QHT-DVF

Oil and Gas Direct Venting System From QHT INC.

Direct Vent Addendum

For use in conjunction with B-10,
or SG atmospheric venting manuals

QHT DVF

Please Read Instructions Carefully Save for Future Reference

WARNING

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

DANGER

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

WHAT TO DO IF YOU SMELL GAS VAPORS

- 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 neighbors phone.
- If you can not reach your gas supplier call the fire department

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

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PORTSMOUTH, NH 03801
PHONE: 603-334-6400
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REV. 12112019

TABLE OF CONTENTS

IMPORTANT INFORMATION
Please read this page carefully.

ALL BOILERS MUST BE INSTALLED IN ACCORDANCE WITH NATIONAL, STATE AND LOCAL PLUMBING, HEATING AND ELECTRICAL CODES AND ORDINANCES, AS WELL AS THE REGULATIONS OF THE SERVING ELECTRICAL, WATER AND GAS UTILITIES.

All systems should be designed by competent contractors, and only persons knowledgeable in the layout and installation of heating systems should attempt the installation of any boiler.

It is the responsibility of the installing contractor to see that all controls are correctly installed and operating properly when the installation is completed.

Do not burn volatile garbage, gasoline, naphtha or other flammable liquids other than No. 2 fuel oil, Natural gas, or Propane. All flammable liquids (especially gasoline), chemicals, rags, paper, wood scraps, debris, etc., should be kept away from the boiler at all times. Keep the boiler area clean and free of all fire hazards.

Please read the literature and warranties supplied by the manufacturers of the various accessory equipment. This equipment is warranted by the respective manufacturers, not by Quincy Hydronic Technologies, Inc. Each piece of equipment must be installed and used according to the recommendations of the manufacturer.

Codes and Regulations:

Installation of the boiler, burner, oil tank and related equipment must conform to national, state and local regulating agencies and codes applicable to the installation of the equipment. In the absence of local requirements, the following codes apply:

A. ANSI/NFPA - #31 Installation of Oil Burning Equipment
B. ANSI/NFPA - #70 National Electric Code
C. ANSI/NFPA - #211 Chimneys and Vents
D. ANSI/NFPA - #Z223.1 National Fuel Gas Code
E. ANSI/NFPA - Domestic Gas Conversion Burner
F. CAN/CGA B149

The above codes are available from:

National Fire Protection Association (NFPA)
Battery March Park
Quincy, Massachusetts, 02269
http://www.nfpa.org

CANADIAN STANDARDS ASSOCIATION
STANDARDS DIVISION
5060 Spectrum Way, Suite 100
Mississauga, Ontario, L4W 5N6

WARNING

- ALL BOILERS MUST BE INSTALLED IN ACCORDANCE WITH NATIONAL, STATE AND LOCAL PLUMBING, HEATING AND ELECTRICAL CODES AND ORDINANCES, AS WELL AS THE REGULATIONS OF THE SERVING ELECTRICAL, WATER AND GAS UTILITIES.
- Improper installation, adjustment, or maintenance of this boiler can cause property damage, personal injury or death. Due to this fact only experienced technicians and installers may install or adjust BIASI boilers. All systems should be designed by competent contractors, and only persons knowledgeable in the layout and installation of heating systems should attempt the installation of any boiler. The homeowner should never tamper with any part of the boiler.
- Thoroughly read and understand all instructions including the B-10 or SG atmospheric venting instructions before beginning this installation.
- After installation place this manual in a safe place in plain view of the boiler. If the manual is no longer legible contact QHT INC. for a new manual.
- After the boiler is installed and in working order, it should be serviced once a year before each heating season. Service on the boiler may only be done by an experienced installer or oil heating technician.
- These boilers may only be direct vented using approved venting systems supplied through QHT INC. For the boiler warranty, please consult the B-10 or SG atmospheric venting manual.
- **Do not burn volatile garbage, gasoline, naphtha or other flammable liquids other than No. 2 fuel oil, Natural gas, or Propane. All flammable liquids (especially gasoline), chemicals, rags, paper, wood scraps, debris, etc., should be kept away from the boiler at all times. Keep the boiler area clean and free of all fire hazards.**
- Please read the literature and warranties supplied by the manufacturers of the various accessory equipment. This equipment is warranted by the respective manufacturers, not by Quincy Hydronic Technologies, Inc. Each piece of equipment must be installed and used according to the recommendations of the manufacturer

WARNING

Any appliance that burns natural gas, propane gas, fuel oil, wood or coal is capable of producing carbon monoxide (CO). Carbon Monoxide (CO) is a gas which is odorless, colorless and tasteless but is very toxic.

If your BIASI boiler is not working properly, or is not vented properly, dangerous levels of CO may accumulate. CO is lighter than air and thus may travel throughout the building. **BRIEF EXPOSURE TO HIGH CONCENTRATIONS OF CO, OR PROLONGED EXPOSURE TO LESSER AMOUNTS OF CO MAY RESULT IN CARBON MONOXIDE POISONING. EXPOSURE CAN BE FATAL AND EXPOSURE TO HIGH CONCENTRATIONS MAY RESULT IN THE SUDDEN ONSET OF SYMPTOMS INCLUDING UNCONSCIOUSNESS.**

Symptoms of CO poisoning include the following:

dizziness	vision problems	shortness of breath
headache	loss of muscle control	unclear thinking
nausea	weakness	unconsciousness

The symptoms of CO poisoning are often confused with those of influenza, and the highest incidence of poisoning occurs at the onset of cold weather or during flu season. A victim may not experience any symptoms , only one symptom, or a few symptoms. **Suspect the presence of carbon monoxide if symptoms tend to disappear when you leave your home.**

The following signs may indicate the presence of carbon monoxide:

- Hot gasses from appliance, venting system, pipes or chimney, escaping into the living space.
- Flames coming out around the appliance.
- Yellow colored flames in the appliance.
- Stale or smelly air.
- The presence of soot or carbon in or around the appliance.
- Very high unexplained humidity inside the building.

If any of the symptoms of CO occur, or if any of the signs of carbon monoxide are present, **VACATE THE PREMISES IMMEDIATELY AND CONTACT A QUALIFIED HEATING SERVICE COMPANY OR THE GAS COMPANY OR THE FIRE DEPARTMENT.**

To reduce the risk of CO poisoning, have your heating system "tuned up" by a licensed heating contractor or the gas company - preferably before each heating season. Also have the service company check your chimney or vent pipes for blockage.

Your home should also be adequately ventilated, particularly if you have insulated your home.

ONLY QUALIFIED, LICENSED SERVICE CONTRACTORS SHOULD PERFORM WORK ON YOUR B-10 OR SG BOILER.

1. General Information

The QHT Direct Vent components have been designed and packaged so that the Biasi B-10 and SG boilers can be directly vented to the outside. Properly maintained, these boiler systems are unsurpassed in efficiency and will provide years of trouble-free operation.

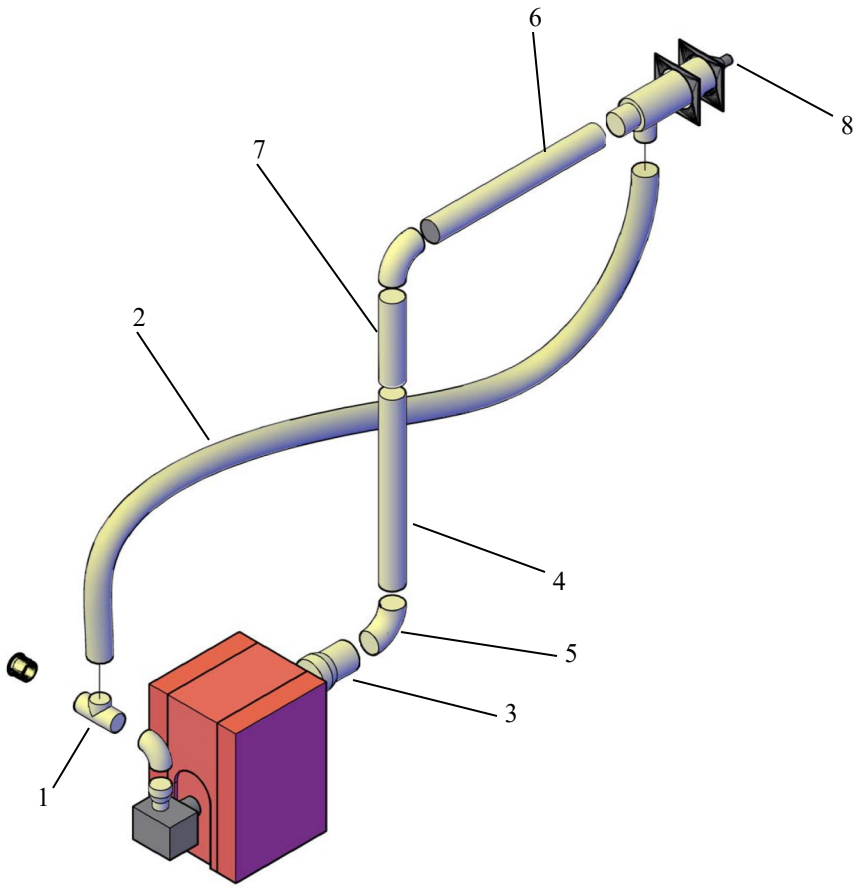
In addition to the standard Biasi boiler package, the Direct Vent Package is supplied with a kit containing the standard make-up air and appropriate exhaust system piping and hoods for your application. The last piece of the complete package is a direct vent specific burner.

The Direct Vent Systems are a non-powered positive pressure vent hood system for gas or oil fired appliances that provides an outlet for exhaust gases and an intake for combustion air. The hood is designed to direct the hot exhaust gases away from the structure without the aid of a motorized fan. All of the internal parts in contact with the flue gases are made from corrosion resistant stainless steel.

NOTICE:

All equipment should be inspected upon delivery, and any damage or shortage should be reported to the supplier and shipper immediately.

DVF Vent System



#	DESCRIPTION	PART #
1	4” Tee with VRV	D-VRV-4
2	4” X 8’ Aluminum Flex Duct	D-4”ALUFLEX
3	6” x 4” boiler adapter	D-400312
4	4” x 24” pipe	D-4PVP-24
5	4” 90^{o} elbow	D-4PVP-E90
6	4” x 36” pipe	D-4PVP-36

#	DESCRIPTION	PART #
7	4” x 18” pipe extension	D-4PVP-18A
8	4” Concentric Vent Hood	D-400300
	1½ x 1 ½ x 1/2 Bull-Head Tee	D-BLRT151505
	Immersion Limit	CPO-220AP48-060C

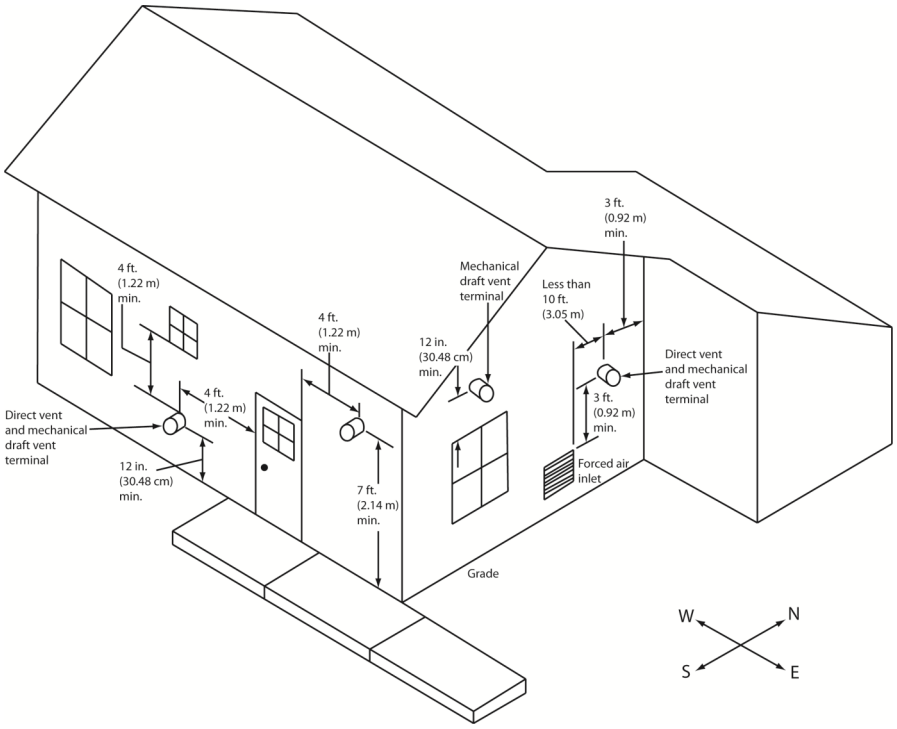
2.1 Installation of DV Oil Hood

CAUTION:

EXTERNAL VENT SURFACES ARE HOT.

NOTE:

USE ONLY LISTED COMPONENTS SUPPLIED WITH THE BOILER. SURFACE DISCOLORATION OF THE BUILDING MAY OCCUR DUE TO IMPROPER BOILER/BURNER ADJUSTMENT. QHT WILL NOT ACCEPT RESPONSIBILITY OR LIABILITY FOR SUCH DISCOLORATION.



The Exhaust Hood must be installed on the leeward side of house and conform to the following guidelines:

1. The Vent hood shall be installed 12” above ground level or 12” above nominal snow level of the region of the installation, which ever is higher.
2. The Vent hood shall not be less than 3 feet above any forced air inlet to the house.
3. The Vent hood shall not be less than 4 feet below, 4 feet horizontally, or 1 foot above any door, window or gravity inlet into any building.
4. The Vent hood shall not be less than 3 feet from any obstruction above the hood.
5. The Vent hood shall not be less than 3 feet from any obstructions horizontally in all directions.
6. The Vent hood shall not be less than 3 feet from an adjacent building.
7. The Vent hood shall be not less than 7 feet above grade when located adjacent to public walkway.
8. The Vent hood shall be located so that flue gasses are not directed to jeopardize people, overheat combustible structures, materials or enter buildings.
9. Minimum of 4’ horizontal clearance from electric meters, gas meters, regulators and relief equipment.
10. **All joints in system are to be sealed to prevent leakage of products of combustion in the building.**
11. Avoid installing exhaust hood on North, West, or prevailing wind side of the house.

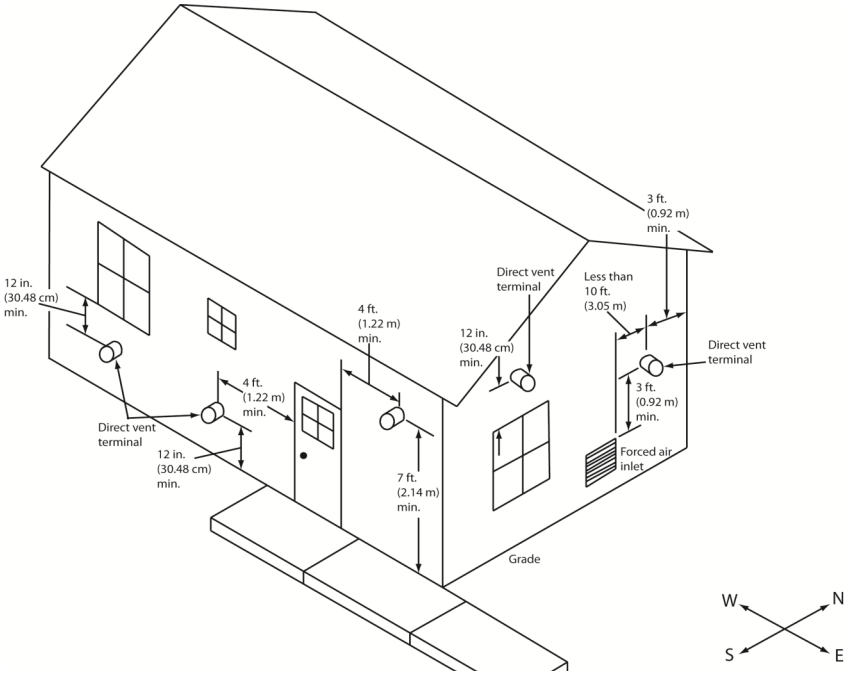
2.2 Installation of DV Gas Hood

CAUTION:

EXTERNAL VENT SURFACES ARE HOT.

NOTE:

USE ONLY LISTED COMPONENTS SUPPLIED WITH THE BOILER. SURFACE DISCOLORATION OF THE BUILDING MAY OCCUR DUE TO IMPROPER BOILER/BURNER ADJUSTMENT. QHT WILL NOT ACCEPT RESPONSIBILITY OR LIABILITY FOR SUCH DISCOLORATION.



The Exhaust Hood must be installed on the leeward side of house and conform to the following guidelines:

1. The Vent hood shall be installed 12” above ground level or 12” above nominal snow level of the region of the installation, which ever is higher.
2. The Vent hood shall not be less than 3 feet above any forced air inlet to the house.
3. The Vent hood shall not be less than 1 foot below, 1 foot horizontally, or 1 foot above any door, window or gravity inlet into any building.
4. The Vent hood shall not be less than 3 feet from the interior corner of a house.
5. The Vent hood shall not be less than 3 feet from any obstruction above the hood.
6. The Vent hood shall not be less than 3 feet from any obstructions horizontally in all directions
7. The Vent hood shall not be less than 2 feet from an adjacent building.
8. The Vent hood shall be not less than 7 feet above grade when located adjacent to public walkway.
9. The Vent hood shall be located so that flue gasses are not directed to jeopardize people, overheat combustible structures (decks), materials or enter buildings.
10. Minimum of 4’ horizontal clearance from electric meters, gas meters, regulators and relief equipment.
11. Avoid installing exhaust hood on North, West, or prevailing wind side of the house.

NOTE
The boiler shall be placed so that the vent pipe is as short as practical. The **VENT HOOD** must be installed at least one foot above ground level or normal snow accumulation level in an area which is free of obstruction at all times. The Vent hood should be installed on the leeward side of the house out of the wind. Outside air must be ducted directly to the burner through the hood unit supplied. **The Direct Vent System must be gas tight to avoid any leakage of exhaust gasses.**

CLEARANCES TO COMBUSTIBLES

	Clearance	
Vent Kit	Horizontal	Vertical
QHT DVF	1” (25 mm)	1” (25 mm)

Note: Clearances are based on an installation of QHT DVF vent system. Routing of vent pipe can be planned after the termination location is determined.

2.3 Exhaust Pipe System

The DVF System must be installed where provisions do not exist for the ducting of combustion products to the outside. **The direct vent connector shall not pass through any floor or ceiling.** The burner exhaust must be ducted directly to the vent hood through listed exhaust pipes provided. The exhaust pipe throughout it's entire length must be readily accessible for inspection, cleaning and replacement.

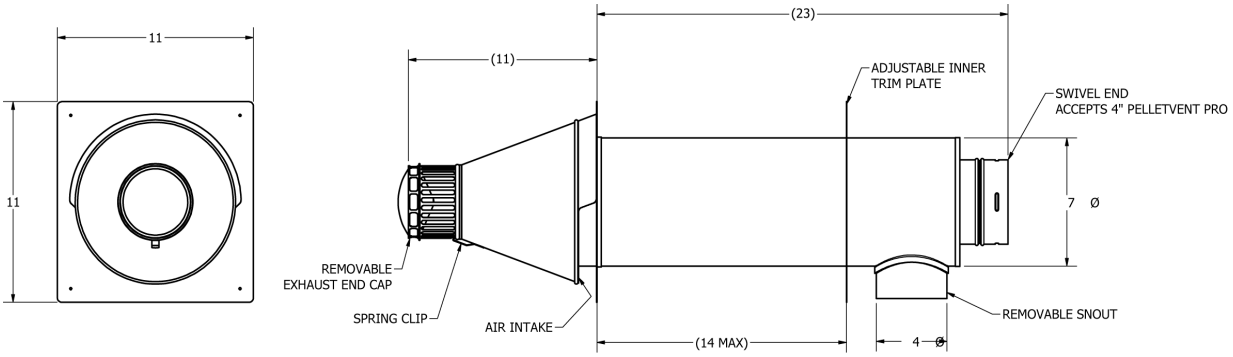
The venting system should be installed and supported in accordance with the National Fuel Gas Code, ANSI Z223.1, CAN/CGA B149 or in accordance with any local codes.

The Exhaust Kit consists of:

DVF System	
1 - 6” to 4” Boiler Adapter	1 - 4” x 36” vent pipe
2 - 4” 90 degree elbows	1 - 4” x 18” vent pipe adjustable extension
1 - 4” x 24” vent pipe	1 - 5” Concentric exhaust

Installation of DVF Exhaust:

1. Begin by locating a suitable location for the exhaust to breech the wall. This location should be at least 12” above ground level or the expected snow level, and on the leeward side of the house. Consult page 6 for required distances from windows, doors, etc.. **The hood location must also allow for a upward slope of a 1/4” per foot for the exhaust piping.**
2. Once the hood location has been determined, cut a 8” hole for a non combustible wall, or a 9” hole for a combustible wall. Using 2” X 2”, Frame a box around the hole on the outside of the house so the flange is mounted away from the siding. Attach the hood to the outside of the house using appropriate screws to support the hood. Use one screw through each of the predrilled holes on the trim plate of the hood. Do not drill or screw through the hood at all.
3. Once the hood is secure, mock up the rest of the vent kit. Start by fitting the boiler adapter onto the



boiler and securing it in place with the locking band on the adapter. Install the rest of the vent sections that are required to complete your job. Connect the next piece of pipe by pushing the female end of the pipe over the male end of the boiler adapter. Once the pipe is fully seated, twist the female end clockwise until the locking mechanism is engaged. Do not screw into the pipe or add sealant to the pipe as this could compromise the factory seal. Continue in this way until the entire kit is complete from the boiler to the vent hood. It is allowable to add extra sections of pipe to the vent kit up to 20’. Each 90 degree elbow is 3 equivalent feet and each 45 degree elbow is 1.5 equivalent feet.

4. Once you are satisfied with the fit of the exhaust, make sure that the vent pipe is properly supported every three feet with a upward slope to the hood of 1/4” every foot.

2.4 Installation of Make-up Combustion Air

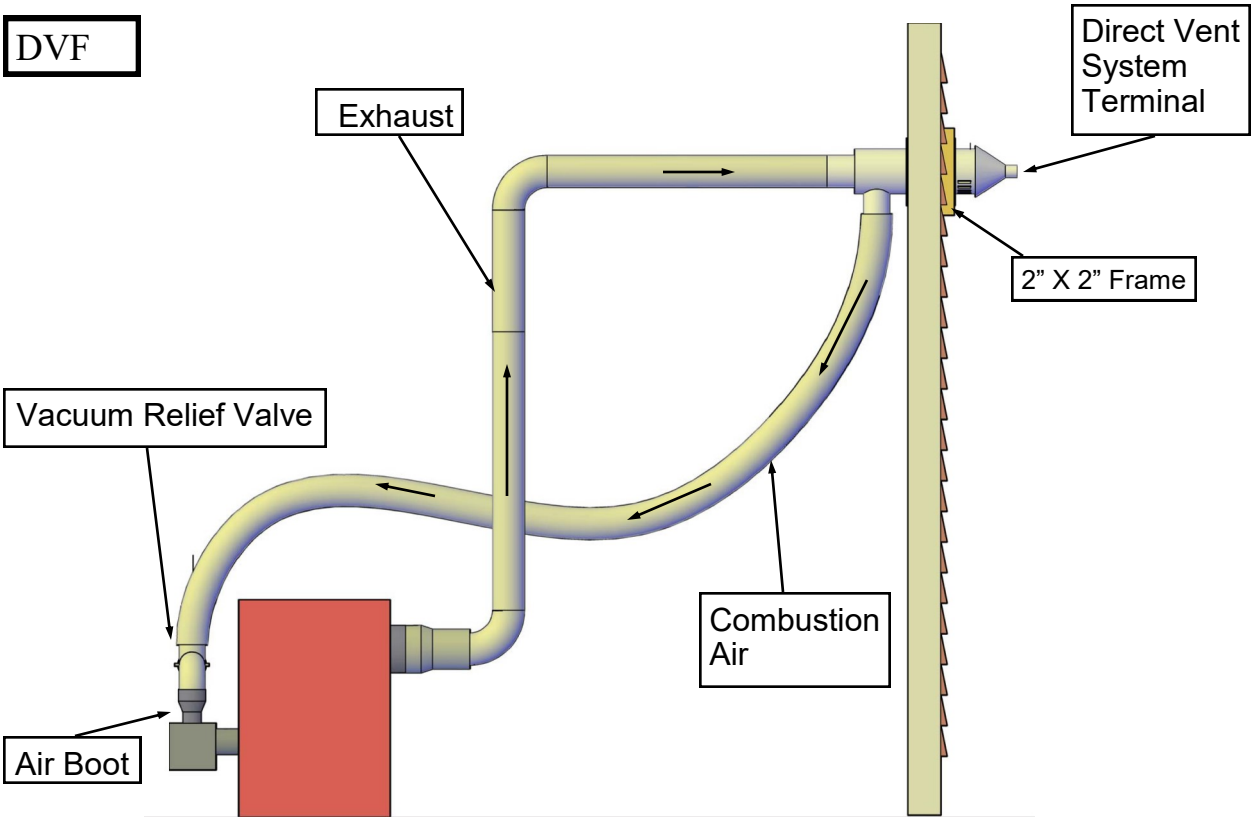
NOTICE

Do not operate the burner with air intake disconnected.

For DVF kits:

4. Use 4 inch diameter flex pipe that is provided in the kit or a comparable single wall metal pipe. The maximum allowable length of intake pipe is twenty feet not including elbows.
5. Begin installing the 4” tee to the burner (Riello requires the supplied 3” to 4” increaser to be installed first). Secure all joints on the intake with three screws each.
6. Install the supplied vacuum relief damper in the branch of the tee making sure that it is mounted with all labeling right side up and perfectly horizontal.
7. In the last run leg of the tee install the aluminum flex pipe.
8. Finally attach the other end of the flex pipe to the intake port on the concentric hood.
9. Inspect the intake system and make sure all connections are secure and then seal each joint with silicone or aluminum tape.

2.3 Vent System Diagram



3. Burner Setup Guidelines

In all boilers, regardless of fuel being burnt or configuration, a 10” X 10” Cerafiber pad should be installed under the flame. This pad is not for acoustic purposes, it is to keep the area under the nozzle warm to prevent flame out.

Good, reliable operation with a minimum of service, starts with attention to the small details:

Oil:

1. Setting the nozzle position and electrodes "by the book" using the manufacturer's guide lines.
2. Installing a quality micron filter before the burner
3. Making careful/tight flare connections, without couplings, on oil suction line.
4. Checking fuel pump pressure is set to specs on following page.
5. Setting the air band properly with well maintained instruments. A good target is 11% to 12.5% of (CO_2) or 6.5% to 3.8% of (O_2) with a zero smoke.

To ensure proper burner setup, gauges should be used to check things such as the pump pressure, CO_2 levels, etc…

Gas:

1. Checking the electrode, orifice size, and flame rod settings against manufacturer’s specs to insure proper operation.
2. Installing properly sized gas piping according to BTU input required and length of gas line run.
3. **Making sure there is proper manifold pressure before and after the gas valve using a calibrated manometer.**
4. Setting the air band properly with well maintained instruments. A good target is 9.0% to 9.5% of (CO_2) or 5% to 3.5% of (O_2) for natural gas, or 10.0% to 11.0% of (CO_2) or 5% to 3.5% of (O_2) for LP gas. CO readings should always be less than 100 ppm.

3.1 B-10 Oil Burner Setup

BURNER MANUFACTURER Beckett NX (NEC 1101, 1102, 1103)

Boiler Model	B10 - 3*	B10 - 4*	B10 - 5*	B10 - 6*
Burner Model	NEC - 1102	NEC - 1101	NEC - 1101	NEC - 1103
Firing Rate	0.55	0.90	1.00	1.20
Insertion Depth	3.5”	6.0”	6.0”	6.0”
Nozzle	.40 X 60°	.65 X 60°	.75 X 60°	.90 X 60°
Spray Pattern	hollow	solid	solid	W
Pump Pressure	180 psi	180 psi	180 psi	180 psi
Head Type	6 slot	9 slot	9 slot	9 slot
Head Position	1.25	3	4	4.25
Air Setting	N/A	N/A	N/A	N/A

BURNER MANUFACTURER Riello BF3 and BF5

Boiler Model	B10-3	B10-4	B10-5	B10-6
Burner Model	BF-3	BF-3	BF-5	BF-5
Firing Rate	0.55	0.80	1.00	1.25
Insertion Depth	3.5”	3.5"	3.0"	3.0"
Nozzle	.5 X 80	.65 X 80	.85 X 60	1.00 X 60
Spray Pattern	W	W	W	W
Pump Pressure	145 psi	145 psi	145 psi	145 psi
Turbulator	2	3	2	3
Air Gate	3.2	4.7	3.4	5

BURNER MANUFACTURER Carlin EZ1-HP-DV

Boiler Model	B10-3	B10-4	B10-5	B10-6
Burner Model	EZ1-HP-DV	EZ1-HP-DV	EZ1-HP-DV	EZ1-HP-DV
Firing Rate	0.50	0.80	1.00	1.25
Insertion Depth	3.0”	3.0”	3.0"	3.0"
Nozzle	.40 X 45	.65 X 70	.85 X 60	1.00 X 60
Spray Pattern	A	A	A	A
Pump Pressure	155 psi	150 psi	150 psi	150 psi
Turbulator	.50	.60/.65	.85/1.00	.85/1.00
Air Gate	.5	.75	1.00	1.20

*** - These burners are not approved for use in Canada on Biasi equipment**

3.2 SG Oil Burner Setup

BURNER MANUFACTURER Beckett NX (NEC 1201, 1202)			
Boiler Model	SG-2*	SG-3*	SG-4*
Burner Model	NEC - 1201	NEC - 1202	NEC - 1202
Firing Rate	0.65	1.00	1.30
Insertion Depth	3.5”	6.0”	6.0”
Nozzle	.50 X 60°	.75 X 60°	1.00 X 60°
Spray Pattern	hollow	solid	solid
Pump Pressure	180 psi	180 psi	180 psi
Head Type	6 slot	9 slot	9 slot
Head Position	1.50	3.50	4.25

BURNER MANUFACTURER Riello BF3 and BF5			
Boiler Model	SG-2	SG-3	SG-4
Burner Model	BF-3	BF-5	BF-5
Firing Rate	0.65	1.00	1.30
Insertion Depth	5.0"	5.0"	5.0"
Nozzle	.55 X 70	.85 X 60	1.10 X 80
Spray Pattern	solid	solid	solid
Pump Pressure	145 psi	145 psi	145 psi
Turbulator	0.5	1.0	2
Air Gate	4.5	4.0	5.6

*** - These burners are not approved for use in Canada on Biasi equipment**

3.3 B10 Gas Burner Setup

Carlin			Natural Gas		
Boiler Model	Burner Model	Input (MBH)	Man. Pres. (W.C.)	Orifice	Air Gate
B-3	EZ-GAS-WC	80	3.50”	#11 (.191”)	30%
B-4	EZ-GAS-WC	110	3.50”	#1 (.228”)	40%
B-5	EZ-GAS-WC	140	3.50”	Let F (.257”)	20%
B-6	EZ-GAS-WC	175	3.50”	5/16” (.312”)	36%

Carlin			Propane		
Boiler Model	Burner Model	Input (MBH)	Man. Pres. (W.C.)	Orifice	Air Gate
B-3	EZ-GAS-WC	80	3.50”	#25 (.150”)	30%
B-4	EZ-GAS-WC	110	3.50”	#15 (.180”)	48%
B-5	EZ-GAS-WC	140	3.50”	#5 (.206”)	20%
B-6	EZ-GAS-WC	175	3.50”	1/4” (.250”)	41%

To determine how much gas is coming into the burner, or to set the gas meter correctly, the following formula can be used.

Ft^3/hr = [3600/(sec. Per rev.)]*(Size of gas meter)

The chart to the right can be used to determine the flow rate depending upon the time per revolution and the size of the gas meter dial.

Seconds per Revolution	Size of Gas Meter Dial (Cubic Foot)		
	0.5	1	2
20	90	180	360
25	72	144	288
30	60	120	240
35	51	103	206
40	45	90	180
45	40	80	160
50	36	72	144
55	33	65	131
60	30	60	120

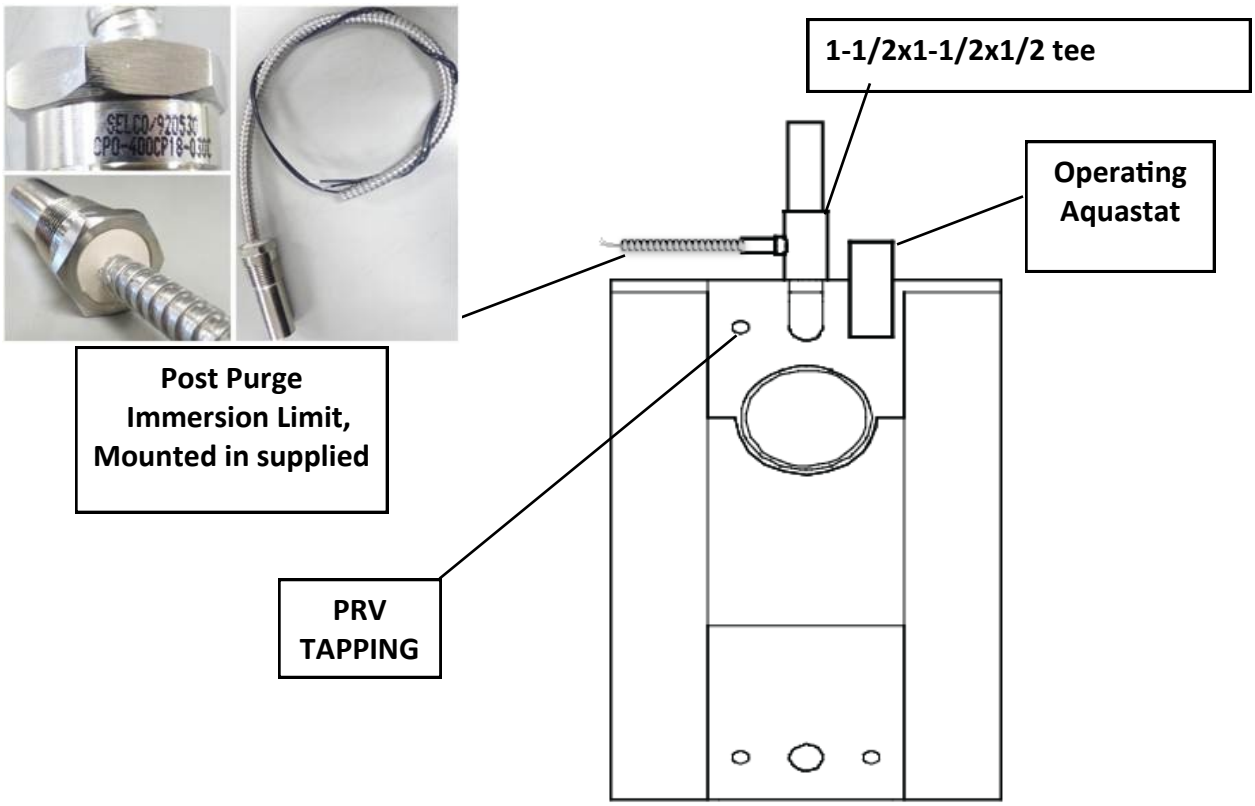
4. Wiring

The electricity to the boiler shall come from a dedicated breaker in the electric service box. A service switch should be mounted on the side of the boiler so the burner technician can service the burner and controls. The electrical wiring should be routed so as not to interfere with normal servicing of the boiler. Wiring done in the field between devices not attached to boiler shall conform with the temperature limitations for type T wire (63F/35C) or other specified wire as applicable when installed in accordance to manufacturer's instructions and wiring diagrams.

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 or Canadian Electrical Code Part I,CSA C22.1, Electrical Code.

The Post Purge Immersion Limit is installed to ensure that if the boiler exceeds 220° F, all power is disconnected to the burner. The Limit should be mounted on the supply side of the boiler into the supplied tee. To wire the post purge Limit please refer to the schematics for your specific burner on the following pages.

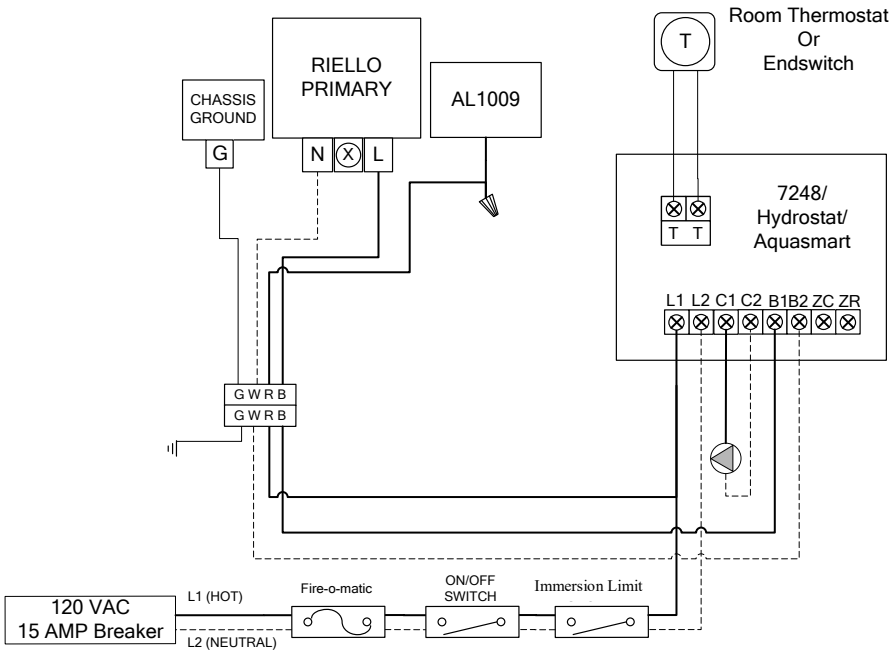
POST PURGE and HIGH LIMIT CONTROL



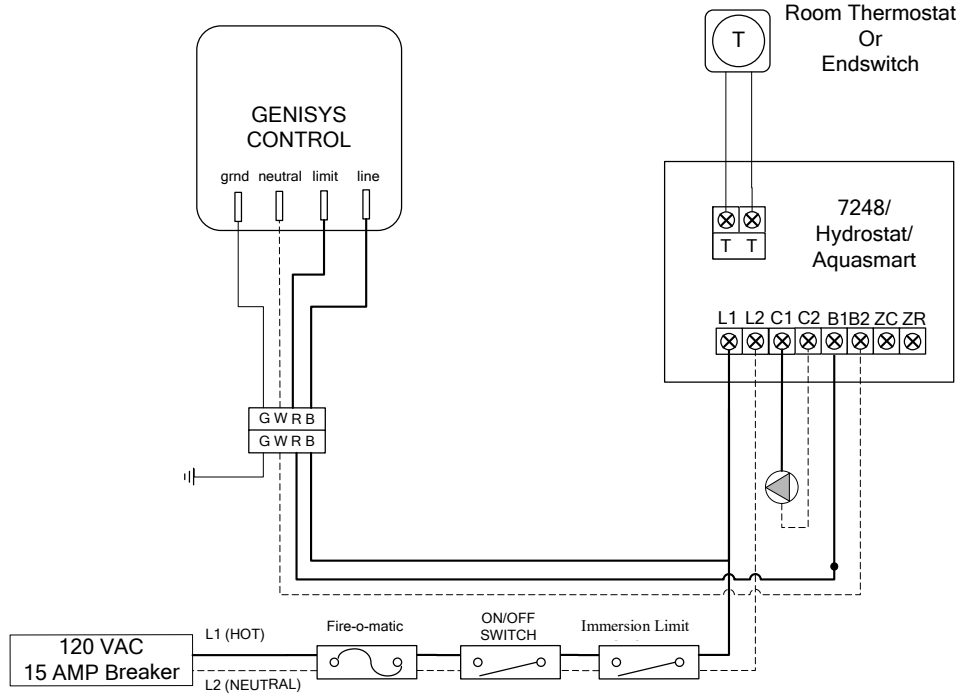
The post purge immersion limit must be mounted in the $1^{1}/_{2}$ x $1\ ^{1}/_{2}$" x 1/2" tee supplied with DVH Trim Kit.

4. Oil Burner Wiring

RIELLO OIL, 7248/Hydrostat/Aquasmart, control wiring



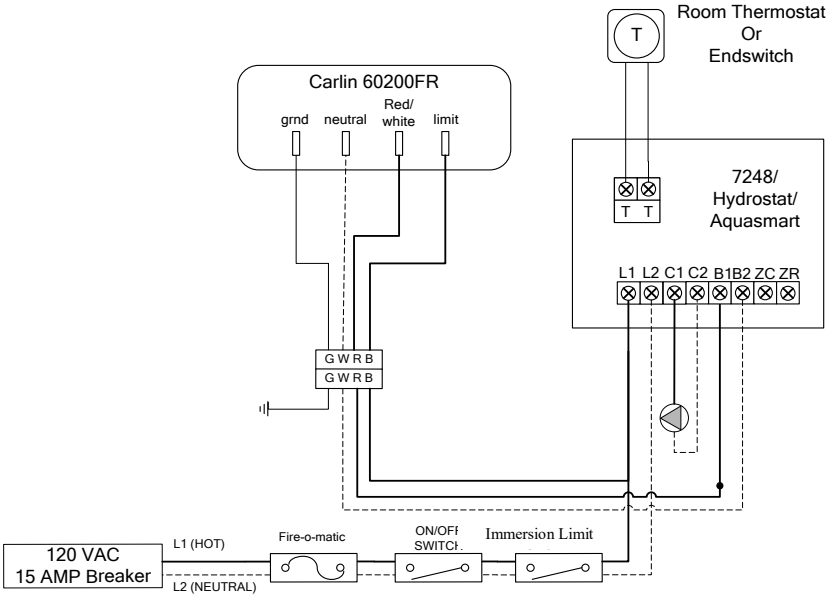
Beckett OIL, 7248/Hydrostat/Aquasmart, control wiring



Note 2: All wiring must be done in accordance with applicable state, local and national codes. Use only copper conductors.

4. Gas Burner Wiring

Carlin EZ-GAS-WC, 7248/Hydrostat/Aquasmart, control wiring



Note 2: All wiring must be done in accordance with applicable state, local and national codes. Use only copper conductors.

5. System Start-up

"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.

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Refer to the user's information manual provided with this boiler. Installation and service must be performed by a qualified installer, service agency or the gas supplier

WARNING: If installed as a direct vent boiler, make sure after service that both the vent intake and exhaust are both properly reinstalled and sealed.

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.

A) 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 you r building
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you can not reach your gas supplier call the fire department

B) 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 .
2) Set thermostat to lowest setting
3) Turn off all electric power to the appliance
4) Do not attempt to light the burner by hand
5) Smell for gas, including near the floor. **If you smell gas, STOP!** Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
6) Turn on all electric power to the appliance.
7) Set thermostat to the desired setting.
8) Once the system is lit, inspect the entire installation.
9) Make sure the pressure in the boiler is stable.
10) Test both high limits by lowering their set points below the temperature of the boiler one at a time. If either aquastat fails to shut the burner down replace it immediately.
11) Simulate a loss of fuel by shutting the oil valve. Once the valve is closed the burner should go into post –purge and then lockout.
12) Reset the burner before turning the oil back on to simulate ignition failure. After ignition failure the burner should go through a purge period and then lookout.
13) Open the oil valve and return the burner to operation. While the burner is running, trip the breaker at the panel, that should disable the burner and all other heating controls.
14) Once it is determined that the system is operating properly, proceed to tuning up the burner using the proper instruments. If you do not have any instruments, do not place this unit in operation until you have a competent burner technician tune up the burner.

6. Installation Inspection

Recommended procedures for safety inspection of an appliance should be in accordance with the National Fuel Gas Code, ANSI Z223.1. The following procedure will help evaluate the venting system. It is intended as a guide to aid in determining that the venting system is properly installed and is in a safe condition for continuous use. This procedure should be recognized as a generalized procedure which cannot anticipate all situations. Accordingly, in some cases, deviation from this procedure may be necessary to determine safe operation of the equipment. If it is determined that a condition exists which could result in unsafe operation, the appliance should be shut off and the owner advised of the unsafe condition. Corrections must be made before the appliance is put into continuous operation. The following steps should be followed in making a safety inspection.

1. Visually inspect the venting system for proper size and determine that there is no flue gas spillage, blockage, restriction, leakage, corrosion, or other deficiency which could cause an unsafe operation.
2. Place in operation the appliance being inspected. Follow the lighting instructions and adjust thermostat so appliance will operate continuously.
3. Determine that the burner is operating properly and that the burner ignition operates satisfactorily by interrupting and re-establishing the electrical power of the appliance in any convenient manner. Test the burner safety device to determine if it is operating properly by disconnecting the flame safety circuit.
4. Test for smoke spillage at the burner inlet air location around the VRV after 5 minutes of operation. Use a draft gauge, flame of a match or candle, or smoke from a cigarette, cigar or pipe. Shut off appliance thermostat and check for spillage around the VRV. If a flow reversal is noticed, house depressurization is occurring and make up air is required.

Once installation is complete, check the boiler with instruments to ensure that it is working properly.

7. Service & Maintenance

In order to ensure that the boiler is operating properly, it should be inspected annually at the beginning of the heating season by a qualified service technician. Failure to do regular maintenance on the boiler, could result in a loss of system efficiency as well as equipment failure.

1) Turn off all electrical power to the boiler before servicing any part of the boiler.
2) During the inspection process, the technician should inspect and correct problems that the owner has noted.
3) Check the area around the boiler to ensure that no combustibles are in the area.
4) Remove any obstruction from the ventilation and combustion air openings to the boiler room. Check to ensure that the openings are open.
5) Check the boiler vent discharge and air intake to ensure that they are unobstructed. If obstructions exist, remove.
6) Visually check the entire flue gas venting system for blockages, deteriorations and leakages. Repair any problems that are found in accordance with local or national codes. (Failure to repair leakages can result with CO (Carbon Monoxide) Poising which can lead to death.)
7) Disconnect vent pipe from the breeching and remove front upper and lower door. Use a light to inspect the boiler heating surfaces. If signs of soot are showing, clean boiler heating surfaces with a wire brush and vacuum any debris in the boiler.
8) Reconnect the vent pipe to the breeching. Put silicon back onto the joint and tighten the clamps before re-commissioning the boiler.
9) With the power to the boiler still off, remove the burner and follow manufactures instructions for cleaning.
10) Before putting burner back onto the boiler, check the insulation on the door. If the insulation is damaged or displaced, do not operate the boiler until the insulation has been repaired or replaced. (Failure to replace damaged insulation can result in a fire hazard and can cause personal injury or death, and can cause substantial property damage.)
11) Return the boiler to normal operation and check all controls before leaving the job.