial filling of the system and each later refill must be done with the electrical supply ON and the boiler in OFF mode.

NOTICE: On initial powerup and every time power is cycled, the automatic pump purge occurs.

Once the hydraulic connections have been carried out, fill the heating system.

- For existing systems, the entirety of the system must be drained and flushed with a pH neutral solution. Refer to section "11.3 Initial flushing of the system" page 44 for details.
- See the Application Guide (available on HVAC Partners) for system piping recommendations.
- Follow all local codes and regulations for installation and piping of boiler.

This operation must be carried out when the system is cold by following the steps below:

- Ensure both supply and return service valves are open.
- Open the cap of the automatic air vent valve (A) behind the circulator pump by two or three turns to allow a continuous venting of the air, leave the plug of the valve (A) open permanently with the operation of the boiler.
- Locate the installed silicone tube to the manual air vent valve (D) and insert the open end into a bucket to collect the water that eventually comes out after the air purge.
- Open the manual air vent valve (D).

⚠ WARNING: Water flushing through the manual air vent valve (D) can cause instant and severe burns when opening the air vent valve on the heat exchanger. Open this valve only when the water in the system is cool.

- Make sure the cold water inlet tap is open.
- Open the filling tap (B).
- Switch ON the 120V electrical supply to the boiler. Operation mode should be left in OFF.
- Wait until only water comes out continuously from the manual air vent valve, close the valve (D).
- Check the pressure value on the screen: when the pressure indicated by the sensor is between 15-21 psi (1-1.5 bar) close the filling tap (B). To get the display screen to show the pressure value refer to INFO MENU in "11.10 Access to the INFO menu" page 47
- Cycle the line power supply off and after a few seconds back on while leaving the boiler in OFF operation mode. This will initiate pump purge to start the venting cycle.

NOTICE: see Section “11.4 Bleeding and Releasing of Circulator Shaft”.

- Begin venting all manual air vents in the hydronic piping system, starting at the lowest first. It may be necessary to go back and add water to the system to increase the pressure until the entire system has been filled.
- Check the operation of the pressure relief valve by lifting the lever from the seat. Purge air through this valve by keeping open until only water comes out.
- Be sure boiler is in “OFF” mode. Open hot water tap(s) to remove air from the DHW circuit. Keep open until only water exits the tap to ensure the air is removed.
- Inspect the system for leaks, fixing any if found.
- After the air purging cycle the boiler is ready to operate.

If there is still air present during operation, repeat the air purging cycle.

⚠ WARNING: Eliminate all system leaks. Continual fresh makeup water will reduce boiler life. Minerals can build up in the heat exchanger, reducing heat transfer, overheating heat exchanger, and causing heat exchanger failure.

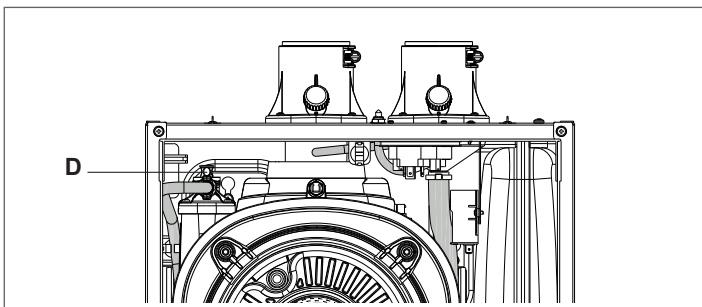
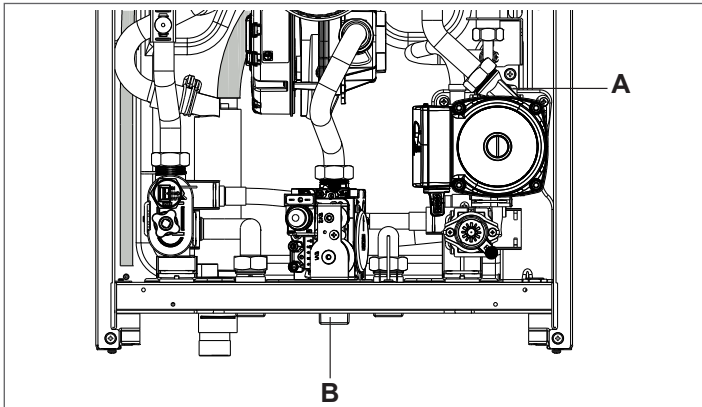
The system may have residual substances that could affect water chemistry. After the system has been filled and leak tested, verify water pH and chlorine/chloramines concentrations are acceptable (see section “7.13 Check/control water chemistry” page 24).

⚠ CAUTION: It is important that you purge the system of air to avoid damage to the boiler.

7.17 Refill of the system

When the system needs to be refilled and an air purge is not needed, perform the steps below:

- Put the boiler in OFF mode.
- Make sure the cold water inlet tap is open.
- Open the filling tap (B for combi boiler - external for heating only boiler model).
- Check the pressure value on the screen: when the pressure indicated by the sensor is between 15-21 psi (1-1.5 bar) close the filling tap. To get the display screen to show the pressure value refer to INFO MENU in s”11.10 Access to the INFO menu” page 47

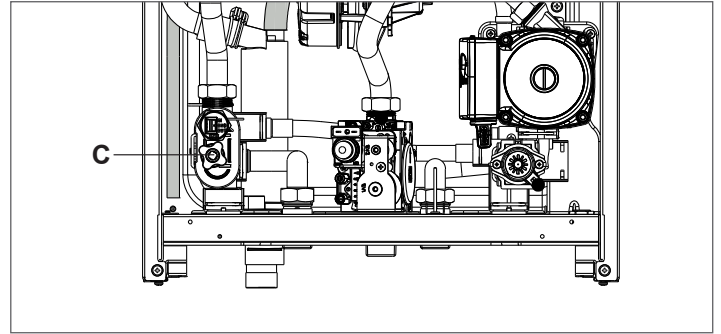


7.18 Draining the heating circuit of the boiler

⚠ DANGER: The system water temperature could be very hot, be sure when opening the drain valve that the rubber pipe is well attached. Water could spray from the front of the unit and cause instant severe burns or death from scalds.

Before draining the system, switch off or disconnect the external power supply to the boiler.

- Close the heating system's valves.
- Manually loosen the system drain valve (C).
- Attach tube supplied in the loose parts bag to the outlet on the system drain valve (C).
- Insert the open end of the tube into a bucket.
- Open drain valve (C) and allow water to drain out of system into bucket.
- It is recommended to open the manual air vent (D) to release any vacuum in the system to allow water to drain.
- To refill the system, close the vent and drain valves (C and D) and see “7.17 Refill of the system” page 25 7.14.



7.19 Emptying the domestic hot water system

Whenever there is risk of freezing, the domestic hot water system must be emptied in the following way:

- turn off the main water supply tap
- turn on all the hot and cold water taps
- drain from the lowest points.

8 GENERAL VENTING

⚠ DANGER: Ensure the exhaust and intake vent piping comply with these instructions regarding the vent system. Inspect finished combustion air intake and exhaust piping thoroughly to ensure all joints are secured well, airtight and comply with all applicable code requirements, as well as with the instructions provided in this manual and the vent manufacturer's installation manual. Failure to provide a properly installed vent system will cause severe personal injury or death.

⚠ WARNING: Carbon Monoxide is invisible, odorless, and toxic! Install a carbon monoxide alarm in your home, even if you do not own a gas appliance. Locate the carbon monoxide alarm in the living area of your home and away from gas appliances and doorways to attached garages. Follow the alarm manufacturer's instruction included with the alarm.

NOTICE: pipe supports shall be placed per local code and the vent manufacturer's instructions.

⚠ WARNING: RISK OF CARBON MONOXIDE POISONING OR FIRE DUE TO JOINT SEPARATION OR PIPE BREAKAGE. Ensure all of the venting system is properly supported and secured per these instructions, venting manufacturer's instructions and with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, CAN/CSA B149.1, and/or applicable provisions of local building codes. Failure to do so may result in substantial property damage, severe personal injury or death.

⚠ WARNING: This vent system will operate with a positive pressure in the pipe. Do not connect vent connectors serving appliances vented by natural draft into any portion of mechanical draft systems operating under positive pressure. Follow the venting instructions carefully. Failure to do so may result in severe personal injury, death, or substantial property damage.

Install the boiler/venting system in accordance with the vent manufacturer's instructions and with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, CAN/CSA B149.1, and/or applicable provisions of local building codes.

This boiler is a direct vent appliance according to ANSI Z21.13/CSA 4.9 standard.

Vent installations shall be in accordance with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or CAN/CSA B149.1, Natural Gas and Propane Installation Code, or applicable provisions of the local building codes.

The safe operation of a system is based on the use of parts supplied by the vent manufacturer and the performance of the system may be affected if the combination of these parts is not used in actual building construction.

Acceptance of the system is dependent upon full compliance with the vent manufacturer's installation instructions, National Fuel Gas Code, ANSI Z223.1/NFPA 54, CAN/CSA B149.1, and/or applicable provisions of local building codes.

8.1 Combustion Air-inlet Contamination

Be careful not to locate the air-inlet termination in an area where contaminants can be drawn in and used for combustion. Combustion air containing dust, debris or air-borne contaminants will drastically increase the required maintenance and may cause a corrosive reaction in the Heat Exchanger which could result in premature failure, fire, serious injury, or death. See table below for a list of areas to avoid when terminating air-inlet piping:

Products to Avoid	Contaminated Sources to Avoid
Antistatic fabric softeners, bleaches, detergents, cleaners	Laundry facilities
Perchloroethylene (PCE), hydrocarbon based cleaners	Dry cleaning facilities
Chemical fertilizer, herbicides/pesticides, dust, methane gas	Farms or areas with livestock and manure
Paint or varnish removers, cements or glues, sawdust	Wood working or furniture refinishing shops
Water chlorination chemicals (chloride, fluoride)	Swimming pools, hot tubs
Solvents, cutting oils, fiberglass, cleaning solvents	Auto body or metal working shops
Refrigerant charge with CFC or HCFC	Refrigerant repair shops
Permanent wave solutions	Beauty shops

Fixer, hydrochloric acid (muriatic acid), bromide, iodine	Photo labs, chemical / plastics processing plants
Cement powder, crack fill dust, cellulose, fiber based insulation	Concrete plant or construction site

⚠ WARNING: Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other gas-fired appliance. Failure to follow instructions may result in serious injury or death.

8.2 Flammable Solvents and Plastic Piping

⚠ DANGER: Flammable Cements and Primers - It is the installers' responsibility to familiarize themselves with the hazards associated with explosive solvents and to take all precautions to reduce these risks. Failure to follow these instructions can cause explosions, property damage, injury or death.

⚠ WARNING: Only solvents, cements and primers approved for ANSI/ASTM F493 (for CPVC) and ANSI D2564 (for PVC) shall be used with their vent system. See approved venting material table below. Failure to do so may result in severe personal injury, substantial property damage or death.

Due to the extremely flammable characteristics of most glues, cements, solvents and primers used in the process of joining plastic vent and air-inlet pipes, explosive solvent vapors must be evacuated from the vent and air-inlet prior to start-up. Avoid using excess cement or primer that may lead to pooling inside the pipe assembly. Freshly assembled piping should be allowed to cure for a minimum of 8 hours before applying power to the gas fired boiler. Refer to Mandatory Pre-commissioning Procedure for Plastic Venting in this section.

8.3 Mandatory Pre-commissioning Procedure for PVC (Air-inlet only) and CPVC Plastic Venting

⚠ WARNING: Read and install the vent in accordance with the vent manufacturer's instructions. Failure to do so may result in severe personal injury, substantial property damage or death.

⚠ CAUTION: Do not apply power to the boiler prior to Step 4 in the Mandatory Pre-commissioning.

⚠ CAUTION: Adhesives and sealants used in the assembly are to be used within their marked time limitations.

Procedure for PVC (air-inlet only) and CPVC Plastic Venting.

- 1 With the power turned off to the boiler, completely install the vent and air-intake system, securely cementing joints together. If possible, allow primers/cements to cure for 8 hours before firing the burner. If curing time is less than 8 hours, proceed with Steps 2 through 6.
- 2 Keep the boiler gas supply shut-off valve in the off position.
- 3 Remove the wiring from the spark generator.

⚠ CAUTION: Spark Ignition Circuit - Maintain a safe distance (2 in. minimum) from the spark ignition circuit to avoid injury from electrical shock.

- 4 Turn power on to the boiler and apply a heat demand.
- 5 Allow for 5 complete trials for ignition, consisting of pre and post purge of the combustion blower, until an ignition lockout occurs. Repeat the process one more time (i.e. 10 complete ignition sequences in total).
- 6 Turn power off and reconnect the wiring to the spark generator.

8.4 General Venting Rules and Guidelines

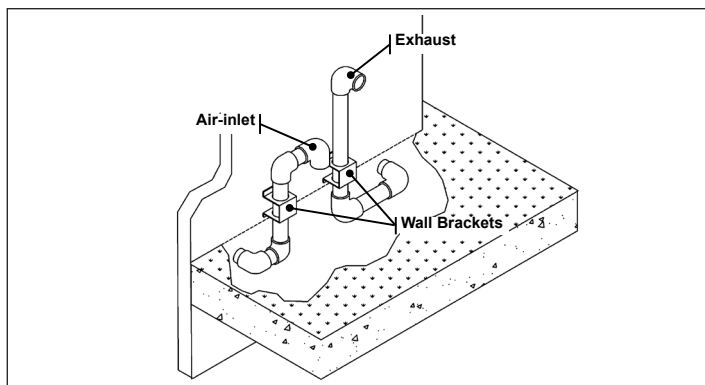
- Prevailing Winds: Ensure the vent is located where it will not be exposed to normal prevailing winds.
- Combustion Air-inlet Contamination: Air for combustion must be drawn from an area free of dust and contaminants.
- Vertical between air-inlet and exhaust vent: The exhaust must be a minimum of 12 in. (305mm) above the air-inlet, and the air-inlet must always be a minimum of 12 in. (305mm) plus allowance above any surface that will support snow. (Two feet plus snow allowance is highly recommended). Consult your weather office for the maximum typical snowfall for your region.

- Horizontal between air-inlet and exhaust vent: The horizontal distance between the inlet and exhaust must be a minimum of 4" [102 mm] center to center.
- Wall Flashing: Under normal operating conditions this boiler will produce a plume of white gases, and should be taken into consideration when selecting an adequate location. A stainless, plastic, or vinyl shield can be used to flash the exterior of the residence.
- Flue Gas Hazard: Position the vent termination where vapors cannot make accidental contact with people and pets or damage nearby shrubs and plants.
- Elbow Extensions: Elbows on outside of wall must be no more than ½ in. away from the wall.
- Vent Sloping: All indoor exhaust piping must be on a slope back to the boiler a minimum of ¼ in. per linear foot (21 mm/m) of vent. For applications where excessive condensation is possible ½ in. per linear foot (42 mm/m) is recommended. The venting system shall be installed so as to prevent accumulation of condensate and, where necessary, have means provided for drainage of condensate.
- Vent screens: It is recommended to install a vent screen or vent termination approved by the vent manufacturer as the last venting component of the vent system (both inlet and exhaust vent) to prevent undesired objects (ie. birds, rodents, debris) from entering the vent system.
- Vent Supports: Where required Vent and Air-inlet piping shall be secured to the wall for more rigidity. All interior vent pipe shall have a minimum support distance given per vent manufacturer's instructions. In the absence of such instructions than a minimum support distance of 36" (914 mm) shall be maintained. The vent and air-inlet piping shall be supported at every connection. The vent and air-inlet piping shall be supported at every fitting. Horizontal portions of the venting shall be supported to prevent sagging.

⚠ WARNING: Failure to provide adequate support may result in substantial property damage, severe personal injury or death.

NOTE: the framing in walls and roofs that the vent will penetrate through shall be constructed to provide for support and attachment of termination assemblies.

- Roof Exhaust: In all roof applications the discharge must point away from the pitch of the roof.
- Roof Flashing: Install adequate flashing where the pipe enters the roof, to prevent water leakage.
- Rain Cap: Install and seal a rain cap over existing chimney openings, in vacant chimney applications.
- Venting Below Grade: For installations that exit the wall below grade refer to figure below.



For installations that exit the wall below grade:

1. Excavate site to a point below where the pipes are to exit as shown.
2. Ensure the wall is fully sealed where the pipes penetrate.
3. The Vent/Air-inlet piping MUST be secured to the side of the building above grade, as shown, to provide rigidity.
4. Only use wall brackets approved for outdoor use and by the vent manufacturer for securing the air-inlet and vent exhaust pipes to the wall.

⚠ WARNING: Failure to properly support the air-inlet and vent may result in substantial property damage, severe personal injury or death.

5. Ensure that the Vent/Air-inlet clearances are maintained, see Section 5.0 for details.

⚠ WARNING: Failure to properly support the air-inlet and vent may result in substantial property damage, severe personal injury or death.

⚠ WARNING: Condensate Hazard: Do not locate vent over public walkways, driveways or parking lots. Condensate could drip and freeze resulting in a slip hazard or damage to vehicles and machinery.

- Wall Thickness: Direct vent terminations are designed to work with any standard wall thickness. Installation guidelines for min/ max wall thickness are as follows: Min. = 1 in., Max. = 36 in.
- Plastic Venting: Plastic venting systems shall not pass through rated fire separations.
- Metal Venting Systems: Except for installation in single-and two-family dwellings, metal venting systems which extend through any storey above that on which the connected appliance is located are to be provided with enclosures having a fire resistance rating equal to or greater than that of the floor or roof assemblies through which they pass.

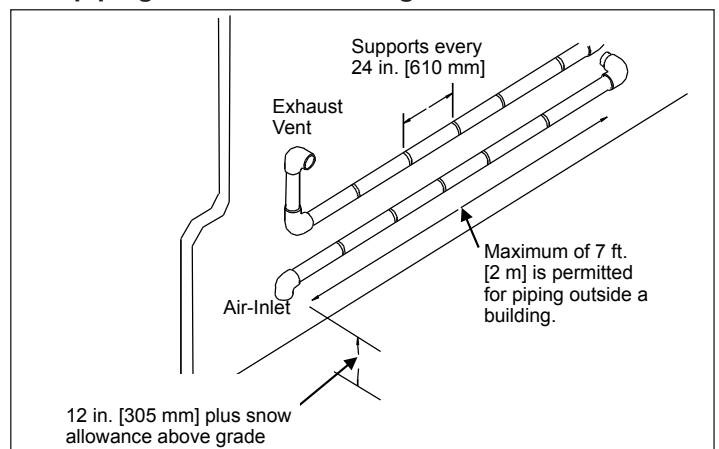
⚠ WARNING: Insulation shall not be used on plastic pipes.

⚠ WARNING: Insulation or other materials shall not be within the required clearance spaces surrounding the vent unless specified in the vent manufacturer's installation instructions.

⚠ Venting Options: Due to potential moisture build-up along the exterior wall or overhangs, the location of sidewall venting must be carefully selected.

⚠ WARNING: Extra precaution must be taken to adequately support the weight of the Vent/Air-inlet piping in applications using roof-top terminations. Failure to follow these instructions may result in venting or boiler component failure resulting in flue gas spillage leading to property damage, serious injury or death.

Vent piping outside the building

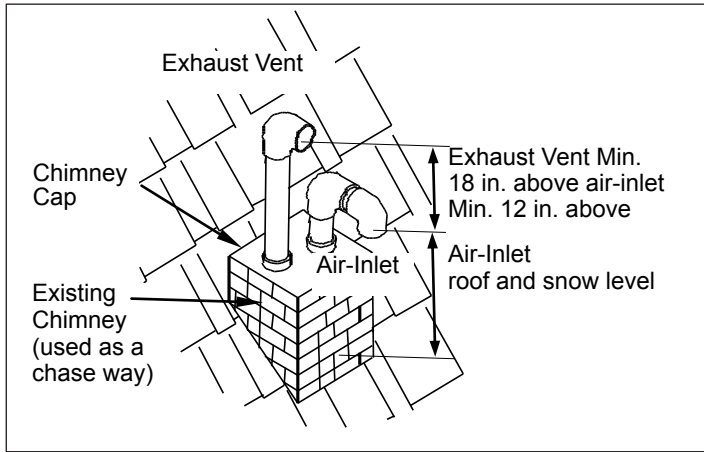


⚠ WARNING: Failure to follow the instructions below may result in substantial property damage, severe personal injury or death.

Vent piping outside the building is permitted under the following conditions:

1. The maximum length outside the building is 7 ft. Note that outdoor length must be included in the overall vent length calculation.
2. All normal termination clearances are maintained.
3. The pipe is supported every 24 in.
4. The exhaust and inlet are sloped back to the boiler ½ in. elevation for every linear foot.
5. The air-inlet and vent pipe must be located in a area where it cannot be contacted or tampered with.

Existing Chimney Chase Way



It is permissible to use an existing chimney as a chase way to run the Vent/Air-inlet piping as long as:

1. The chimney is not being used by any other appliance.
2. Flue gases do not enter the vacant chimney.
3. Only approved vent manufacturer's venting shown in section 8.9 can be used.
Vent lengths are within the maximums specified.
4. The top of the chimney is capped and the Vent Air-inlet pipes are flashed to prevent leakage into the vacant chimney.

Under no circumstances may an existing chimney or chase-way be used to vent or provide combustion intake air to the boiler. The existing chimney or chaseway can only be used as a passageway to allow the approved venting material to pass through. Failure to follow these instructions will result in fire, property damage, serious injury or death.

8.5 Combustion Air and Ventilation Openings

Provisions for combustion and ventilation air must be made in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or Sections 7.2, 7.3 or 7.4 of CAN/CGA B149.1, Installation Codes, or applicable provisions of the local building codes.

⚠ CAUTION: BOILER DAMAGE AND OPERATIONAL FAILURES!

Provisions for combustion air and ventilation are always required through a grille, regardless whether the combustion air is taken from the outside (sealed combustion).

- ⚠** Make sure that intake and exhaust openings are sufficiently sized and no reduction or closure of openings takes place
- If this is not the case, then the problem is not resolved, do not operate the boiler.
 - Please note these restrictions and its dangers to the operator of the boiler.

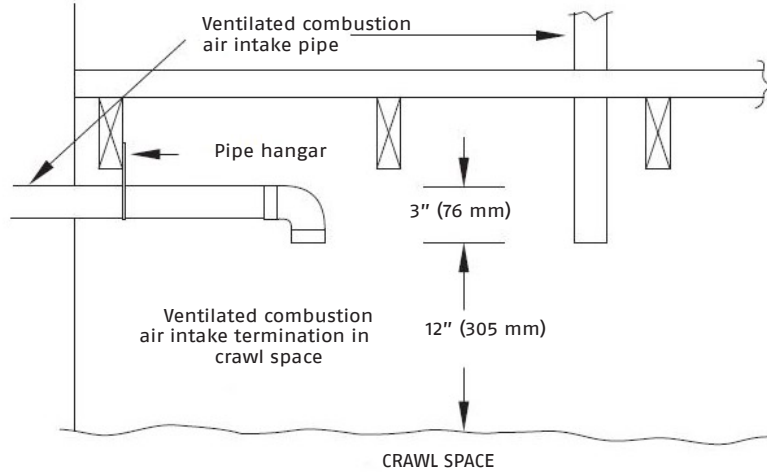
⚠ WARNING: BOILER DAMAGE!

- Boiler must be clear and free from combustible materials, gasoline and other flammable vapors and liquids, and corrosive liquids and vapors. Never use chlorine and hydrocarbon containing chemicals (such as spray chemicals, solution and cleaning agents, paints, glues etc.) in the vicinity of the boiler.
- Do not store and use these chemicals in the boiler room.
- Avoid excessive dust formation and build-up.

⚠ DANGER: FIRE DANGER!

- Do not store flammable materials and liquids in the immediate vicinity of the boiler.

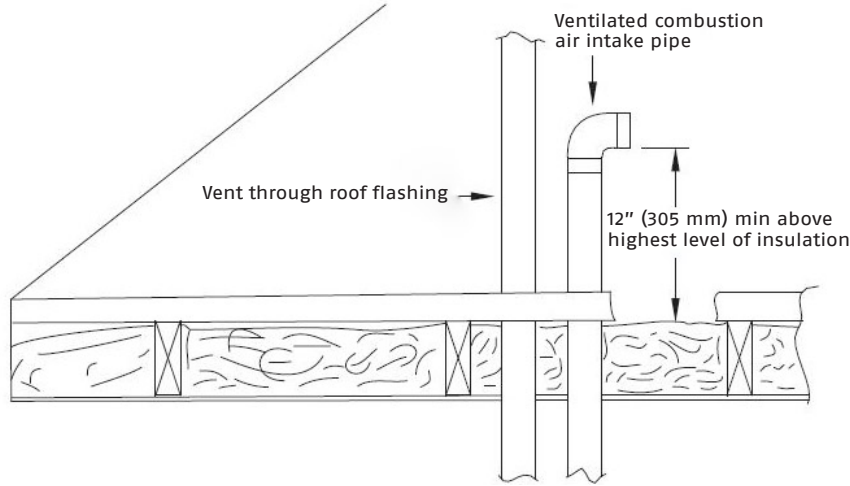
Crawl Space and Attic combustion air



CRAWL SPACE

For vent and combustion air pipe length refer to the approved configuration of horizontal and vertical vent installation - Section 8.8, fig. 7 for 2" and fig. 20 for 3"

⚠ WARNING: When using a ventilated crawl space for combustion air ensure the make-up air opening is adequately sized for the boiler per National Flue Gas Code, ANSI Z223.1/NFPA 54as well as applicable provisions of the local building code, in the United States and CAN/CGA B149.1, Installation Codes as well as applicable provisions of the local building code, in Canada.



ATTIC

For vent and combustion air pipe length refer to the approved configuration of horizontal and vertical vent installation - Section 8.8, fig. 13-14 for 2" and fig. 18-19 for 3"

⚠ WARNING: When using a ventilated attic space for combustion air ensure the make-up air opening is adequately sized for the boiler per National Flue Gas Code, ANSI Z223.1/NFPA 54as well as applicable provisions of the local building code, in the United States and CAN/CGA B149.1, Installation Codes as well as applicable provisions of the local building code, in Canada.

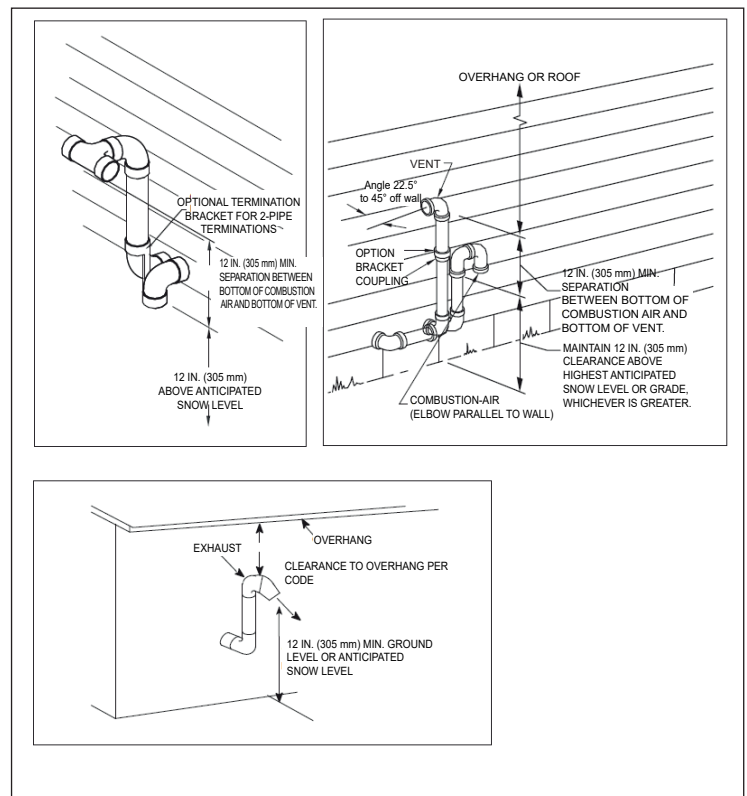
Alberta and Saskatchewan Vent Terminations

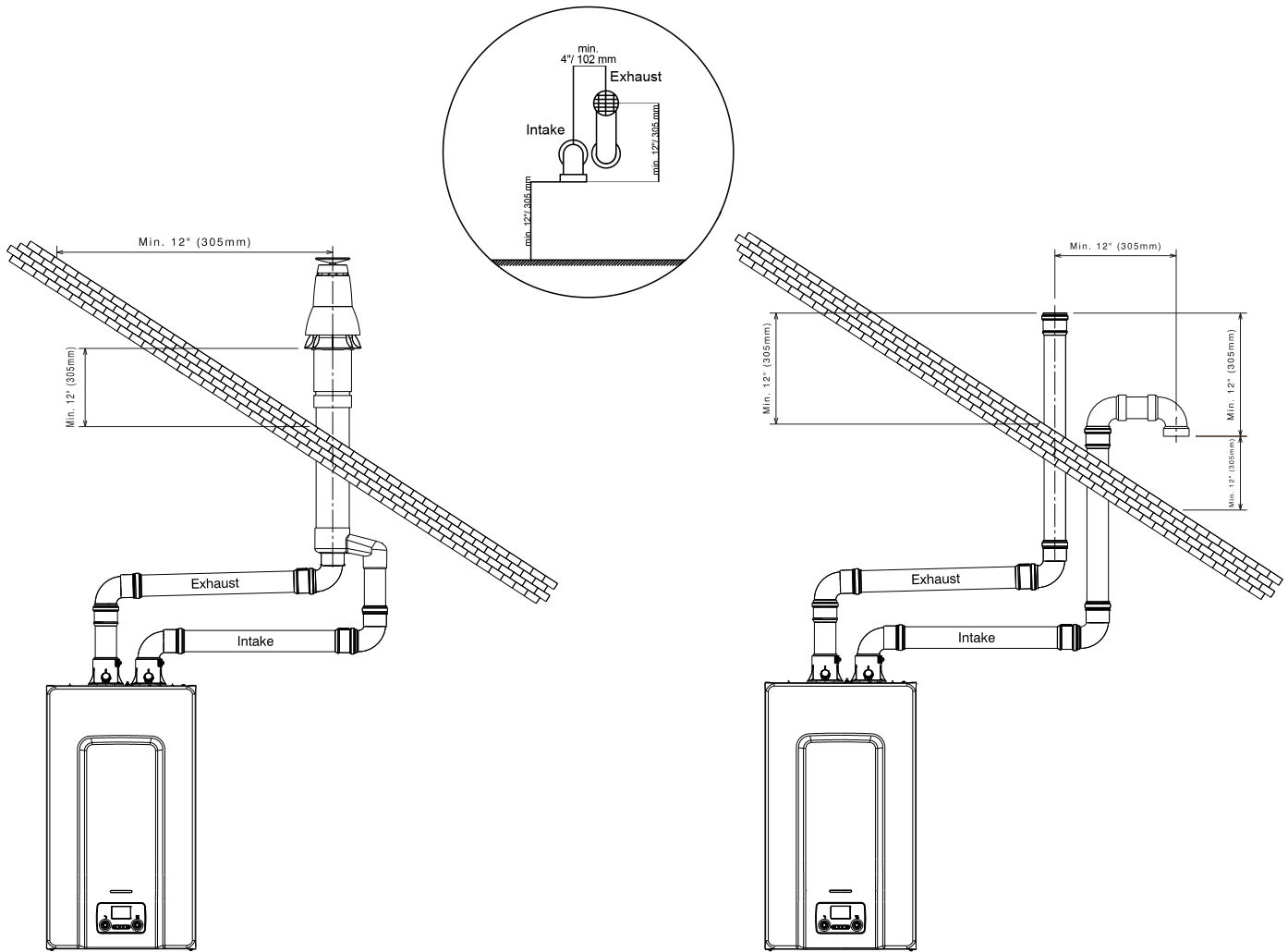
The Provinces of Alberta and Saskatchewan require a minimum unobstructed distance of 4ft. (1.2m) from the foundation to the property line of the adjacent lot for vent termination of any appliance with an input over 35,000 btuh. If there is less than 4 ft. (1.2m) of unobstructed distance to the property line of the adjacent lot, no type of vent termination is permitted for appliances with inputs greater than 35,000 btuh.

There are no additional restrictions on unobstructed distances greater than 8ft. (2.4m). All single, two-pipe and concentric vents may be used, providing all other Code and manufacturer's requirements in these instructions are adhered to. Refer to the appropriate Vent Termination section above for locating the vent termination.

If the unobstructed distance from the foundation to the property line of the adjacent lot is no less than 4ft. (1.2m) and no greater than 8ft. (2.4m), it will be necessary to re-direct the flue gas plume. In this situation, a concentric vent kit cannot be used. A 2-pipe termination (or single pipe termination when permitted with ventilated combustion air applications) that re-directs the flue gas away by use of an elbow or tee, certified to ULC S636 from the adjacent property line must be used. See fig. beside.

The kit currently cannot be modified to attach an elbow to the vent portion of the rain cap. A tee attached to the rain cap could potentially direct the flue gas plume toward the intake air stream and contaminate the incoming combustion air for the boilers. Refer to figure below for terminations approved for use in Alberta and Saskatchewan.





(*) above maximum snow level or at least 24" (610 mm) whichever is greater

VENT/AIR-INLET TERMINATION CLEARANCES

The quick reference table below is to be read in conjunction with the numbered notes as indicated in figures of the previous page, and the Venting Rules and Guidelines in Section 8.4. The instructions detailed in this section are a combination of specific and National Gas Code restrictions. Ensure the installation clearances are in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 in the US, CAN/CSA B149.1 in Canada, and/or applicable provisions of local building codes; the clearances shown within this manual do not supersede these codes. Compliance alone does not insure a satisfactory installation as good common sense must also be applied.

WARNING: failure to follow these instructions may result in fire, property damage, serious injury or death.

Vent Termination Minimum Clearances		US Installations ²	Canadian Installations ¹
A	Clearance above grade, veranda, porch, deck, or balcony	12" (305mm)	12" (305mm)
B	Clearance to window or door that may be opened	12" (305mm)	3 ft. (0.9m)
C	Clearance to permanently closed window	12" (305mm)	12" (305mm)
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (610mm) from the center line of the terminal	18" (457mm)	18" (457mm)
E	Clearance to unventilated soffit	18" (457mm)	18" (457mm)
F	Clearance to outside corner	9" (229mm)	9" (229mm)
G	Clearance to inside corner	3 ft. (0.9m)	3 ft. (0.9m)
H	Clearance to each side of centerline extended above meter/ regulator assembly	3 ft. (0.9m) within a height of 15 ft. (4.5m) above the meter/ regulator assembly	3 ft. (0.9m) within a height of 15 ft. (4.5m) above the meter/ regulator assembly

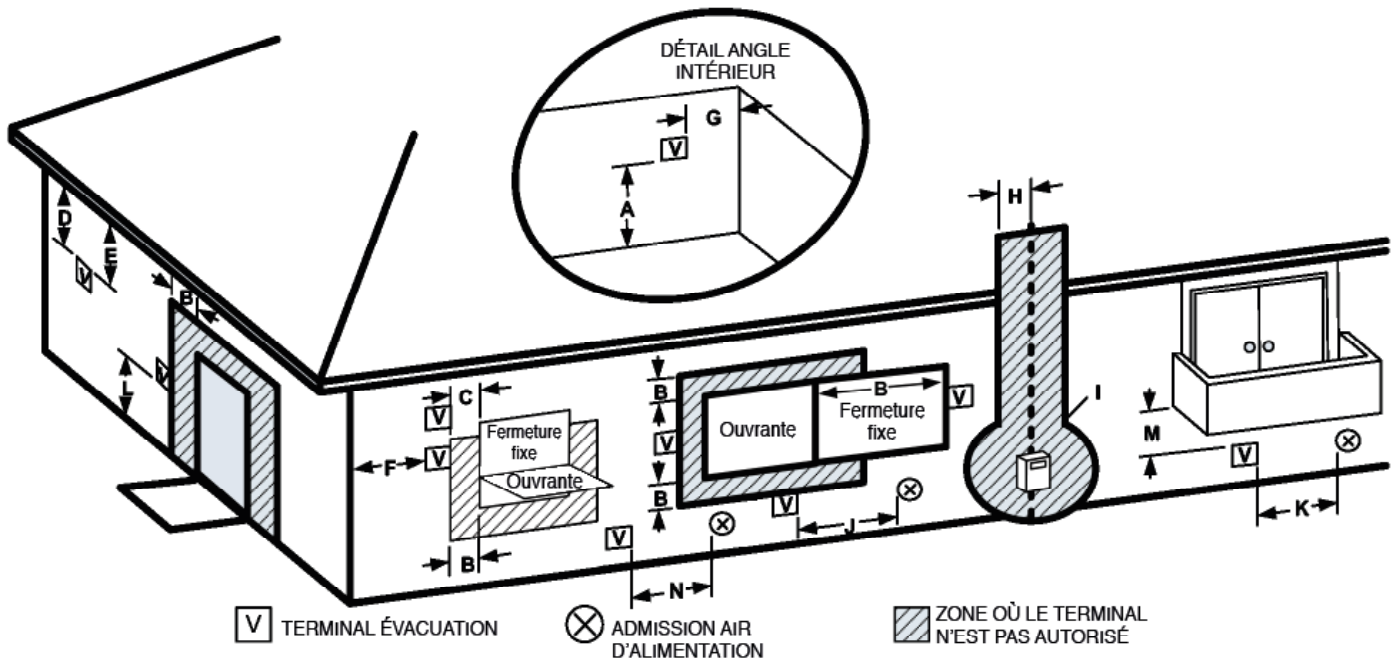
I	Clearance to service regulator vent outlet	3 ft. (0.9m)	3 ft. (0.9m)
J	Clearance to non-mechanical air supply inlet	12" (305mm)	3 ft. (0.9m)
K	Clearance to mechanical air supply inlet	3 ft. (0.9m) above if within 10 ft. (3m) horizontally	
L	Clearance above paved sidewalk or paved driveway located on public property ⁵	7 ft. (2.1m)†	7 ft. (2.1m)†
M	Clearance under veranda, porch, deck or balcony	12" (305mm)‡	12" (305mm)‡
N	Clearance to the combustion air inlet to any other appliance	12" (305mm)	3 ft. (0.9m)

Notes:


- 1 - Canadian installations must comply with the current CSA B149.1 Natural Gas and Propane Installation Code and local building codes.
 - 2 - US installations must comply with current ANSI Z223.1/NFPA 54 National Fuel Gas Code and local building codes.
 - 3 - Concentric vent must protrude from the roof 24" (610mm) measuring from the terminal end-cap vanes.
 - 4 - 24" is the recommended snow level allowance above grade/roofline or any surface that will support snow, debris, or ice (i.e. for roof venting clearances - roofline and snow level). If living in a snowfall region, consult your local weather office for the maximum typical snowfall for your area.
 - 5 - Above public walkways, driveways or parking lots if adjacent to it and condensate cannot drip, freeze, or create a hazard.
 - 6 - The termination shall be located, or protected by a guard, in such a way to prevent possible contact.
- † - A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.
- ‡ - Permitted only if veranda, porch, deck or balcony is fully open on a minimum of two sides beneath the floor.

⚠ WARNING: Vent termination must keep the following minimum clearances from electric meters, gas meters, regulators and relief equipment: 4 ft. (1220mm) horizontally and in no case above and below, unless a horizontal distance of 4 ft. (1220mm) is maintained.

Termination Clearance Quick Reference Diagram



APPROVED FOR

Material	Item	Standard [USA]	Standard [Canada]	Pipe diameter per boiler	
CPVC schedule 40	Flue gas or combustion air only	ANSI/ASTM F441	ULC S636	2" (60mm) 3" (80mm)	 WARNING: all vent and air inlet materials installed on gas fired appliances in CAN/US must meet the specifications provided in this table. Failure to comply could result in fire, serious injury or death.
PVC schedule 40	Combustion air only	ANSI/D1785		2" (60mm) 3" (80mm)	
PP approved vendor(s)/ material - M&G Duravent PolyPro, Centrotherm Innoflue SW, Z-Flex , Z-Dens, Selkirk Polyflue	Flue gas or combustion air only	ANSI Cat IV Approved Polypropylene		2" (60mm) 3" (80mm)	
PP-Flex approved vendor(s)/part number Z-Flex/Z-Dens (ZZDFL412 or ZZDFL413) (***)	Flue gas or combustion air only	ANSI Cat IV Approved Polypropylene		2" (60mm) 3" (80mm)	
Stainless Steel AL29-4C	Flue gas or combustion air only	UL1738		2" (60mm) 3" (80mm)	
CPVC	Primer	ASTM F656		X	
	Cement	ANSI/ASTM F493			
PVC	Primer	ASTM F656	X		
	Cement	ANSI/ASTM D2564			

Tab. 1 Approved Flue gas or combustion air materials and fittings per boiler

Roof Terminal (vertical)	Material	Supplier	Part Number
Ø 3/5" (Ø 80/125 mm) Concentric	CPVC	IPEX System 636 Type IIa & IIb	197117 (CPVC) 197107 (CPVC) 197109(CPVC)
Ø 2/4" (Ø 60/100 mm) Concentric	PP	M&G Duravent PolyPro	2PPS-VKL 2PPS-VKL-TC
Ø 3/5" (Ø 80/125 mm) Concentric	PP	M&G Duravent PolyPro	3PPS-VKL 3PPS-VKL
3" (Ø 80 mm)	PP	Centrotherm InnoFlue	ISTT03

Tab. 2 Roof terminals approved

Wall Terminal (horizontal)	Material	Supplier	Part Number
Ø 3/5" (Ø 80/125 mm) Concentric	CPVC	IPEX System 636 Type IIa & IIb	197117 (CPVC) 197107 (CPVC) 197109(CPVC)
Ø 2/4" (Ø 60/100 mm) Concentric	PP	M&G Duravent PolyPro	2PPS-HKL-N (*)
Ø 3/5" (Ø 80/125 mm) Concentric	PP	M&G Duravent PolyPro	3PPS-HKL-N (**)
Ø 3" (Ø 80 mm) twin pipe termination	PP	M&G Duravent PolyPro	3PPS-HTPL
Ø 2" (Ø 60 mm) twin pipe termination	PP	M&G Duravent PolyPro	2PPS-HTPL
2" (Ø 60 mm) single pipe horizontal termination	PP	M&G Duravent PolyPro	2PPS-HSTL
3" (Ø 80 mm) single pipe horizontal termination	PP	M&G Duravent PolyPro	3PPS-HSTL
Ø 3/5" (Ø 80/125 mm)	PP	Centrotherm InnoFlue	ICWT352
3" (Ø 80 mm) low profile wall termination	PP	Centrotherm InnoFlue	ISLPT03303

Tab. 3 Wall terminals approved

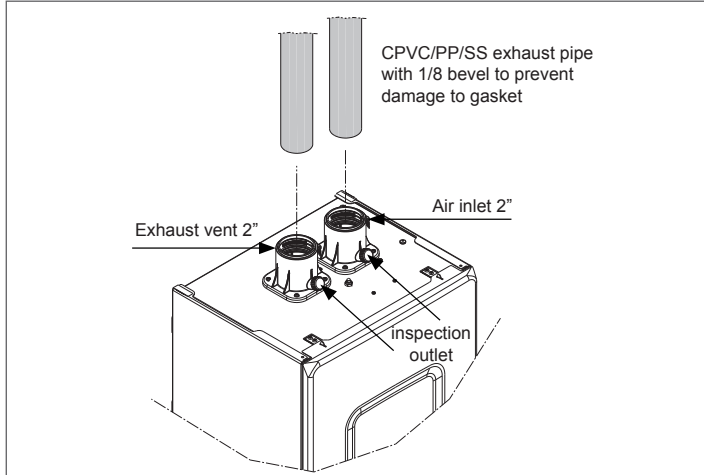
(*) With this type of terminal it is mandatory to use the Ø 2" (60 mm) vent adapter (see "4.2 Boiler box content" page 5), factory supplied and approved with the boiler, for venting connection.

(**) with this type of terminal, It is mandatory to use the Ø 3" (80 mm) vent adapter (see "4.2 Boiler box content" page 5), factory supplied and approved with the boiler, for venting connection

(***) requires a reduced percentage of the overall length of the venting system according the table page 29

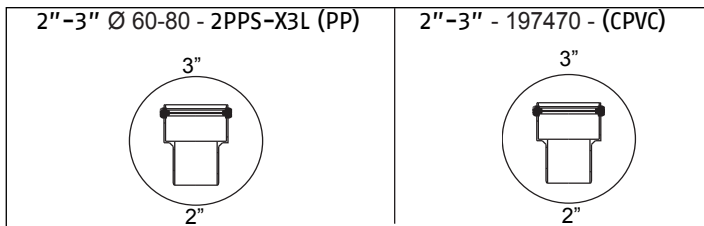
8.5.1 NearBoiler Vent/Air-inlet Piping

The boiler employs universal Exhaust-vent and Air-inlet appliance adapters that accept 2 in. (60 mm) CPVC, Polypropylene (PP) or FasNSeal Stainless Steel (SS) piping, without the need for additional adapters. Prior to inserting the piping into the universal adapter, ensure it is properly beveled (approximately 1/8 in.) to avoid damaging or dislodging the sealing gasket during installation.



WARNING: The boiler Exhaust and Combustion Air Inlet are 2-in. (60 mm). If larger pipes are required, field supplied increasers are required. Increasers must be of the same material type used as the venting system. For polypropylene vent systems, refer to the vent manufacturer's instructions for connecting polypropylene pipe.

WARNING: Fix the increaser with his own included connector clamp.



WARNING: Gasket Seating - Improper seating can cause leakage and eventual failure of the sealing gasket. Ensure the vent pipe is properly beveled, prior to installation, and that the pipe is fully inserted into universal appliance adapter. Failure to follow these instructions may result in serious injury or death.

WARNING: exhaust venting must be supported using the approved materials and methods stated in the vent manufacturer's instructions, to reduce strain on piping joints. Failure to follow these instructions may result in result in damage, serious injury or death.

The first **3 ft (915 mm)** of vent piping must be readily accessible for inspection.

8.6 Connecting flue gas accessories

Approved vent systems are:

- Twin pipe, concentric pipe
- Approved materials: CPVC, PP (M&G Duravent PolyPro, Centrotherm InnoFlue, Z-Flex, Z-Dens and Selkirk Polyflue)
- Approved materials: PP-Flex (Z-Flex, Z-Dens)
- Stainless steel
- Sealed combustion/direct vent
- Terminations can be either horizontal or vertical (see approved configurations) The diameters of the flue outlet and combustion air inlet adapters supplied with the boiler are designed to fit standard PP and CPVC pipes.

When installing approved venting, the installation instructions provided by the vent manufacturer shall be followed in their entirety. Failure to do so can result in severe injury, death or property damage.

WARNING: Do not use any DWV plumbing pipes to vent this boiler.

WARNING: Do not use inlet Indoor Air for combustion

WARNING: ABS/PVC venting is not approved for use as an exhaust vent material. Failure to comply could result in personal injury, death or property damage and could void the boiler warranty.

WARNING: Use of cellular core PVC (ASTM F891) or Radel® (polyphenolsulfone) in venting systems is strictly prohibited.

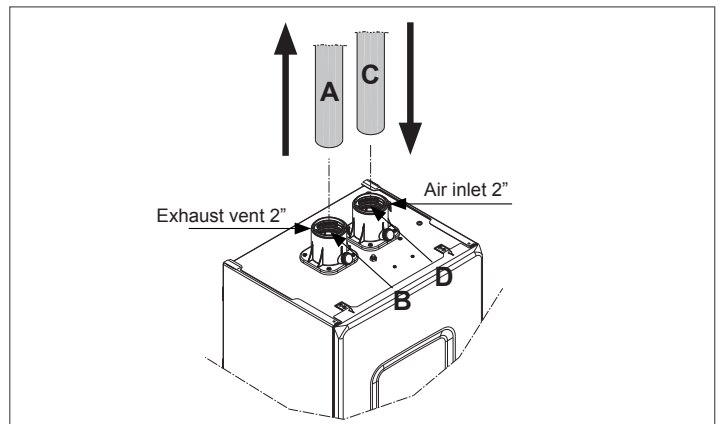
WARNING: Covering non-metallic vent pipe and fitting with thermal insulation shall be prohibited.

WARNING: the vent must be secured to the boiler by tightening the gear clamp at the top of the boiler.

8.6.1 Installing of the exhaust and air intake system

- Insert the flue exhaust pipe "A" completely into the adapter and tighten the clamp "B" present in the flue exhaust adapter.
 - Insert the air intake pipe "C" completely into the adapter and tighten the clamp "D" present in the air intake adapter.
- The correct flow direction into two pipes is shown in the figure below.

WARNING: Failure to follow the above instruction in their entirety will result in in substantial property damage, severe personal injury or death.



8.7 Vent and combustion air pipe length

The maximum length for vent and combustion air pipes can be found in the following table. Please note the length is for each vent/combustion air pipe and not combined.

In the following tables are listed the equivalent length for CPVC pipes and PP pipes:

Equivalent lengths for CPVC and PVC pipe and fittings	Ø 2" (60 mm)	Ø 3" (80 mm)
1 ft vent pipe	1 ft	1 ft
45° elbows	2.5 ft	3 ft
90° elbows	5 ft	6 ft
Tee	9 ft	12 ft

Equivalent length for PP pipes	Ø 2/4" (60/100 mm)	Ø 3/5" (80/125 mm)	Ø 2" (60 mm)	Ø 3" (80 mm)
1 ft vent pipe	1 ft	1 ft	1 ft	1 ft
45° elbows	4 ft	3 ft	3 ft	3 ft
90° elbows	5 ft	5 ft	5 ft	5 ft

To calculate lengths different from the approved configuration please consider the losses indicated in the above tables.

8.8 Approved configurations of horizontal and vertical venting installation

- Place pipe supports per the vent manufacturer's instructions and local code. The first support should be a close to the boiler as possible.
- The condensate must be disposed of in accordance with applicable rules.
- Avoid locating vent terminals near equipment or building features which can be subject to degradation from exhaust gases.
- If multiple boilers are installed in a row, allow at least 1 foot (305 mm) in the United States and 3 foot (915 mm) in Canada clearance between the exhaust vent termination of one and the combustion air intake of the other.

Fig. 1 Horizontal flue terminal 2/4 in. (Ø 60-100 mm) PP flue gases/air

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	30 ft (9.14 m)	23 ft (7.01 m)
Terminal length (L1)	2.33 ft (0.711 m)	2.33 ft (0.711 m)

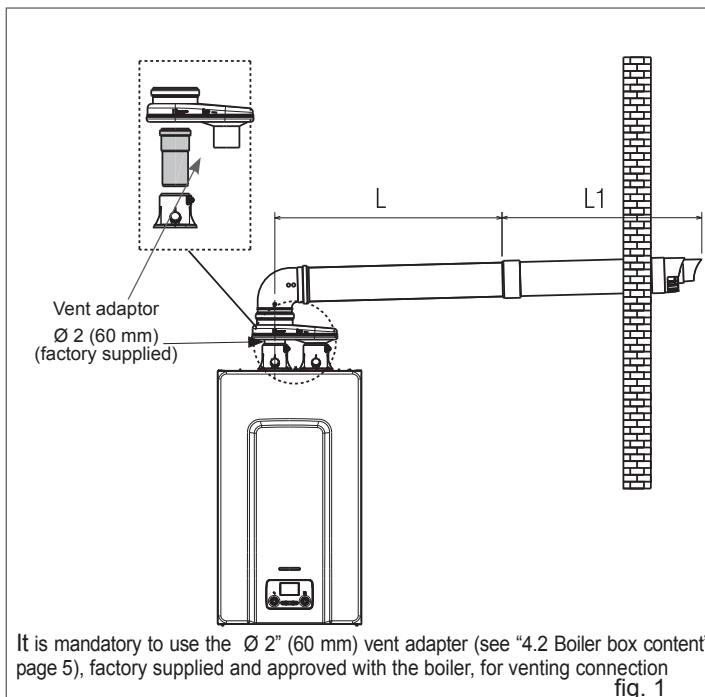


Fig. 2 Vertical flue terminal 2/4 in. (Ø 60-100 mm) PP flue gases/air for pitched roof

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	35 ft (10.67 m)	28 ft (8.53 m)
Terminal length (L1)	4.17 ft (1.27 m)	4.17 ft (1.27 m)

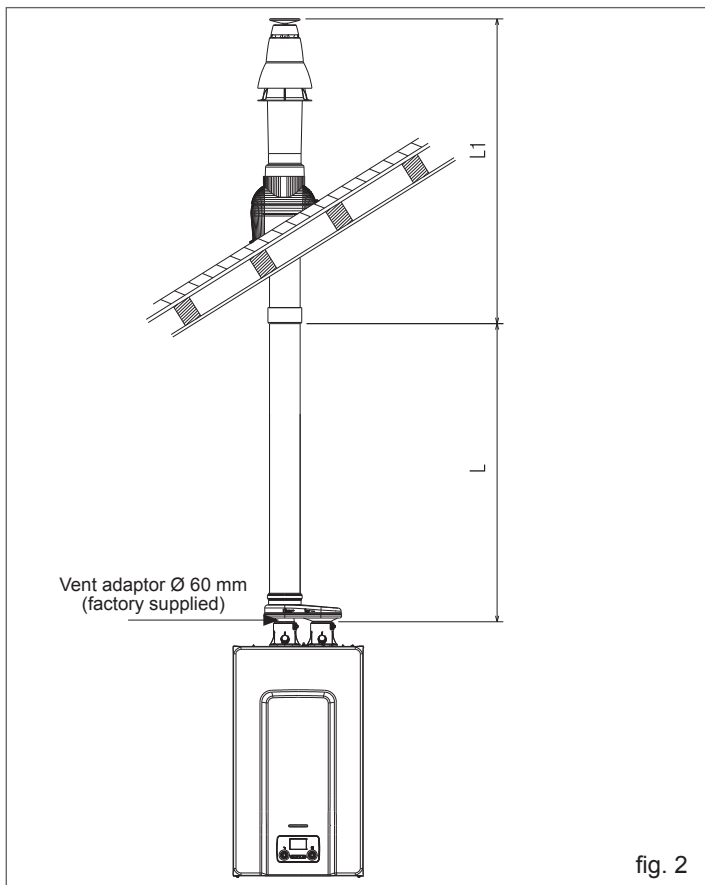


Fig. 3 Vertical flue terminal 2/4 in. (Ø 60-100 mm) PP flue gases/air for flat roof

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	35 ft (10.67 m)	28 ft (8.53 m)
Terminal length (L1)	4.17 ft (1.27 m)	4.17 ft (1.27 m)

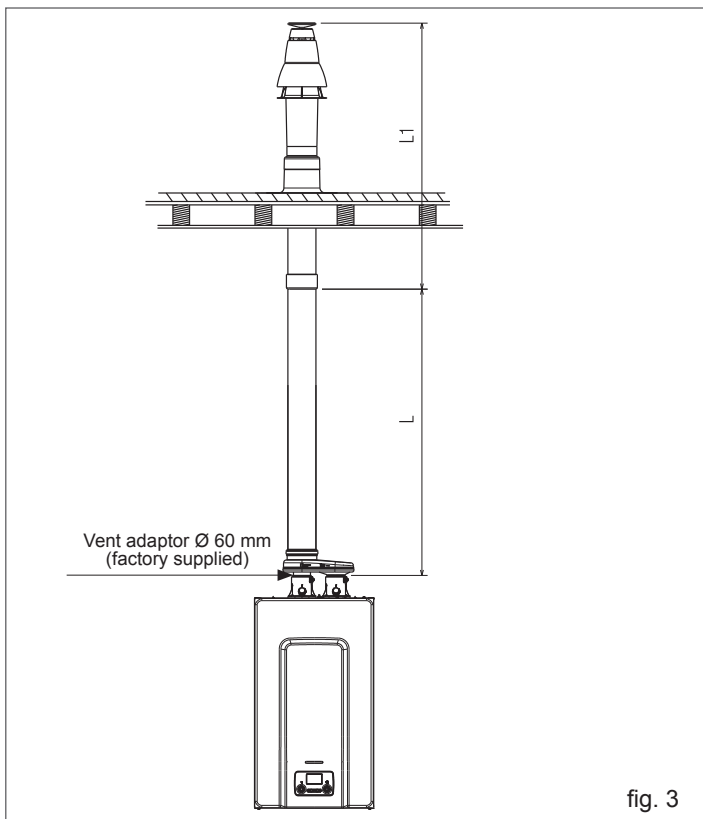


Fig. 4 Horizontal flue terminal 3/5 in. (Ø 80-125 mm) PP flue gases/air

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	40 ft (12.19 m)	60 ft (18.29 m)
Terminal length (L1)	2.42ft (0,74 m)	2.42ft (0,74 m)

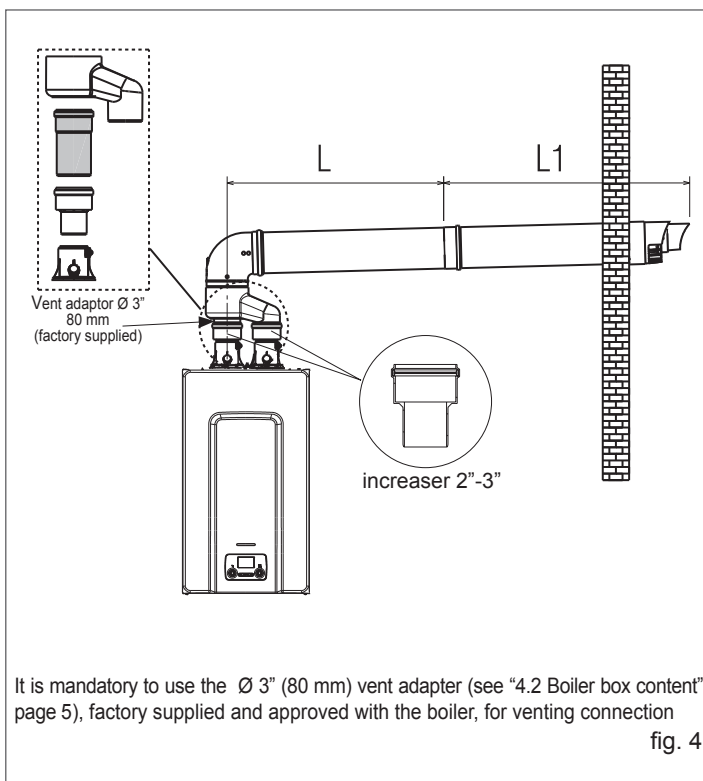


Fig. 5 Vertical flue terminal 3/5 in. (Ø 80-125 mm) PP flue gases/air for pitched roof

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	45 ft (13.71 m)	65 ft (19.81 m)
Terminal length (L1)	4.42 ft (1.35 m)	4.42 ft (1.35 m)

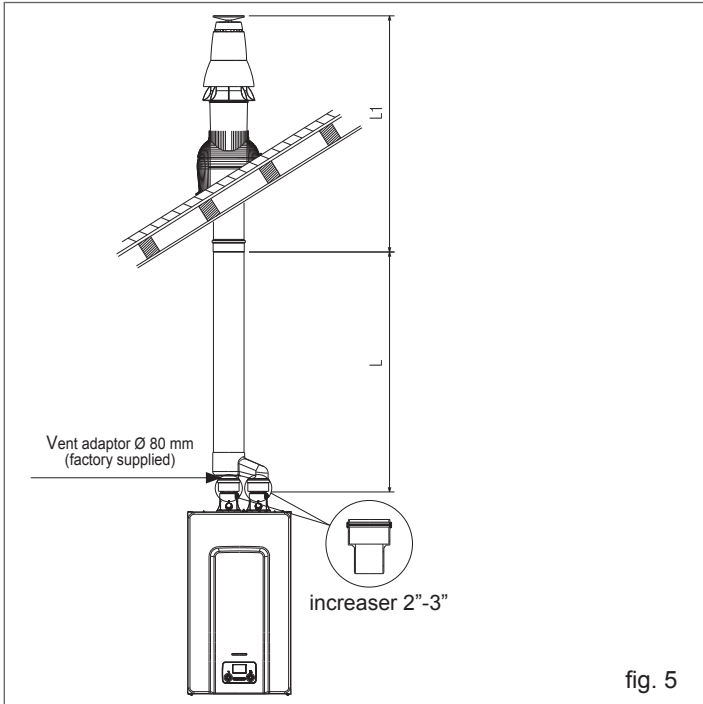


Fig. 6 Vertical flue terminal 3/5 in. (Ø 80-125 mm) PP flue gases/air for flat roof

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	45 ft (13.71 m)	65 ft (19.81 m)
Terminal length (L1)	4.42 ft (1.35 m)	4.42 ft (1.35 m)

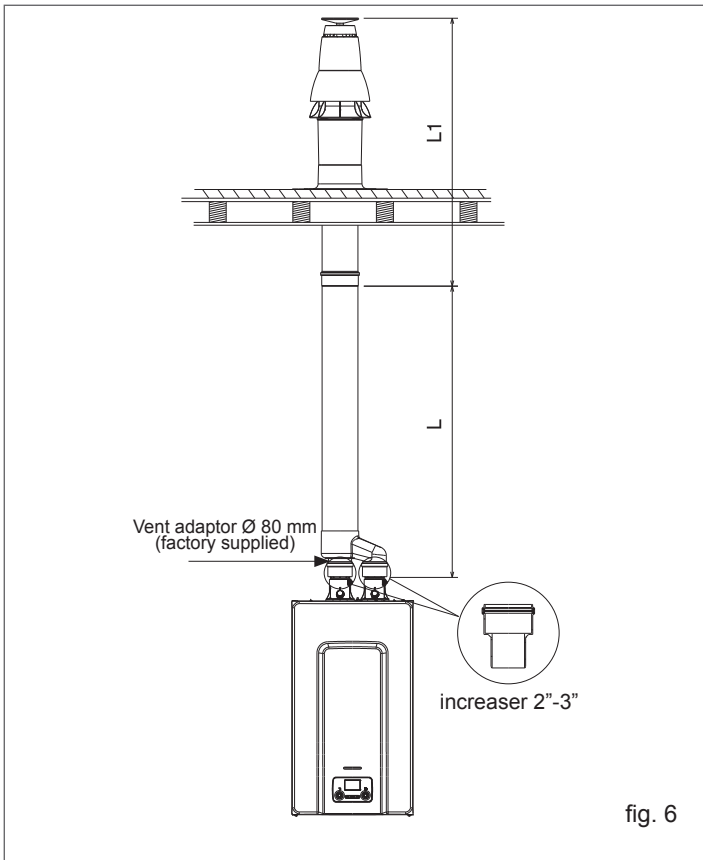


Fig. 7 Twin flue system 2 in. PP (Ø 60 mm)

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	30.5+30.5 ft (9.30+9.30 m)	28+28 ft (8.53+8.53 m)
Max length (L1)	25.5+25.5 ft (7.77+7.77 m)	23+23 ft (7.01+7.01 m)
90° bend	5 ft (1.52m)	5 ft (1.52m)

the expressed lengths are without the terminations

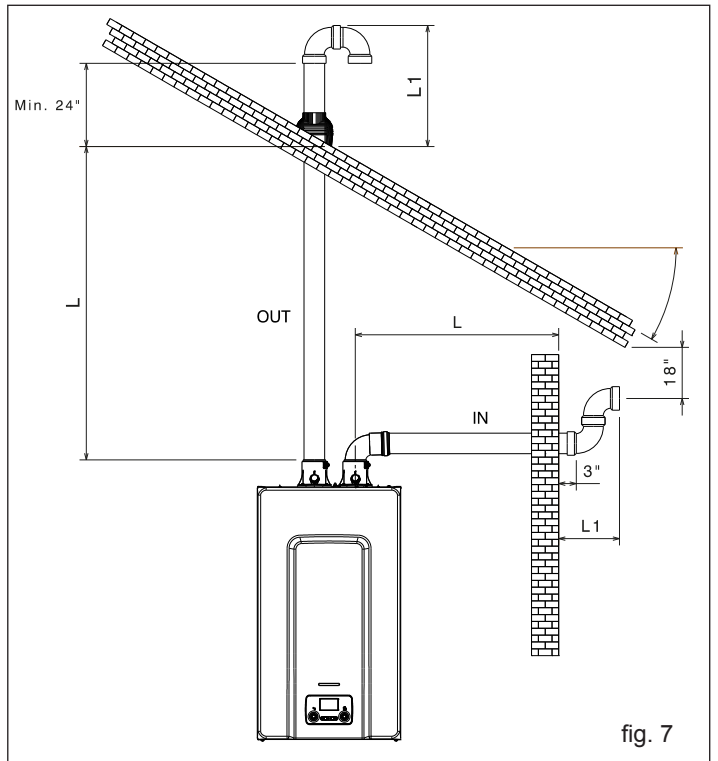


Fig. 8 Twin flue system 2 in. (Ø 60 mm) with horizontal terminal 2/4 in. (Ø 60 /100 mm) PP flue gases/air

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	25.5 + 25.5 ft (7.77 + 7.77m)	23 + 23 ft (7.01+7.01 m)
Terminal length (L1)	2.33 ft (0.71 m)	2.33 ft (0.71 m)

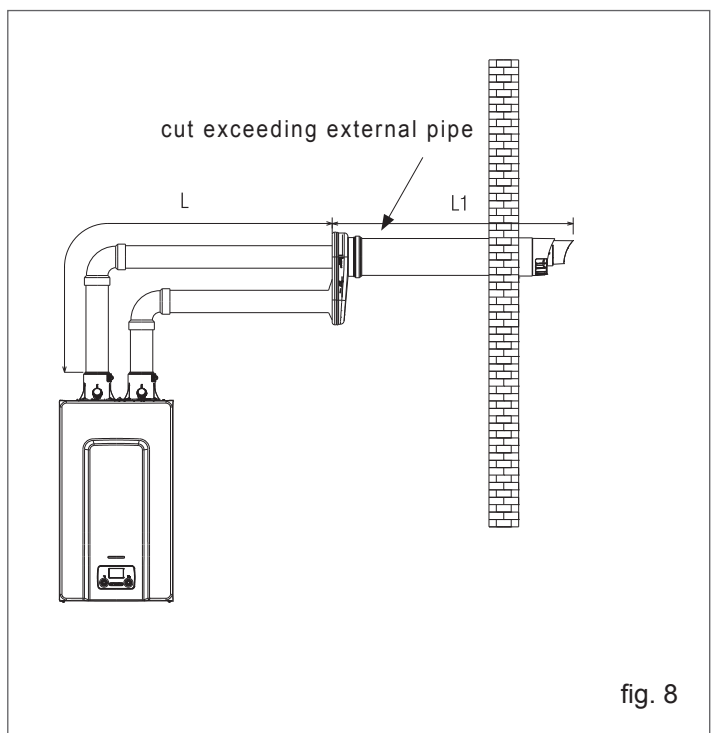


Fig. 9 Twin flue system 3 in. (Ø 80 mm) with horizontal terminal 3/5 in. (Ø 80-125 mm) PP flue gases/air

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	76 + 76 ft (23.16 + 23.16m)	76 + 76 ft (23.16 + 23.16 m)
Terminal length (L1)	2.42 ft (0.74 m)	2.42 ft (0.74 m)

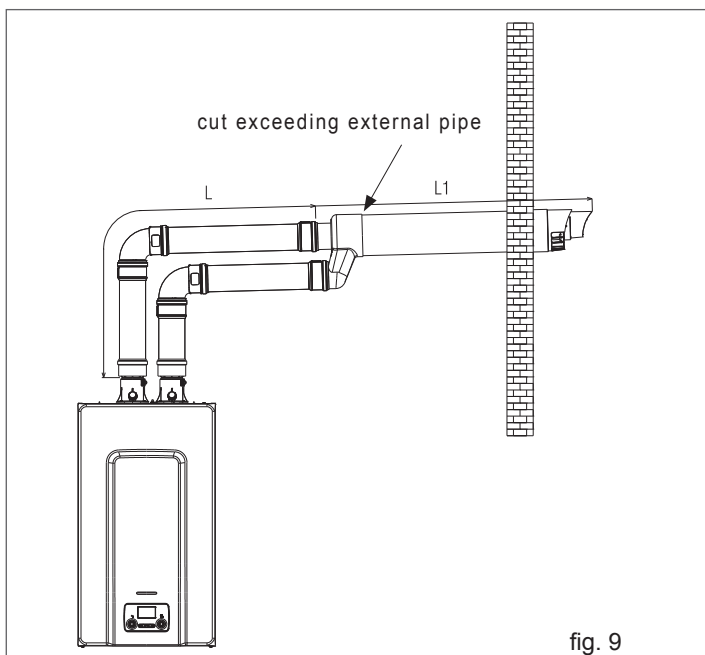


Fig. 10 Horizontal twin flue system 2 in. (Ø 50,8 mm) with terminal bend CPVC

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	25.5+25.5 ft (7.77+7.77 m)	23+23 ft (7.01+7.01 m)
90° bend	5 ft (1.52m)	5 ft (1.52m)

the expressed lengths are without the terminations

Horizontal twin flue system 2 in. (Ø 50,8 mm) with terminal bend PP

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	25.5+25.5 ft (7.77+7.77 m)	23+23 ft (7.01+7.01 m)
90° bend	5 ft (1.52m)	5 ft (1.52m)

the expressed lengths are without the terminations

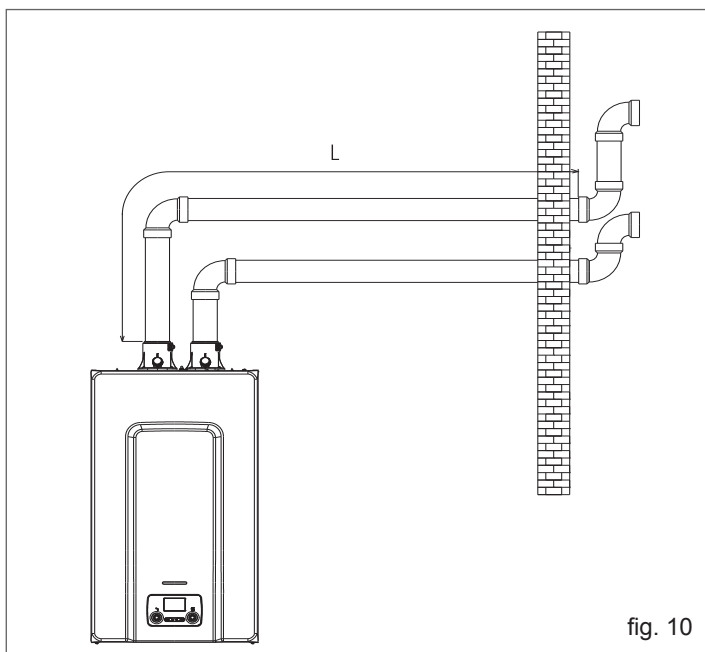


Fig. 11 Twin flue system 2 in. (Ø 50,8 mm) with horizontal terminal 3 in. (Ø 72,6 mm) CPVC

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	25.5+25.5 ft (7.77+7.77m)	23+23 ft (7.01+7.01 m)
Terminal length (L1)	part n° 197009	1.67 ft (0.5 m)
	part n° 197107	2.67 ft (0.8 m)
	part n° 197117	3.67 ft (1.1 m)

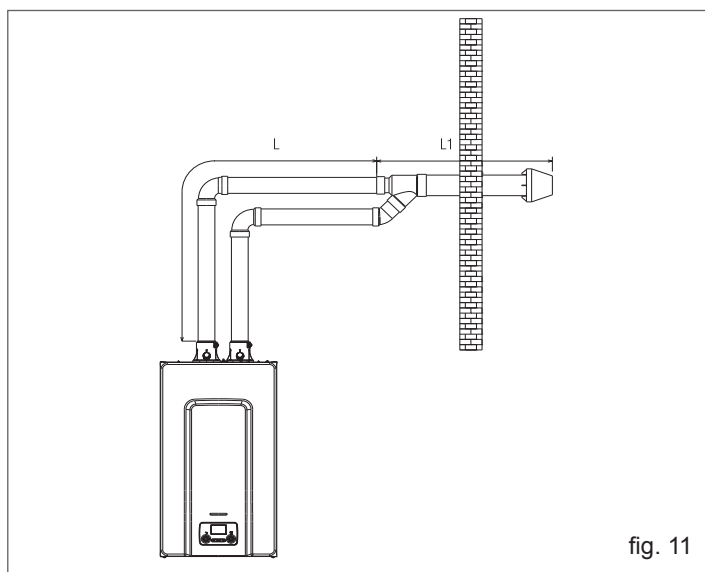


Fig. 12 Twin flue system 2 in. (Ø 50,8 mm) with vertical terminal 3 in. (Ø 72,6 mm) CPVC

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	30.5+30.5 ft (9.30+9.30m)	28+28 ft (8.53+8.53 m)
Terminal length (L1)	part n° 197009	1.67 ft (0.5 m)
	part n° 197107	2.67 ft (0.8 m)
	part n° 197117	3.67 ft (1.1 m)

Twin flue system 2 in. (Ø 50,8 mm) with vertical terminal 3 in. (Ø 72,6 mm) PP

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	30.5+30.5 ft (9.30+9.30m)	28+28 ft (8.53+8.53 m)
Terminal length (L1)	part n° 197009	1.67 ft (0.5 m)
	part n° 197107	2.67 ft (0.8 m)
	part n° 197117	3.67 ft (1.1 m)

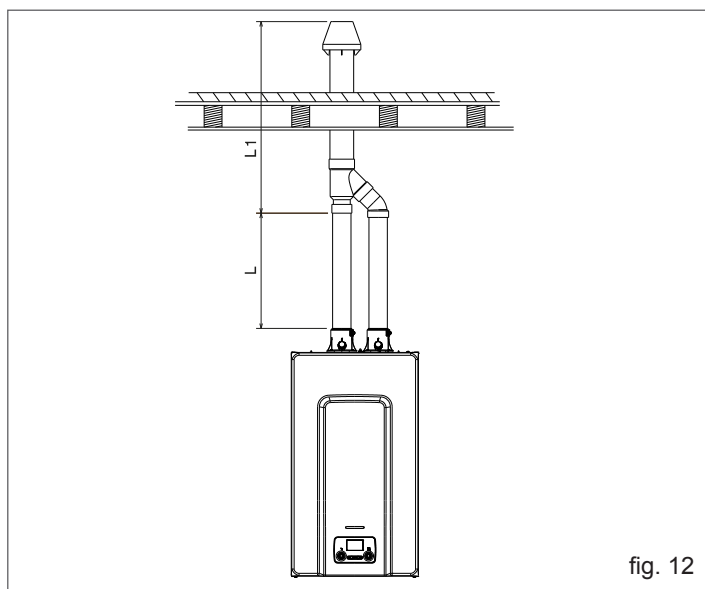


Fig. 13 Vertical twin flue system 2 in. (Ø 50,8 mm) with terminal bend CPVC for pitched roof

	BWCAAG000120 BWHAAG000120	BWCAAG000150 BWHAAG000150
Max length (L)	30.5+30.5 ft (9.30+9.30 m)	28+28 ft (8.53+8.53 m)
90° bend	5 ft (1.52m)	5 ft (1.52m)

the expressed lengths are without the terminations

Vertical twin flue system 2 in. (Ø 50,8 mm) with terminal bend PP for pitched roof

	BWCAAG000120 BWHAAG000120	BWCAAG000150 BWHAAG000150
Max length (L)	30.5+30.5 ft (9.30+9.30 m)	28+28 ft (8.53+8.53 m)
90° bend	5 ft (1.52m)	5 ft (1.52m)

the expressed lengths are without the terminations

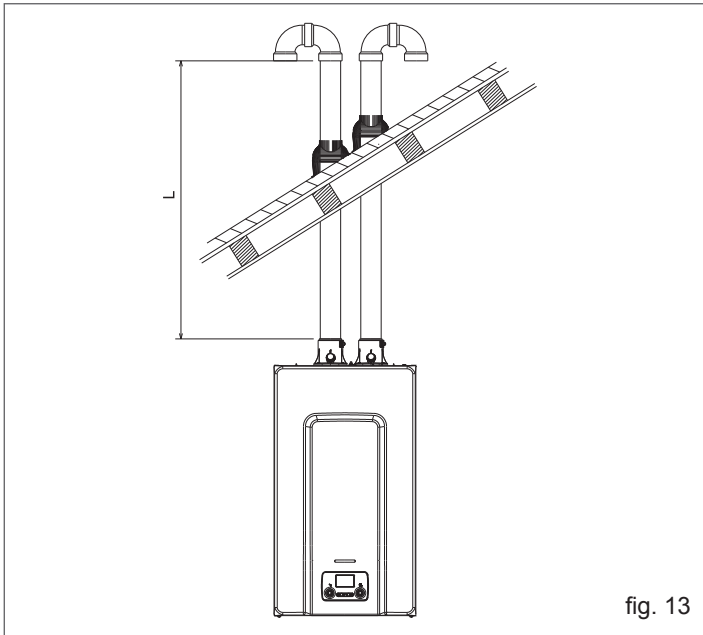


Fig. 14 Vertical twin flue system 2 in. (Ø 50,8 mm) with terminal bend CPVC for flat roof

	BWCAAG000120 BWHAAG000120	BWCAAG000150 BWHAAG000150
Max length (L)	30.5+30.5 ft (9.30+9.30 m)	28+28 ft (8.53+8.53 m)
90° bend	5 ft (1.52m)	5 ft (1.52m)

the expressed lengths are without the terminations

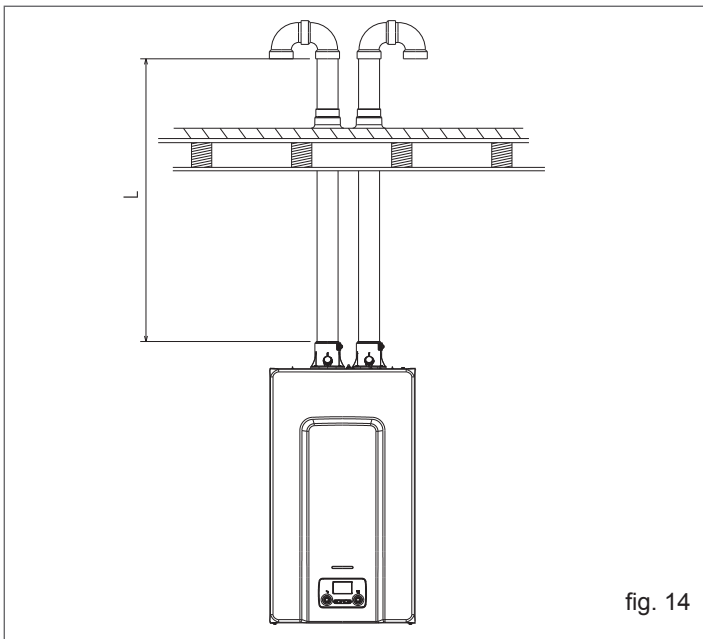


Fig. 15 Horizontal twin flue system 3 in. (Ø 76,2 mm) with terminal bend CPVC

	BWCAAG000120 BWHAAG000120	BWCAAG000150 BWHAAG000150
Max length (L)	76+76 ft (23.16+23.16m)	76+76 ft (23.16+23.16 m)
90° bend	6 ft (1.83m)	6 ft (1.83m)

the expressed lengths are without the terminations

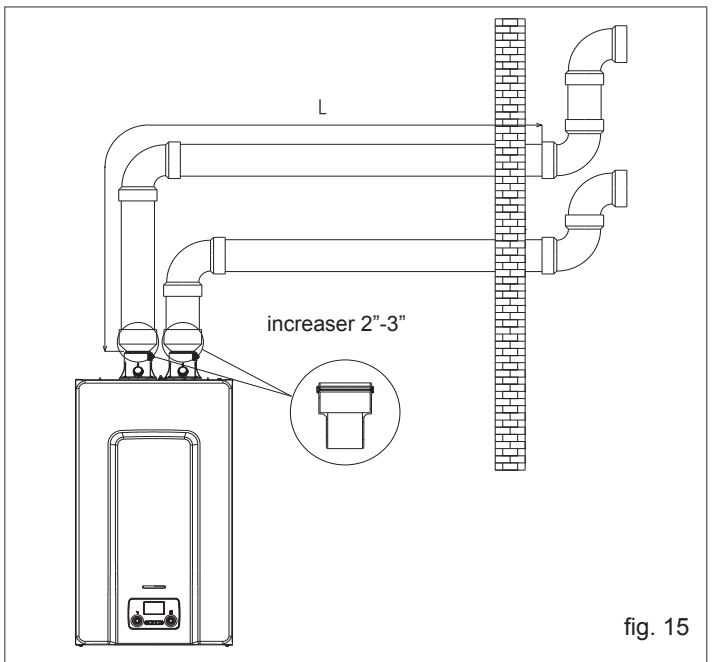


Fig. 16 Twin flue system 3 in. (Ø 76,2 mm) with horizontal terminal 3 in. (Ø 76,2 mm) CPVC

	BWCAAG000120 BWHAAG000120	BWCAAG000150 BWHAAG000150
Max length (L)	76+76 ft (23.16+23.16m)	76+76 ft (23.16+23.16 m)
Terminal length (L1)	part n° 197009	1.67 ft (0.5 m)
	part n° 197107	2.67 ft (0.8 m)
	part n° 197117	3.67 ft (1.1 m)

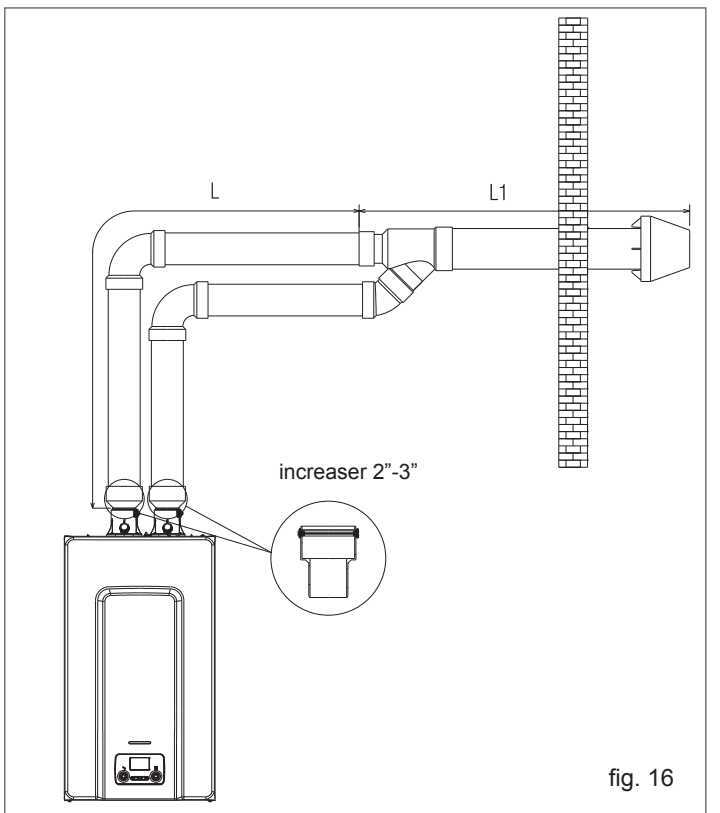


Fig. 17 Twin flue system 3 in. (Ø 76,2 mm) with vertical terminal 3 in. (Ø 76,2 mm) CPVC (L)

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	82+82 ft (24.99+24.99m)	82+82 ft (24.99+24.99 m)
Terminal length (L1)	part n° 197009	1.67 ft (0.5 m)
	part n° 197107	2.67 ft (0.8 m)
	part n° 197117	3.67 ft (1.1 m)

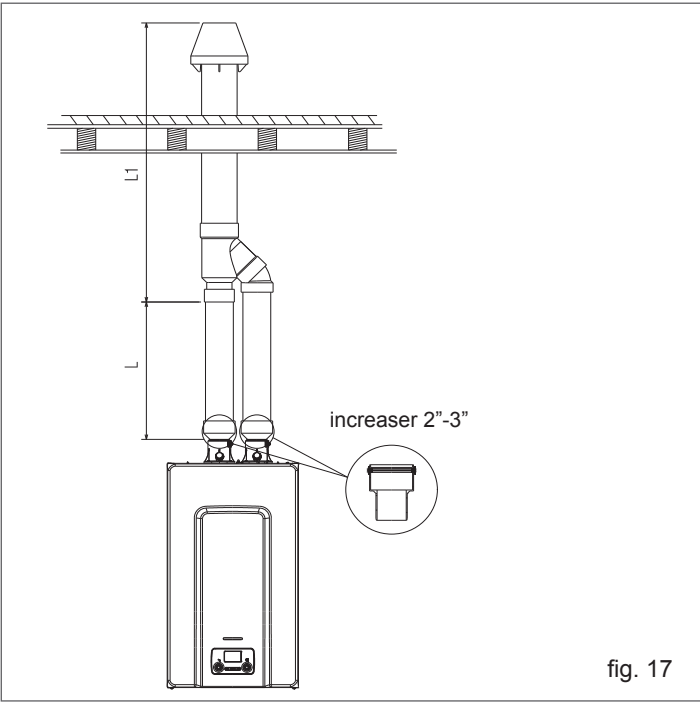


fig. 17

Fig. 18 Vertical twin flue system 3 in. (Ø 76,2 mm) with terminal bend CPVC for pitched roof (L)

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	82+82 ft (24.99+24.99m)	82+82 ft (24.99+24.99 m)
90° bend	6 ft (1.83m)	6 ft (1.83m)

the expressed lengths are without the terminations

Vertical twin flue system 3 in. (Ø 76,2 mm) with terminal bend PP for pitched roof (L)

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	82+82 ft (24.99+24.99m)	82+82 ft (24.99+24.99 m)
90° bend	6 ft (1.83m)	6 ft (1.83m)

the expressed lengths are without the terminations

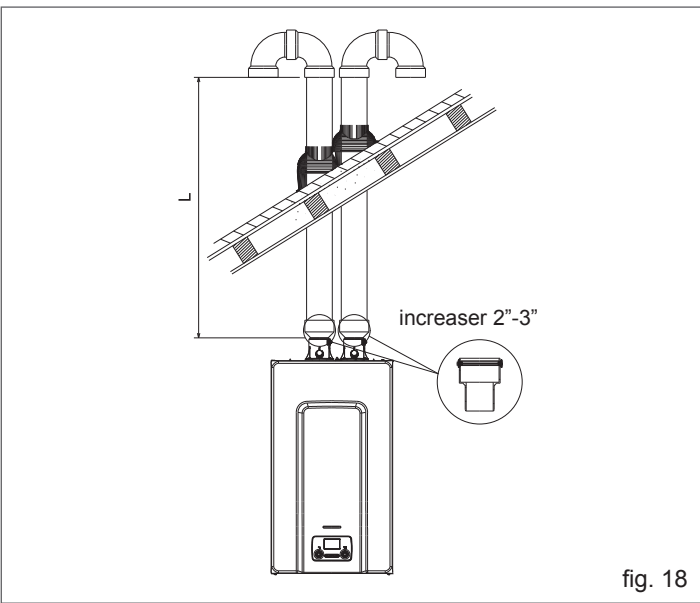


fig. 18

Fig. 19 Vertical twin flue system 3 in. (Ø 76,2 mm) with terminal bend CPVC for flat roof (L)

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	82+82 ft (24.99+24.99m)	82+82 ft (24.99+24.99 m)
90° bend	6 ft (1.83m)	6 ft (1.83m)

the expressed lengths are without the terminations

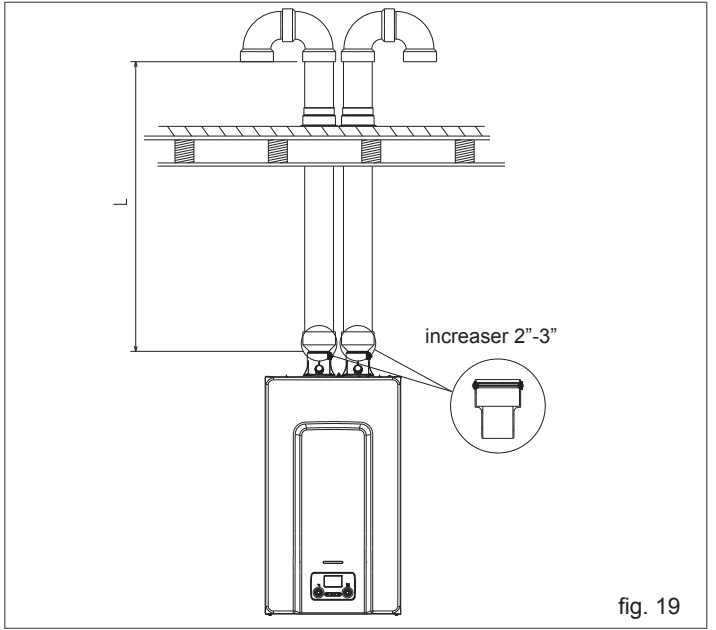


fig. 19

Fig. 20 Twin flue system 3 in. PP (Ø 76,2 mm)

	BWCAAG000120 BWAAG000120	BWCAAG000150 BWAAG000150
Max length (L)	82+82 ft (24.99+24.99m)	82+82 ft (24.99+24.99 m)
Max length (L1)	76 + 76 ft (23.16 + 23.16m)	76+76 ft (23.16+23.16 m)
90° bend	6 ft (1.83m)	6 ft (1.83m)

the expressed lengths are without the terminations

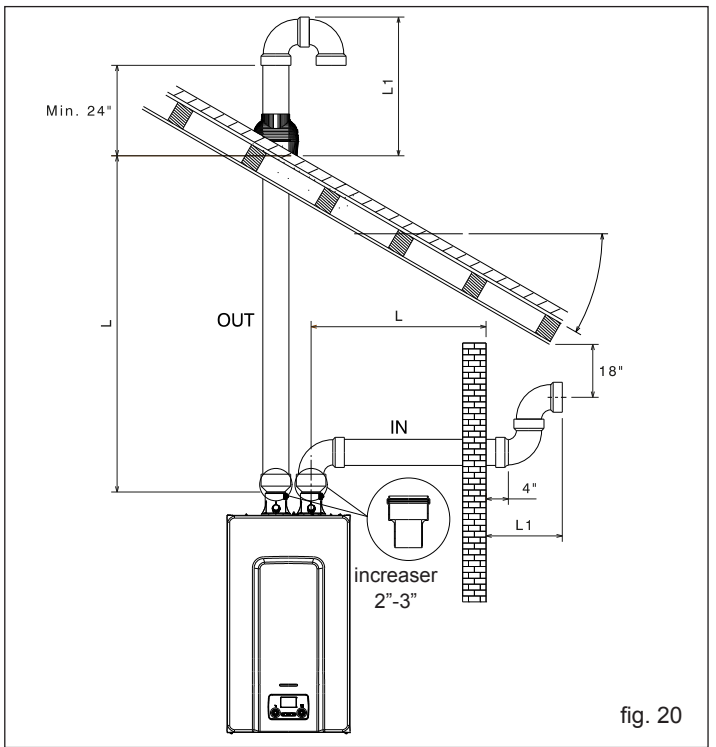


fig. 20

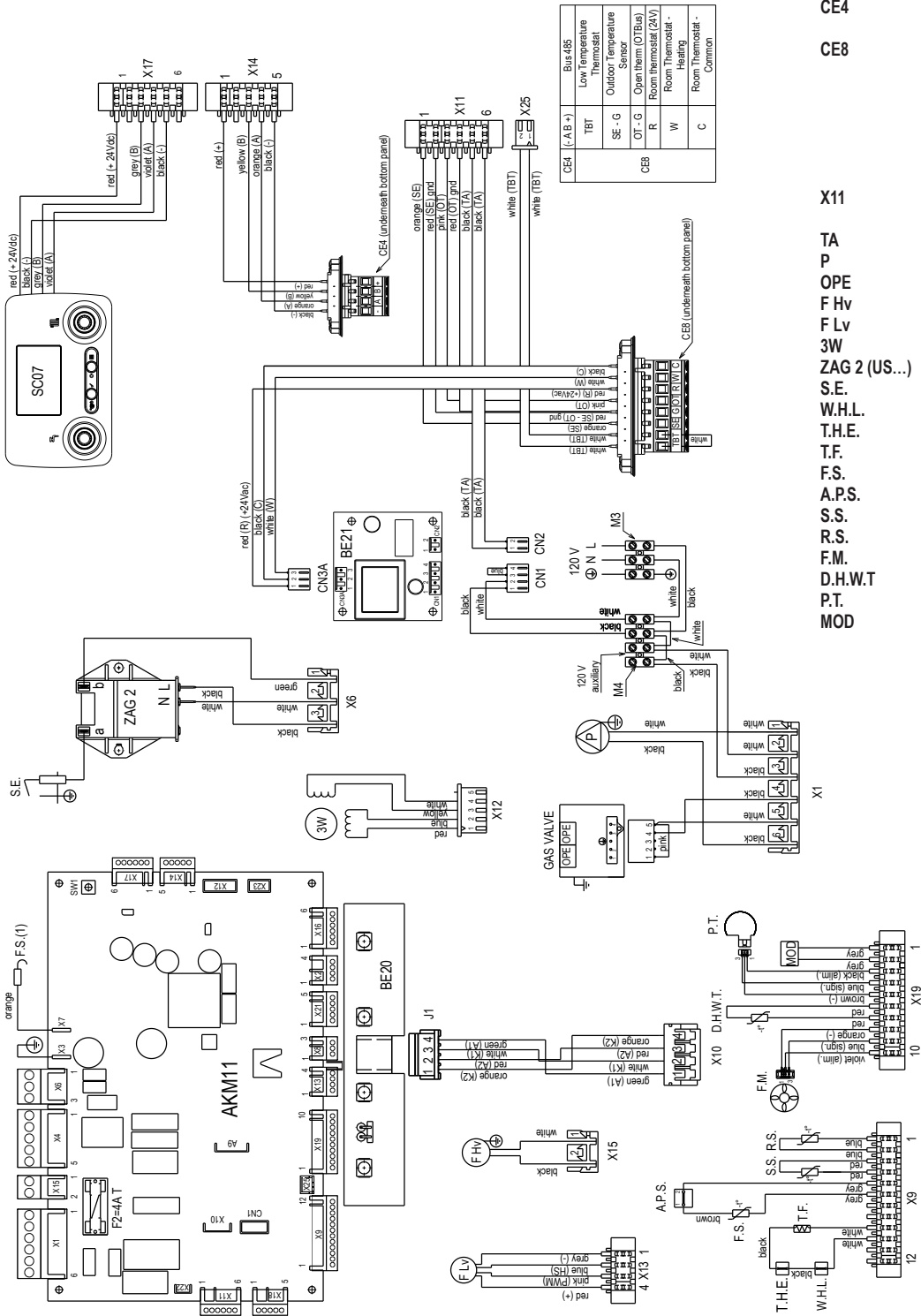
8.9 Multi Family boiler installation

In Multi-Family installations where cascade venting multiple boilers and venting assemblies pass through fire rated floors or partitions, submit requests directly to Duravent (layouts@duravent.com) or Security Chimneys (layouts@securitychimneys.com) for an approved engineered design by the venting manufacturer.

9 WIRING DIAGRAM

9.1 Electrical diagram

BWCAAG000120/BWCAAG000150 - Combi Model

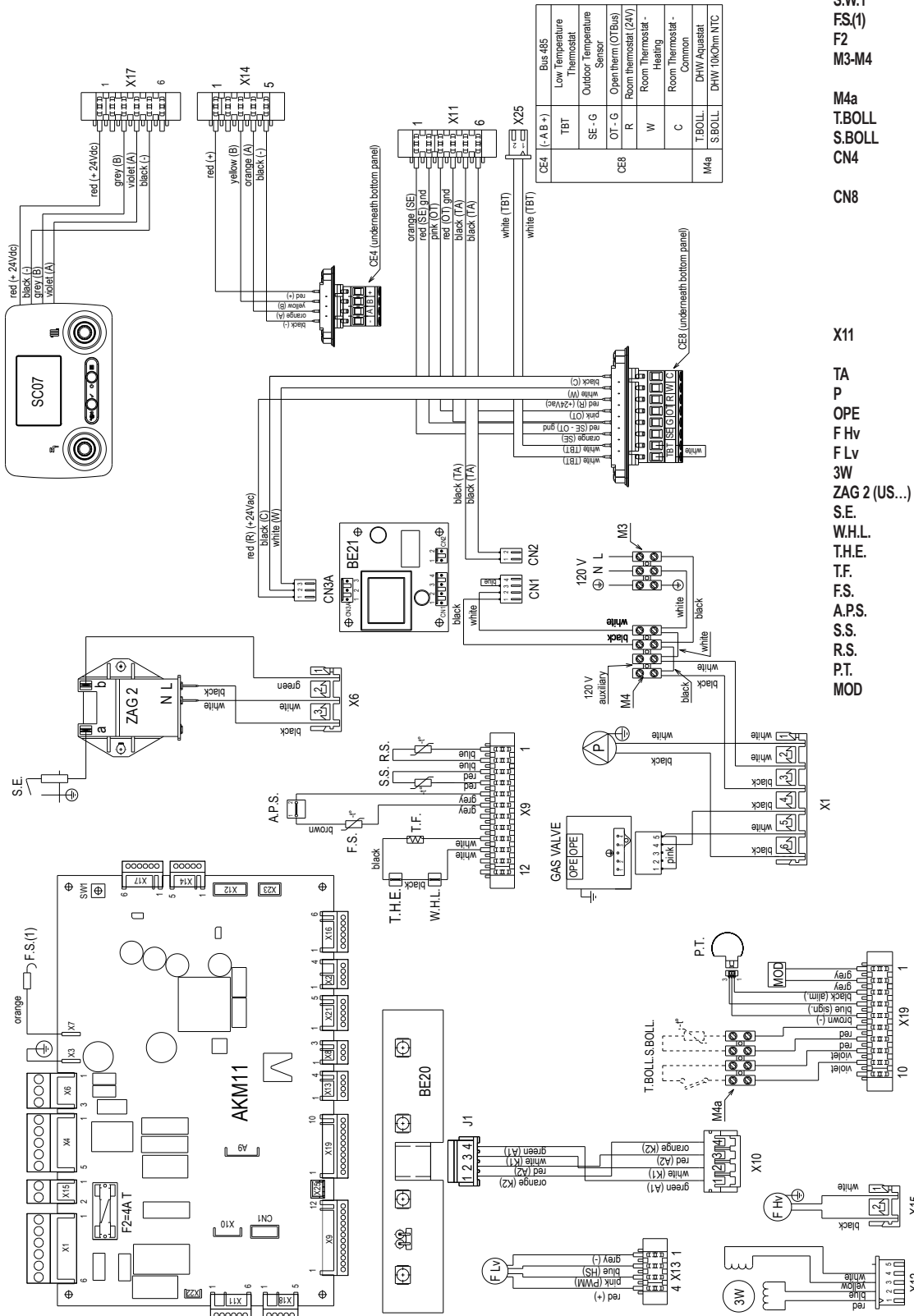


- AKM11** Main PCB
- SC07** Control Interface
- BE20** Board Led: green led (operating or temporary stop)
red led (boiler in lockout)
- BE21** 24VAC Thermostat
- X1-X25** Connectors
- CN1-CN2-CN3A** Connectors
- S.W.1** CO₂ function button
- F.S.(1)** Flame sensor
- F2** Fuse 4A T
- M3-M4** Terminal strip for electrical connection high power
- CE4** External links connector:
(- A B +) Bus 485
- CE8** External links connector:
TBT Low Temperature Thermostat
OT - G Open therm (OTBus)
SE - G Outdoor Temperature Sensor
R Room Thermostat (24V)
W Room Thermostat - Heating
C Room Thermostat - Common
- X11** Room thermostat (voltage free contact input)
- TA** Pump
- P** Gas valve solenoids
- OPE** Fan power supply 120 V
- F Hv** Fan signal control
- F Lv** 3 way valve motor
- 3W** Spark generator
- ZAG 2 (US...)** Spark electrode
- S.E.** Water high limit
- W.H.L.** Heat exchanger thermostat
- T.H.E.** Thermal fuse
- T.F.** Flue sensor
- F.S.** Air pressure switch
- A.P.S.** Supply sensor (thermistor)
- S.S.** Return sensor (thermistor)
- R.S.** Flow meter
- F.M.** Domestic hot water temperature sensor
- D.H.W.T.** Low water cutoff
- P.T.** Modulator gas valve
- MOD**

NOTICE: It is recommended to comply with terminal markings:
L (LINE)/N (Neutral) and Chassis Ground

BWHAAG000120/BWHAAG000150 - Heating Only Model

⚠ In C CASE configuration “boiler + external indirect tank with sensor” add a jumper on the TBOL input of the M4a



- AKM11** Main PCB
- SC07** Control Interface
- BE20** Board Led: green led (operating or temporary stop)
red led (boiler in lockout)
- BE21** 24VAC Thermostat
- X1-X25** Connectors
- CN1-CN2-CN3A** Connectors
- S.W.1** CO2 function button
- FS.(1)** Flame sensor
- F2** Fuse 4A T
- M3-M4** Terminal strip for electrical connection high power
- M4a** Terminal strip for electrical connection: DHW Aquastat
- T.BOLL** DHW 10kOhm NTC
- S.BOLL** DHW 10kOhm NTC
- CN4** External links connector: (- A B +) Bus 485
- CN8** External links connector: TBT Low Temperature Thermostat
OT - G Open therm (OTBus)
SE - G Outdoor Temperature Sensor
R Room Thermostat (24V)
W Room Thermostat - Heating
C Room Thermostat - Common
SE Outdoor Temperature Sensor
OT+ Open therm (OTBus)
- X11** Room Thermostat (voltage free contact input)
- TA** Pump
- P** Gas valve solenoids
- OPE** Fan power supply 120 V
- F Hv** Fan signal control
- F Lv** 3 way valve motor
- 3W** Spark generator
- ZAG 2 (US...)** Spark electrode
- S.E.** Water high limit
- W.H.L.** Heat exchanger thermostat
- T.H.E.** Thermal fuse
- T.F.** Flue sensor
- F.S.** Air pressure switch
- A.P.S.** Supply sensor (thermistor)
- S.S.** Return sensor (thermistor)
- R.S.** Low water cutoff
- P.T.** Modulator gas valve
- MOD**

9.2 Ladder diagram

BWCAAG000120/BWCAAG000150 - Combi Model

wire color code	
bk	black
w	white
bl	blue
br	brown
r	red
g	green
y	yellow
p	pink
v	violet
o	orange
gr	grey

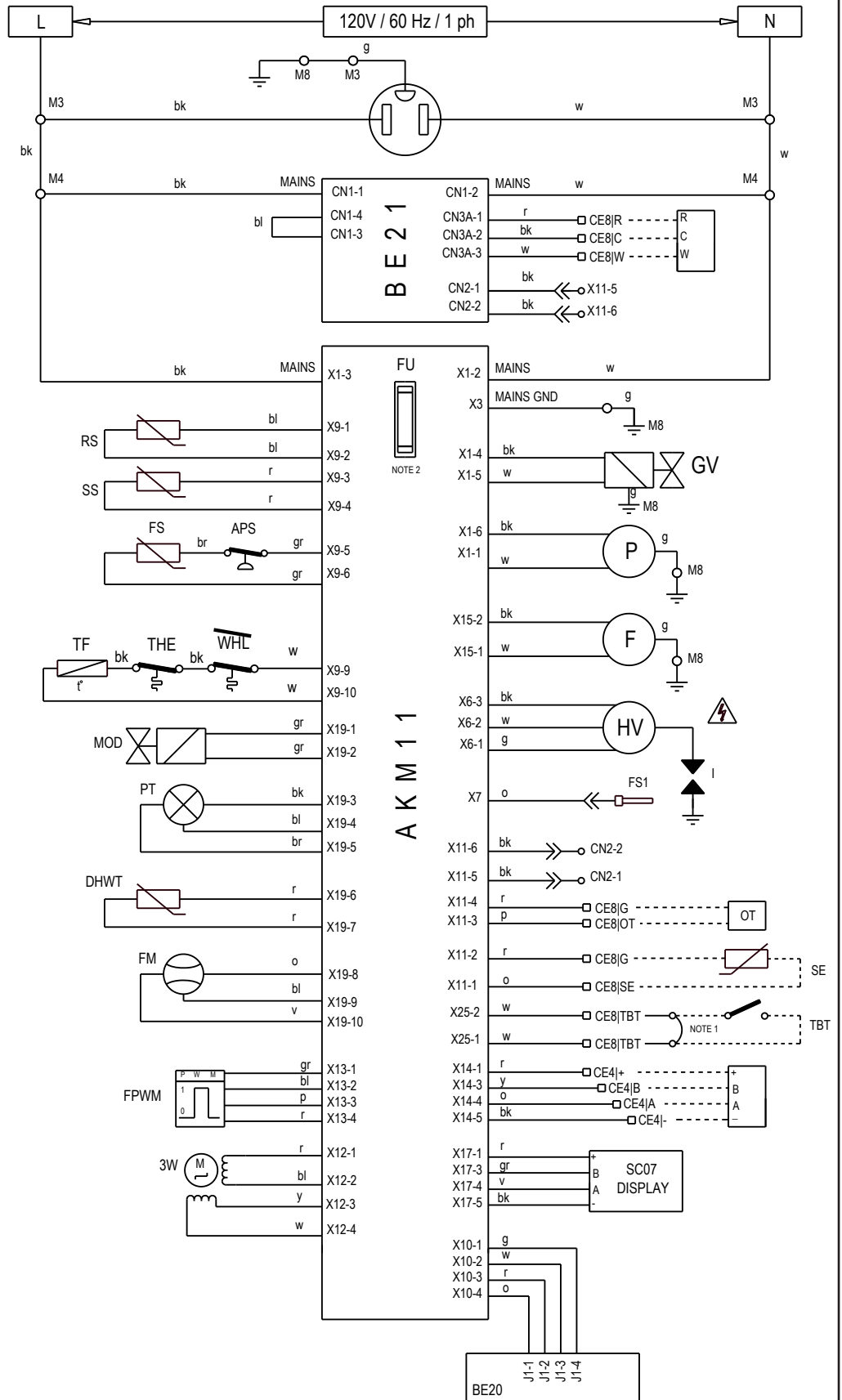
wire line type	
	factory wiring
	field wiring

COMPONENTS LABELS	
AKM11	Main board
BE21	24 VAC Thermostat
SC07	Control interface
M3-M4	Mains terminal strip
M8	Multi-clip ground plate
CE4-CE8	External links connectors
FU	Fuse
BE20	Lighting guide

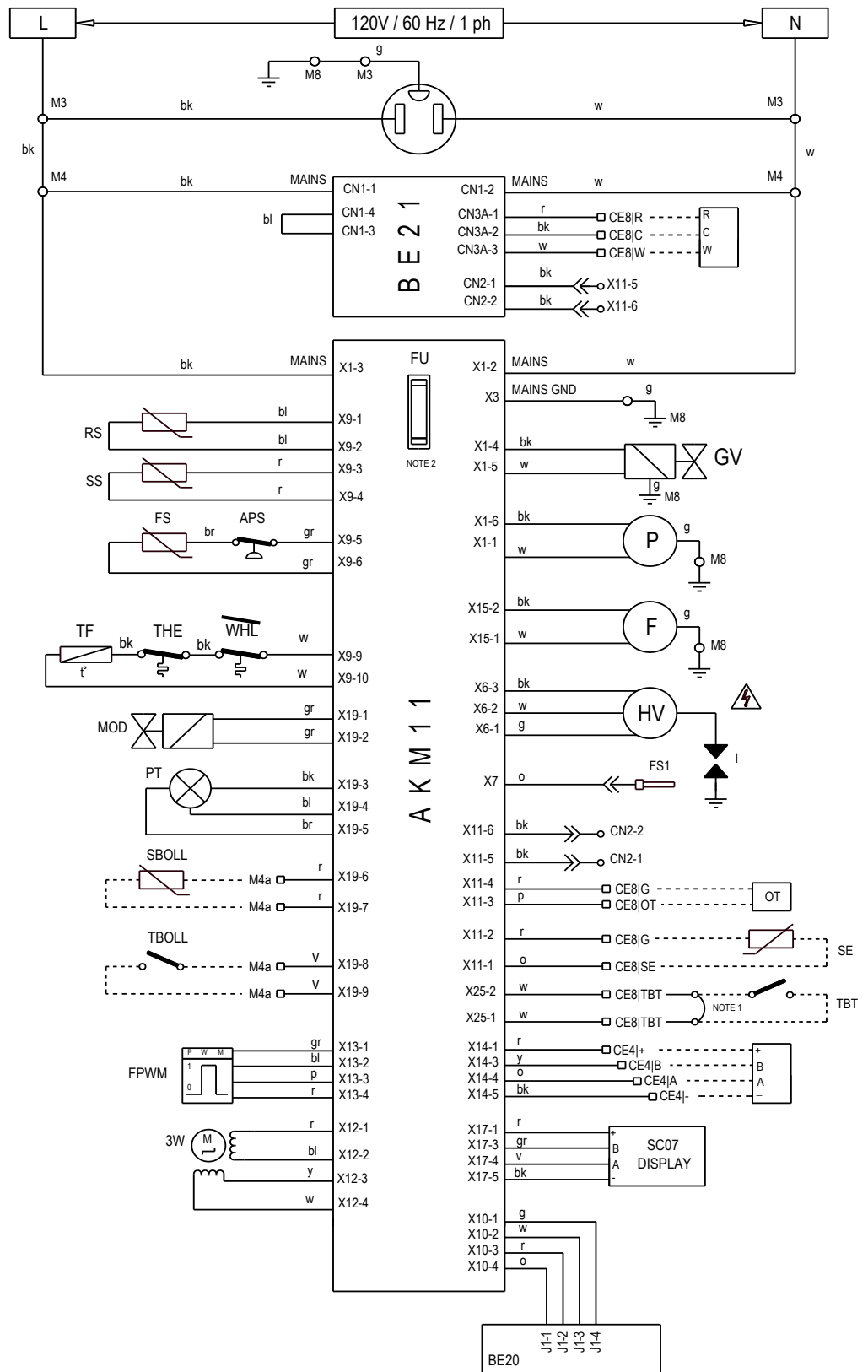
RS	Return sensor (thermistor)
SS	Supply sensor (thermistor)
FS	Flue sensor
APS	Air pressure switch
TF	Thermal fuse
WHL	Water high limit
THE	Thermostat Heat Exchanger
MOD	Gas valve modulator coil
PT	Pressure transducer
DHWT	Domestic hot water temp. sensor
FM	Flow meter
FPWM	Fan PWM signal
3W	3 way stepper valve

R	Room thermostat 24 VAC
C	Common
W	Room thermostat heating
GV	Gas valve
P	Pump
F	Fan (blower)
HV	High voltage
I	Ignitor
FS1	Flame sensor
OT	OpenTherm (OTbus)
SE	Outdoor temp. sensor
TBT	Low temp. limit thermostat
+ B A -	Bus 485

Notes:
 1. Remove jumper to connect TBT.
 2. Fuse 4A T.



BWHAAG000120/BWHAAG000150 - Heating Only Model



wire color code	
bk	black
w	white
bl	blue
br	brown
r	red
g	green
y	yellow
p	pink
v	violet
o	orange
gr	grey

wire line type	
	factory wiring
	field wiring

COMPONENTS LABELS	
AKM11	Main board
BE21	24 VAC Thermostat
SC07	Control interface
M3-M4	Mains terminal strip
M8	Multi-clip ground plate
CE4-CE8	External links connectors
M4a	Terminal strip for electrical connections
BE20	Lighting guide
FU	Fuse

RS	Return sensor (thermistor)
SS	Supply sensor (thermistor)
FS	Flue sensor
APS	Air pressure switch
TF	Thermal fuse
WHL	Water high limit
THE	Thermostat Heat Exchanger
MOD	Gas valve modulator coil
PT	Pressure transducer
SBOLL	Indirect tank sensor
TBOLL	Aquastat
FPWM	Fan PWM signal
3W	3 way stepper valve

R	Room thermostat 24 VAC
C	Common
W	Room thermostat heating
GV	Gas valve
P	Pump
F	Fan (blower)
HV	High voltage
I	Ignitor
FS1	Flame sensor
OT	OpenTherm (OTbus)
SE	Outdoor temp. sensor
TBT	Low temp. limit thermostat
+ B A -	Bus 485

Notes:
 1. Remove jumper to connect TBT.
 2. Fuse 4A T.

10 LIGHTING INSTRUCTIONS

There are several steps involved in starting up the boiler.

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 (death).

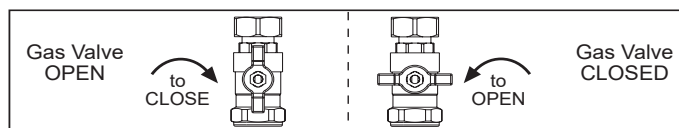
- A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air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

WHAT TO DO IF YOU SMELL GAS:

- Do not try to light any appliance.
 - Do not touch any electric switch; do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- C. Use only your hand to turn the gas control knob. Never use tools. If the knob will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempted 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.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Turn external gas shutoff valve clockwise to close valve to the full OFF position.
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above on this label.
7. Turn gas shutoff valve counterclockwise to open valve to the ON position.
8. Turn on all electrical power to the appliance.
9. Set thermostat to desired setting.
10. If the appliance will not operate, follow the instructions "To Turn Off Gas To the Appliance" and call your service technician or gas supplier.



TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Turn gas shutoff valve clockwise to close valve to the full OFF position.

POUR VOTRE SECURITE LISEZ AVANT DE METTRE EN MARCHÉ

AVERTISSEMENT: Quiconque ne respecte pas à la lettre les instructions dans la présente notice risque de déclencher un incendie ou une explosion entraînant des dommages, des blessures ou la mort.

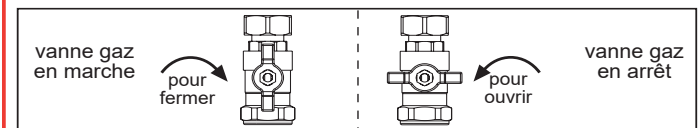
- A. Cet appareil ne comporte pas de veilleuse. Il est muni d'un dispositif d'allumage qui allume automatiquement le brûleur. Ne tentez pas d'allumer le brûleur manuellement.
- B. **AVANT DE FAIRE FONCTIONNER**, reniflez tout autour de l'appareil pour détecter une odeur de gaz. Reniflez près du plancher, car certains gaz sont plus lourds que l'air et peuvent s'accumuler au niveau du sol.

QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ:

- Ne pas tenter d'allumer d'appareil.
 - Ne touchez à aucun interrupteur; ne pas vous servir des téléphones se trouvant dans le bâtiment.
 - Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
 - Si vous ne pouvez pas rejoindre le fournisseur, appelez le service des incendies.
- C. Ne touchez pas la manette d'admission du gaz qu'à la main; ne jamais utiliser d'outil. Si la manette reste coincée, ne pas tenter de la réparer; appelez un technicien qualifié. Le fait de forcer la manette ou de la réparer peut déclencher une explosion ou un incendie.
 - D. N'utilisez pas cet appareil s'il a été plongé dans l'eau, même partiellement. Faites inspecter l'appareil par un technicien qualifié et remplacez toute partie du système de contrôle et toute commande qui ont été plongés dans l'eau.

INSTRUCTIONS DE MISE EN MARCHÉ

1. **ARRÊTEZ!** Lisez les instructions de sécurité sur la portion supérieure de cette étiquette.
2. Réglez le thermostat à la température la plus basse.
3. Coupez l'alimentation électrique de l'appareil.
4. Cet appareil ne comporte pas de veilleuse. Il est muni d'un dispositif d'allumage qui allume automatiquement le brûleur. Ne tentez pas d'allumer le brûleur manuellement.
5. Tournez le bouton de la vanne gaz extérieur dans le sens horaire à la position "arrêt" (OFF).
6. Attendre cinq (5) minutes pour laisser échapper tout le gaz. Reniflez tout au tour de l'appareil, y compris près du plancher, pour détecter une odeur de gaz. Si vous sentez une odeur de gaz **ARRÊTEZ!** Passez à l'étape "B" des instructions de sécurité sur la portion supérieure de cette étiquette. S'il n'y a pas d'odeur de gaz, passez à l'étape suivante.
7. Tourner le bouton de commande de gaz dans le sens antihoraire à la position "marche" (ON).
8. Mettez l'appareil sous tension.
9. Réglez le thermostat à la température désirée.
10. Si l'appareil ne se met pas en marche, suivez les instructions intitulées "Comment couper l'admission de gaz de l'appareil" et appelez un technicien qualifié ou le fournisseur de gaz.



COMMENT COUPER L'ADMISSION DE GAZ DE L'APPAREIL

1. Réglez le thermostat à la température la plus basse.
2. Coupez l'alimentation électrique de l'appareil s'il faut procéder à l'entretien.
3. Tournez le bouton de commande de gaz dans le sens horaire à la position "arrêt".

11 COMMISSIONING

11.1 Preliminary checks

When commissioning the boiler, the first ignition is carried out by competent person from an authorized service agency.

Massachusetts:

Boiler installation must conform to Commonwealth of Massachusetts code 248 CMR which includes but is not limited to:

- Installation by licensed plumber or gas fitter.

In the state of Massachusetts:

- This product must be installed by a licensed plumber or gas fitter.
- When flexible connectors are used, the maximum length shall not exceed 36 in. (914 mm).
- When lever type gas shutoffs are used they shall be T-handle type.
- The use of copper tubing for gas piping is not approved by the state of Massachusetts.

Gas furnaces manufactured on or after May 1, 2017 are not permitted to be used in Canada for heating of buildings or structures under construction.

Before starting up the boiler, check:

- that the data of the supply networks (electricity, water, gas) correspond to the label data
- that the exhaust vent and the air inlet pipes are working correctly
- ensure the vent system has been installed properly and in accordance with the instructions and codes
- Verify there is enough access to the boiler to perform future maintenance and future repairs
- check the gas piping system to the boiler for leaks. Close the boiler's individual manual shutoff valve during any pressure testing of the gas supply piping system. Test at pressures equal to or less than 1/2 psi (3.5 kPa) and check for leaks using gas detector,
- non corrosive detection fluid, or other leak detection method acceptable to local codes. Do not use open flames or other ignition sources to check for leaks. Correct all leaks, are re-test for leaks to verify correction.
- that the fuel flow rate, corresponds to values required by the boiler (check using gas meter)
- that the fuel supply system is sized to provide the correct flow rate to the boiler, and that it has all the safety and control devices required by current regulations
- that the hydronic system has been filled, air bubbles removed and the pressure set to 15 p.s.i. (1 bar)
- that the circulator rotates freely because, especially after long periods of inactivity, deposits and/or debris can prevent free rotation (See section 11.5 for more details).

11.2 Instructing the user

Hand over all documentation supplied with this appliance – including these instructions – and explain the importance of keeping them in a safe place.

Explain to the user how to isolate the appliance from the gas, water and electrical supplies, and the locations of all drain points. Show the user how to operate the appliance and any associated controls correctly.

Show the user the location of any isolating valves and the location of all manual vent points.

Explain to the user how to turn off the appliance for both long and short periods and advise on the necessary precautions to prevent freeze damage.

Explain the user not to try to repair the boiler personally. Call a qualified technician.

Explain to the user that for continued safe and efficient operation, the appliance must be serviced annually by a qualified service person. Inform the user of the required maintenance that should be performed by a qualified technician. Details are shown in section 12.2.

11.3 Initial flushing of the system

The whole of the heating system must be flushed before connecting this boiler to the heating system.. Open all radiator or heating valves and the boiler supply & return service valve. Drain the boiler and system from the lowest points. Open the drain valve completely to

remove any installation debris from the boiler.

Refill the boiler and heating system (See Section 7.13 for more details).

Once the system is brought to the central heating setpoint, it is recommended that a second flush and fill be commenced to remove any other contaminants from the system.

⚠ DANGER: When flushing the system there is a risk of spraying, scalding water proper precautions should be made to prevent severe injury or death.

⚠ Do not drain or flush the system until it has reached room temperature

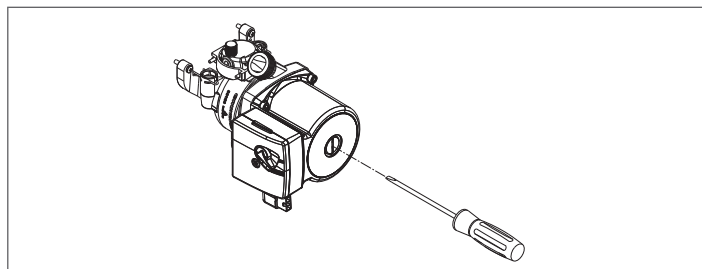
NOTICE: Chemicals used to clean the system and/or inhibit corrosion must be pH neutral, i.e. they should ensure that the level of the pH in the system water remains neutral. Premature failure of certain components can occur if the level of pH in the system water is out of normal levels.

11.4 Bleeding and Releasing of Circulator Shaft

The pump used in the boiler is a wet rotor pump; for this reason the pump should be bled by:

- Turn the closing cap with a large flat-bladed screw driver until is release from the seal, and some fluid begins dripping.
- Re-tighten the closing cap to reseal
- Perform this operation with extreme caution to avoid damaging the components.

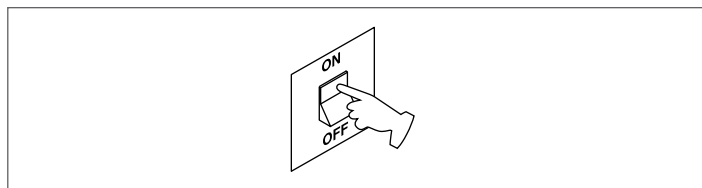
NOTICE: Before loosening or removing the closing cap, protect any electrical devices underneath any water outlet.



NOTICE: The boilers are live-fired tested at the factory. In some instances water can dry around the pump impeller causing it to stick upon initial commissioning. This can be resolved by removing the closing cap and spinning the impeller with a #2 Phillips screwdriver.

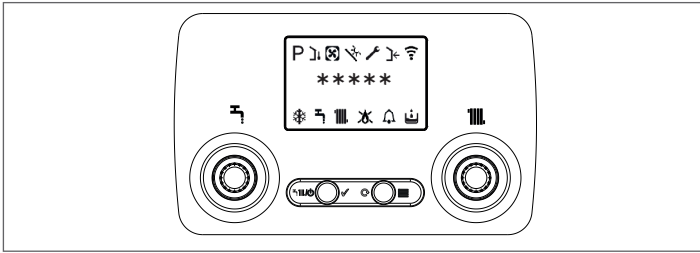
11.5 Programming the boiler

- Plug the boiler into a wall outlet. Turn on the breaker for the outlet.

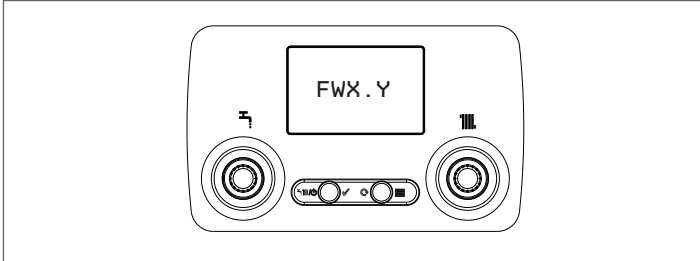


“Start-up phase” activates to check the display function. On the display, the following checks will happen:

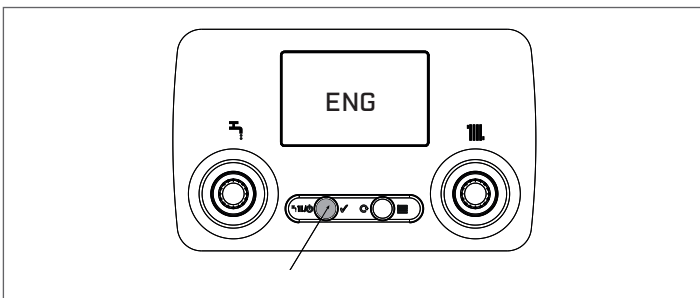
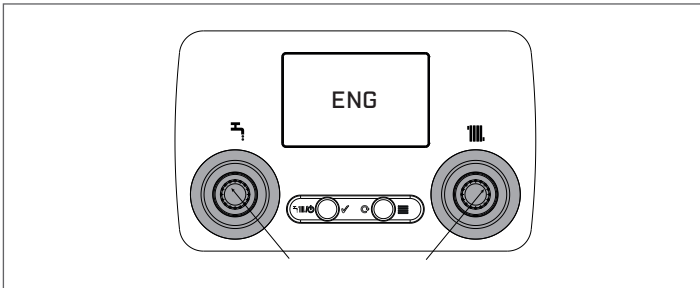
- Display functionalities: all icons available and the sliding “*****” text will appear. Press the “MODE/OK” button in order to stop the display testing



- Display firmware version: e. g. FW0.1 (no actions are required)

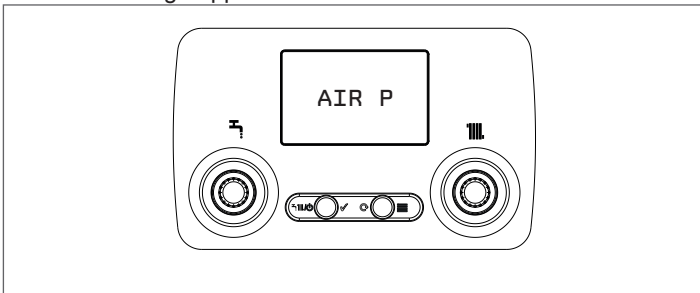


- Set language ("ENG"=Us, "FRA"=French). Rotate one of the two dials to choose the preferred language ("ENG" default)
- Press the "MODE/OK" button in order to confirm. If the "MODE/OK" button is not pressed, the default language is left set up.

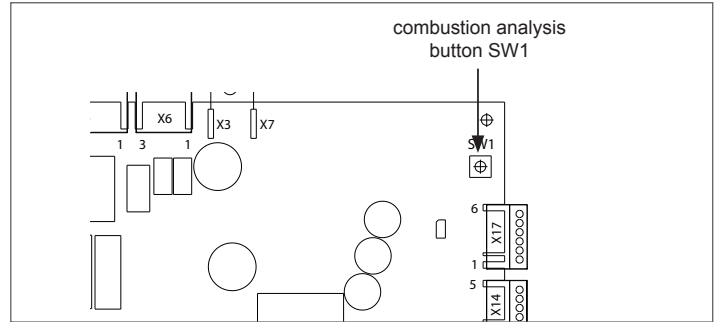


AIR PURGING FUNCTION

NOTICE: Each time the boiler is started up an automatic air purging cycle is carried out; lasting 4 min. When the air purging is in progress, all heat requests are inhibited and the sliding "AIR PURG." message appears.



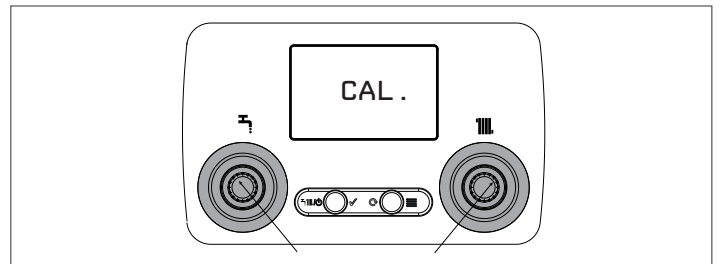
NOTICE: The air purging cycle can be interrupted beforehand by removing the cap from the control board cover and pressing the combustion analysis button SW1 or by pressing the MODE button for at least 5 seconds.



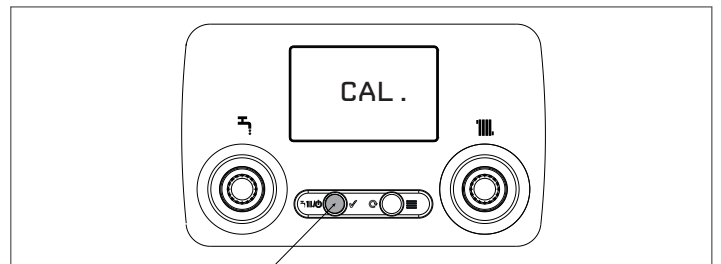
- After the "Start-up phase", "WAIT COMM." will always appear, which means that the SC07 front control is waiting for communication with the boiler. After which, the "Operation phase" starts: in this phase it is possible to perform all the supported actions (with the exception of language selection). The controller stays in the "Operation mode" for 60 seconds starting from the last time a knob was rotated or a key was pressed. After 60 seconds has expired, the controller goes into a "Stand-by" mode, back-light OFF. If there is a knob rotation or a button pressed the device goes back to the "Operation mode", back-light ON, for a period of 60 seconds.

11.6 First commissioning

- Power electrically the boiler by turning the main power switch to "ON". Plug the boiler into a wall outlet.
- set the status of the boiler to OFF
- access the technical parameter menu as explained in section "11.11 Access to the PARAMETER menu" page 47
- navigate through the menu by rotating one of the two knobs: clockwise or counter-clockwise.



Select the FORCE AUTO CAL parameter and confirm by pressing the "MODE/OK" button.

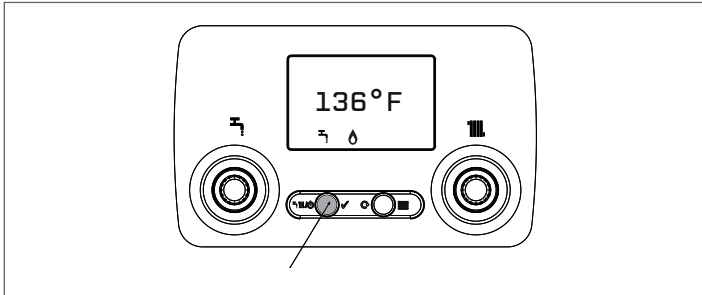
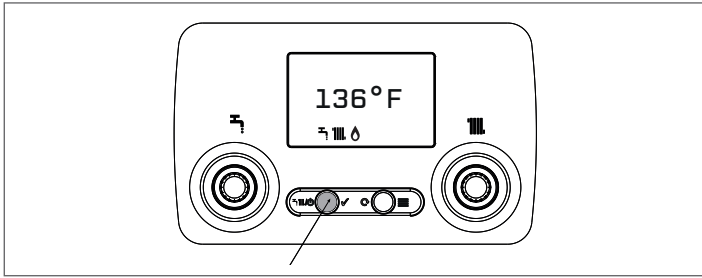


The display shows the current value, to modify it, rotate one of the knobs and set the value to 2 (enabled with offset resetted).

FORCE AUTO CAL function starts and the display shows the icon "🔥". When the icon disappears the function is finished.

After that:

- power on the boiler
- open the gas tap to allow fuel to flow.
- Adjust the room thermostat to the desired temperature (~72°F/ 22°C) or, if the system is equipped with a programmable thermostat, set the occupancy temperature to the desired temperature. Ensure that the thermostat is "active" and set correctly (~72°F/ 22°C)
- Then press the "MODE/OK" button repeatedly to select CH or CH/DHW mode



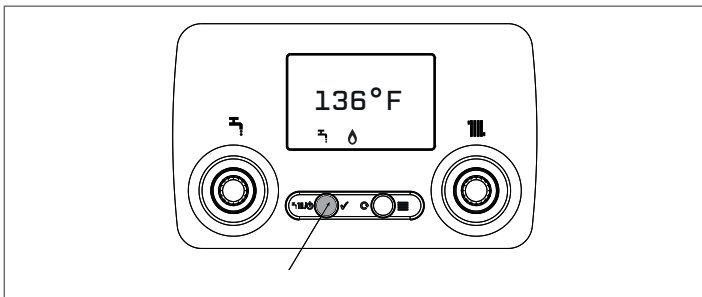
- When there is a heat request and the boiler has ignited, the “” icon appears on the display. The boiler will start-up and continue working until the set temperatures are reached, after which it will then go back to standby.

DHW ONLY : press the “MODE/OK” button until the faucet symbol appears to select the DHW ONLY mode, the domestic hot water mode is now activated. The display normally shows the DHW temperature.

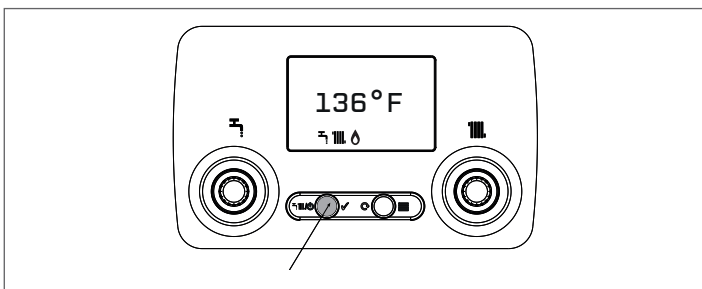
With the **heating only boilers** the function is active only with an indirect tank.

The user interface normally displays the temperature of the domestic hot water stored in the indirect tank (only when using an indirect tank sensor).

When using an indirect tank with aquastat or a domestic hot water request in progress, the boiler delivery temperature is displayed.



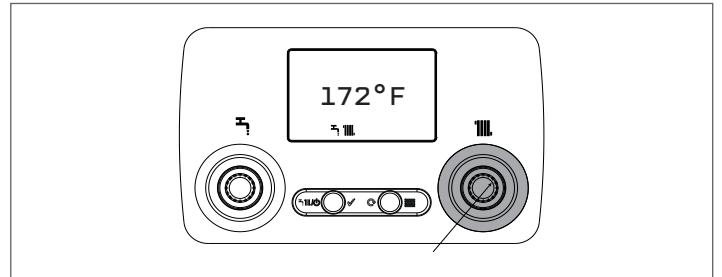
CH&DHW : press the “MODE/OK” button repeatedly to select both the faucet and radiator symbol indicating the boiler is in the CH (central heating) & DHW (domestic hot water) mode, the central heating and domestic hot water modes are now both active. The display normally shows the domestic hot water delivery temperature unless a call for central heating is made in which case it will show the actual supply temperature to the heating system.



11.7 Adjusting the heating water temperature without an outdoor temperature sensor connected

When there is no outdoor temperature sensor, the boiler operates at a fixed setpoint. If the central heating mode is active, to adjust the central heating temperature rotate the knob until the “” symbol highlighted. Rotate the knob to change the setpoint value. After few seconds the value will be confirmed automatically.

NOTICE: It is recommend to use the included Outdoor Temperature Sensor with the boiler to conserve energy. Not doing so, depending on the application, could be in violation of local codes. Installation of this sensor is also a Department of Energy requirement for space heating.



11.8 Adjusting the heating water temperature with an outdoor temperature sensor connected

When an outdoor temperature sensor is installed, the outlet temperature is automatically selected by the system, which quickly adjusts the ambient temperature according to the variations in the outdoor temperature. If you want to change the temperature, raising it or lowering it with respect to that automatically calculated by the electronic board, it is possible to change the central heating setpoint by rotating the knob with the “” symbol and selecting the desired comfort level (see section “11.12 Setting the outdoor reset curve with an outdoor sensor” page 50) within the range 59-77°F (15-25°C) from the environment temperature 68°F (20°C). Wait for two seconds from the last rotation, then the value will be confirmed and the display come back to the main page.

NOTICE: when there is an outdoor temperature sensor connected it is still possible to have the boiler operate at a fixed setpoint by setting the values of the MINIMUM CH SETPOINT and MAXIMUM CH SETPOINT at the desired HEATING setpoint.

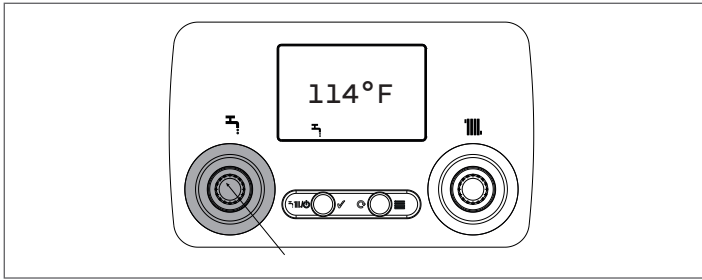
11.9 Adjustment of the domestic hot water temperature

To adjust the domestic hot water temperature (bath, shower, kitchen, etc.) rotate the knob with the “” symbol. Rotate the knob to change the setpoint value. Wait for two seconds from the last rotation, then the value will be confirmed and the display come back to the main page.

For **heating only boilers**:

- **EXAMPLE A:** heating only with tank thermostat: in this condition, the boiler delivers hot water to the water tank whenever a demand is made by the relative thermostat (default for BWH model)
- **EXAMPLE B:** heating only with tank sensor and sliding outlet: in this case, the outlet setpoint in a DHW request is no fixed at 120°F (49°C) but variable
- **EXAMPLE C:** heating only with tank sensor and fixed outlet: this setting performs a modulation to a fixed outlet value of 120°F (49°C) when there is a DHW request.

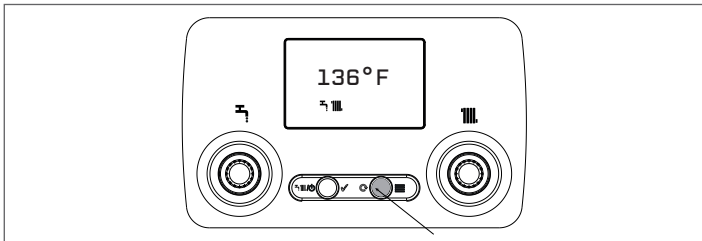
If the water heater is not supplied by our company, make sure that the relative indirect tank sensor (NTC sensor) has the following characteristics: 10 kOhm at 77°F (25°C), B 3435 ±1% or use KBANT0101111 kit.



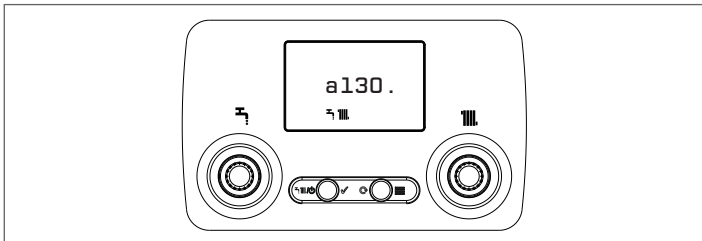
11.10 Access to the INFO menu

Make sure you are in the “Operation mode”, backlight ON (see section 11.6).

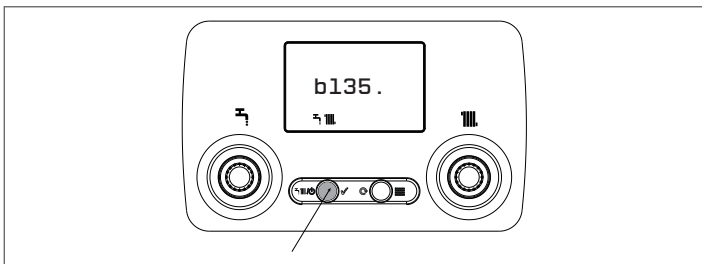
Using the boiler control panel it is possible to access the INFO menu by pressing the “MENU/RESET” button one to illuminate the screen, then again for less than 5 seconds. The INFO menu allows the user to view some of the boilers sensor readings and can be very helpful when diagnosing issues with the unit (see INFO list in the next column; indexed by a lower case alphabetical letter). Pressing the “MENU/RESET” button for more than 5 seconds will access the Parameter menu. This menu will timeout with inactivity in about 30 seconds if accidentally accessed.



Once the button is pressed, the first value of the INFO menu appears: e. g. “a130.6°F”. It scrolls from right to left because of the length of the string (up to 5 characters) in the following sequence: letter + value + unit of measure.



To move from one letter to another press the “MODE/OK” button. The next value will appear: e. g. “b135.1°F” (sliding from right to left).



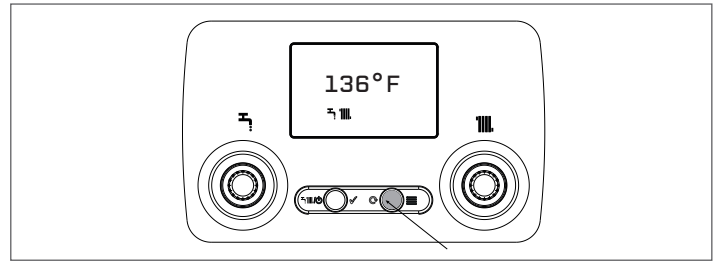
INFO list

INFORMATION	STRING
CH sensor	“a” + “value (e.g. xx.x)” + “°F”
Return sensor	“b” + “value (e.g. xx.x)” + “°F”
DHW sensor	“c” + “value (e.g. xx.x)” + “°F”
Flue sensor	“d” + “value (e.g. xx.x)” + “°F”
Outdoor temperature sensor	“e” + “value (e.g. xx.x)” + “°F”
Fan speed	“f” + “value (e.g. xxxx)” + “rpm”
Flue hour counter	“g” + “value” + “h”
CH Water Pressure	“h” + “value” + “psi”
Domestic Flow Rate	“i” + “value” + “gpm”
Boiler firmware version	“j” + “version”
Past days since service required	“k” + “number of days” + “days”

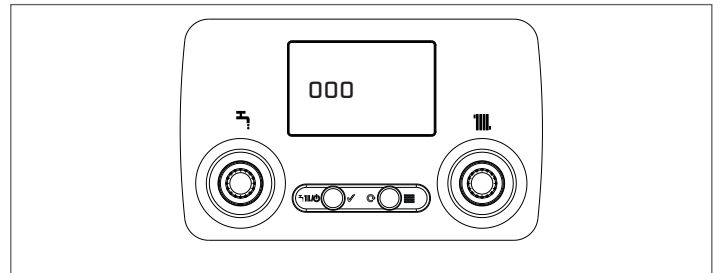
11.11 Access to the PARAMETER menu

NOTICE: Make sure you are in the “Operation mode”, backlight ON (see section 11.6).

Access to the PROGRAMMING menu by pressing the “MENU/RESET” button for at least 5 seconds, until “000” appears. Pressing the “MENU/RESET” button for less than 5 seconds will access the INFO menu.



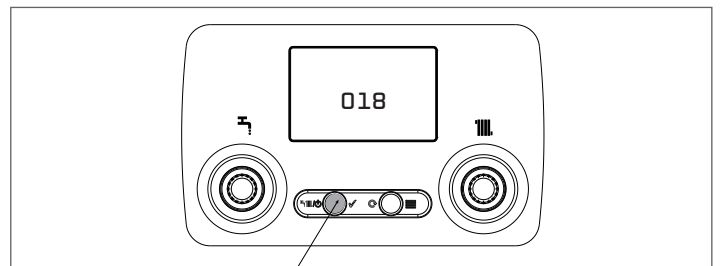
The display shows “000”.



Now you can enter the password menu. The password to access the installer level is “018”, service level is “053”.

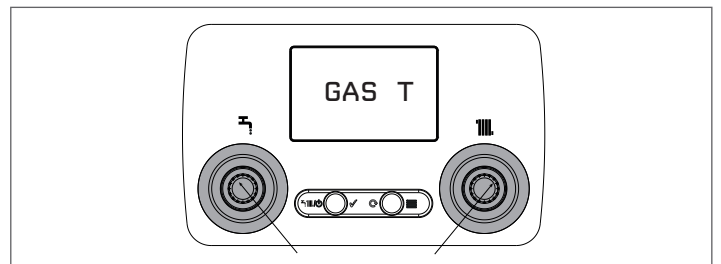
! WARNING: The parameters accessed by using this parameter should only be adjusted by a qualified service technician. Failure to comply may result in substantial property damage, severe personal injury or death.

To set the password turn either knob clockwise to increase in value and counterclockwise to decrease in value. Once at “018” (or 053), confirm the password pressing the “MODE/OK” button.



The first parameter of the list will appear on the display: the string can be fixed or sliding (if the text exceeds 5 characters, e. g. GAS TYPE).

It is possible to navigate through the menu by rotating one of the two knobs: clockwise or counterclockwise.



Select the parameter by pressing the “MODE/OK” button.

PARAMETER list

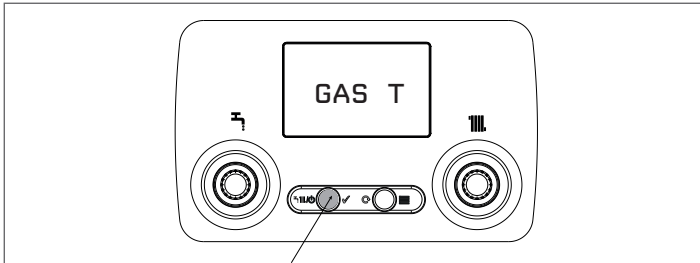
PARAMETER DESCRIPTION	VALUE	VALUE FACTORY SET	RANGE	ACCESS LEVEL	DISPLAYED MESSAGE
Hydraulic configuration	0 = combi and flowswitch 1 = combi and flowmeter 2 = heating only with tank thermostat 3 = heating only with tank sensor and sliding outlet 4 = heating only with tank sensor and fixed outlet	BWC = 1 BWH = 2	[0:4]	INSTALLER	HYDR. CFG
Gas Type	0 = Natural gas 1 = LP gas	0	[0:1]	INSTALLER	GAS TYPE
Heating timer	0 = Active Timers 1 = Timers disabled	0	[0:1]	INSTALLER	HEAT TIMER
DHW Thermostat	0 = Correlated Thermostat 1 = Absolute Thermostat	1	[0:1]	INSTALLER	DHW THERMO
System	0 = High Temperature 1 = Low Temperature	0	[0:1]	INSTALLER	SYSTEM
Pre-Heating	0 = disabled 1 = enabled	0	[0:1]	USER	PREHEAT.
Combustion analysis	0 = disabled 1 = enabled (15 min)	0	[0:1]	INSTALLER	-ACO-
Min DHW fan speed	see technical data table		[min:max]	INSTALLER	MIN
Max DHW fan speed	see technical data table		[min:max]	INSTALLER	MAX
Max CH fan speed	see technical data table		[min:max]	INSTALLER	MAX CH
MAX CH ADJ	see technical data table		[min:max]	INSTALLER	RANGE RATE
Night Comp	0 = enabled 1 = disabled	0	[0:1]	INSTALLER	NIGHT COMP
Outdoor reset	2 0.4	2	[1:3] High Temp [0.2:0.8] Low Temp	INSTALLER	OTD CURVES
Minimum DHW Setpoint	100°F (37°C)	100°F	[100:120]	INSTALLER	MINDHWSET
Maximum DHW Setpoint	120°F (49°C)	120°F	[120:140]	INSTALLER	MAXDHWSET
Minimum CH Setpoint	68°F (20°C) High Temp 68°F (20°C) Low Temp	68°F	[68:180] High Temp [68:113] Low Temp	INSTALLER	MINCHSET
Maximum CH Setpoint	180°F (82°C) High Temp 113°F (45°C) Low Temp	180°F	[68:180] High Temp [68:113] Low Temp	INSTALLER	MAXCHSET
Reset flue hour counter	0 = disabled 1 = enable (reset)	0	[0:1]	INSTALLER	HOUR COUNT
Auxiliary output	0 = jumper X21.1-2 presence: W-R input active when OT presence, jumper not present: second pump handling enable. 1 = zone valve handling is enabled 2 = secondary pump handling is enabled	0	[0:2]	INSTALLER	DO_AUX1

NOTICE: Parameters should be verified for the application and boiler configuration if a PCB was replaced. See PCB replacement instructions.”

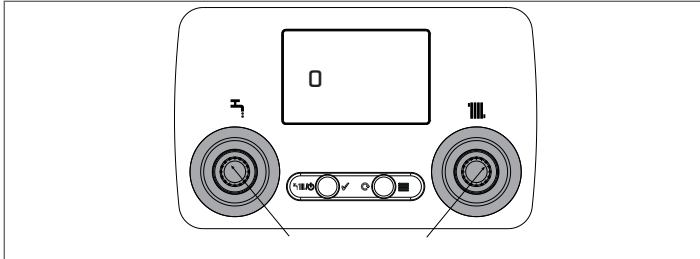
PARAMETER list for SERVICE

PARAMETER DESCRIPTION	VALUE	VALUE FACTORY SET	RANGE	ACCESS LEVEL	DISPLAYED MESSAGE
Combustion Power	0 = 120 kBTU (32 kW) 1 = none 2 = 150 kBTU (42 kW)	150 kBTU or 120 kBTU (per rating plate)	[0:2]	SERVICE	BOIL TYPE
Restore Combustion Offset Curve	0 = default 1 = Enable Action	0	[0:1]	SERVICE	SET OFFS
Reset Combustion Offset Curve	0 = default 1 = Enable Action	0	[0:1]	SERVICE	CLEAR OFFS
Water flow switch type	0 = On-Off 1 = Frequency	0	[0:1]	SERVICE	LWCO
Filling Type	0 = manual 1 = semi-automatic	0	[0:1]	SERVICE	FILL TYPE
Force Automatic Calibration (*)	0 = disabled 1 = enabled with offset restored 2 = enabled with offset resetted	0	[0:2]	SERVICE	FORCE CAL.
Call for service	0=1=disabled 2=enabled	2	[0:2]	SERVICE	CALL SRV
Service expire	Number of weeks	52	[0:255]	SERVICE	SRV EXPIRY

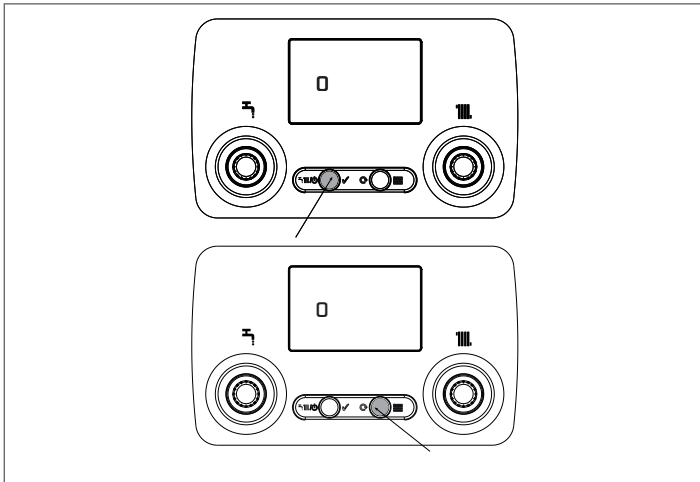
(*) reset = original curve (factory set) - restore= current curve. We suggest to set this parameter, first commissioning done, to 1 in case of gas valve, electrode and main PCB substitution



The display shows the value of the selected parameter. To modify it, rotate one of the knobs.



Confirm the parameter value by pressing the "MODE/OK" button, or exit without modifying the value by pressing the "MENU/RESET" button.



In order to exit from the parameter menu there are two possibilities:
 - pressing the "MENU/RESET" button
 or
 - leave the controls untouched for 60 seconds, the system automatically exits the parameter menu.

11.11.1 Hydraulic configuration

This parameter allows you to choose the configuration of your boiler selecting between:

- 0 = combi and flowswitch
- 1 = combi and flowmeter (default for BWC model)
- 2 = heating only with tank thermostat: in this condition, the boiler delivers hot water to the water tank whenever a demand is made by the relative thermostat (default for BWH model)
- 3 = heating only with tank sensor and sliding outlet: in this case, the outlet setpoint in a DHW request is no fixed at 176°F (80°C) but variable
- 4 = heating only with tank sensor and fixed outlet: this setting performs a modulation to a fixed outlet value of 176°F (80°C) when there is a DHW request.

NOTICE: This parameter should always be set to 1 for BWC Combi model.

11.11.2 Sliding outlet (heating only boiler)

The SLIDING OUTLET function modifies the outlet setpoint used by the boiler when receiving a DHW request. The outlet setpoint is calculated automatically by the boiler based on the difference between the desired DHW setpoint and the temperature value detected by the indirect tank sensor.

NOTICE: we do not recommend activating this function for water tanks with a capacity of over 26 US gallons (100 liters) since the water tank filling would be too slow.

11.11.3 Heating timer

This parameter is used to manage the following timers:

- the REDUCED HEATING MAXIMUM OUTPUT TIMING, during which the speed of the fan is limited to 75% of the maximum heating output that has been set
- the ANTI-CYCLE, for three minutes the boiler is forced to be in OFF mode.

The factory setting for this parameter is ACTIVE TIMERS.

To disable the timers select the value 1.

Note: for low dissipation system this parameter is useful to be 0.

For high dissipation system this parameter is suggested to set to 1.

11.11.4 Domestic hot water thermostat (combi boiler only)

This parameter allows you to set the type of DOMESTIC HOT WATER THERMOSTAT differential.

The factory setting for this parameter is CORRELATED THERMOSTAT, i.e. for domestic hot water the boiler switches off at the setpoint +9°F (+5°C) and restarts at the setpoint +7°F (+4°C).

To select the ABSOLUTE THERMOSTAT value, where the boiler for domestic hot water will switch off at +149°F (65°C) and restart at +145°F (63°C), follow the instructions in section 11.12 and select a value of 1 to change the parameter to an ABSOLUTE THERMOSTAT.

11.11.5 System

This parameter allows you to specify the type of system to be heated, it is possible to choose from the following options:

- HIGH TEMPERATURE (factory setting) [20°C (68°F) - 82°C (180°F)]
- LOW TEMPERATURE [20°C (68°F) - 45°C (113°F)].

11.11.6 Preheating (combi boiler only)

By selecting a value of 1, the boiler's domestic hot water function activates. This function keeps the water in the domestic hot water exchanger at the DHW setpoint, to reduce standby times when a request is made. When the preheating function is enabled the symbol P comes on at the top. During the burner ignition following a preheating request, the symbol P starts flashing. To deactivate the preheating function select 0.

NOTICE: some applications may not be suitable for preheating, such as those with low flow rates and above average incoming water temperatures. The combination of these two occurrences can result in short-cycling when used in conjunction with preheating.

11.11.7 Minimum CH setpoint

This parameter allows you to specify the minimum heating setpoint that is possible:

- for high temperature systems: range 68°F (20°C) - 180°F (82°C), default 68°F (20°C)
- for low temperature systems: range 68°F (20°C) - 113°F (45°C), default 68°F (20°C).

11.11.8 Maximum CH setpoint

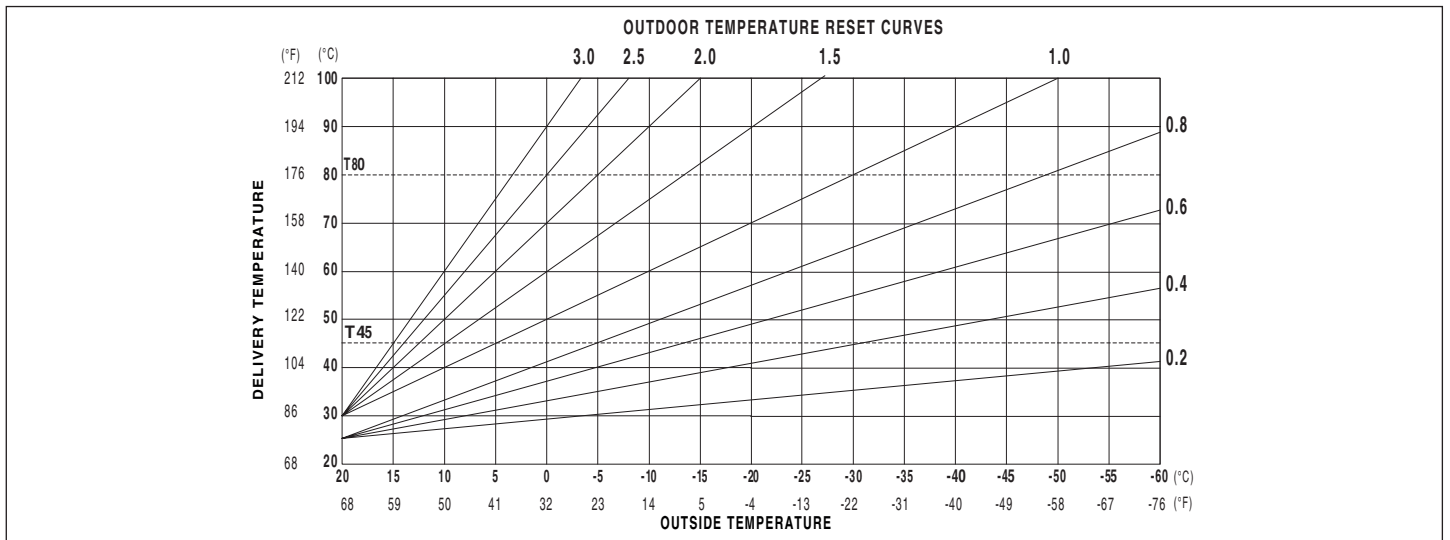
This parameter allows you to specify the maximum heating setpoint that is possible:

- for high temperature systems: range 68°F (20°C) - 180°F (82°C), default 180°F (82°C)
- for low temperature systems: range 68°F (20°C) - 113°F (45°C), default 113°F (45°C).

NOTICE: The factory default setting for the boiler is high temperature (radiator) system. Leaving this default setting could cause property damage in low temperature applications.

11.11.9 Minimum DHW setpoint

This parameter allows you to specify the minimum domestic hot water setpoint that is possible: range 100°F (37°C) - 120°F (49°C), default 100°F (37°C).



11.11.10 Maximum DHW setpoint

This parameter allows you to specify the maximum domestic hot water setpoint that is possible: range 120°F (49°C) - 140°F (60°C), default 120°F (49°C).

11.11.11 Reset flue hour counter

In case of E091 error it is suggested that the contractor performs an inspection in the boiler to check the heat exchanger status; at the end of the inspection the contractor will set the flue hour counter parameter to 1 in order to start the reset it. At the end of this procedure the value automatically returns to 0.

11.11.12 Auxiliary output

Default 0= jumper X21.1-2 presence. W-R input active when OT presence. Or jumper not present : second pump handling enables.

11.11.13 Night Setback and Outdoor Reset Correction

See Section 11.12.

11.11.14 CALL FOR SERVICE

The function is enabled with parameter = 2. In this condition, at the end of the operating period set with the SERVICE EXPIRE parameter, the display starts to show the message CALL SRV for 1min every 10 min, indicating the need to call a qualified technician.

SERVICE EXPIRE

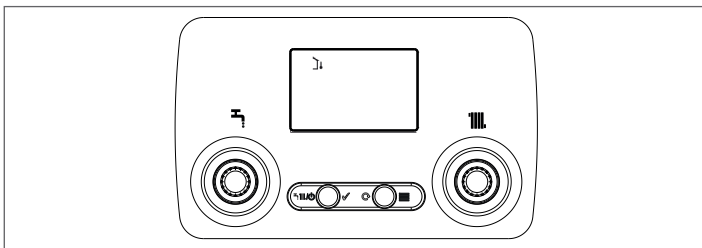
This parameter allows you to set the number of weeks of boiler operation (factory default value = 52 weeks), before the CALL FOR SERVICE signal appears on the display.

In the INFO MENU it is possible to check how many days have passed since the appearance of the CALL FOR SERVICE MESSAGE (see "11.10 Access to the INFO menu").

11.12 Setting the outdoor reset curve with an outdoor sensor

Outdoor temperature reset only works with the outdoor air sensor connected, therefore, after installation, connect the outdoor air sensor to the relative connections on the boiler terminal board. This enables the outdoor temperature reset function.

The temperature measured by the outdoor temperature sensor is displayed as shown below.



The user can program the desired supply temperature based on the heat transmitter that will be used in the installation. Once the outdoor sensor is connected to the control board, the water temperature of the boiler will adjust to run the boiler more efficiently

and provide greater comfort to the living space.

NOTICE: The DHW temperature is independent from the outdoor air sensor.

Selecting the offset heating curve

The offset heating curve maintains a theoretical ambient temperature of 68°F (20°C) at outdoor temperatures ranging from 68°F to -4°F (+20°C to -20°C). The choice of the curve depends on the rated minimum outdoor temperature (of the geographical area) and the rated delivery temperature (on the type of system) and must be carefully calculated by the installer using the following formula using the correct values in °F or °C:

$$\text{Curve selection} = \frac{\text{Nominal supply Temp.} - \text{Tshift}}{72^\circ\text{F} (22^\circ\text{C}) - \text{min. external design Temp.}}$$

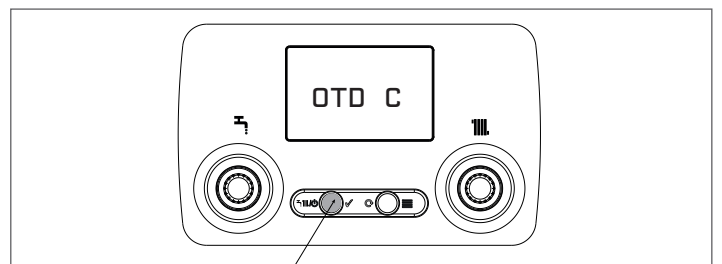
Tshift = 86°F (30°C) standard systems (radiators)
77°F (25°C) infloor systems

If the calculation generates an intermediate value between two curves, choose the nearest offset heating curve to that value.

E.g.: if the value obtained by the calculation is 1.3, it lies between curve 1 and curve 1.5. In this case, select the nearest curve, i.e.: 1.5.

Using the front control it is possible to set the curve:

- access the parameter menu as described in "11.11 Access to the PARAMETER menu" page 47
- select the parameter "OTD CURVE" pressing the "MODE/OK" button



- the display shows the value of the selected parameter. To modify it rotate one of the two knobs.

The settable values of curves are:

- standard system: 1.0, 1.5, 2.0, 2.5, 3.0
- floor system: 0.2, 0.4, 0.6, 0.8.

- Confirm the parameter value by pressing the "MODE/OK" button.

The programming complete, press the "MENU/RESET" button to exit from the parameter menu and come back to the main page.

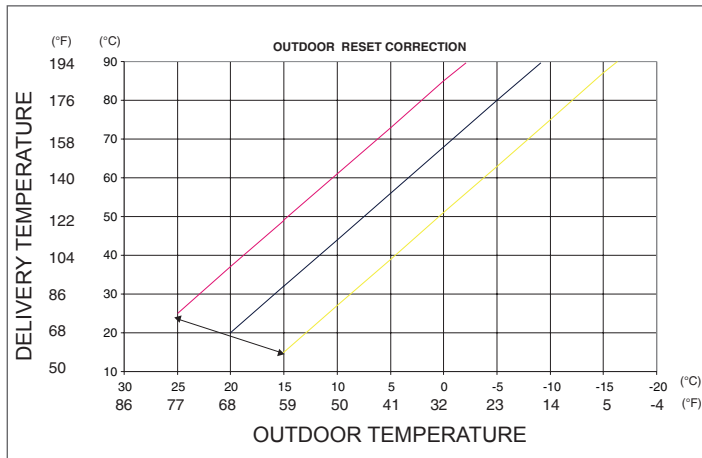
TYPE OF HEAT REQUEST

If a room thermostat is connected to the boiler

The room thermostat makes a heat request when its contact closes, and stops the request when its contact opens. Though delivery temperature is automatically calculated by the boiler, the user may manually override it.

When the outdoor thermistor is connected the HEATING SET POINT will no longer be displayed if the outdoor sensor is connected, but just a value that can be set from 77°F to 59°F as required by turning the right knob.

Please note that the number displayed is a comfort level: 77°F means it feels hotter, 59°F means it feels colder. Modifications to this value do not directly change supply temperature but affect the calculation made to automatically determine its value by modifying the reference temperature of the system. It is recommend to adjust the Outdoor Reset Curve (section 11.12) If this adjustment of 59°F to 77°F is not adequate enough to provide sufficient comfort.



PROGRAMMABLE TIMER (DAY+NIGHT)

Available if NIGHT COMP parameter is set to function active. If a programmable timer (day+night selector) is connected to the boiler.

This feature is useful if a non-programmable thermostat is used, but night setback is desired.

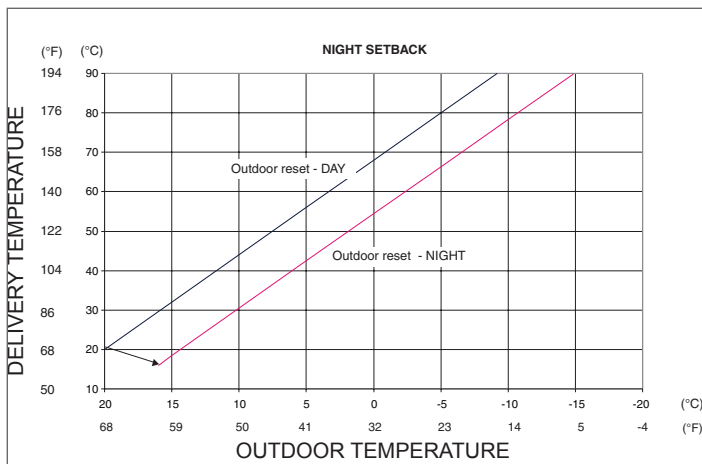
When the contact is closed, the heat request is made by the delivery sensor on the basis of the external temperature in order to maintain the rated ambient temperature at the DAY level 68°F (20 °C). When the contact opens, it does not stop the heat request but reduces (parallel shift) the temperature curve to the NIGHT level 61°F (16 °C).

This activates the night mode.

Though supply temperature is automatically calculated by the boiler, the user may manually override it.

By modifying HEATING on the user interface, the HEATING SET POINT will no longer be available but just a value that can be set from +5 to -5 as required. Please note that the number displayed is a comfort level: +5 means it feels hotter, -5 means it feels colder. Modifications to this value do not directly change flow temperature but affect the calculation made to automatically determine its value by modifying the reference temperature of the system (0 = 68°F (20°C) for DAY level; 61°F (16°C) for NIGHT level).

NIGHT SETBACK



11.13 Checks during and after the first commissioning

After start-up, check that the boiler carries out the start-up procedures and subsequent shut-down properly.

Check the domestic hot water operation by opening a hot water tap in CH&DHW and DHW ONLY mode.

Check the full stoppage of the boiler by turning off the system's main power switch.

After a couple of minutes of continuous operation with the boiler

in DHW ONLY mode and by keeping the domestic hot water tap open, it will be possible to carry out a combustion check (Refer to "11.15 Combustion analysis" for details).

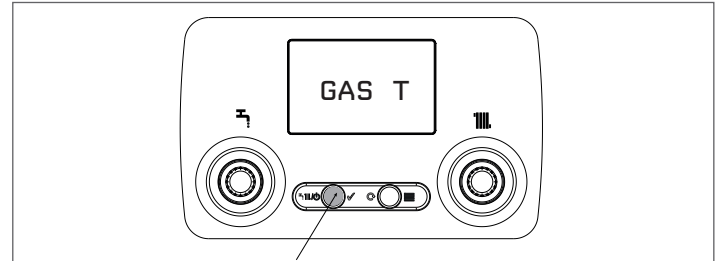
11.14 Converting the boiler gas type

The boiler is factory supplied to use natural gas (gas A). The boiler can use also LPG (gas E) gas by setting the parameter.

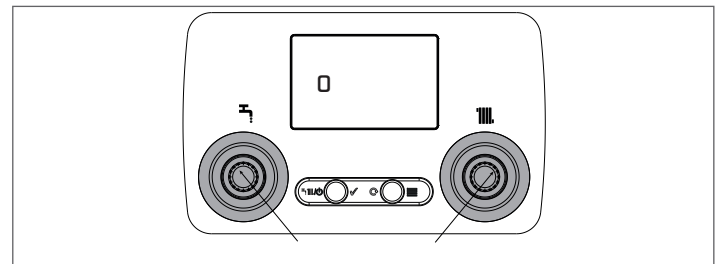
! WARNING: The boiler may only be converted by qualified technician. Failure to comply may result in substantial property damage, severe personal injury or death.

To convert the boiler to LPG (gas E) proceed as follows:

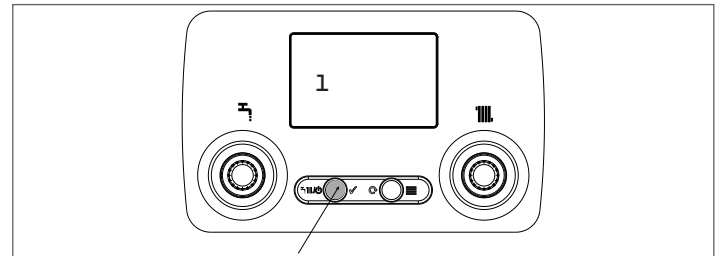
- access the parameter menu as described in "11.11 Access to the PARAMETER menu" page 47
- select the parameter "GAS TYPE" pressing the "MODE/OK" button.



- the display shows the value of the selected parameter. To modify it rotate on one of the two knobs.



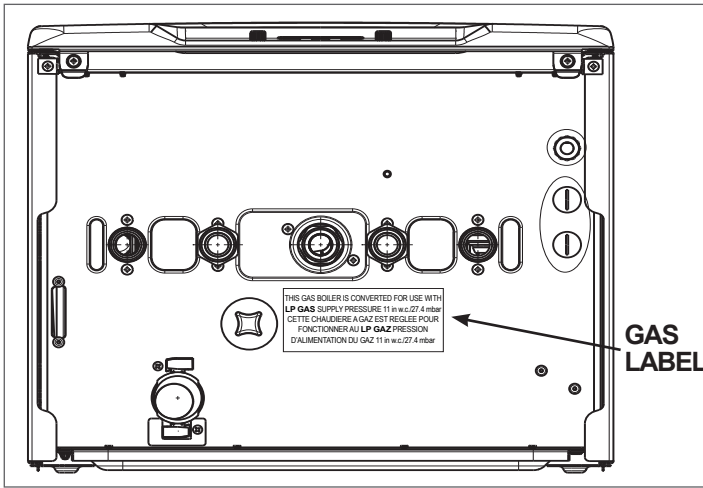
- confirm the parameter value by pressing the "MODE/OK" button.



The programming complete, press the "MENU/RESET" button to exit from the parameter menu and come back to the main page.

The boiler DOES NOT require additional adjustments.

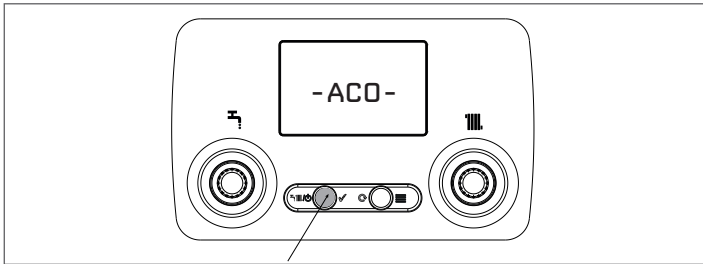
! WARNING: After conversion apply the new rating plate contained in the boiler. Failure to do so may result in substantial property damage, severe personal injury or death.



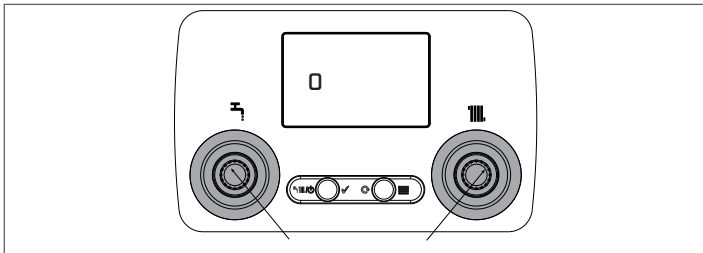
11.15 Combustion analysis

To carry out the combustion analysis, proceed as follows:

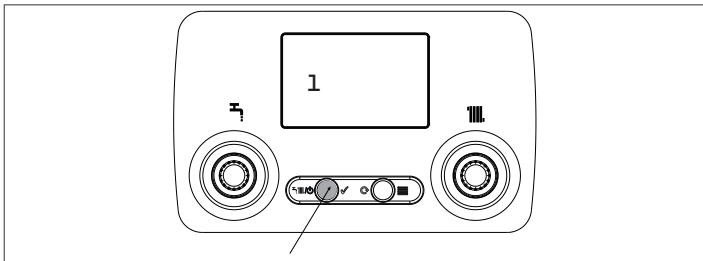
- power the boiler electrically by turning the main power switch to "ON"
- set the status of the boiler to OFF
- access the parameter menu as described in "11.11 Access to the PARAMETER menu" page 47
- select the parameter "-ACO-" pressing the "MODE/OK" button.



- the display shows the value of the selected parameter. To modify it rotate on one of the two knobs.



- confirm the parameter value by pressing the "MODE/OK" button.

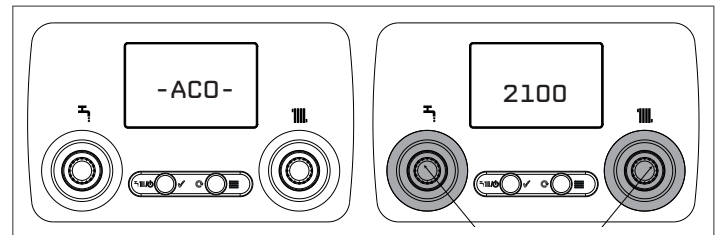


The programming complete, press the "MENU/RESET" button to exit from the parameter menu and come back to the main page.

In this case two strings will be displayed alternatively, every 2 seconds: one related to the parameter description and the other

referring to the speed value of the fan speeds (rpm).

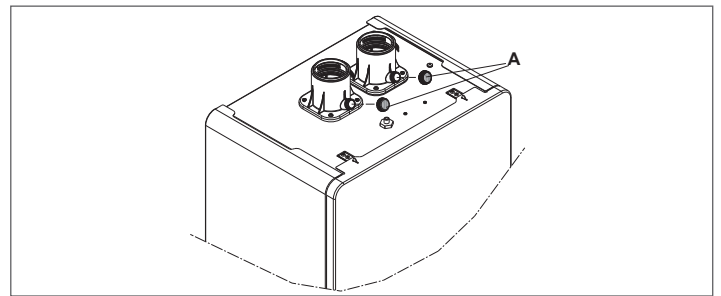
To adjust the value choose one of the two knobs and start to rotate. Wait for two seconds from the last rotation, then the value will be confirmed and the display come back to the main page.



Wait for the burner to ignite.

The boiler will operate at maximum heating output and it will be possible to regulate the combustion.

- Insert the analyzer probe in the specific positions on the air distribution box, after removing the two taps (A).



- Perform the combustion check verifying that the CO₂ values correspond to those indicated in the technical data table.
- Once checks are completed, remove the analyzer probe and close the combustion analysis sockets with appropriate caps and screw.

⚠ WARNING: If the value displayed is different from the one shown in the technical data table **DO NOT MAKE ANY ADJUSTMENTS ON THE GAS VALVE**, please contact the Technical Assistance Centre.

⚠ WARNING: The gas valve DOES NOT require adjustments and the possible tampering can cause a malfunction or failure of the boiler which may result in substantial property damage, severe personal injury or death.

NOTICE: When the sweeper function is in progress all the heat requests are inhibited. The 2 strings, alternatively every second, will be displayed: "ACO" and the string referring to the speed value of the fan speeds.

When the checks are completed:

- set the boiler to "DHW" or "CH&DHW" mode
- regulate the heat request temperature values according to the customer's needs.

IMPORTANT

The sweeper function is active for a time limit of 15 minutes; the burner shuts down if an outlet temperature of 203°F (95°C) is reached. It will ignite again when the temperature falls below 167°F (75°C).

In case of a low temperature system we recommend carrying out the efficiency test by setting the boiler to DHW mode, opening the hot water tap to full capacity and setting the temperature of the domestic hot water to the maximum.

11.16 Lights and faults/Reset procedure

If any faults should occur a brief alphanumeric description of the fault will appear on the display.

See "Boiler fault list" below for a description of the errors.

Boiler faults list

ERROR CODE	ERROR MESSAGE	RED LED	GREEN LED	RED and GREEN	DESCRIPTION OF TYPE OF ALARM
E010	flame lockout/ACF electronic fault	ON			definitive
E011	parasitic flame	flashing 0.2 sec on/0.2 sec off			transitional
E020	water high limit/heat exchanger thermostat	flashing 0.5 sec on/0.5 sec off			definitive
E030	fan fault	ON			definitive
E040	low water cutoff - check system water pressure			ON	definitive
E041	low water cutoff - check system water pressure		flashing 0.5 sec on/0.5 sec off		transitional
	low water pressure fault		flashing 0.5 sec on/0.5 sec off		transitional
E042	low water cutoff fault			ON	definitive
E044	high water fault		flashing 0.5 sec on/0.5 sec off		transitional
E060	domestic hot water sensor fault (combi model) / indirect tank sensor fault (heating only model)			flashing 0.5 sec on/0.5 sec off	transitional
E070	supply sensor fault high limit supply sensor supply/return sensor differential error	ON			transitional definitive definitive
E077	external error contact	ON			transitional
E080	fault return line sensor return line sensor high limit supply/return line sensor differential error	ON			transitional definitive definitive
E090	fault flue gases sensor flue gases high limit sensor			flashing 0.5 sec on/0.5 sec off	transitional definitive
E091	clean primary heat exchanger			flashing 0.5 sec on/0.5 sec off	notification
E099	reset attempts exhausted, boiler blocked	It is referred to the last fault occurred			definitive, not resettable
WAIT COMM.	wait communication from the boiler board				transitional
COMM. LOST	lost communication from the boiler board	ON			transitional
CL	Time to SERVICE overdue			flashing 0.1 sec on/0.1 sec off	notification

List of combustion faults

ERROR CODE	ERROR CODE DESCRIPTION	RED LED	GREEN LED	DESCRIPTION OF TYPE OF ALARM
E021	iono error	ON		<p>These are temporary errors that if they occur several times in an hour they become a hard lock-out; the alarm E097 is displayed and is followed by post-purging for 45 seconds at the fan's maximum speed. It is not possible to release the error before the end of the post-purging unless the boiler's power supply is switched off.</p> <p>⚠ WARNING: first action verify the condensate check valve and if the condensate trap drains correctly - see section 7.4</p>
E022	iono error	ON		
E023	iono error	ON		
E024	iono error	ON		
E067	iono error	ON		
E088	iono error	ON		
E097	iono error	ON		
E085	ACC monitor error	ON		<p>These are temporary errors that if they occur several times an hour they become a hard lock-out; the last error to occur is displayed and is followed by a post-purging of 5 minutes at the fan's maximum speed. It is not possible to release the error before the end of the post-purging unless the boiler's power supply is switched off.</p>
E094	ACC monitor error	ON		
E095	ACC monitor error	ON		
E058	supply voltage fault	ON		<p>These are temporary faults that restrict the ignition cycle.</p>
E065	current modulation error	ON		
E086	obstruction fumes error	ON		<p>Temporary fault reported during the post ventilation. It is maintained a post ventilation of 5 min at maximum fan speed.</p>

Definitive= boiler BLOCK, manual reset needed

Transitional= the boiler automatically restores the alarm without any external intervention

Notification = the boiler does not stop, this is just a signalling message

Fault E020

This kind of fault has two potential causes:

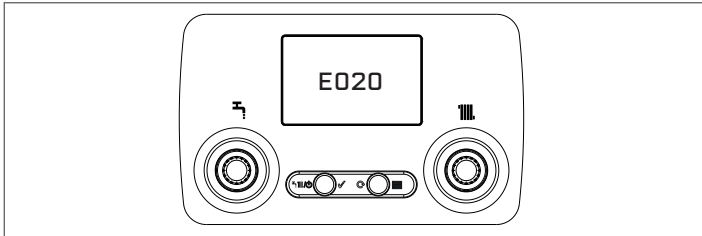
1) **Water high limit thermostat** intervention: due to absence or poor water in the circuit or absence of circulation; check pressure value on the pressure gauge and if necessary restore it (14 - 22 psi (1 and 1.5 bar)) and check the correct working of the circulator.

2) **Heat Exchanger Thermostat** intervention: due to presence of excessive dirt/deposits inside the primary heat exchanger. This condition could lead to frequent faults E020. Once established that condition 1 is satisfied, it is necessary to clean the heat exchanger

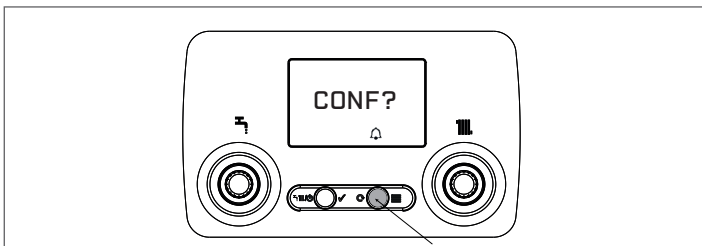
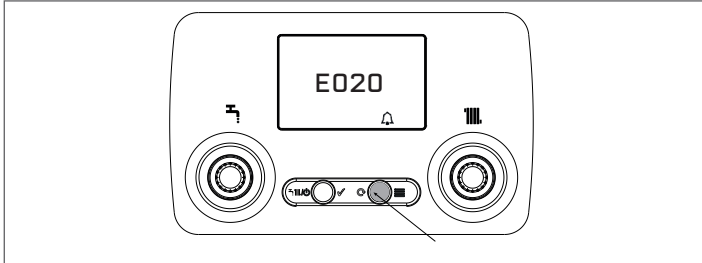
- see "12.4 Maintenance of the combustion control system" page 56.

Press the "ENTER" button with the rules described below.

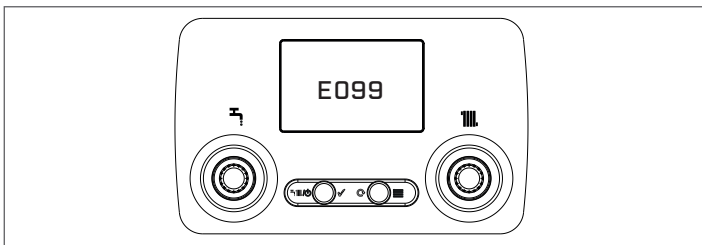
⚠ WARNING - If the attempts to reset the boiler are unsuccessful, please contact the technical service.



The reset procedure consists of pressing the “MENU/RESET” button two times: the first time to request a reset procedure, the second to confirm it.



At this point, if the correct operating conditions have been restored, the boiler will restart automatically. There are a maximum of 3 consecutive attempts to reset a fault. In case of all the attempts are exhausted, the definitive fault “E099” occurs on display. In that case the appliance will need to be disconnected briefly from the electrical supply. Once the electrical supply has been restored, further attempts can be carried out.



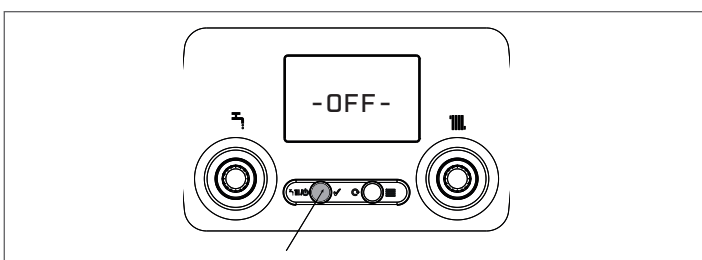
⚠ WARNING: If the attempts to reset the boiler are unsuccessful, call a qualified technician.

⚠ WARNING: If in the “Start-up Phase” and the sliding message “WAIT COMM.” persists, call a qualified technician.

NOTICE: If communication between SC07 front control and boiler is lost, “COMM.LOST” appears on the display: contact a qualified technician.


11.17 Temporary switch-off

In the event of temporary absences (weekends, short breaks, etc.) set the status of the boiler to OFF by pressing the “MODE/OK” button until the display shows “-OFF-”.



While the electrical supply and the fuel supply remains active, the boiler is protected by the following:

- **heating anti-freeze:** this function is activated if the temperature measured by the supply sensor drops below 41°F (5°C). A heat request is generated in this mode with the ignition of the burner at minimum output, which is maintained until the outlet water temperature reaches 95°F (35°C);
- **domestic hot water anti-freeze:** the function starts if the temperature measured by the DHW NTC sensor falls below 41°F (5°C). A heat request is generated in this mode with the ignition of the burner at minimum output, which is maintained until the outlet water temperature reaches 131°F (55°C);
- **domestic hot water anti-freeze (only an indirect water tank is connected - heating only boiler model):** the function starts if the temperature measured by the indirect tank sensor falls below 41°F (5°C). A heat request is generated in this phase with the ignition of the burner at minimum output, which is maintained until the outlet water temperature reaches 131°F (55°C).

⚠ The activation of the ANTI-FREEZE function is indicated by the  icon displayed on the front control.

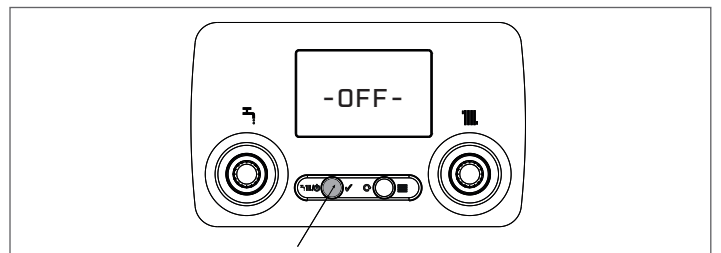
- **circulator anti-seize:** the circulator activates every 24 hours of stoppage for 30 seconds.

11.18 Switching off for long periods

If the boiler is not used for a long time, the following operations must be carried out:

- set the status of the boiler to OFF by pressing the “MODE/OK” button till the display shows “-OFF-”
- set the system’s main power switch to “off”
- close the fuel and water taps of the heating and domestic hot water system.

⚠ WARNING: In this case, the anti-freeze and anti-seize systems are deactivated. Drain the heating and domestic water system if there is any risk of freezing.



11.19 Replacing of the PCB board

The configuration operations should be carried out by professionally qualified personnel.

When replacing the AKM11 electronic board, the spare part PCB is configured with the parameters shown in the column “VALUE FACTORY SET” in the PARAMETERS’S LIST (see section “11.11 Access to the PARAMETER menu” page 47).

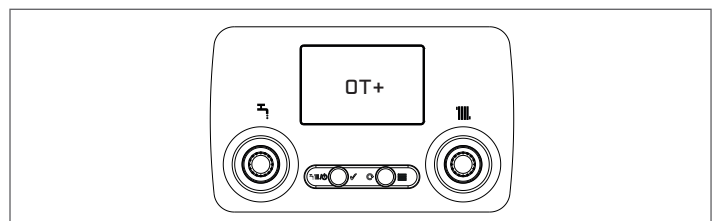
It is necessary for the installer to verify the parameters of the replacement PCB match the boiler and the application.

11.20 Remote devices presence

Remote control OTBus

In case the boiler is connected to a remote control OTBus, the boiler display shows the “OT+” message.

In this situation it is possible to reset a fault by pressing the “MENU/RESET” button and to modify the CH setpoint (only if zone valve has been previously enabled); the other boiler functions are disabled.



12 SERVICING INSTRUCTIONS

12.1 General

To ensure the continued safe and efficient operation of the boiler, it is recommended that it is checked and serviced at regular intervals. Maintenance is mandatory once a year.

If the application works in heavy duty conditions it may require a higher frequency of maintenance than yearly (*), refer in any case to the yearly check list (paragraph 13.2.1).

(*) Higher frequency of maintenance is necessary under below condition:

- Needs identified during yearly check
- Efficiency reduction, a fault, malfunction or breakage.
- Gas with high sulphur rates, still inside the range of acceptability but close the limits declared: a maximum annual peak over a short period of time of 150 mg/m³ and an annual average of 30 mg/m³.
- Water Hardness, pH and Chlorine concentration still inside the range of acceptability but close the limits declared in manufacturer's instructions
- Air for combustion drawn from an area with dust, debris or airborne contaminants
- In the case of works or maintenance of structures located near the flue and/or air ducts and their accessories
- Frequent on-off cycles
- Boiler oversized or undersized compared to the real needs of the building, that leads to frequent ON-OFF cycles or boiler operation much longer than the usual annual average.

It is essential that any worn or failed component be replaced only with genuine spare parts.

Use of non-genuine spare parts could void your warranty and may pose a potential safety hazard.

The following instructions apply to the appliance and its controls, however, it is important to pay attention also to the maintenance of the central heating and the domestic hot water systems and all plant components.

⚠ WARNING: Before commencing any maintenance operations, make sure the boiler is disconnected from the power supply.

⚠ WARNING: To avoid potential of severe burn, DO NOT REST HANDS ON OR GRASP PIPES. Use a light touch; heating piping and hot water outlet piping will heat up quickly.

⚠ WARNING: After servicing, reset the original operating parameters of the boiler if they were changed.

12.2 Maintenance

⚠ WARNING: In the boiler there are gas, flue and electrical hazards so maintenance and REGULAR SERVICE must be performed by a qualified service agency.

⚠ WARNING: Regular service and maintenance are mandatory to ensure safety for the users and maximum operating efficiency and life of the appliance. Furthermore it allows for reduction of consumption, polluting emissions and keeping the product reliable over time.

The frequency of servicing will depend upon the particular installation conditions, but, in general, at least once per year must be done.

The State Boilers Laws require that any service work is carried out by a competent person such as a qualified technician, an approved service agent, or other suitably qualified personnel.

Tools for maintenance operations:

- A dynamometer device
- A combustion analyser
- A vacuum cleaner
- White vinegar in a spray bottle
- A nylon hand brush
- A nylon mechanic brush with a portable drill
- Mains water

12.3 Maintenance program

To ensure the continued safe and efficient operation of the boiler, it is recommended that it is checked and serviced at regular intervals. Maintenance is mandatory according to the below schematic program, refer to the table and to the relevant explanation that the table refers to.

- The yearly maintenance is also highlighted on the display with CALL FOR SERVICE (refer to paragraph "Lights and Faults" for understand the conditions related to the CALL FOR SERVICE).
- The maintenance must be done every year or each time that alarm E91 appears on the boiler display (refer to paragraph "Lights and Faults" for understand the conditions related to the E91)
- The first maintenance is intended within 365 days from first ignition and the following maintenances within 365 days from the previous one

WARNING: once the maintenance operation has been completed, reset the total hour meter to zero (0), refer to E091 alarm, as indicated in paragraph "11.11.11 Reset flue hour counter".

Yearly maintenance program	Yearly maintenance program	Door gasket maintenance procedure	Gas valve
Year 1	X		
Year 2	X	X	
Year 3	X		
Year 4	X	X	
Year 5	X		
Year 6	X	X	
Year 7	X		
Year 8	X	X	
Year 9	X		
Year 10	X	X	X

Yearly maintenance program

1	Check that area is free from combustible materials, gasoline and other flammable vapors and liquids.
2	Visually check top of vent for soot. Call service person to clean. Some sediment at bottom of vent is normal.
3	Clean the screens in the vent terminal
4	Visually inspect all flue product carrying areas of the boiler including the venting system and main burner for proper functioning, deterioration or leakage.
5	Verify that the vent is not obstructed. Check for and remove any obstruction to the flow of combustion or ventilation air to heater.
6	Venting must be pitched towards the boiler to allow condensate to drain
7	Ensure that condensate drains are inspected and ensure that condensate is being directed to appropriate condensate management system or drain, as required by local codes.
8	Check operation of safety devices.
9	Check fan and fan motor.
10	Check if there is any flue leakage from the heat exchanger flue outlet and adaptor junctions. In case of leakage detection replace the related gaskets (1).
11	Remove the burner door (8), check that combustion chamber is free of deposits and proceed to clean.
12	Check the burner door insulation panel (6), gasket (4) and high temperature glass braided rope (5) for deterioration, and if they are worn, replace them.

13	Check the combustion chamber insulation panel (3) and, if it is worn, replace it.
14	Check the condition of the burner (7), ensure that it is not loose; clean if necessary.
15	Verify spark and check the flame ignition electrode (12) for deterioration and, if it is worn, replace it. If the electrode is removed from its seat, its gasket (11) must be replaced.
16	Check the flame sensor electrode (10) for deterioration and, at the slightest sign of deterioration, replace it. If the sensor is removed from its seat, its gasket (9) must be replaced.
17	Check the boiler condensate trap, remove and clean if needed – re-prime trap.
18	Check the correct working of the condensate check valve dispositive.
19	Cleaning of the filters is required.
20	Check for piping leaks around pumps, relief valves and other fittings. Repair, if found. DO NOT use petroleum-based stopleak.
21	Inspection of the low water cutoffs in the boiler and system. Also it needs to specify that float type low water cutoffs must be periodically flushed.
22	Check the correct working of the relief valve. Refer to manufacturer's instructions on valve.
23	Visually inspect the burner flame and ignition sequence to ensure proper operation.

Door gasket maintenance procedure

1	Replace the burner door gasket (4).
---	-------------------------------------

Gas valve

1	Replace gas valve
---	-------------------

⚠ WARNING: Failure to properly reassemble and reseal the air-vent system may result in substantial property damage, severe injury or death. To properly reassemble and reseal the air-vent system, follow the vent manufacturer's instructions in their entirety.

⚠ WARNING: After carrying out the maintenance operations a combustion analysis needs to be carried out to make sure the boiler is operating correctly.

⚠ WARNING: After the replacement of the electronic board or the maintenance of the flame sensor or the burner, the combustion analysis, it may be necessary to proceed with combustion analysis procedure as described in section "11.15 Combustion analysis".

Note: When the flame sensor is replaced, the combustion parameters can not be excluded. This data will return to the nominal values after a few hours of operation.

⚠ WARNING: Do not clean the appliance or its parts with flammable substances (e.g. petrol, alcohol, etc.).

NOTICE: Do not clean outer casing panels, painted parts and plastic parts with paint thinner, scourers or abrasive cleaners; use only a clean damp cloth.

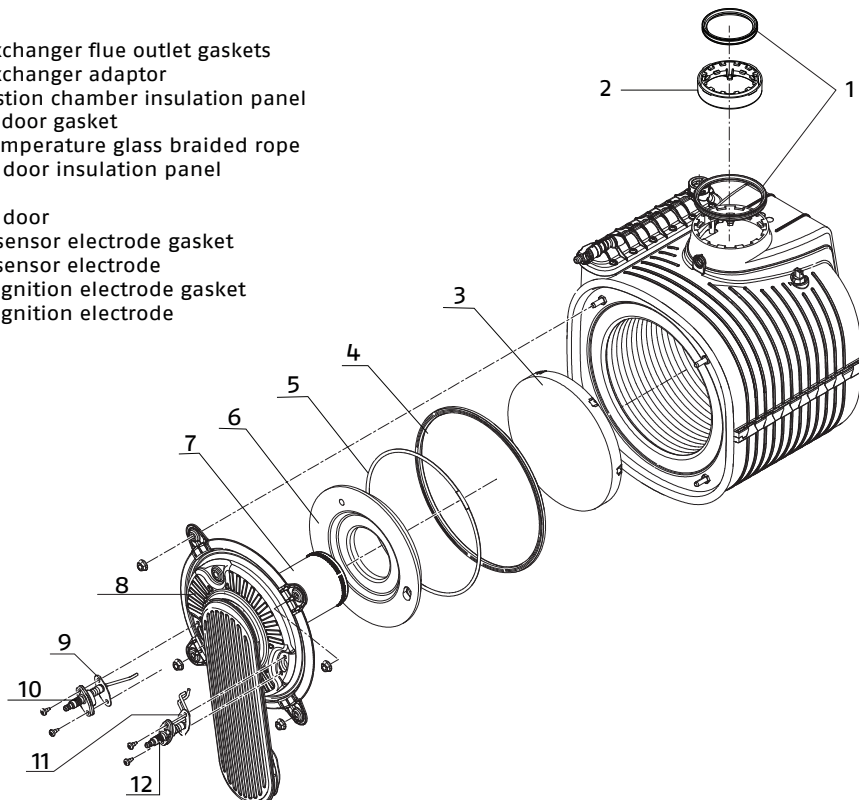
CAUTION: Outer casing panels cleaning must be carried out only with soapy water.

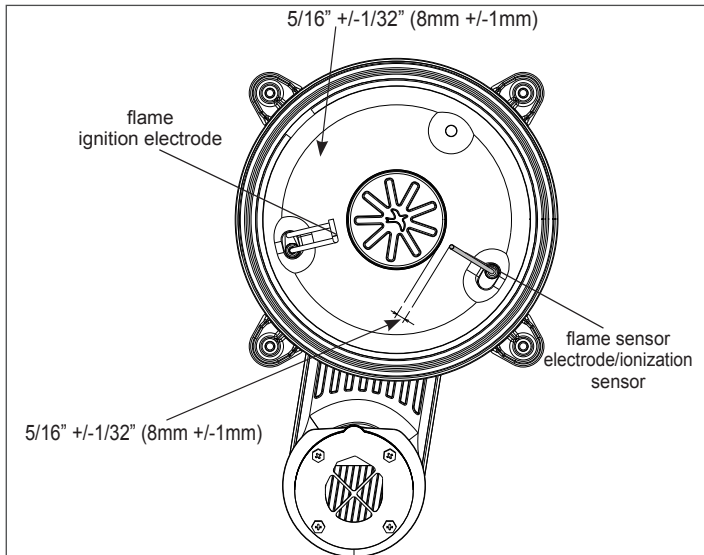
12.4 Maintenance of the combustion control system

12.4.1 Flame sensor

The flame/ionization sensor has an important function in the boiler ignition phase and in the maintenance of proper combustion; in case of replacement, it is necessary to always ensure that it is correctly positioned and to strictly observe the reference shown in the figure below.

- 1 Heat exchanger flue outlet gaskets
- 2 Heat exchanger adaptor
- 3 Combustion chamber insulation panel
- 4 Burner door gasket
- 5 High temperature glass braided rope
- 6 Burner door insulation panel
- 7 Burner
- 8 Burner door
- 9 Flame sensor electrode gasket
- 10 Flame sensor electrode
- 11 Flame ignition electrode gasket
- 12 Flame ignition electrode





⚠ WARNING: Do not rub the electrode with sandpaper.

MANDATORY: In order to prevent potential malfunctions, during annual maintenance, check the flame sensor for deterioration and, at the slightest sign of deterioration, replace it.

The geometry of the wire, the absence of alumina deposit, as well as the quality of the insulation and of the gaskets must be checked.

- Remove the electrode by unscrewing the two fixing screws.
- Clean the gasket supporting surface.
- Reassemble the electrode by using a new gasket.

CAUTION: Take care not to damage the burner door insulation.

- Fix the electrode by screwing its screws with a torque wrench at 2.5Nm.
- Check the position of the electrode against the burner, as well as the distance of the flame sensor wires (refer to the picture).
- Adjust the electrode gap if necessary.

12.4.2 Gas valve

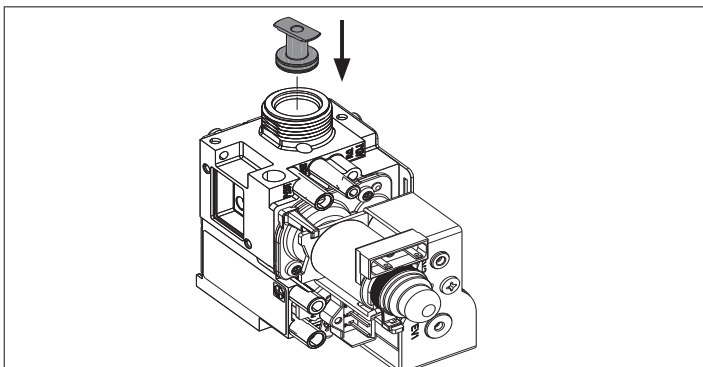
The gas valve is a safety and adjustment device which oversees the correct operation of the product.

⚠ WARNING: In order to maintain the technical characteristics of the device and full efficiency, it is recommended to **replace it every 10 years**.

When replacing the gas valve, ensure the injector located at the top of the gas valve being replaced is removed and correctly inserted into the new gas valve.

Check that the O-ring on the injector is not worn or failed and, if necessary, replace the injector.

Failure to do so may result in substantial property damage, severe personal injury or death.



12.4.3 Burner

Check the condition of the burner, carefully clean it with a soft brush if necessary. Do not use a brush with metallic bristles as this might damage it.

If there is dirt remaining inside the burner, blow it out with compressed air.

12.4.4 Burner door

MANDATORY: Check the insulation panel and, if it is worn and in case of a rise of the condensates in the heat exchanger, it must be replaced.

Material characteristics do not require individual protection devices but, for safety, we recommend the use of a protective mask, gloves and glasses.

⚠ WARNING: The insulation panel is maintained by silicone glue.

- Remove the electrodes.
- Remove the insulation by sliding under its periphery a thin tool to loosen and remove it.
- Remove and clean the residues of the insulation and silicone glue.
- Put two points of glue silicone temperature-resistant (Loctite 5366 or Ottoseal S17) on the plate of the door.
- Engage the insulation and place it in contact with the two points of glue silicone.
- Make sure that the burner is in proper condition, remove any possible insulation residues on the burner blowing them out with compressed air.
- **MANDATORY:** Replace the electrodes by using new gaskets.
- **MANDATORY:** Check the burner door gasket and, if it is worn, it must be replaced. Anyway, **regardless of deterioration, replace it as indicated in the paragraph "12.3 Maintenance program"**.
- **MANDATORY:** Check the high temperature glass braided rope and, if it is worn, it must be replaced. The high temp braided rope is maintained by silicone glue.
- Remove the braided rope by sliding a thin tool under it to loosen and remove it.

CAUTION: Take care not to damage the burner door insulation.

- Remove and clean the residues of the braids and silicone glue.
- Put a thin string of silicon temperature resistant glue (Loctite 5366, Ottoseal S17 or equivalent) in the seal housing.
- Engage the high temperature braided rope and place it in contact of the glue and press the braids.
- **MANDATORY:** Check the flame ignition electrode deterioration and, if it is worn, replace it.
- The geometry of the wire, the absence of alumina deposit, as well as the quality of the insulation and of the gaskets must be checked.
- Remove the electrode by unscrewing the two fixing screws.
- Clean the gasket supporting surface.
- Reassemble the electrode by using a new gasket.

CAUTION: Take care not to damage the burner door insulation.

- Fix the electrode by screwing its screws with a torque wrench at 2.5Nm.
- Check the position of the electrode against the burner, as well as the distance of the ignition electrode wires (refer to the picture).
- Adjust the electrode gap if necessary.

Reassemble the burner door set on the heat exchanger respecting a torque wrench of the four nuts at 5Nm.

12.4.5 Heat exchanger


MANDATORY: Check that combustion chamber is free of deposits and, proceed to clean.


⚠ WARNING: BEFORE OF CLEANING, remove the siphon connection pipe from the condensate drain connection of the exchanger and connect a temporary collection pipe to it.


- Vacuum the combustion residues.
- Clean with a nylon brush.

⚠ WARNING: Use nylon brush only. DO NOT use metallic brush, which can damage the heat exchanger.


- Vacuum the remaining residues.
- Rinse with mains water.


 **WARNING:** DO NOT rinse the insulation panel.

 **NOTICE:** In case of serious dirt build-up rinsing can be repeated several times, spray white vinegar and wait about 3 to 5 minutes, clean with a mechanical nylon brush and rinse with mains water.

 **WARNING:** DO NOT spray and rinse the insulation panel.

- **MANDATORY:** Check the insulation panel and, if it is worn, it must be replaced

 **WARNING:** Material characteristics do not require individual protection devices but, for safety, we recommend the use of a protective mask, gloves and glasses.

 **WARNING:** During operations, protect the lower part of the internal coils of the heat exchanger to avoid that dust and parts of the insulation panel fall off within them.

To replace the insulation

- Use a blade to cut the insulation panel approximately 2,63" (60 mm) from the circumference.
- Lift and remove the 2 panel pieces from the seat.

NOTICE: The insulation panel is fixed by a central clip and six radial clips; if during removal operations the clips detach, remove them from the combustion chamber.

- Vacuum any material residue present on the exchanger coils and panel support.
- Position the new insulation panel close its seat and insert it completely by pressing on central part.
- **MANDATORY:** Check the flue outlet gasket and, if it is worn, it must be replaced.
- Reassemble the burner door set on the heat exchanger respecting a tightening torque of the four nuts at 5Nm.

12.5 Annual servicing check list

BWCAAG000120 - BWCAAG000150 BWHAAG000120 - BWHAAG000150

Owner Information:

Name: _____ ph: _____

Street: _____ Email: _____

City: _____ State/Prov: _____ Zip / Postal Code: _____

Please provide data as noted.

Installer Information

Installer Name	
Company Name	
Company Address	
Phone Number	
Email Address	
Distributor Name	
Unit Purchase Date	
Unit Model	
Unit Serial Number	
Installer Signature	
Unit Commissioning	

This document is intended as a guideline only. The Installation & Operation Manual For Contractors shall be read in its entirety and adhered to when performing an annual maintenance this appliance.

DANGER: All seal, gaskets, O-rings and washers that are disturbed during maintenance must be replaced. If any portion of venting system is disturbed, it must be re-installed in accordance to the vent manufacturer's instructions, the BWH-BWC Installation & Operation Instructions For Contractors and any applicable provisions of local building codes as well as the National Fuel Gas Code ANSI Z223.1/NFPA 54 and/or CAN/CSA B149.1, Natural Gas and Propane Installation Code. Failure to do so may result in substantial property damage, severe injury or death.

⚠ WARNING: This document is intended as a guideline only, the **BWCAAG000 - BWHAAG000** US/CAN Installation & Operations Instructions For Contractors must be read and followed in its entirety. Failure to do so may result in substantial property damage, severe personal injury or death.

Yearly maintenance program

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Maintenance date	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____
Disconnect power supply and protect the PC board to ensure it cannot get wet during service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using a digital manometer, check incoming gas pressure at the gas regulator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using a digital manometer, check pressure at bottom of gas valve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check gas line size & length, ensuring it is adequately sized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Isolate & drain the boiler, check the expansion tank pressure is correct for the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check that area is free from combustible materials, gasoline, and other flammable vapors and liquids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check that the Pressure Relief Valve is properly oriented in a vertical position beneath the boiler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the correct working of the relief valve. Refer to manufacturer's instructions on valve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the water domestic inlet screen, clean if necessary (BWC model only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the water inlet filter screen in the inlet manifold, clean if necessary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the flowmeter filter screen, clean if necessary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check venting type, length, installation, condition & screens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visually check top of vent for soot. Call service person to clean. Some sediment at bottom of vent is normal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clean the screens in the vent terminal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visually inspect all flue product carrying areas of the boiler including the venting system and main burner for proper functioning, deterioration or leakage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify that the vent is not obstructed. Check for and remove any obstruction to the flow of combustion or ventilation air to heater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Venting must be pitched towards the boiler to allow condensate to drain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensure that condensate drains are inspected and ensure that condensate is being directed to appropriate condensate management system or drain, as required by local codes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check operation of safety devices. Refer to manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check fan and fan motor for deposits presence and damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check if there is any flue leakage from the heat exchanger flue outlet and adaptors junctions. In case of leakage detection replace the related gaskets (1).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remove the burner door (8), check that combustion chamber is free of deposits and proceed to clean with water and nylon brush.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the burner door insulation panel (6), gasket (4) and high temperature glass braided rope (5) for deterioration, and if they are worn, replace them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Yearly maintenance program (.... continue)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Maintenance date										
Check the combustion chamber insulation panel (3) and, if it is worn, replace it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the burner (7), ensure that it is not loose; clean if necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify spark and check the flame ignition electrode (12) for deterioration and, if it is worn, replace it. If the electrode is removed from its seat, its gasket (11) must be replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the flame sensor electrode (10) for deterioration and, at the slightest sign of deterioration, replace it. If the sensor is removed from its seat, its gasket (9) must be replaced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the boiler condensate trap, remove and clean if needed – re-prime trap	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the correct working of the condensate check valve dispositive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Refill the boiler and purge all air from system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check for piping leaks around pumps, relief valves and other fittings. Repair, if found. DO NOT use petroleum-based stopleak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspection of the low water cutoffs in the boiler and system. Also it needs to specify that float type low water cutoffs must be periodically flushed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power boiler back on	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify the polarity and ground of the power supply (L-N=120v, L-G=0v, N-G=0v)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check incoming power to spark generator - minimum 120VAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify the unit is set for the proper gas by accessing the "Gas Type" parameter on the boilers front screen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visually inspect the burner flame and ignition sequence to ensure proper operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Perform a combustion check per section 10.21 - Combustion Analysis in the Installation & Operation Instructions For Contractors using a combustion analyzer. Ensure the CO2% and CO ppm are within the acceptable limits given in the IOM and by local codes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensure the CH and DHW temperature setpoints are set correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Door gasket maintenance procedure

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Maintenance date										
Replace the burner door gasket (4).		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Gas valve maintenance procedure

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Maintenance date										
Gas valve										<input type="checkbox"/>

CAC/BDP

7310 West Morris St
Indianapolis - IN 46231
USA

BWC-H-01SI

The Company is constantly working to perfect all of its production processes, therefore the aesthetics and size, technical data, equipment and accessories of the products may be subject to change.