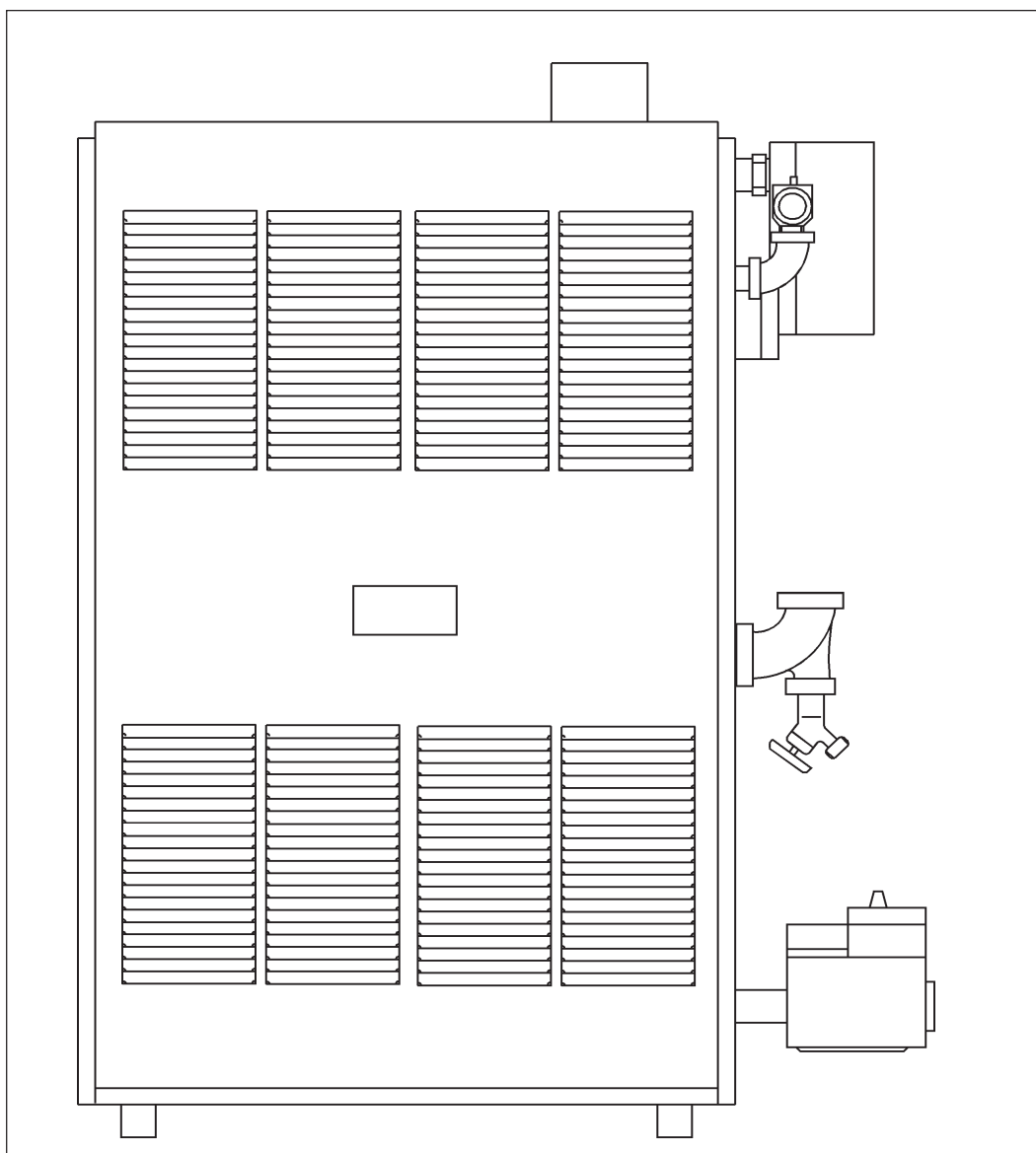


DV-B

GAS FIRED BOILERS
FOR FORCED HOT WATER



Utica Boilers • P.O. Box 4729 • Utica, NY 13504

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KEEP THIS MANUAL NEAR BOILER
RETAIN FOR FUTURE REFERENCE

SERIES DV-B
CAST IRON
GAS FIRED BOILERS

INSTALLATION MANUAL AND
OPERATING INSTRUCTIONS

Published May 1999
Printed in USA
Made in USA

Safety Symbols

The following defined symbols are used throughout this manual to notify the reader of potential hazards of varying risk levels.

DANGER

DANGER - Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

WARNING

WARNING - Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.


CAUTION

CAUTION - Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT! READ ALL INSTRUCTIONS BEFORE INSTALLING.

WARNING:

1. Keep boiler area clear and free from combustible materials, gasoline and other flammable vapors and liquids.
2. **DO NOT** obstruct air openings to the boiler room.
3. Modification, substitution or elimination of factory equipped, supplied or specified components may result in property damage, personal injury or the loss of life.
4. To the owner: Installation and service of this boiler must be performed by a qualified installer.
5. To the installer: Leave all instructions with the boiler for future reference.
6. When this product is installed in the Commonwealth of Massachusetts the installation must be performed by a Licensed Plumber or Licensed Gas Fitter.

 **WARNING:** **ALL INSTALLATIONS OF BOILERS AND VENTING SHOULD BE DONE ONLY BY A QUALIFIED EXPERT AND IN ACCORDANCE WITH THE APPROPRIATE UTICA BOILERS MANUAL. INSTALLING OR VENTING A BOILER OR ANY OTHER GAS APPLIANCE WITH IMPROPER METHODS OR MATERIALS MAY RESULT IN SERIOUS INJURY OR DEATH DUE TO FIRE OR TO ASPHYXIATION FROM POISONOUS GASES SUCH AS CARBON MONOXIDE WHICH IS ODORLESS AND INVISIBLE.**

INSTALLATION PROCEDURE



WARNING:

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.

1. The installation must conform to the requirements of the authority having jurisdiction or, in absence of such requirements, to the latest revision of the National Fuel Gas Code, ANSI Z223-1. (Available from the American Gas Association, Pleasant Valley Road, Cleveland, Ohio 44134.) Reference should also be made to local gas utility regulations and other codes in effect in the area in which the installation is to be made.

2. Where required by the authority having jurisdiction, the installation must conform to American Society of Mechanical Engineers Safety Code for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME No. CSD-1.

3. This boiler is classified as a Category I and III and vent installation shall be in accordance with Part 7 of the latest revision of the National Fuel Gas Code, ANSI Z223.1 or applicable provisions of the local building codes.

4. LOCATE BOILER on level, solid base as near the outside wall as possible and centrally located with respect to the heat distribution system as practicable.

5. Allow 24 inches at the front and right side for servicing and cleaning.

6. When installed in utility room, the door should be wide enough to allow the largest boiler part to enter, or to permit replacement of another appliance such as a water heater.

7. The boiler shall be installed such that the gas ignition system components are protected from water, (dripping, spraying, rain, etc.), during appliance operation and service, (circulator replacement, condensate trap, control replacement, etc.).

8. FOR INSTALLATION ON NON-COMBUSTIBLE FLOORS ONLY. *The boiler must not be installed on carpeting. Minimum clearances to combustible constructions are:

TOP	18 IN.
FRONT	ALCOVE
FLUE CONNECTOR	6 IN.
REAR	4 IN.
CONTROL SIDE	9 IN.
OTHER SIDE	3 IN.

NOTE : GREATER CLEARANCES FOR ACCESS SHOULD SUPERSEDE FIRE PROTECTION CLEARANCE.

* FOR INSTALLATION ON COMBUSTIBLE FLOORING SPECIAL BASE PART NO.325-2-8.00 MUST BE USED.

VENTILATION & COMBUSTION AIR



WARNING: AIR OPENINGS TO COMBUSTION AREA MUST NOT BE OBSTRUCTED. BY FOLLOWING THE INSTRUCTIONS BELOW, ADEQUATE COMBUSTION AIR CAN BE MAINTAINED.

COMBUSTION AIR REQUIREMENTS (MINIMUM SQUARE INCHES OPENING)				
MODEL NUMBER	*UNCONFINED AREA		**CONFINED AREA	
	OUTSIDE COMBUSTION AIR 1 SQ. IN. /5000 BTU/HR (SEE PAR. #2)	INSIDE COMBUSTION AIR 1 SQ. IN. /1000 BTU/HR (SEE FIG. 1)	OUTSIDE COMBUSTION AIR	
			VERT. DUCTS 1 SQ. IN. /4000 BTU/HR (SEE FIGS. 2 & 3)	HORZ. DUCTS 1 SQ. IN. /2000 BTU/HR (SEE FIG. 4)
DV 50B	10	100	13	25
DV 75B	15	100	19	38
DV 100B	20	100	25	50
DV 125B	25	125	32	63
DV 150B	30	150	38	75
DV 175B	35	175	44	88
DV 200B	40	200	50	100

* Unconfined area: A space whose volume is not less than 50 cubic feet per 1000 BTU per hour of all appliances installed in that space (cubic feet of space = height x width x length).

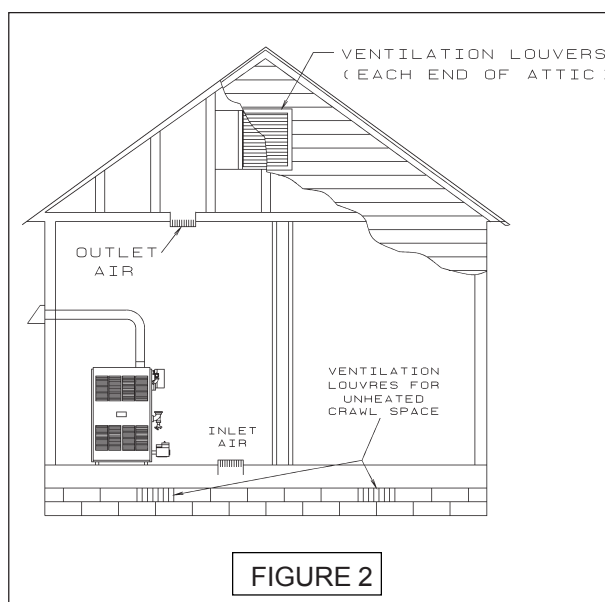
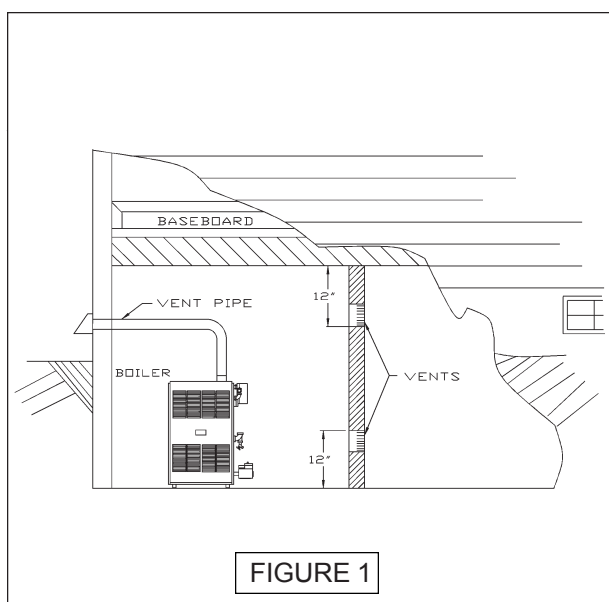
** Confined area: A space whose volume is less than 50 cubic feet per 1000 BTU per hour of all appliances installed in that space (cubic feet of space = height x width x length).

1. Ventilation of the boiler room must be adequate to provide sufficient air to properly support combustion per the latest revision of the National Fuel Gas Code, ANSI Z223.1 section 5.3.

2. When a boiler is located in an unconfined space in a building or conventional construction frame, masonry or metal building, infiltration normally is adequate to provide air for combustion and ventilation. However, if the equipment is located in a building of unusually tight construction (See the national Fuel Gas Code, Ansi Z223.1 section 1.7), the boiler area should be considered as a confined space. In this case air for combustion and ventilation shall be provided according to part 5 on page 4. If there is any doubt, install air supply provisions in accordance with the latest revision of the National Fuel Gas Code.

3. When a boiler is installed in an unconfined space, in a building of unusually tight construction, air for combustion and ventilation must be obtained from outdoors or from spaces freely communicating with the outdoors. A permanent opening or openings having a total free area of not less than 1 square inch per 5,000 BTU per hour of total input rating of all appliances shall be provided. Ducts may be used to convey makeup air from the outdoors and shall have the same cross-sectional area of the openings to which they are connected.

4. When air for combustion and ventilation is from inside buildings, the confined space shall be provided with two permanent openings, one starting 12 inches from the top and one 12 inches from the bottom of the enclosed space. Each opening shall have a minimum free area of 1 square inch per one thousand (1000) BTU per hour of the total input rating of all appliances in the enclosed space, but must not be less than one hundred (100) square inches. These openings must freely communicate directly with other spaces of sufficient volume so that the

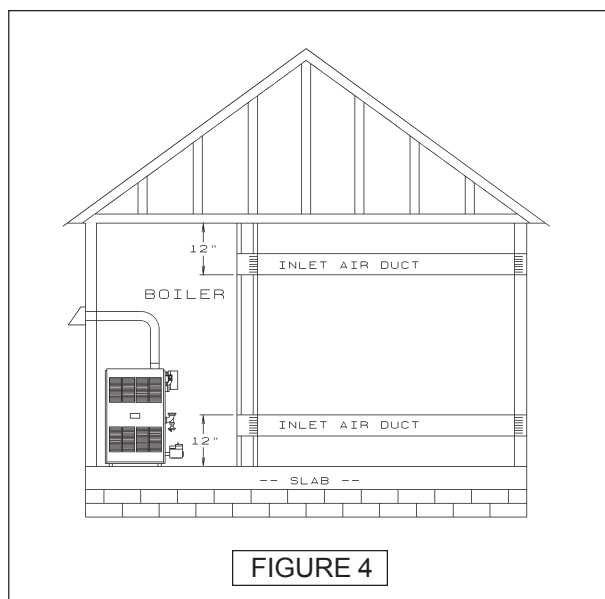
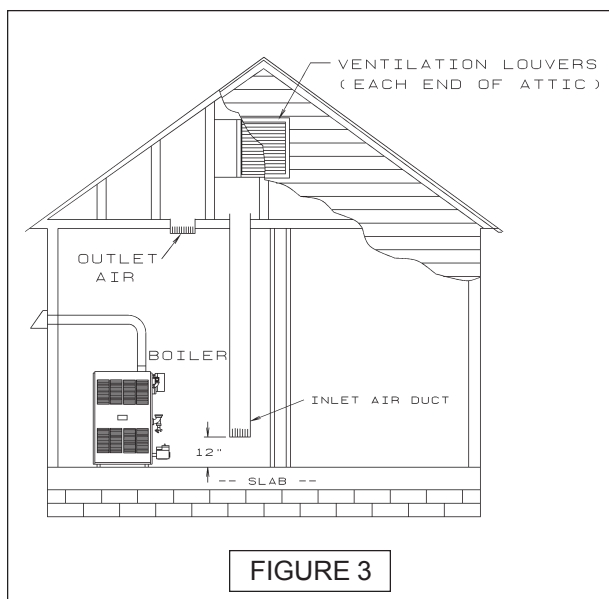


combined volume of all spaces meets the criteria for an unconfined space.

5. When the boiler is installed in a confined space and all air is provided from the outdoors the confined space shall be provided with one or two permanent openings according to methods A or B. When ducts are used, they shall be of the same cross sectional area as the free area of the area of the openings to which they connect. The minimum dimension of rectangular air ducts shall be not less than 3 x 3 inches or 9 square inches.

A. When installing two openings, one must commence within 12 inches from the top and the other within 12 inches from the bottom of the enclosure. The openings shall communicate directly, or by ducts, with the outdoors or spaces (crawl or attic) that freely communicate with the outdoors. One of the following methods must be used to provide adequate air for ventilation and combustion.

1. When directly communicating with the outdoors, each opening shall have a minimum free area of 1 square inch per 4,000 BTU per hour of total input rating of all equipment in the enclosure. See figure 2 above.



2. When communicating with the outdoors by means of vertical ducts, each opening shall have a minimum free area 1 square inch per 4,000 BTU per hour of total input rating of all appliances in the enclosed space. See figure 3 above.

3. If horizontal ducts are used, each opening and duct shall have a minimum free area 1 square inch per 2,000 BTU per hour of total input rating of all appliances in the enclosed space. See figure 4 above.

B. One permanent opening, commencing within 12 inches of the top of the enclosure, shall be permitted where the equipment has clearances of at least 1 inch from the sides, 1 inch from the back, and 6 inches from the front of the boiler. The opening shall directly communicate with the outdoors or shall communicate through a vertical or horizontal duct to the outdoors or spaces (crawl or attic) that freely communicate with the outdoors. The openings must have a minimum free area of 1 square inch per 3000 Btu per hour of the total input rating of all equipment located in the enclosure. The free area must be no less than the sum of the areas of all vent connectors in the confined space.

6. In calculating free area using louvers, grilles or screens for the above, consideration shall be given to their blocking effect. Screens used shall not be smaller than 1/4 inch mesh. If the free area through a design of louver or grill is known, it should be used in calculating the size opening required to provide the free area specified. If the design and free area is not known, it may be assumed that wood louvers will have 20-25% free area and metal louvers and grilles will have 60-75% free area. Louvers and grilles should be fixed in the open position or interlocked with the boiler so they are opened automatically during the boiler operation.

CONNECTING SUPPLY AND RETURN PIPING

IMPORTANT: Circulators in the following illustrations are mounted on the system supply side, but mounting on the system return side is also acceptable practice.

1. Connect supply and return piping as suggested in figure 5, below. When the boiler is used in connection with refrigerated systems:

A. The chilled medium **MUST BE IN PARALLEL** with the boiler.

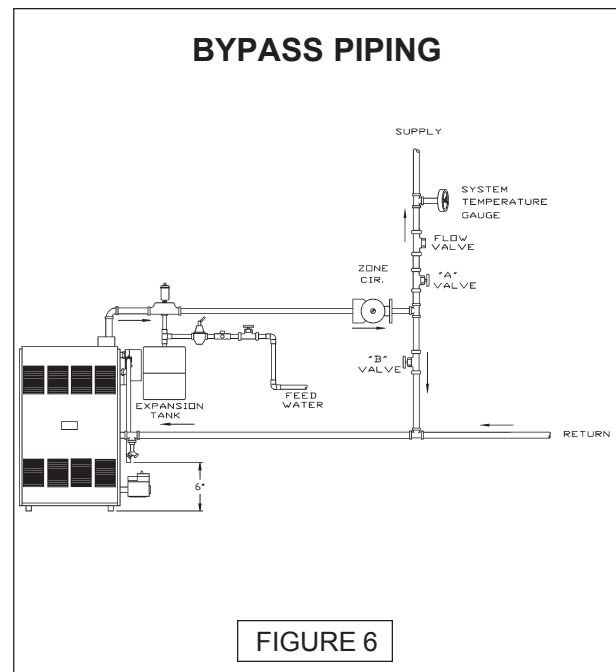
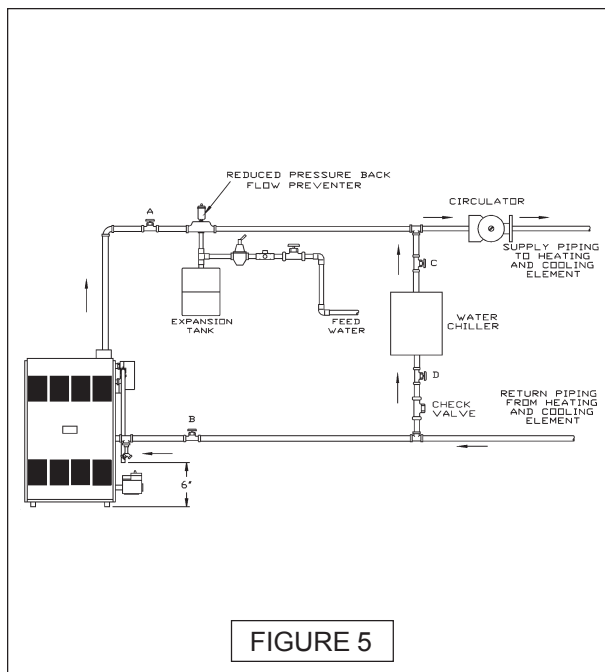
B. Use appropriate valves to prevent the chilled medium from entering the heating boiler.

1. During heating cycle open valves A and B. Close valves C and D.

2. During cooling cycle open valves C and D, close valves A and B.

C. Maintain a minimum clearance of one inch to hot water pipes.

In air handling units where they may be exposed to refrigerated air circulation, the boiler piping system **MUST** be supplied with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.



2. Hot water boilers installed above radiation level must be provided with a low water device either as part of the boiler or at the time of boiler installation.

3. When a boiler is connected to a heating system that utilizes multiple zoned circulators, each circulator must be supplied with a flow control valve to prevent gravity circulation.

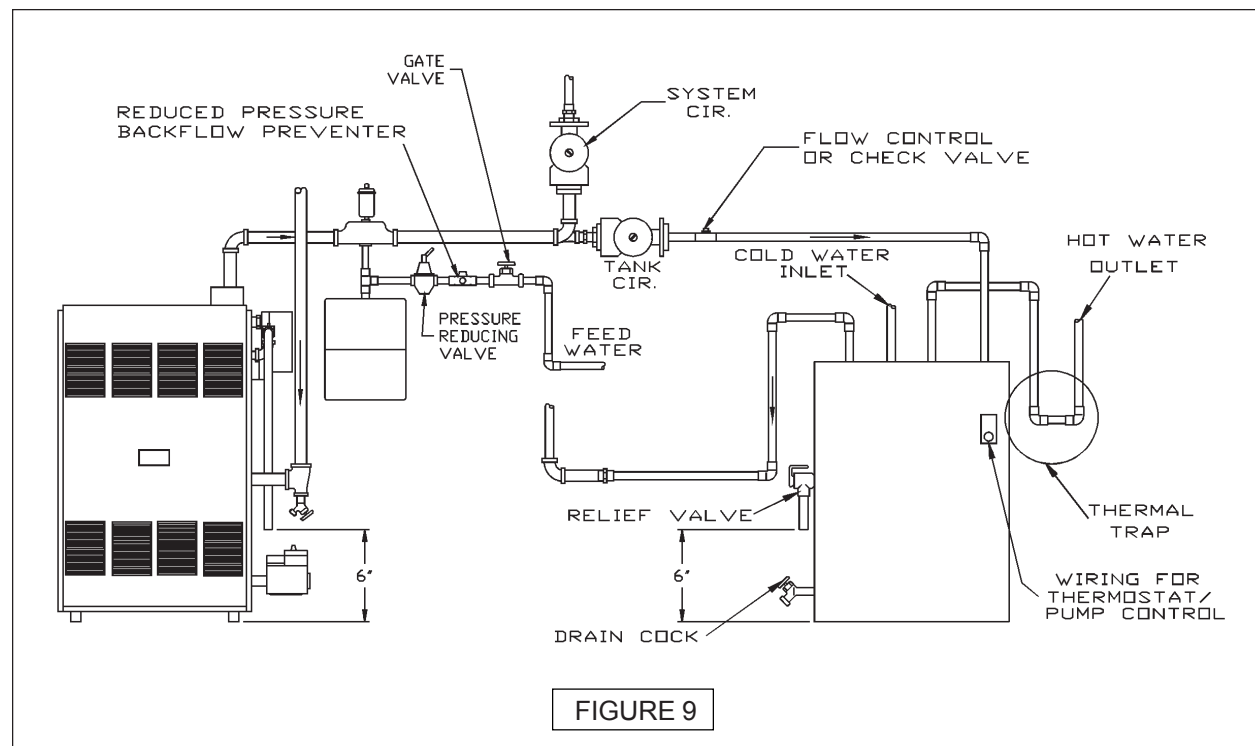
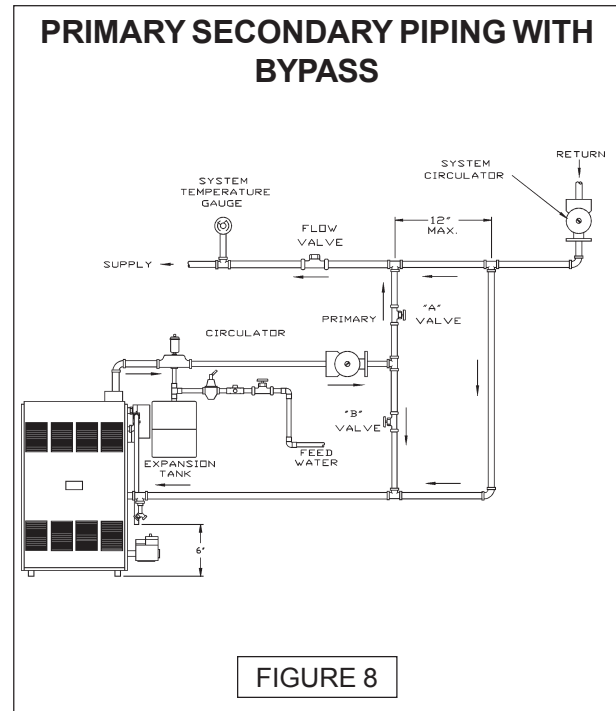
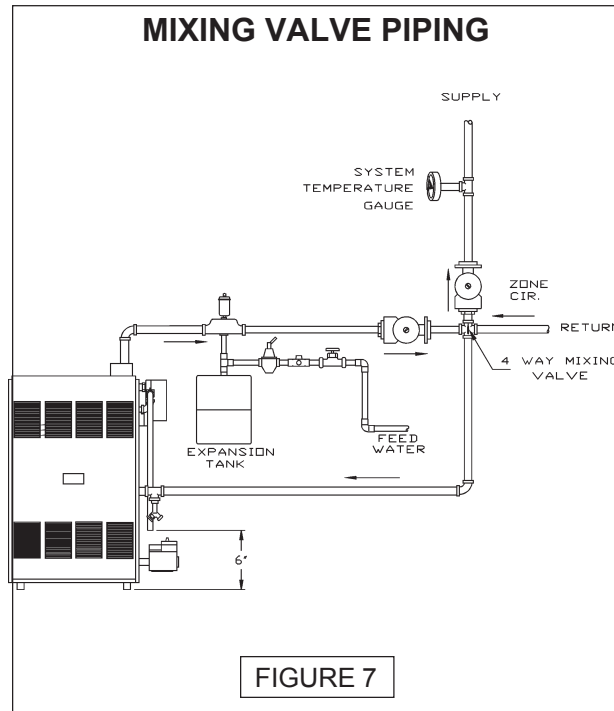
* Reduced pressure back flow preventer must be present under provisions required by the Environmental Protection Agency, (EPA).

4. Bypass piping is an option which gives the ability to adjust the supply boiler water temperature to fit the system or condition of the installation. Although, this method of piping is not typically required for baseboard heating systems.

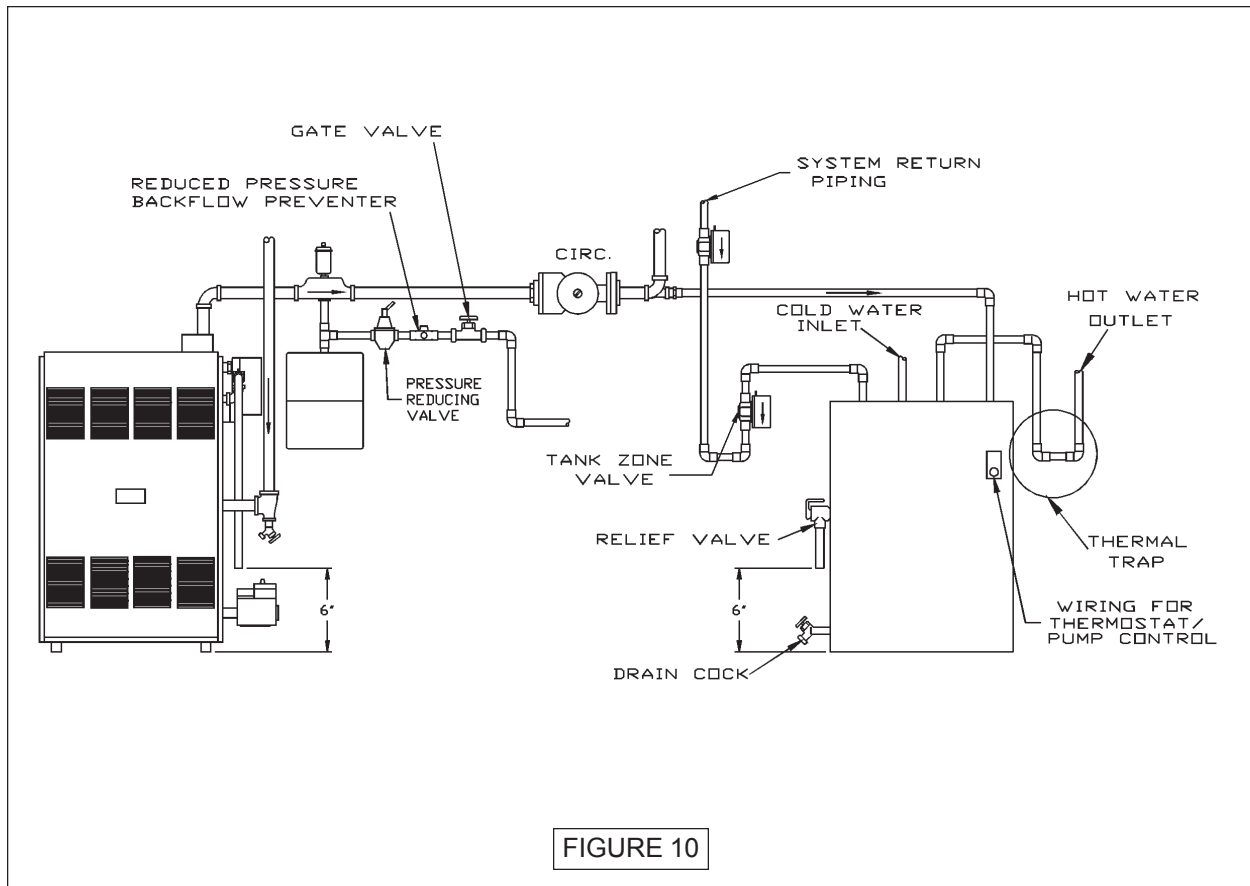
A. This method is used to protect boilers from condensate forming due to low temperature return water. Generally noticed in large converted gravity systems or other large water volume systems. See figure 6 above.

B. This method is used to protect systems using radiant panels and the material they are encased in from high temperature supply water from the boiler. And protect the boiler from condensate. See figure 7 & 8 below.

C. This method is used to protect boilers from condensate forming as well as protecting the heating system from high water temperatures See figure 8 below.



5. Note: When using bypass piping, adjust valves A and B until desired system temperature is obtained
6. Bypass loop piping must be same size piping for the supply and the return.
7. Typical installation using circulators is shown in figure 9, on page 7.
8. Typical installation using zone valves is shown in figure 10, below.
9. For further piping information refer to the I=B=R installation and piping guide.



APPLICABLE FEDERAL CODES

NFPA 54/ANSI Z223.1, National Fuel Gas Code (Part 7) and NFPA/ANSI211, Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances. These codes contain information on special gas vents for Category II, III and IV appliances, vent sizing, location, air space clearances to combustibles and safe installation practices. The gas vent installer should be familiar with these Federal Codes as well as Local Codes and Regulations.

GENERAL INFORMATION GAS VENTS AND APPLIANCES:

By Federal Codes, gas appliances are categorized by the pressure and temperature of the flue gas vented from the appliance. Category I and II appliances are natural draft (draft hood) vented, with high flue gas temperatures (Category I), and low flue gas temperatures (Category II). Category III and IV appliances are fan forced vents with high temperature (Category III) and low temperature (Category IV) flue gasses. Appliance efficiency is directly related to flue gas temperature. Higher efficiency appliances remove more heat from the gas, so they will have lower temperature flue products. When flue gas temperatures are lowered, corrosive condensates may form in the gas vent or in the appliance. Condensates may form in Category II, III, IV appliance vents, so special, corrosive resistant venting systems are required for higher efficiency appliances.



WARNING:

Vents for Category I appliances may not be suitable for use with Category II, III, or IV appliances because condensate may corrode the vent.



WARNING:

Vents for Category III appliances may not be suitable for use with Category I appliances because flue gas temperatures may be too high.

Proper operation of the vent system and appliance is dependent upon the use of all parts specified by the manufacturer for use in the particular installation. Appliance and vent system performance may be affected by improper assembly.

SEE VENTING ADDENDUM FOR VENT PIPE INSTALLATION AND COMPONENTS.

VENT PIPE MODIFICATION

When an existing boiler is removed from a common venting system, the common venting system is likely to be too large for the proper venting of the appliances remaining connected to it. If this situation occurs, the following test procedure must be followed:

REMOVAL OF BOILER FROM VENTING SYSTEM

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 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. 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 appliance will operate continuously.

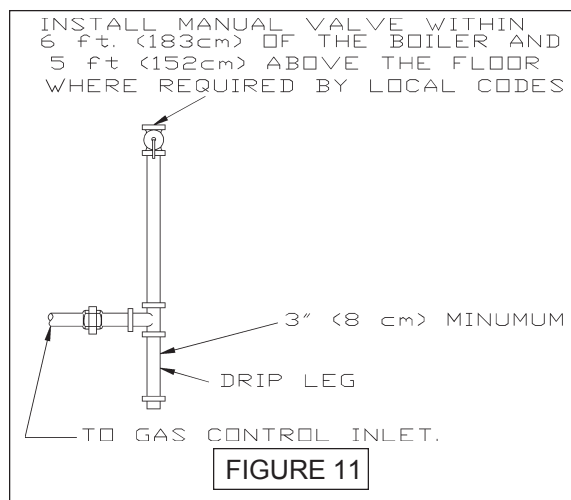
(E) Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar or pipe.

(F) After it has been determined that each appliance remaining connected to a common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas burning appliance to their previous conditions of use.

(G) Any improper operation of the common venting system should be corrected so the installation conforms with the latest revision of the National Fuel Gas Code, ANSI Z223.1. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined using the appropriate tables in appendix G in the latest revision of the National Fuel Gas Code, ANSI Z223.1.

CONNECT GAS SERVICE

Connect gas service meter to control assembly in accordance with the latest revision of the ANSI Z223.1 and local codes or utility. A ground joint union should be installed for easy removal of gas control for servicing. A drip or trap must be installed at the bottom of a vertical section of piping at the inlet to the boiler. A pipe compound resistant to the action of liquefied petroleum gases must be used on all threaded pipe connections. Check with the local utility for location of manual shutoff valve if required see figure 11 below.



1. The gas line should be of adequate size to prevent undue pressure drop and never smaller than the pipe size of the main gas control valve. See chart below.

Maximum Capacity of Pipe in Cubic Feet of Gas Per Hour
(Gas pressure = 0.5 psig or less, pressure drop = .5 in.w/c)

Nominal Iron Pipe Size	Length of Pipe (Feet)						
	10'	20'	30'	40'	60'	80'	100'
1/2"	175	120	97	82	66	57	50
3/4"	360	250	200	170	138	118	103
1"	680	465	375	320	260	220	195
1.1/4"	1400	950	770	660	530	460	400

For additional information refer to part 10, table 10-2 of the National Fuel Gas Code Handbook.

2. To check for leaks in gas piping, use a soap and water solution or other approved method. DO NOT USE AN OPEN FLAME.
3. Disconnect the boiler from the gas supply piping system during any pressure testing of the gas piping.

ELECTRICAL WIRING

Electrical wiring must conform with the latest revision of the National Electrical Code, ANSI/NFPA No. 70 and/or local authority having jurisdiction.

1. When an external electrical source is utilized, the boiler, when installed, MUST BE electrically grounded in accordance with these requirements.

2. Install a fused disconnect switch between boiler and meter at a convenient location.

3. COMPONENT CODING

TH-1	Thermostat (millivolt)	1K2	Relay Contacts
TH-2	Thermostat (24 Volt)	LS	Limit Switch
TH-3	Thermostat (Line Voltage)	MS	Manual Switch
TR-1	Transformer (120V/24V 40VA)	CIR	Circulator
TR-2	Transformer (120V/24V 50VA)	ECO	Energy Cut-Off
LGV	24 Volt Gas Valve	PSC	Pilot Safety Coil
LGV-1	24 Volt Gas Valve	—●—	Wire Connection
PS	Pressure Switch	LWCO	Low Water Cut Off
MR-PS	Manual Reset Pressure Sw.	EWf	Electric Water Feeder
—○—	Control Terminal	PG	Power Generator
1K	Relay Coil	RSW	Roll-Out Switch
1K1	Relay Contacts		

* NOT ALL COMPONENTS LISTED ARE USED IN ALL CONTROL SYSTEMS.

4. Honeywell hot water control and intermittent ignition wiring for DVB series boiler with fail safe relay. See figure 12 on page 13.

NOTES:

* Switches are shown in position during the heating cycle.

* If any of the original wiring supplied with the boiler is replaced it must be replaced with like wire size and type of insulation or equivalent.

5. WIRING CODE

—————	LINE VOLTAGE BY FACTORY
—————	LOW VOLTAGE BY FACTORY
- - - - -	LINE VOLTAGE BY INSTALLER
- - - - -	LOW VOLTAGE BY INSTALLER

HOT WATER CONTROL AND INTERMITTENT IGNITION WIRING FOR DV SERIES

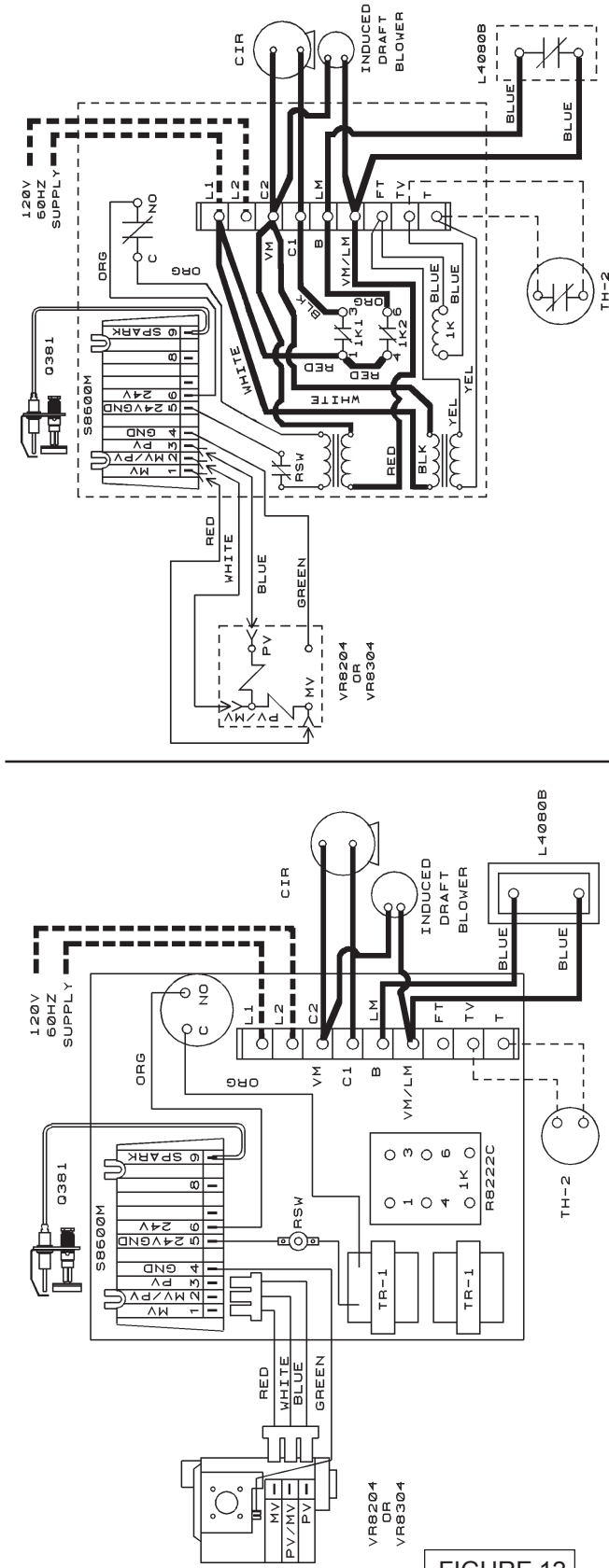


FIGURE 12

COMPONENT CODE

TH-1	TH-2	TH-3	TR-1	MGV	LGV	LGV-1	PS	MR-PS	SD	1 K	1 K1	1 K2	LS	MS	CIR	ECO	LWCO	EW	PG	PSC	MANUAL SWITCH	CIRCULATOR	ENERGY CUT-OFF	LOW WATER CUT-OFF	ELECTRIC WATER FEEDER	POWER GENERATOR	PILOT SAFETY COIL	WIRE CONNECTION
THERMOSTAT (MILLIVOLT)	THERMOSTAT (24 VOLT)	THERMOSTAT (LINE VOLTAGE)	TRANSFORMER (120V/24V 40VA)	MILLIVOLT GAS VALVE	24 VOLT GAS VALVE	24 VOLT GAS VALVE	MR-PS	SD	1 K	1 K1	1 K2	LS																

NOT ALL COMPONENTS LISTED ARE USED IN ALL CONTROL SYSTEMS

WIRING
LINE VOLTAGE BY FACTORY
LOW VOLTAGE BY FACTORY
LINE VOLTAGE BY INSTALLER
LOW VOLTAGE BY INSTALLER

- NOTES:
- 1) SWITCHES ARE SHOWN IN POSITION TAKEN DURING THE HEATING CYCLE.
 - 2) IF ANY OF THE ORIGINAL WIRING SUPPLIED WITH THE BOILER IS REPLACED, IT MUST BE REPLACED WITH LIKE WIRE, SIZE, AND TYPE OF INSULATION OR EQUIVALENT

THERMOSTAT INSTALLATION

1. Thermostat should be installed on an inside wall about four feet above the floor.
 2. NEVER install a thermostat on an outside wall.
 3. Do not install a thermostat where it will be affected by:
 - A. Drafts
 - B. Hot or cold pipes
 - C. Sun light
 - D. Lighting fixtures
 - E. Television
 - F. Near a fireplace or chimney
 4. Check thermostat operation by raising and lowering thermostat as required to start and stop the burners.
 5. Instructions for the final adjustment of the thermostat are packaged with the thermostat (adjusting heating anticipator, calibration, etc.).
-

LIGHTING INSTRUCTIONS



WARNING:

IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.



CAUTION:

Before operating, make certain the boiler and system are full of water to minimum pressure (this is usually 12 lbs. per square inch on most systems) and system is vented of air. See the operating and lighting instructions.

LIGHTING PROCEDURE FOR BOILER WITH INTERMITTENT PILOT SYSTEM FOR YOUR SAFETY READ BEFORE OPERATING

A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.

B. Before operating, smell all around the appliance for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.



CAUTION:

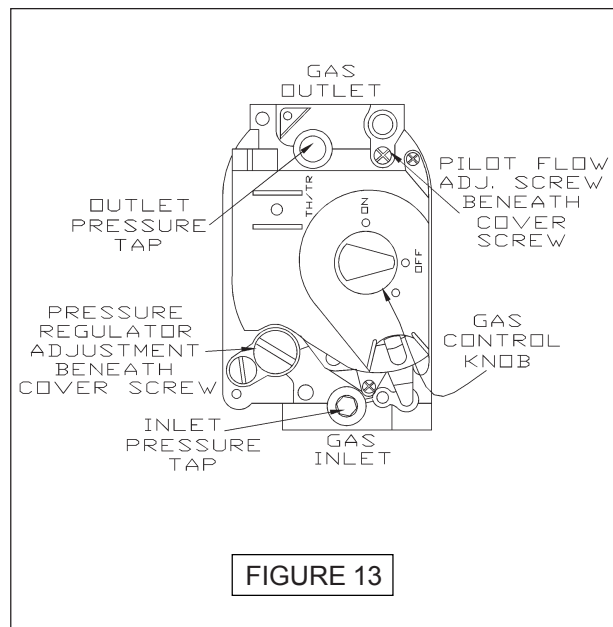
WHAT TO DO IF YOU SMELL GAS

- * 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 push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician.

! WARNING: 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 gas control which has been under water.



“OPERATING INSTRUCTIONS”

1. STOP! Read the safety information in the user's information manual.
2. Set 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 pilot. DO NOT try to light the pilot by hand.
5. Turn gas control knob clockwise  to "off."
6. Wait five (5) minutes to clear out any gas. If you then smell gas, STOP, Follow "B" in the safety information "What To Do If You Smell Gas". If you don't smell gas, go to the next step.
7. Turn gas control knob counterclockwise  to "ON."
8. Turn on all electric 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 Appliance" (Below) and call a qualified service technician or your gas supplier.

TO TURN OFF GAS TO APPLIANCE

1. Set thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Turn gas control knob clockwise  to "OFF." **DO NOT FORCE**

SEQUENCE OF OPERATION

On a call for heat:

- 1.) The thermostat will actuate, completing the circuit between terminals T and T.
- 2.) The R8222C relay coil will energize thus pulling in the relay contacts.
- 3.) The circulator starts and power is switched to the limit. If limit circuit is closed the venter motor and TF-2 transformer are energized.
- 4.) The venter motor starts and develops static pressure.
- 5.) When the static pressure is reached the pressure switch pulls in completing the circuit between TF-2 and the S8600M ignition control.
- 6.) The S8600M opens the pilot valve and ignites pilot. After pilot is proven the main burner will ignite.
- 7.) In the event the boiler water temperature exceeds the high limit setting the power will be interrupted to the venter motor, and TF-2 thus interrupting power to the ignition system. Power will remain off until the water temperature drops below the high limit setting. The circulator will continue to operate under this condition until the thermostat is satisfied.
- 8.) Should the air flow (static pressure) be interrupted (example blocked flue,etc.), the pressure switch will sense a drop in pressure, opening the circuit between the ignition system and TF-2. The venter motor will continue to operate until static pressure is reached or thermostat is satisfied.
- 9.) In the event the flow of combustion products through any part of the boiler flueway becomes blocked, a flame safety roll-out switch will shut off the main burners. If this condition occurs, do not attempt to place the boiler back operation.
- 10.) When the thermostat is satisfied power is interrupted to the relay coil and the relay drops out cutting power to the circulator, venter motor, and TF-2.

GENERAL INSTRUCTION FOR SEASONAL START UP AND MAINTENANCE

It is suggested that a qualified service agency be employed to make an annual inspection of the boiler and the heating system. They are experienced in making the inspection outlined below.

In the event repairs or corrections are necessary they can make the proper changes for safe operation of the boiler.



CAUTION:

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

Verify proper operation after service.

1. If the venter has oil cups, lubricate venter motor once a month during the heating season with a few drops of non-detergent motor oil (SAE 20 or 30). Replace the rubber plugs when finished.



CAUTION:

DO NOT OVER OIL.

2. BEGINNING OF EACH HEATING SEASON

A. Before seasonal start up, it is highly advisable to have a competent service agency check the boiler for soot and scale build up in the flues, clean the burners and

check the gas input rate to maintain high operating efficiency

B. The service agency should make certain the system is filled with water to minimum pressure (approximately 12 pounds per square inch) and open air vents (if used) to expel any air that may have accumulated in the system.

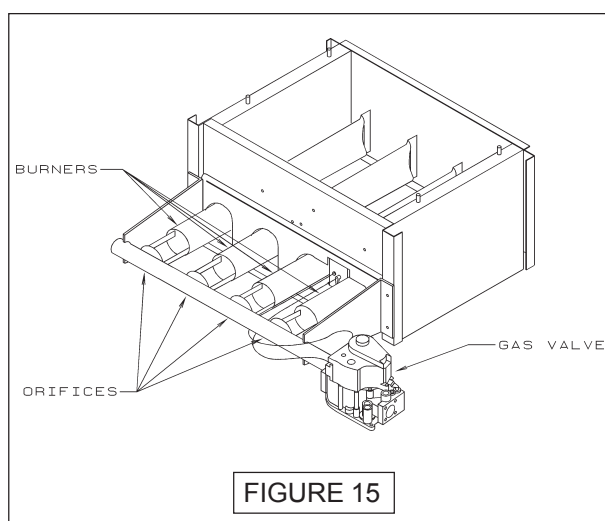
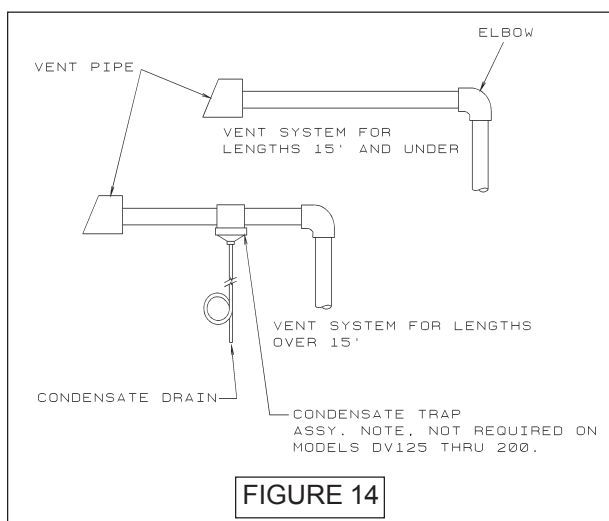
C. Check automatic air vents for leakage.

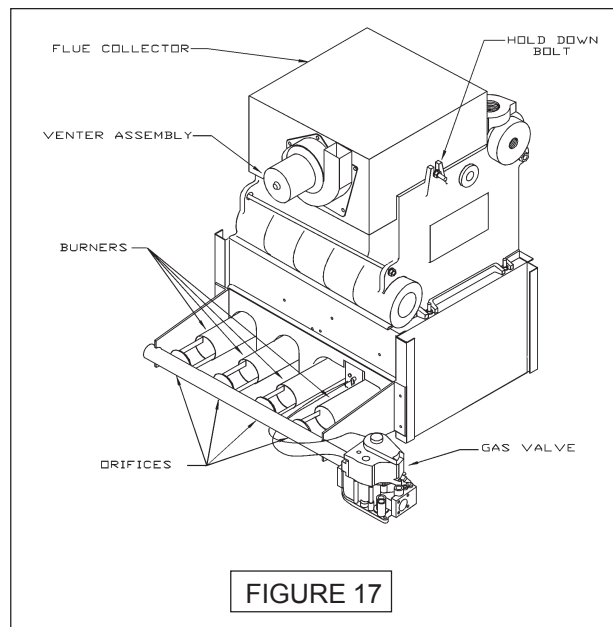
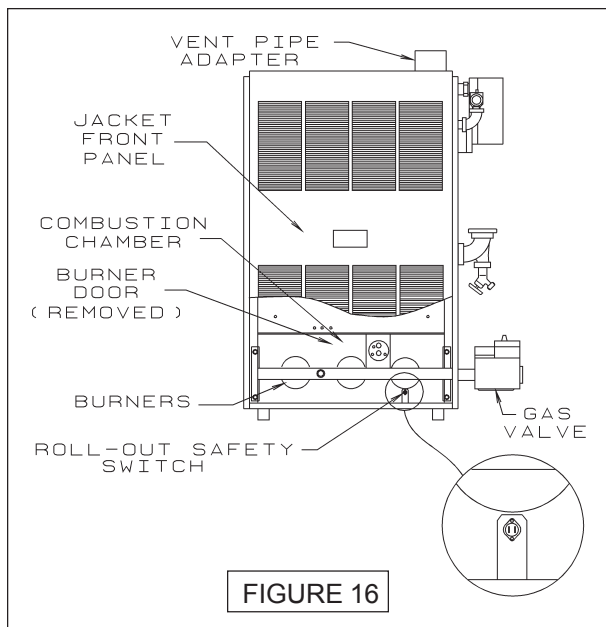
D. Inspect venting system at the start of each heating season. Check the pipe from the boiler for signs of deterioration and sagging joints. Repair if necessary. Remove the vent pipe from the boiler and check for obstructions.

E. Clean condensate tee & trap.

Periodic cleaning of the condensate collection system is required. When a condensate collection system is installed in a venting system, it is recommended that the cleaning become a part of the annual servicing. The procedure for cleaning this system is as follows:

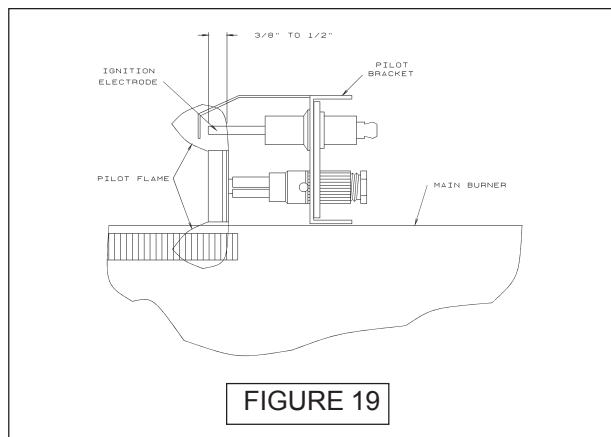
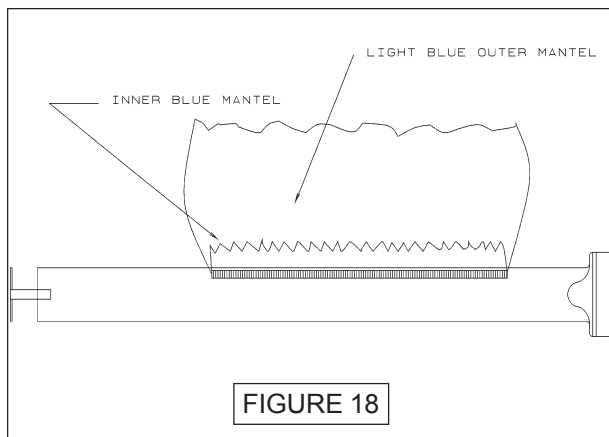
1. Remove tubing from condensate tee.
2. Empty all liquid from tubing.
3. Rinse tubing inside & out in a sink with water.
4. If tubing cannot be cleaned inside, the tubing should be replaced with the same type and size of tubing.
5. Replace tubing as described in figure 14 below. (Fill trap with water.)
6. Visually inspect entire piping system and if any leaks appear, have them repaired as soon as possible. DO NOT use petroleum based stop leak compounds.
7. Check venter assembly static pressure as follows:
 - a. With the boiler off, disconnect the white compression fitting on the pressure switch.
 - b. Connect a slope manometer to the compression fitting with additional tubing.
 - c. Turn the boiler on and read suction pressure on the manometer. Reading should be negative (-) $.55 \pm .05$ inches of water column or higher for the DV 38B thru 150B and negative (-) $.65 \pm .05$ inches of water column or higher for the DV 175B and 200B.
8. If static pressures are not at the minimum allowable level (listed above), check vent pipe for obstructions.





3. The following procedure should be followed to clean and check the boiler flue passageways:

- A. Remove the burners from the combustion chamber by raising the burners up from the manifold orifices and pulling toward the front of the boiler. See figure 15 on page 17.
- B. Disconnect the vent pipe from the vent adapter.
- C. Remove the top jacket panel. See figure 16 above.
- D. Disconnect the white compression fitting from the pressure switch.
- E. Disconnect venter wires from relay.
- F. Remove the flue collector and venter from the boiler castings by loosening the hold-down bolts located on each side of the collector. See figure 16 above.
- G. Visually inspect the venter assembly for any unusual wear or dirt build up. Clean with vacuum if necessary.
- H. Place a sheet of heavy paper or similar material over the bottom of the combustion chamber and brush down the flue passageways. The soot and scale will collect on the paper and is easily removed with the paper.
- I. Vacuum out base and flueways and reassemble the boiler in reverse order.
- J. Seal flue collector and vent adapter with IS808 silicone part no. MS-022.02, or equivalent.
- K. Start boiler to insure proper operating condition.
 1. KEEP the area around the boiler clean and free of combustible materials such as gasoline, paints, paint thinner and other such flammable vapors and liquids.
 2. The free flow of combustion and ventilating air to the boiler and boiler room must not be restricted or blocked.
 3. Some circulators require periodic servicing. These circulators usually have oil cups or openings at each end of the motor and one for the shaft bearing. Put about one teaspoon of SAE 20 or 30 non-detergent motor oil in each opening twice per year. DO NOT OVER OIL. Follow the manufacturers instructions attached to the circulator. When oil cups or holes are not provided, bearings are either permanently lubricated or water lubricated.



4. Visually check the main burners and pilot flame at the start of each heating season and again midway through the season.



A. Check the burner throats and burner orifices for lint and dust obstructions. See figure 17 on page 18.

B. The main burner flame should have a well defined inner blue mantel with a lighter blue outer mantel. See figure 18 above.

C. The pilot flame should envelop $\frac{3}{8}$ to $\frac{1}{2}$ inch of the tip of the pilot sensing device. See figure 19 above.

5. Adjusting the pilot flame:

A. Remove the pilot adjustment cover screw.



B. Turn inner screw (adjustment screw) clockwise  to decrease and counterclockwise  to increase the pilot flame, see figure 13, on page 15.

C. After adjustment, be sure to replace cover screw to prevent possible gas leakage.

D. The main burners and the pilot burner should be checked for signs of corrosion or scale build up.

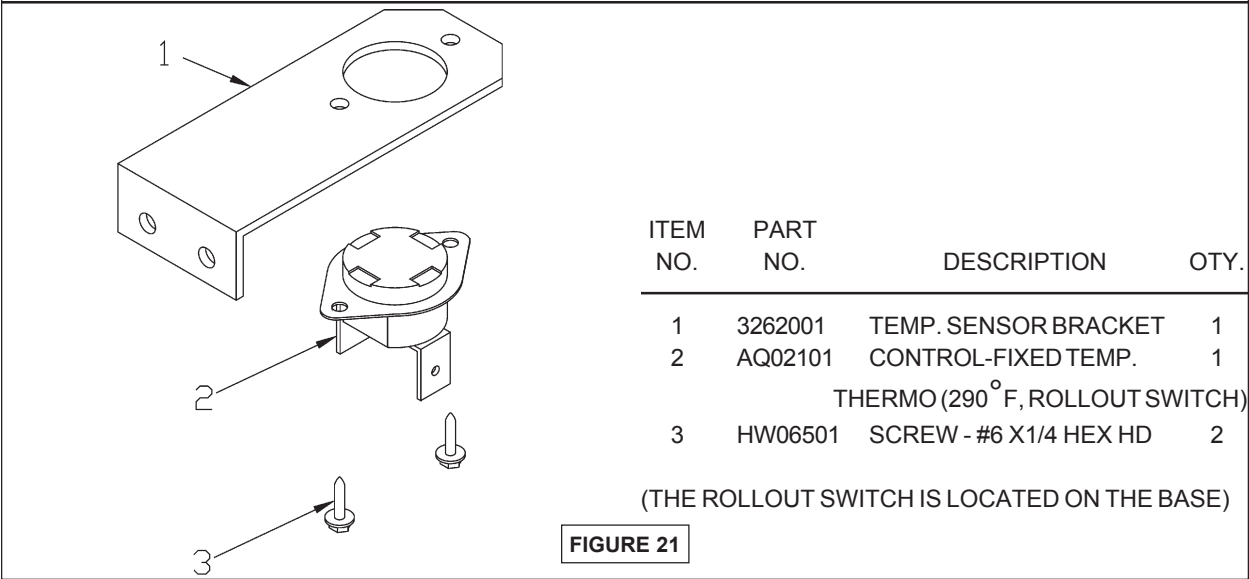
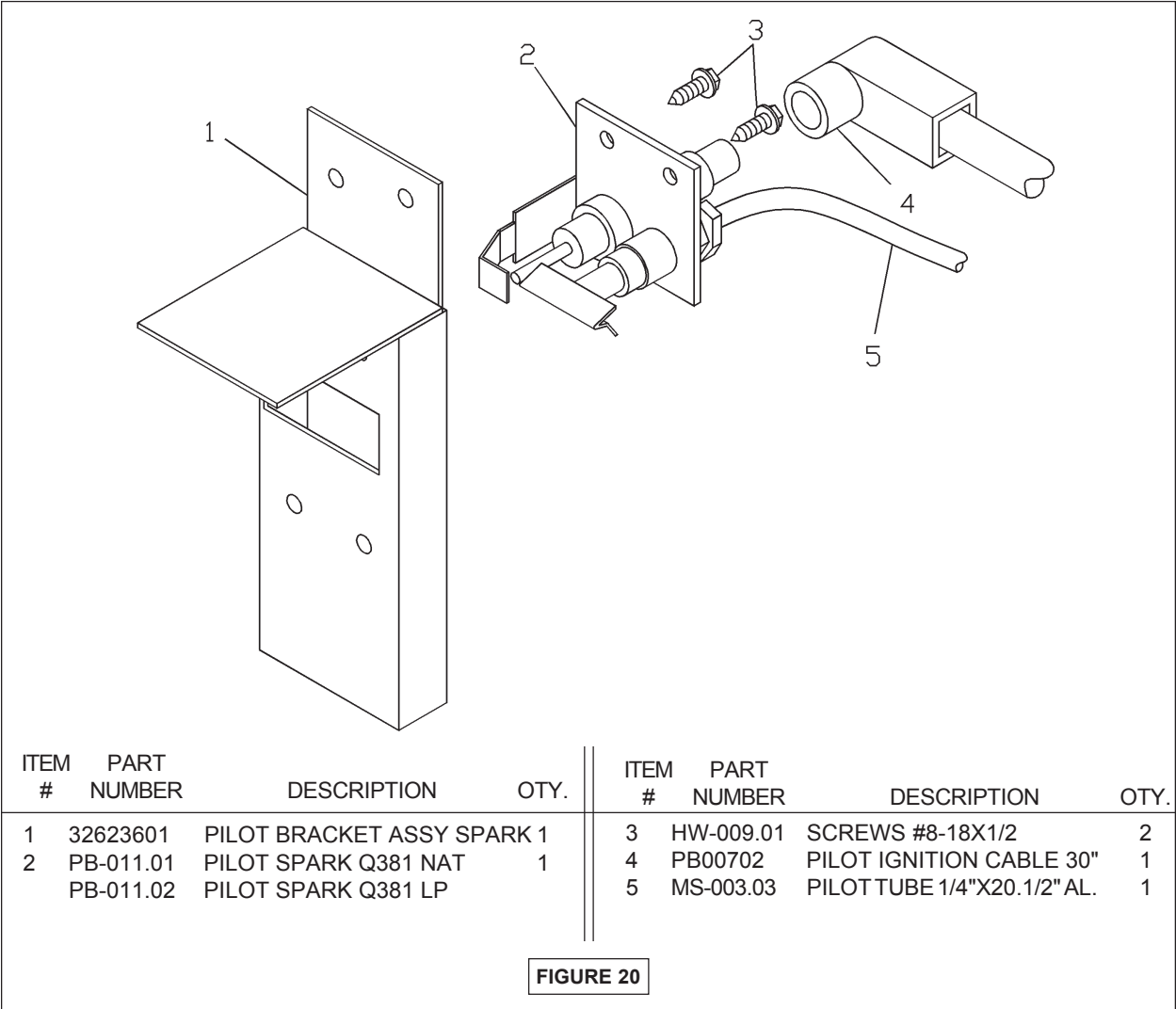
E. Clean main burners and pilot burner with a steel bristle brush.

CHECK GAS INPUT RATE TO BOILER

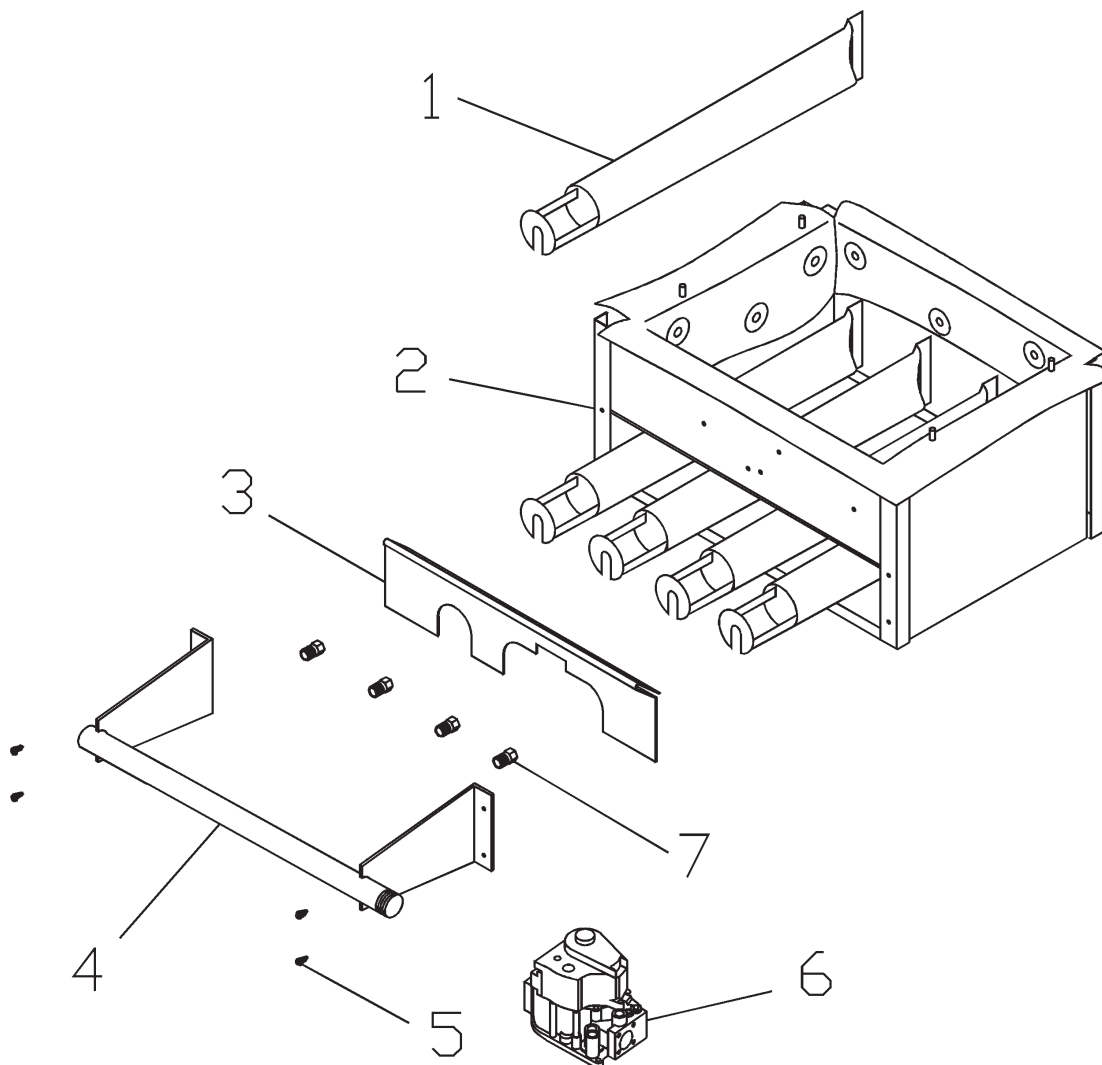
1. Maximum permissible gas supply pressure must not be higher and minimum supply pressure must not be lower than what is specified on the rating plate.
2. To check for proper flow of natural gas to boiler using the gas meter, proceed as follows:
 - A. Turn off the gas supply to all other appliances, except the boiler.
 - B. With the boiler operating, determine the flow of gas through the meter for two minutes and multiply by 30 to get the hourly rate.
 - C. Divide the input rate shown on the rating plate by the heating value of the gas as obtained from the local gas company. This will determine the number of cubic feet of gas required per hour.
 - D. If minor adjustment is necessary, adjust the pressure regulator on the combination gas control. Increase or decrease manifold pressure to obtain gas input required as described on the rating plate. To increase, turn the regulator adjusting screw clockwise  or counterclockwise  to decrease pressure, see figure 13 on page 15. The manifold pressures are taken at the outlet side of the gas valve.
 - E. Relight all the other appliances turned off in step A above. Be sure all pilot burners are operating.

DVB SERIES REPLACEMENT PARTS

PILOT & ROLLOUT SWITCH



DVB SERIES REPLACEMENT PARTS - BASE

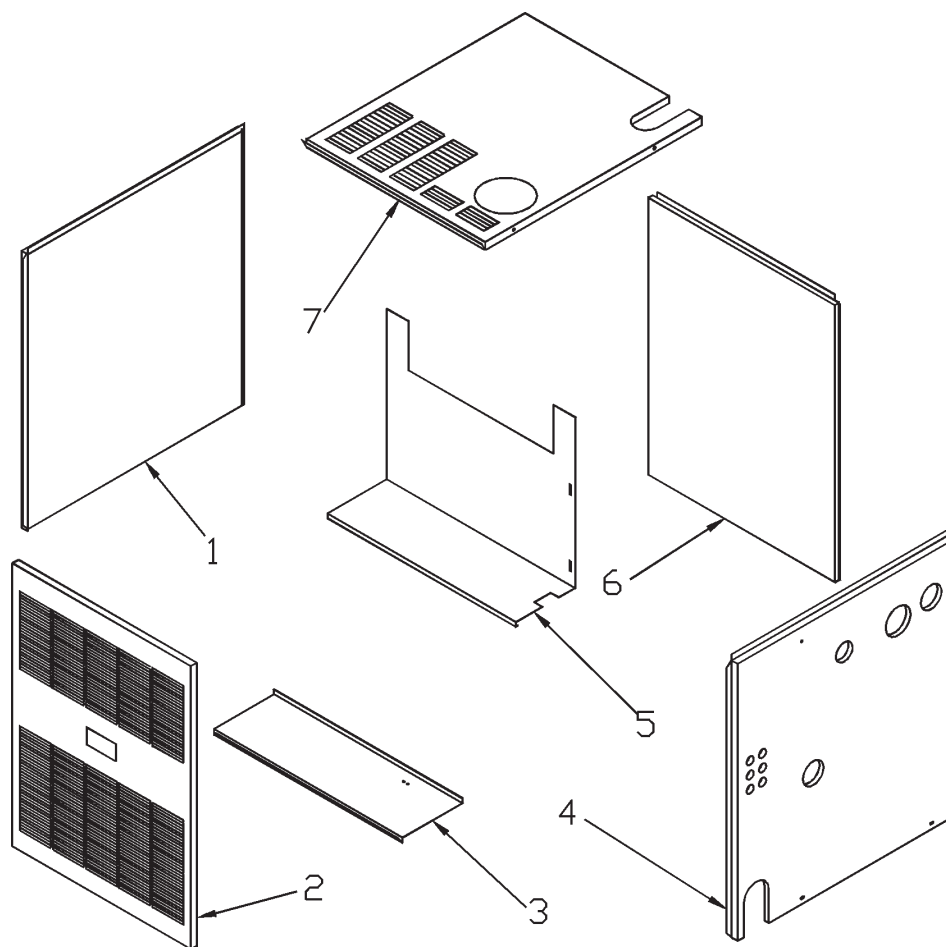


ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	3352401	BURNER TUBE 1.3/4"	
	DV50B (1)	DDV100B (2)	
	DV125B (3)	DV150B (3) DV200B (4)	
2	5611607	BASE W/INSUL DV50B	1
	5611608	BASE W/INSUL DV100B	
	5611609	BASE W/INSUL DV125B & 150B	
	5611604	BASE W/INSUL DV200B	
3	32512501	BURNER DOOR DV50B	1
	32523001	BURNER DOOR DV100B	
	32523101	BURNER DOOR DV125B&150B	
	32523102	BURNER DOOR DV200B	
4	356-2-1.01	MANIFOLD DVB50B	1
	356-2-1.02	MANIFOLD DV100B	
	356-2-1.03	MANIFOLD DV125B&150B	
	356-2-1.04	MANIFOLD DV200B	
5	HW-005.01	SCREW 1/4-20X1/2 SELF TAP	4

ITEM #	PART NUMBER	DESCRIPTION	QTY.
6	VG01101	GAS VALVE VR8204H-1006	1
		DV50B - 150B SPARK NAT	
	VG01103	GAS VALVE VR8304H4206	
		DV200B SPARK NAT	
	VG01104	GAS VALVE VR83043216	
		DV50B - 200B SPARK LP	
7	355-1-5.01	ORIFICE #30 24V	1
		DV50B, 100B, 150B, & 200B	
	355-1-5.02	ORIFICE #31 24V	
		DV125B	
	355-1-5.04	ORIFICE #47 LP	
		DV50B, 100B, 150B, & 200B	
	355-1-5.06	ORIFICE #49 LP DV125B	

FIGURE 22

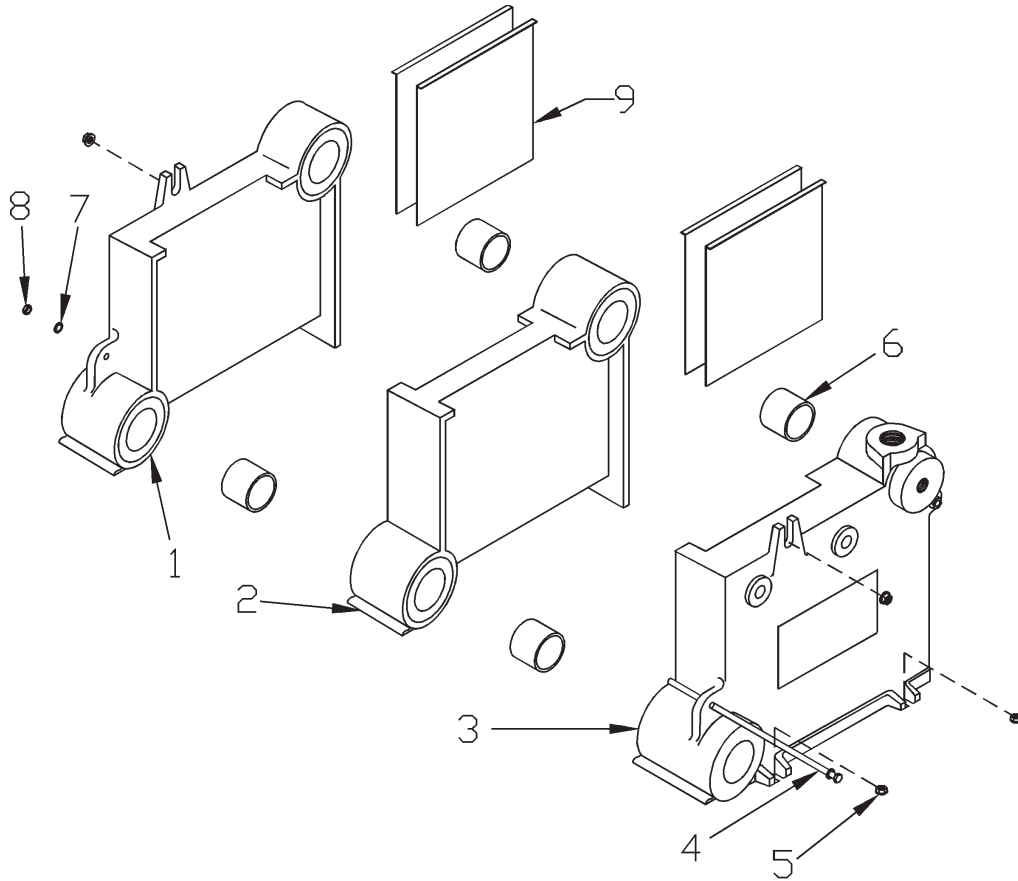
DVB SERIES REPLACEMENT PARTS - JACKETS



ITEM #	PART NUMBER	DESCRIPTION	QTY.	ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	3162702	PANEL - LEFT DV50B-200B	1	6	3162601	PANEL - REAR DV50B	1
2	315-2-19.01	PANEL - FRONT DV50B	1		3162602	PANEL - REAR DV100B	
	315-2-19.02	PANEL - FRONT DV100B			3162603	PANEL - REAR DV125B & 150B	
	315-2-19.03	PANEL - FRONT DV125B & 150B			3162604	PANEL - REAR DV200B	
	315-2-19.04	PANEL - FRONT DV200B		7	31522701	PANEL - TOP DV50B	1
3	315-2-12.01	PANEL - BASE DV50B	1		31522702	PANEL - TOP DV100B	
	315-2-12.02	PANEL - BASE DV100B			31522703	PANEL - TOP DV125B & 150B	
	315-2-12.03	PANEL - BASE DV125B & 150B			31522704	PANEL - TOP DV200B	
	315-2-12.04	PANEL - BASE DV200B					
4	3162701	PANEL - RIGHT DV 50B-200B	1				
5	31522401	PANEL - SEPARATOR DV50B	1				
	31522402	PANEL - SEPARATOR DV100B					
	31522403	PANEL - SEPARATOR DV125B & 150B					
	31522404	PANEL - SEPARATOR DV175B & 200B					

FIGURE 23

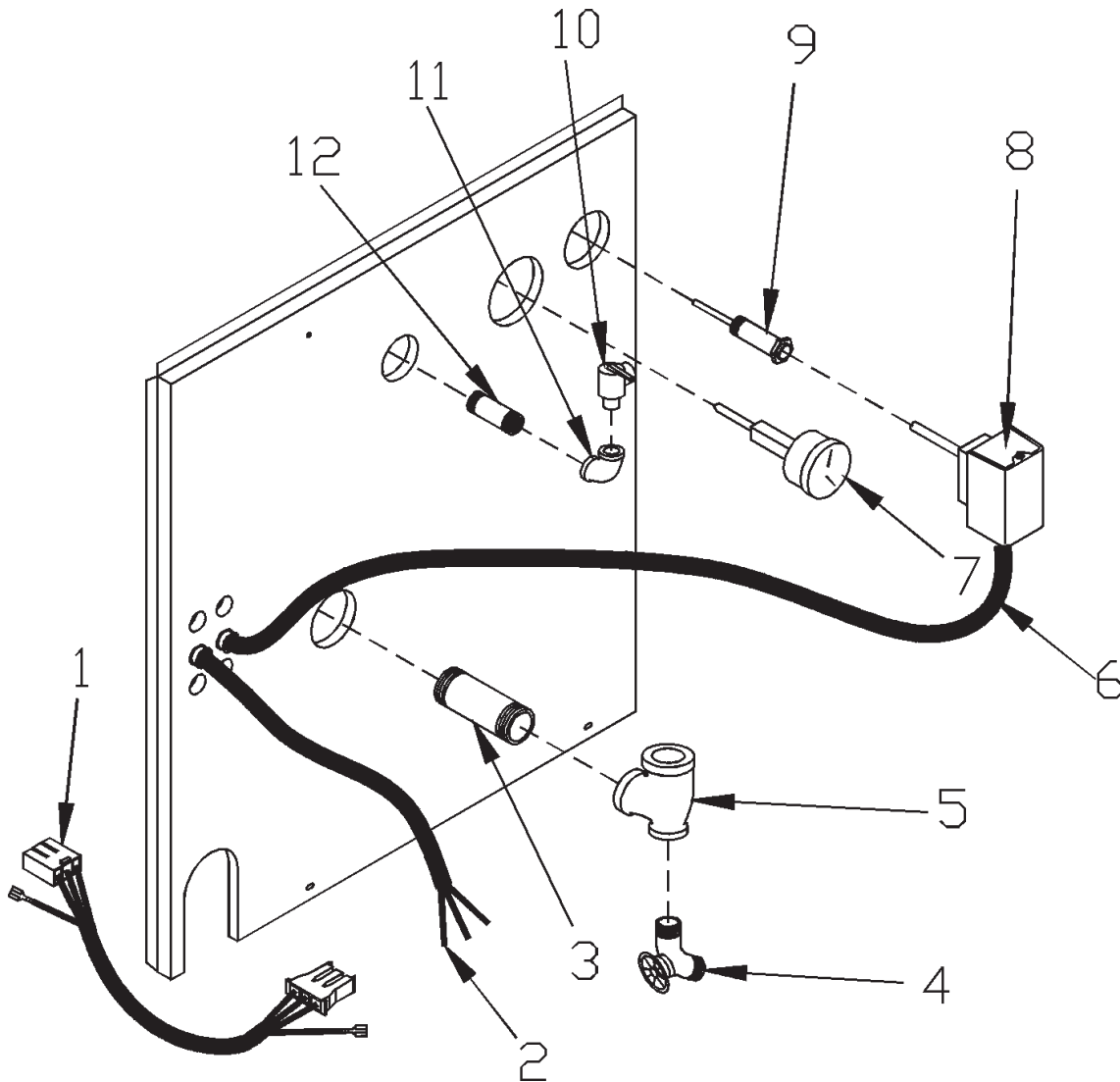
DVB SERIES REPLACEMENT PARTS HEAT EXCHANGER



ITEM NO	P/N	DESCRIPTION	QTY.
1	100-2-2.01	B-LEFT HAND SECTION	1
2	100-2-1.01	B-CENTER SECTION	1
3	100-2-3.01	B-RIGHT SECTION	1
4	HW-011.01	TIE ROD 1/4X11.1/2 DV100B	2
5	HW-011.03	TIE ROD 1/4X15.1/2 DV125B & 150B	2
6	HW-011.05	TIE ROD 1/4X19.1/2 DV200B	2
7	HW06901	NUT 5/16-18 WISLOCK	6
8	PF-004.13	PIPE FIT BUSH 3/4 X 1/4 NPT	1
9	PF-006.07	PIPE-NPL 1.1/4X4.1/2 NPT	1
10	43300976	PUSHNIPPLE 2" MACH.	1
11	3461601	BAFFLE DV50B, 2 Per Flueway	2
	3472301	BAFFLE DVB, 2 Per Flueway	2
	HW-008.01	WASH-5/16 FLAT STL ZP	4
	HW-003.02	NUT-1/4-20 HEX-STL ZP	2
COMPLETE HEAT EXCHANGER ASSEMBLY			
	100-2-7.01	HEAT EXCHANGER 3 SECTION DV100B	1
	100-2-7.02	HEAT EXCHANGER 4 SECTION DV125B & DV150B	1
	100-2-7.03	HEAT EXCHANGER 5 SECTION DV200B	1
	100-2-7.06	HEAT EXCHANGER 2 SECTION DV50B	1

FIGURE 24

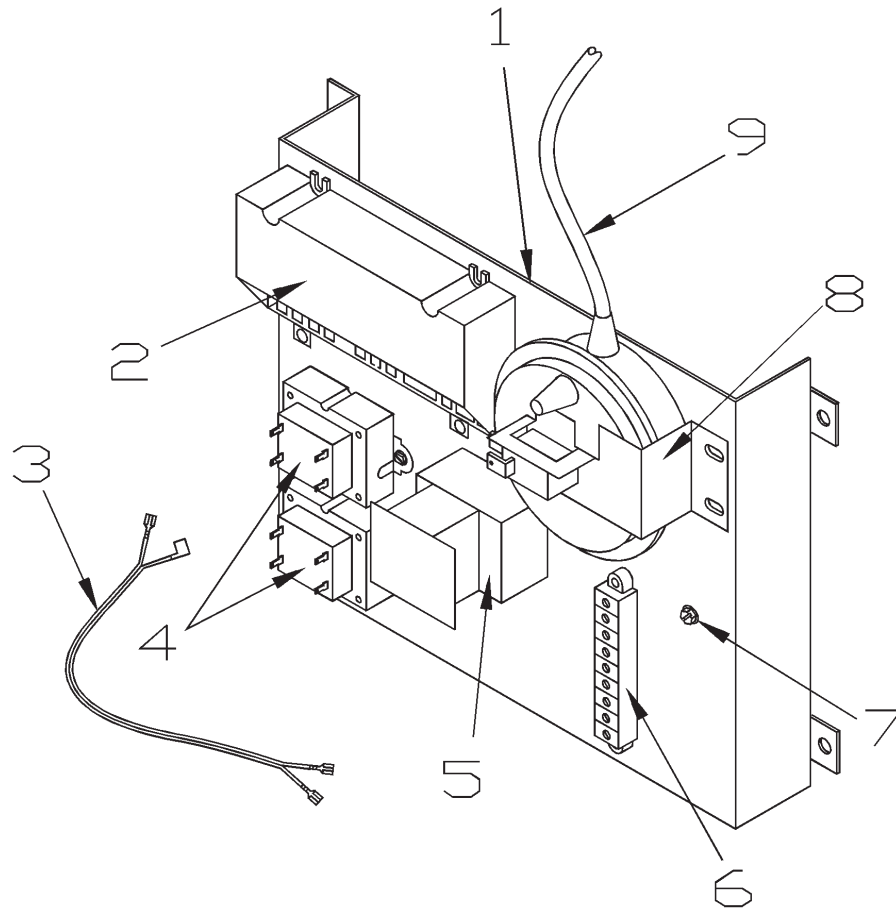
DVB SERIES REPLACEMENT PARTS PIPING & CONTROLS



ITEM NO	P/N	DESCRIPTION	QTY.
1	37413601	HARNESS IGN/GV DV 36"	1
2	37519501	HARNESS - CIRCULATOR 72"	1
3	PF-006.07	PIPE - NPL 1.1/4X4.1/2 NPT	1
4	HW-016.03	DRAIN - SHORT	1
5	PF-008.03	PIPE - TEE 1.1/4X3/4X1.1/4	1
6	37518901	HARNESS-DV CONTROL/LIMIT 38"	1
7	GA-001.00	GAUGE - THERALTIMETER	1
8	AQ02201	CONTROL L4080B	1
9	AQ-020.01	WELL 3/4"X3"	1
10	VR-001.01	RELIEF VALVE 30# 3/4"	1
11	PF-002.04	PIPE - ELBOW 3/4" 90°	1
12	PF-005.11	PIPE - NPL 3/4"X4"	1

FIGURE 25

DVB REPLACEMENT PARTS - ELECTRICAL



ITEM NO	P/N	DESCRIPTION	QTY.
1	31522201	CONTROL SUPPORT BRACKET DV	1
2	PB00604	PLT SPARK CONTROL S8600M1013 HW	1
3	37614501	WIRE ROLLOUT SWITCH 40"	1
4	EF03801	TRANSFORMER - 40VA	2
5	RY-002.01	CONTROL R8222C-1008 (RELAY)	1
6	EF04001	9 TERM STRIP	
7	HW09001	SCREW 10-32X5/16 GREEN GROUND	1
8	SS00801	PRESSURE SWITCH (FS6205A-2413) DV50B - DV150B	1
	SS00802	PRESSURE SWITCH (FS6273A-3065) DV200B <u>ONLY</u>	1
9	HW09701	HW TUBE SIL ORANGE 1/8ID	1

FULLY ASSEMBLED CONTROL BRACKET
31522901 CONTROL BRACKET SUB-ASSY DV50B - DV150B
31522902 CONTROL BRACKET SUB-ASSY DV200B
(P/N 31522901 & 31522902 INCLUDE PART # 1-8 & ALL WIRING)

FIGURE 26

DVB SERIES REPLACEMENT PARTS FLUE COLLECTOR & VENTER COMPONENTS

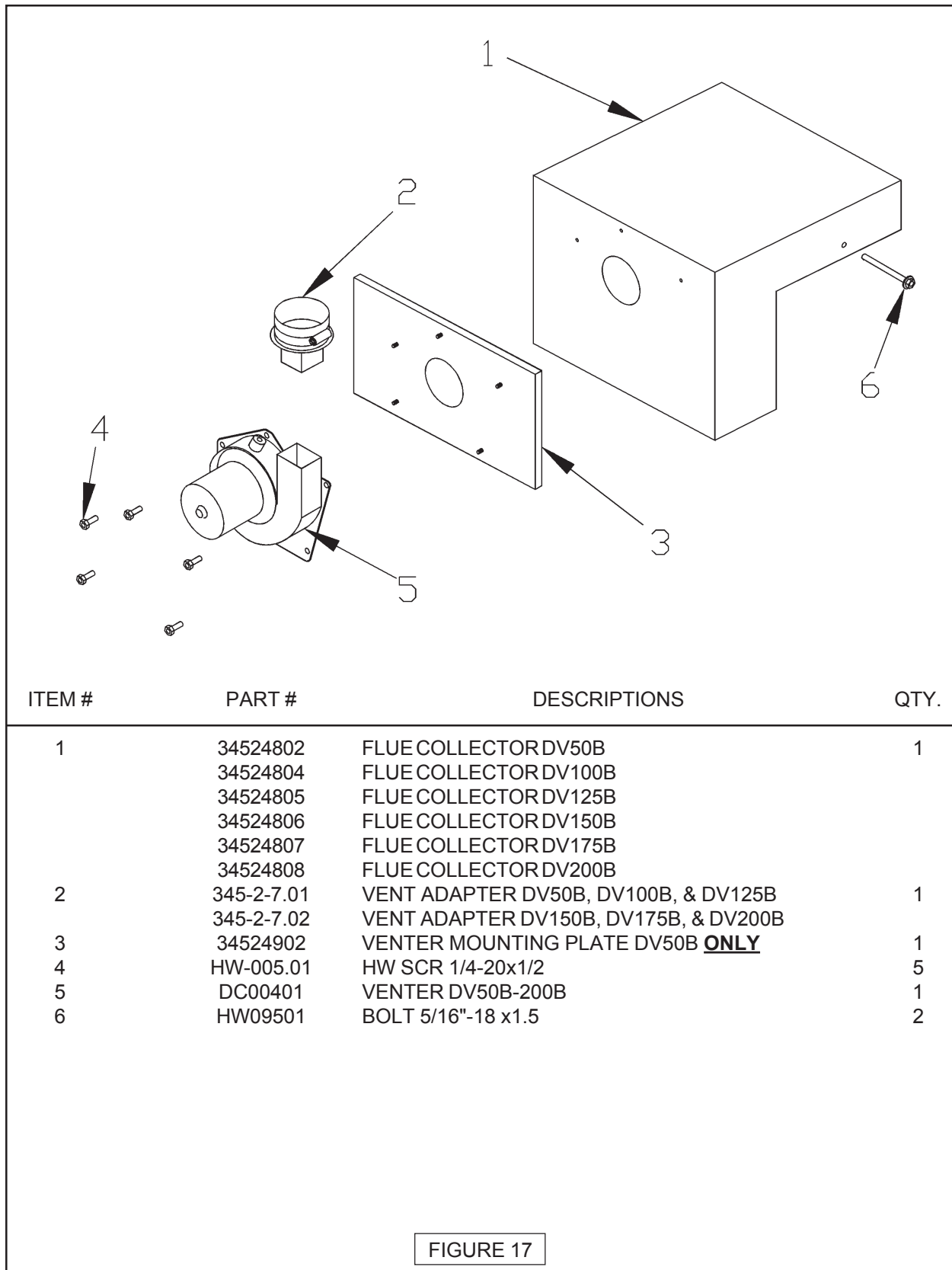


FIGURE 17

DVB SERIES

Cast Iron, Direct Vent, Gas-Fired, Hot Water Boiler RATINGS

Boiler No.	A.G.A* Input Btu/Hr.	Heating Capacity* Btu/Hr.	I=B=R** Net Output Btu/Hr.	No. Of Burners	Water Content (Gals.)	AFUE Ratings
DV50B	50,000	42,000	37,000	1	2.4	83%
DV75B	75,000	62,000	54,000	2	4.0	82%
DV100B	100,000	82,000	71,000	2	4.0	82%
DV125B	125,000	103,000	90,000	3	5.6	82%
DV150B	150,000	122,000	106,000	3	5.6	80%
DV175B	175,000	143,000	124,000	4	7.2	80%
DV200B	199,999	160,000	139,000	4	7.2	80%

STANDARD EQUIPMENT Boiler Jacket, Cast Iron Boiler Battery, Combination Aquastat Relay, Theraltimeter Gauge, Circulator, Main Gas Burners, Electric Ignition System, A.S.M.E relief Valve, Drain Cock, Induced Draft Fan, and Safety Pressure Switch

All boilers are design certified for installation on non-combustible floors. For installation on combustible floors, use combustible floor kit.

This boiler is a Category III Designed Certified appliance which requires a special horizontal through the wall venting system. Only HEAT-FAB® SAF-T-VENT™, FLEX-L® STAR-34™, ProTech™ FasNSeal®, and Z-FLEX® Z-VENT™ vent material products shall be used.

Should a chimney installation be required, see venting addendum.

See venting addendum for maximum vent lengths and proper configurations.

MEA number for the DV series boilers is 415-90-E.

Electric service to be 120 Volts, 15 Amps, 60 Hz.

**For equivalent square feet of radiation, divide I=B=R output by 150.

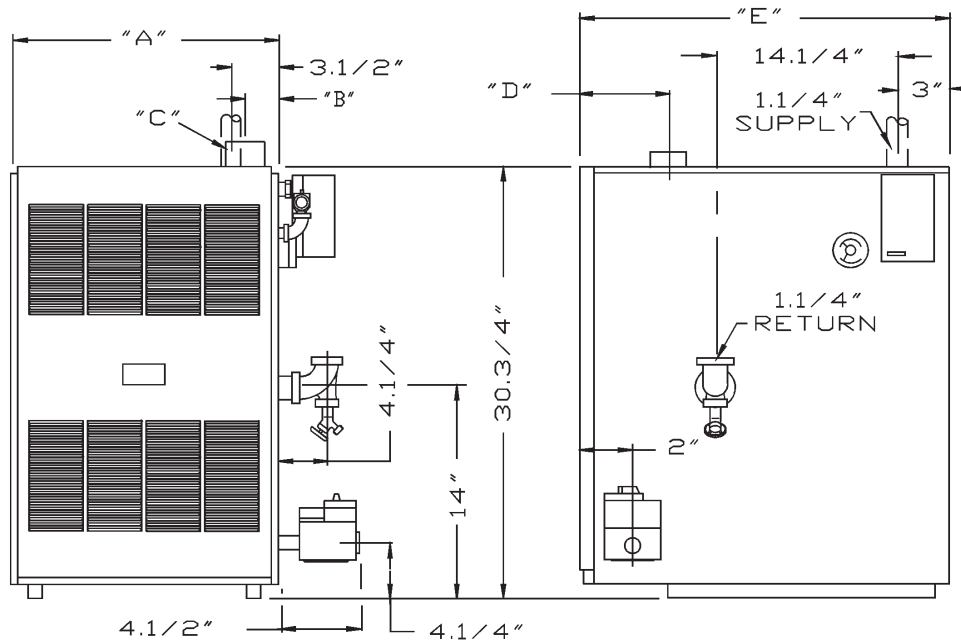
DVB SERIES

Cast Iron, Direct Vent, Gas-Fired, Hot Water Boiler Dimensions

BOILER NO.	Natural Gas Inlet	Dimensions					Pump Size Sup. & Ret. Tappings	No. Of Burners	AFUE Ratings
		A	B	C	D	E			
DVB-50	1/2	11.1/4	2.1/8	3	6.3/8	27	1.1/4	1	83%
DVB-75	1/2	15.1/8	4.1/8	3	6.3/8	27	1.1/4	2	82%
DVB-100	1/2	15.1/8	4.1/8	3	6.3/8	27	1.1/4	2	82%
DVB-125	1/2	19	6	3	6.3/8	27	1.1/4	3	82%
DVB-150	1/2	19	6	4	6.3/8	27	1.1/4	3	80%
DVB-175	1/2	22.7/8	8	4	7	28	1.1/4	4	80%
DVB-200	1/2	22.7/8	8	4	7	28	1.1/4	4	80%

NOTE: For altitudes above 2,000 ft. ratings should be reduced at the rate of 4% for each 1,000 ft. above sea level.

DIRECT VENT SERIES BOILER



FRONT VIEW

RIGHT SIDE VIEW



CSA Certified for Natural
gas or Propane



Tested for 100 lbs. ASME
Working Pressure

