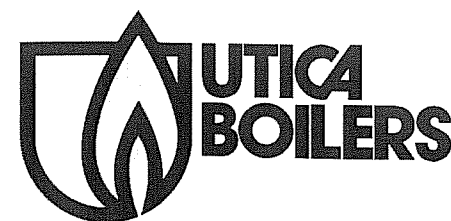
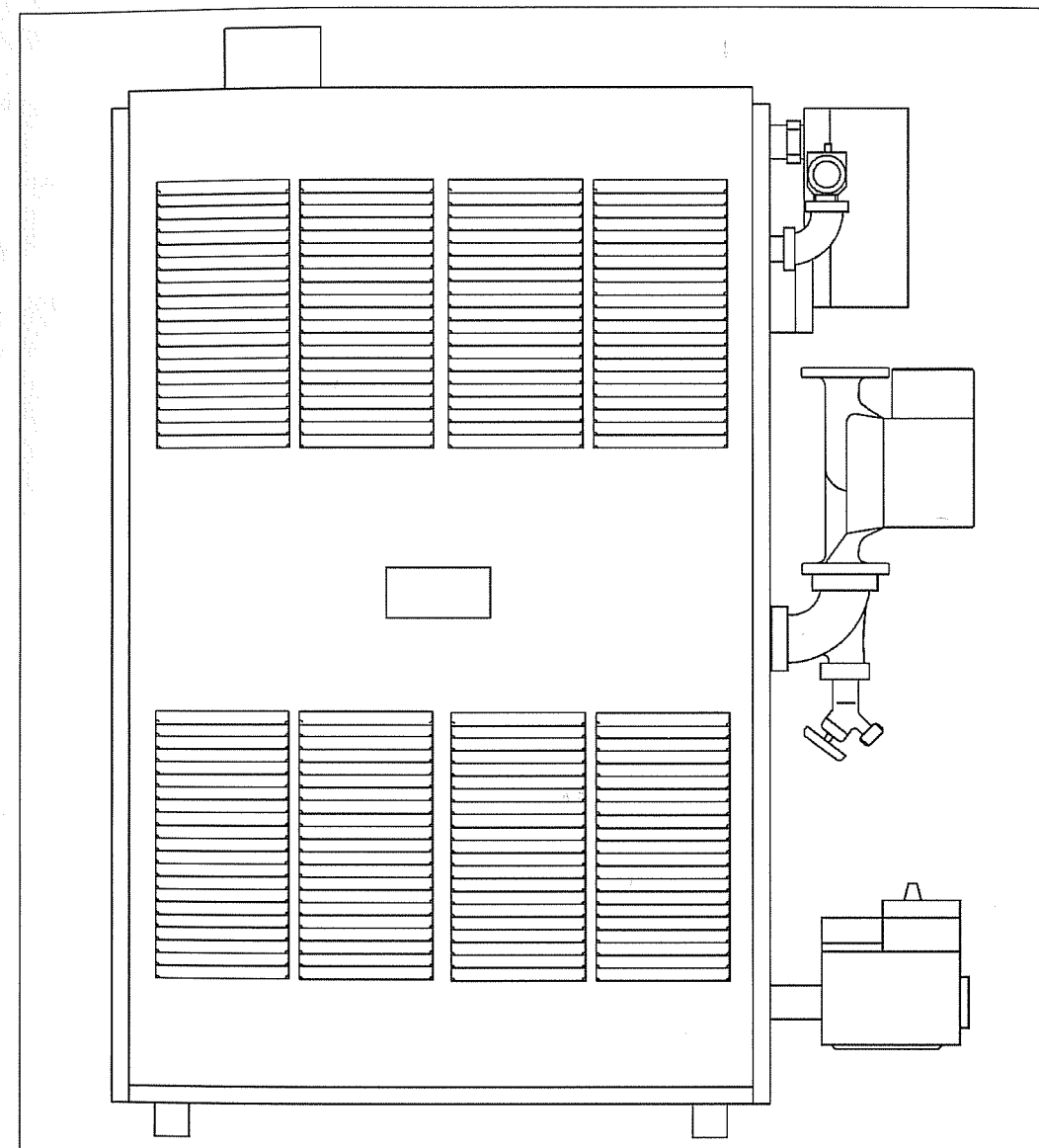


DV-A

GAS FIRED BOILERS
FOR FORCED HOT WATER



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

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KEEP THIS MANUAL NEAR BOILER
RETAIN FOR FUTURE REFERENCE

SERIES DV-A
CAST IRON
GAS FIRED BOILERS

INSTALLATION MANUAL AND
OPERATING INSTRUCTIONS

Published January 1996
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.

 **WARNING:** ALL INSTALLATIONS OF BOILERS AND VENTING SHOULD BE DONE ONLY BY A QUALIFIED EXPERT AND IN ACCORDANCE WITH THE APPROPRIATE UTICA BOILERS, INC. 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 National Fuel Gas Code, ANSI Z223-1-1992. (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 III and vent installation shall be in accordance with Part 7 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 CHART 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 38	8	100	10	19
DV 50	10	100	13	25
DV 75	15	100	19	38
DV 100	20	100	25	50
DV 125	25	125	32	63
DV 150	30	150	38	75
DV 175	35	175	44	88
DV 200	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).

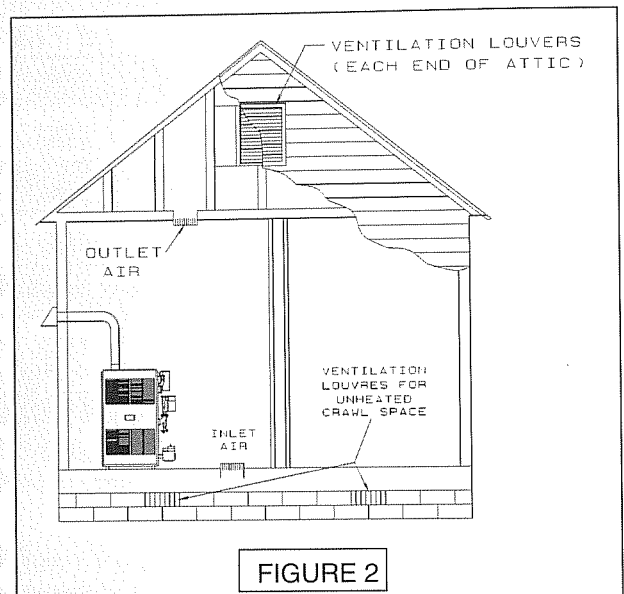
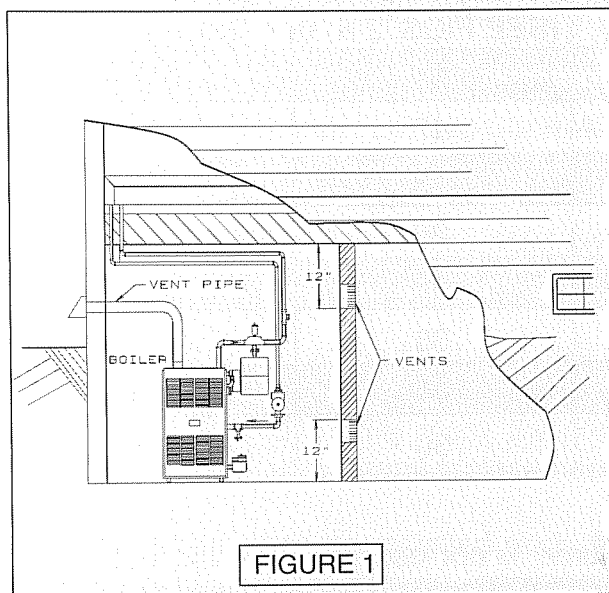
1. Ventilation of the boiler room must be adequate enough to provide sufficient air to properly support combustion.

2. When a boiler is located in an UNCONFINED SPACE in a building of conventional construction frame, masonry or metal, infiltration is normally adequate to provide air for combustion and ventilation. However, in any building which has been altered to conserve energy or to minimize infiltration, the boiler area should be considered as a CONFINED SPACE. If there is any doubt, install air supply provisions for combustion and ventilation in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1, the recommendations that follow, or applicable provisions of the local building codes.

3. When a boiler is installed in an UNCONFINED SPACE, in a building of unusually tight

construction, air for combustion and room 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 make-up 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 room 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 (1,000) 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 with the interior areas having adequate infiltration from the outside. (See figure 1 below.)



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 two permanent openings, one commencing within 12 inches from the top and one commencing 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.

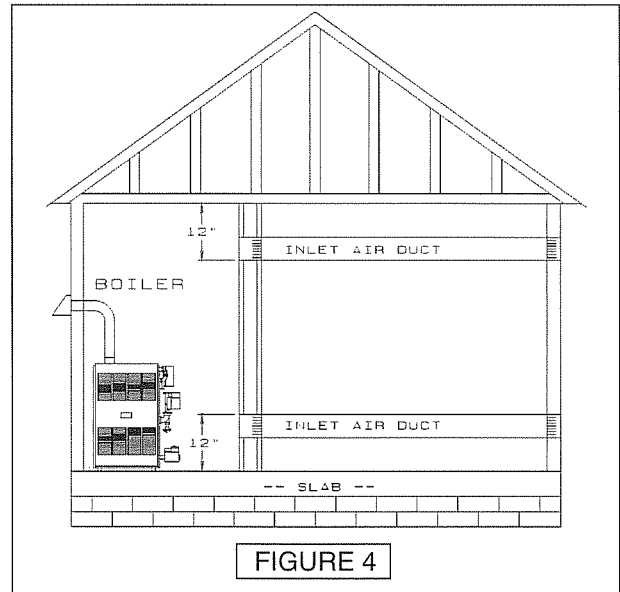
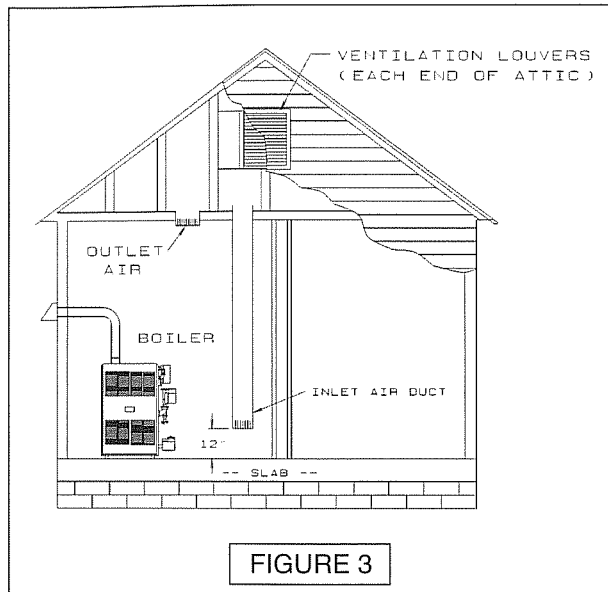
A. When directly communicating with the outdoors, each opening shall have a minimum free area of 1 square inch per 4,000 BTU per hour of total input rating of all equipment in the enclosure. (See figure 2 above.)

B. 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 on page 5.)

C. 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 ON PAGE 5.)

D. 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 inches.

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 grille 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 shall be fixed in the open position or interlocked with the boiler so that they are opened automatically during boiler operation.



CONNECTING SUPPLY AND RETURN PIPING

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.

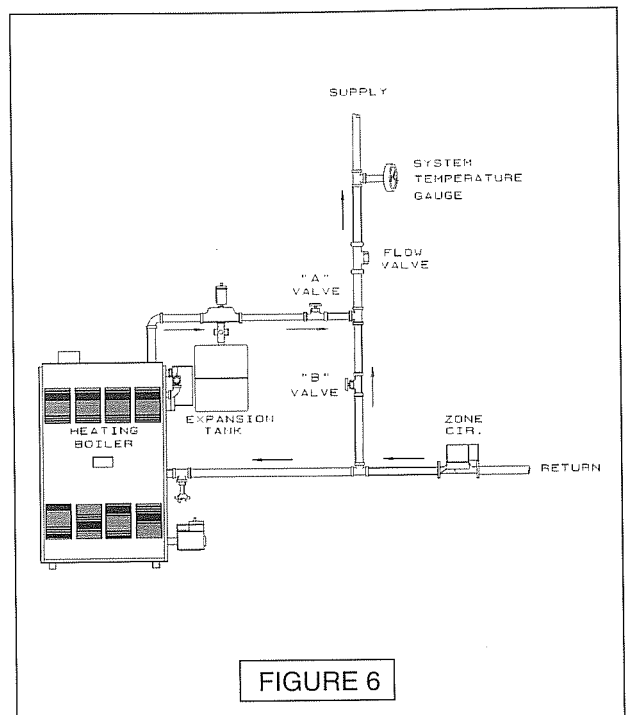
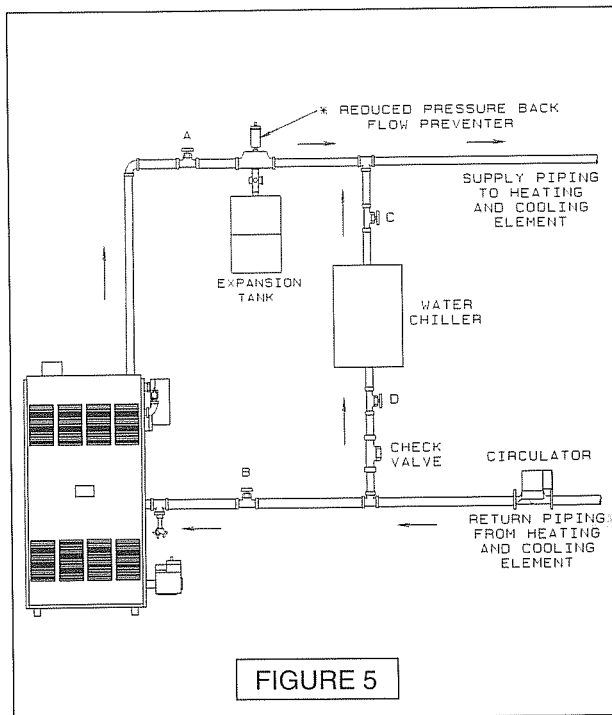
B. Use appropriate valves to prevent the chilled medium from entering the heating boiler.

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.

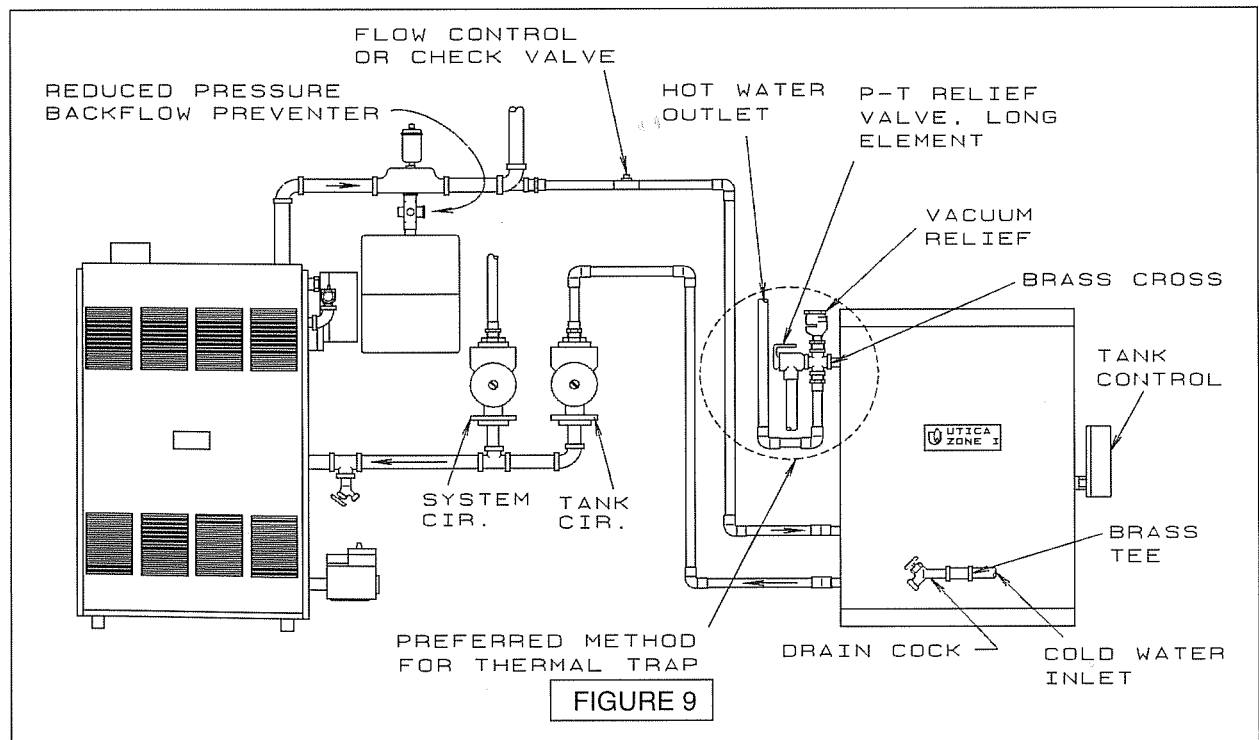
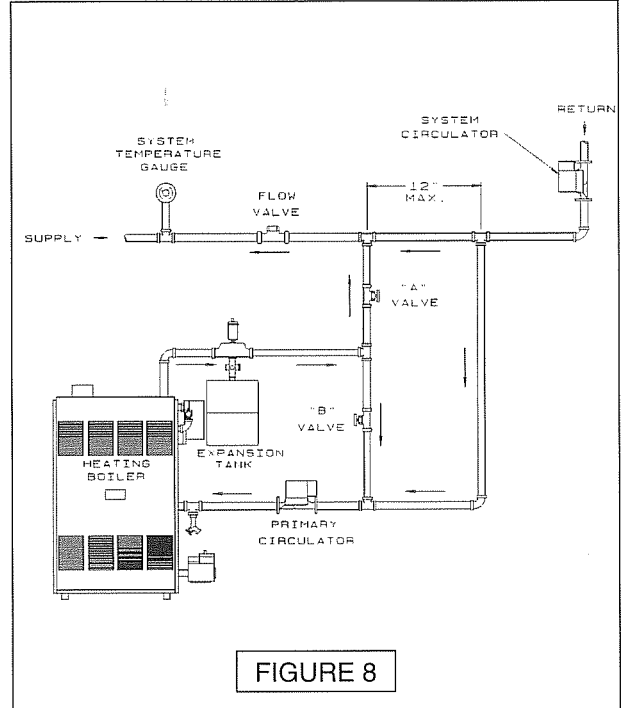
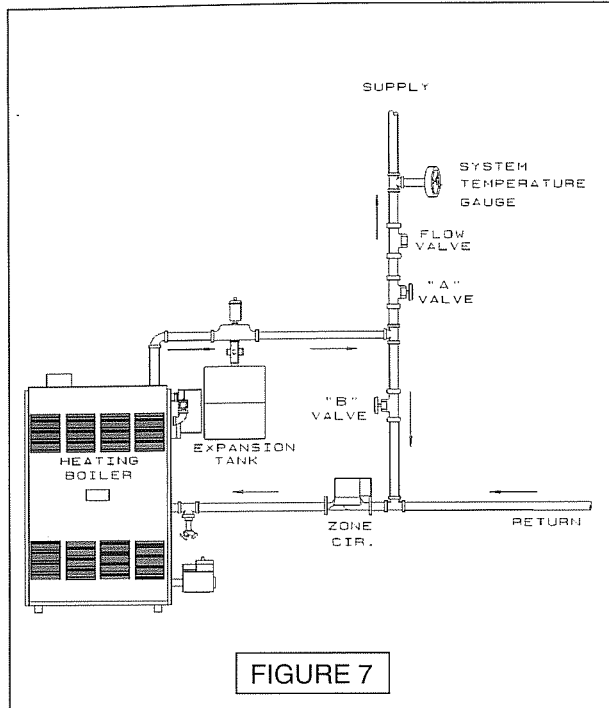
* Reduced pressure back flow preventer must be present under provisions required by the Environmental Protection Agency, (EPA).

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.

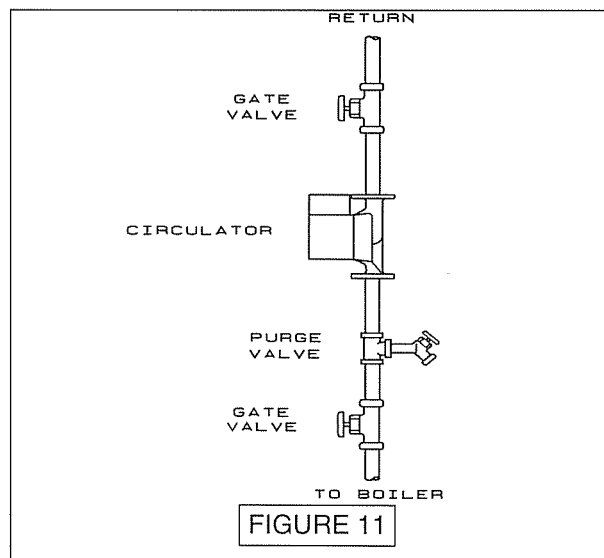
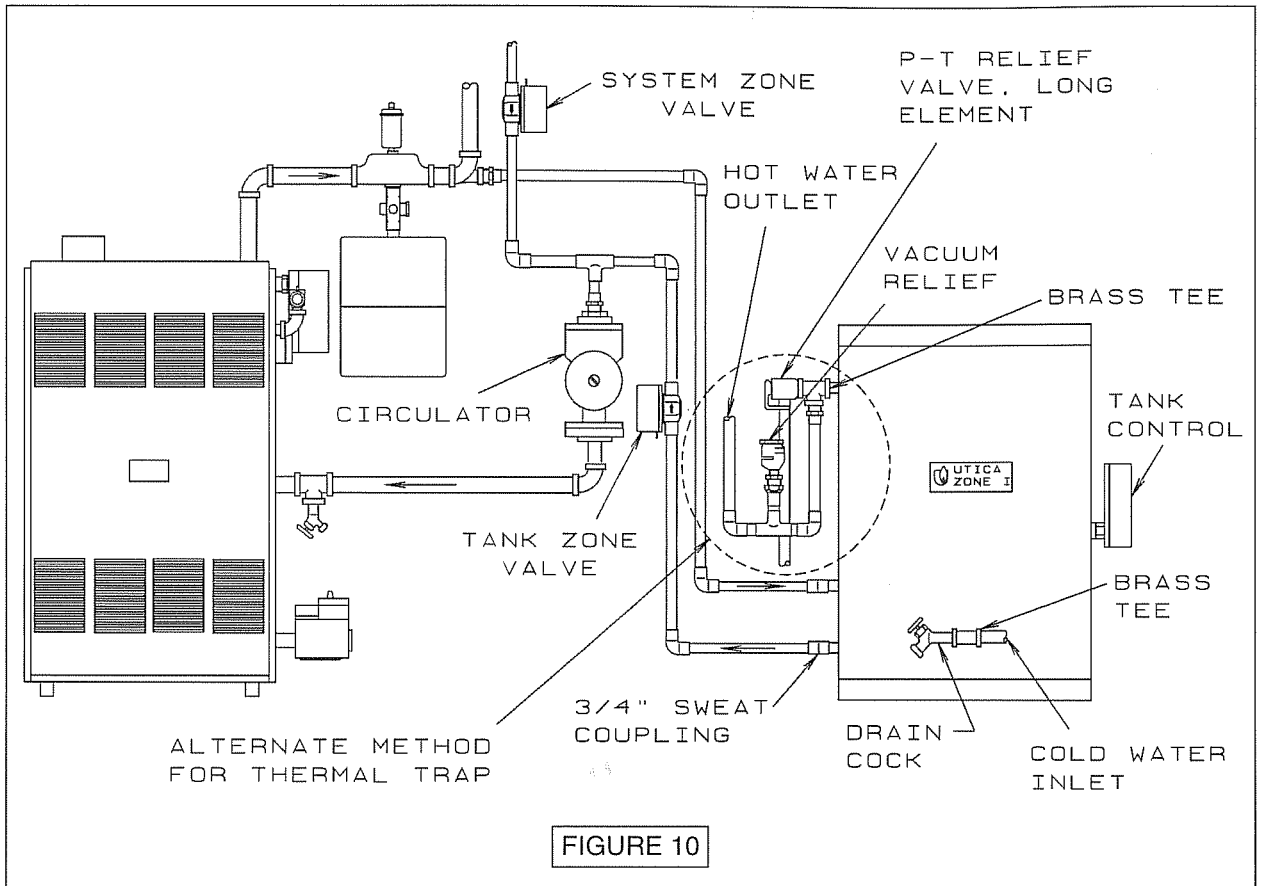
A. This method is used to protect systems using radiant panels and the material they are encased in from high temperature supply water from the boiler. See figure 6 above.

B. 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 7 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. Typical circulator installation shown below (Figure 11 below).
10. For further piping information refer to the I=B=R installation and piping guide.



HORIZONTAL VENT PIPE INSTALLATION INSTRUCTIONS

(Through the wall)

THIS BOILER IS DESIGN CERTIFIED FOR USE WITH PLEXVENT®, PLEXVENT II®, ULTRA-VENT®, OR SEL-VENT® VENTING SYSTEMS.

! CAUTION: THE ABOVE VENT PIPE AND FITTINGS ARE USED FOR VENTING GAS BURNING CATEGORY III AND IV APPLIANCES. DO NOT USE THIS VENT PIPE OR FITTINGS FOR VENTING APPLIANCES BURNING FUELS SUCH AS WOOD, OIL, KEROSENE OR COAL.

! CAUTION: DO NOT USE THIS VENT PIPE AND FITTINGS FOR VENTING INCINERATORS OF ANY KIND.

! WARNINGS:

1. FOR CORRECT INSTALLATION OF VENT SYSTEM, READ ALL OF THESE INSTRUCTIONS.

2. FAILURE TO USE THIS VENTING SYSTEM WILL VOID THE MANUFACTURER'S WARRANTY AND MAY RESULT IN RAPID DETERIORATION OF THE VENTING SYSTEM, A POTENTIAL HEALTH HAZARD.

3. FAULTY VENT INSTALLATION CAN ALLOW TOXIC FUMES TO BE RELEASED INTO LIVING AREAS. THIS MAY CAUSE SERIOUS BODILY INJURY OR PROPERTY DAMAGE. VENT PERFORMANCE MAY ALSO BE AFFECTED BY IMPROPER ASSEMBLY.

4. INSTALL SEPARATE VENTS FOR FORCED EXHAUST APPLIANCES AND NATURAL DRAFT APPLIANCES. A COMMON VENT BETWEEN NATURAL DRAFT AND FORCED EXHAUST APPLIANCES MAY CAUSE TOXIC GASES TO EXHAUST THROUGH THE NATURAL DRAFT APPLIANCE RATHER THAN TO OUTSIDE AIR. BREATHING EXHAUST GASES WILL CAUSE SERIOUS PERSONAL INJURY OR DEATH.


! WARNING: ALL INSTALLATIONS OF BOILERS AND VENTING SHOULD BE DONE ONLY BY A QUALIFIED EXPERT AND IN ACCORDANCE WITH THE APPROPRIATE UTICA BOILERS, INC. 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.


APPLICABLE FEDERAL CODES

NFPA 54/ANSI Z223.1, National Fuel Gas Code (Part 7) and NFPA/ANSI 211, 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.

1. Cutting vent pipe:

A.  **WARNING!** CUT ONLY WITH A HAND SAW, DO NOT USE A POWER SAW OR ANY OTHER METHOD OF CUTTING. OTHER METHODS COULD RESULT IN PERSONAL INJURY OR DAMAGE TO THE PIPE. DO NOT CUT OR ALTER FITTINGS. Cutting with a power saw may cause cracking or shattering of cut edge.

B. Hand cut horizontal and vertical vent pipe lengths with sharp hacksaw. The hacksaw blade MUST have at least 24 teeth per inch.

C. The cut should be as square as possible. Using a miter box to guide the hacksaw may be advisable.

JOINING AND SEALING VENT SYSTEM:

A. For sealing vent system use GE Industrial Silicone, #IS 808 or equivalent. **DO NOT USE OTHER ADHESIVES OR SOLVENT CEMENTS.**

B. Insert pipe completely into socket of fitting or adaptor, then use a felt pen or pencil, to mark the pipe at the full insertion point.

C. Squeeze a generous bead of adhesive material around the end of the pipe inside the marked area, spreading the adhesive bonding material to cover the entire area.

D. Insert pipe into fitting or adaptor, rotate the pipe in the fitting or adaptor to insure that a complete ring of adhesive is made around the inside of every connection.

E. When bottomed out, inspect each connection. Look for a continuous ring of adhesive material all AROUND the connection between the pipe and fittings or adaptor. Additional adhesive or rotating of the pipe may be required for a complete seal. The continuous ring of adhesive provides a gas tight seal required for proper venting of this appliance.

F. Allow joints to dry 24 hours for full strength.

Plex-Grip TAPE JOINING (US Patent No. 5248173)

(FOR USE WITH PLEXVENT® & PLEXVENT II® VENTING SYSTEMS)

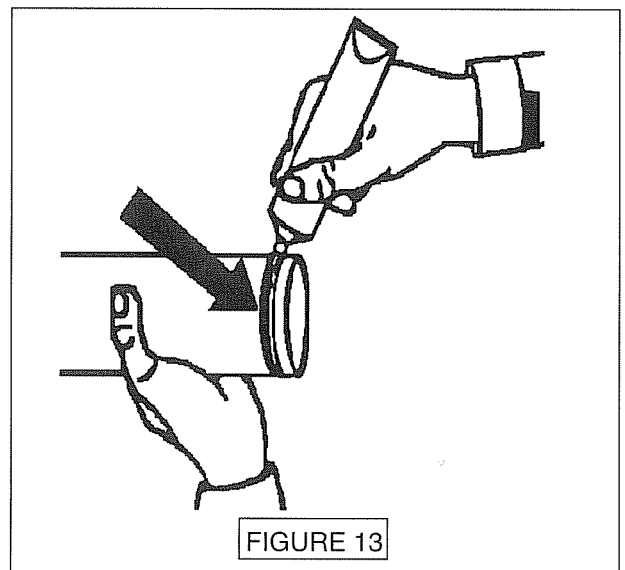
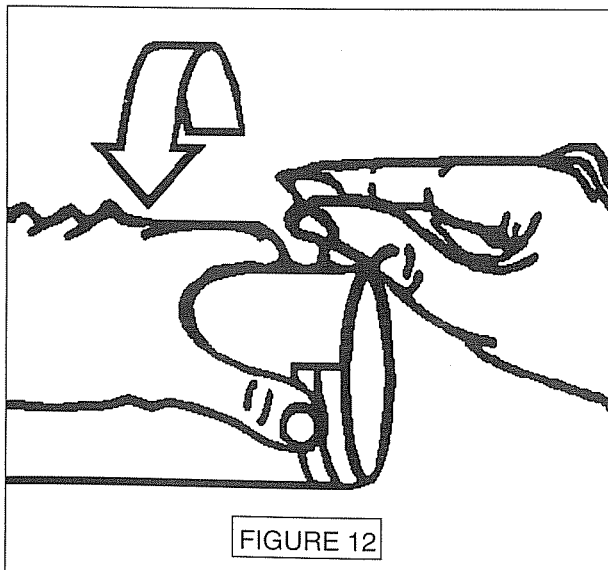
Use part no. VP01001 (red tape with blue strip) only for 3" (75 mm) vent. Use part no. VP01002 (black tape with green stripe) only for 4" (100mm) vent. **BEFORE JOINING**, the pipe end must be squarely cut with all chips and burs removed. The pipe end, the fitting socket and the Plex-Grip Tape must be clean and dry.

Step 1. With a pocket knife, remove the clear plastic backing from the Plex-Grip Tape.

Step 2. Apply Plex-Grip Tape to the pipe end. Hold one end of the tape against the pipe and stretch the tape around the pipe. Keep the leading (front) edge flush with the pipe end. Overlap the tape ends about 1/4" (6mm), and press together firmly. See Figure 12 below.

Step 3. Apply a bead of adhesive about 1/4" (6mm) wide to the trailing (back) edge of the Plex-Grip Tape. **DO NOT** put adhesive on the stripe or the leading (front) edge or in the fitting socket. See figure 13 below.

Step 4. Push the fitting and pipe straight together to the bottom of the fitting socket. **DO NOT TWIST.** See Figure 14 on page 12.



Step 5. Wipe off excess adhesive and inspect the joint for a complete, uninterrupted adhesive all around the joint. The uninterrupted adhesive ring provides the gas-tight seal required for Category III and IV appliance vents.

! WARNINGS:

Do not drill holes in pipe or fittings. Drilling may cause cracking or shattering around the hole.

Do not use sheet metal screws, rivets, or metal locking clips. Rivets or screws may place undue stress on the vent pipe and fittings, which are likely to cause cracking or leakage in the area of the fasteners.

Do not use unapproved cleaning solvents.

Do not use unapproved adhesives.

Do not use solvent cements

Do not apply adhesive to the fitting socket.

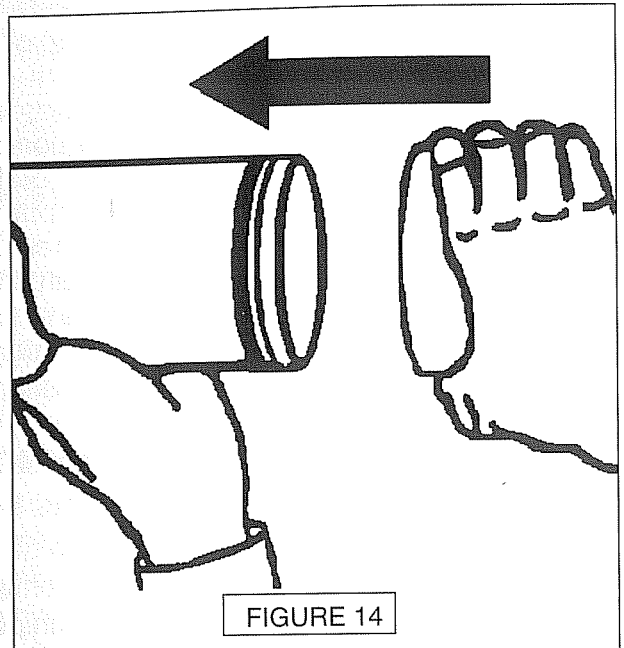


FIGURE 14

HORIZONTAL VENT INSTALLATION:

A. The boilers covered in this section design-certified as CATEGORY 3 for venting, only when they are installed with manufacturer specified vent system components and installation practices.

B. Install vent pipe beginning at the vent connector and work toward the vent cap.

C. Vent pipe and fittings MUST NOT be routed into, through, or within any other vent, such as an existing masonry chimney or factory built chimney. (Recommended installation is shown in figure 15a page 13, unacceptable installation is shown in figure 15b page 13).

D. Vent pipe lengths. The maximum length is the combined length of straight horizontal and vertical runs, and the equivalent straight length of fittings. The required lengths for each boiler are as follows:

VENT PIPE LENGTHS

Model	Vent Pipe Dia.	VENT LENGTHS		EQUIV. feet per fitting
		Maximum	Minimum	
DV38/100	3"	30' W/ Condensate Tee & 2 Elbows	2' W/1 Elbow	5'
DV125	3"	25' W/ 1 Elbow	2' W/1 Elbow	5'
DV150/200	4"	30' W/1 Elbow	2' W/1 Elbow	5'

Example: 20 feet of vent pipe w/1 elbow is Equivalent to 15 feet of vent pipe w/2 elbows. Note, condensate trap is not required on models DV150 thru 200.

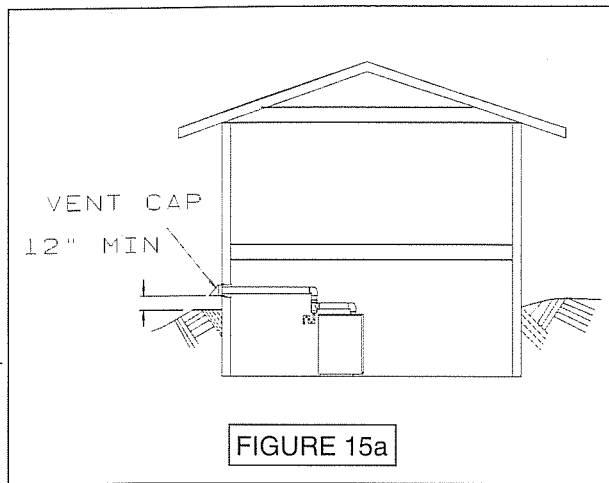


FIGURE 15a

E. The vent pipe should slope upward from the boiler at least 1 inch for every 4 feet.

F. No portion of the vent pipe should have dips or sags where condensate could collect, see figure 16 below right for a typical vent system.

G. Loosely support vent pipe every 5 feet and at the elbows. Plumbers straps may be used.

H. Clearances and enclosures. ALL vent pipe and fittings must be installed with appropriate air space clearances to combustibles. These air space clearances apply to indoor or outdoor vents, whether they are open, enclosed, horizontal or vertical or pass through floors, walls roofs or framed spaces. The appropriate air space clearances should be observed to joists, studs, subfloors, plywood, drywall or plaster enclosures, insulated sheathing, rafters, roofing, and any other combustible material. The minimum air space clearance also applies to electrical wires and any kind of building insulation.

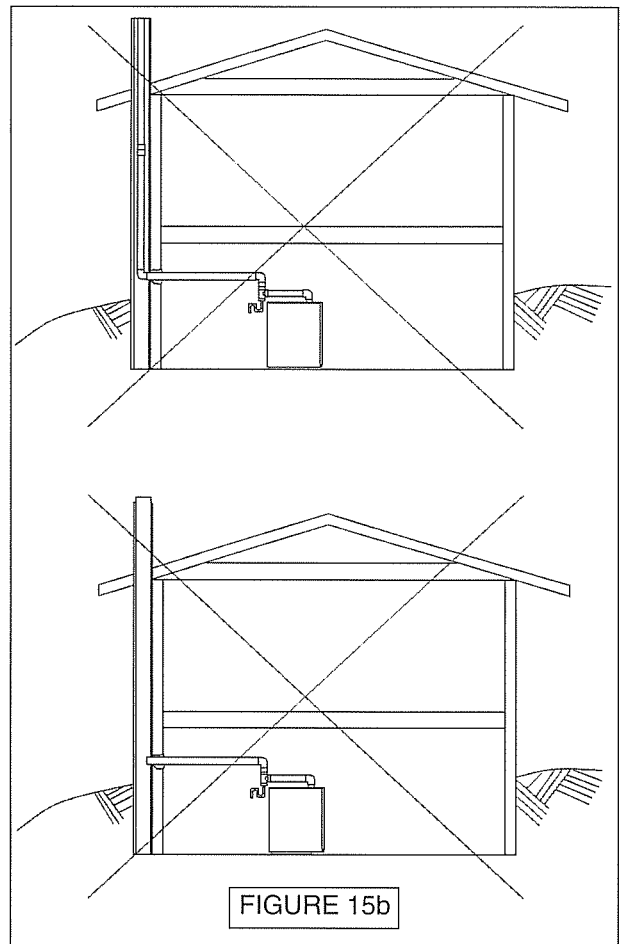


FIGURE 15b

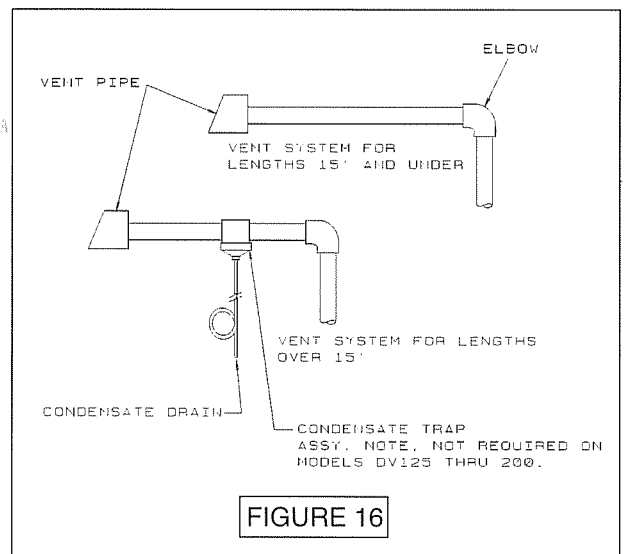


FIGURE 16

⚠ WARNING: DO NOT INSULATE OR OTHERWISE WRAP VENT PIPE OR FITTINGS.

INSTALLATION PROCEDURE FOR VENTING SYSTEM THRU NONCOMBUSTIBLE WALL

- 1) Refer to figure 18 on page 15 when determining the location of the vent outlet.
- 2) Assemble vent pipe as outlined in "Vent Pipe Installation Instructions." Do not silicon the last length of pipe into its fitting at this time.
- 3) Cut the required size hole through the noncombustible wall. Minimum of 3.1/4" for DV 38-125 or 4.1/4" for DV 150-200.
- 4) Install the last piece of vent pipe from the last fitting through the wall. Leave the pipe extended beyond the exterior wall 5" for the DV 38-125 or 4.3/4" for the DV 150-200.
- 5) Silicon the last piece of vent pipe into its fitting at this time.
- 6) Position the extension bracket over the vent pipe and secure it to the exterior wall.
- 7) Using GE IS 808 silicon, run a bead around the end of the vent pipe extending through the wall.
- 8) Install the cut 90° termination on the end of the vent pipe keeping the opening parallel to the ground.
- 9) Slip the vent cap over the cut 90° termination and mount it to the extension bracket using 4 galvanized sheet metal screws.

INSTALLATION PROCEDURE FOR VENTING SYSTEM THROUGH A COMBUSTIBLE WALL

When passing through a combustible wall, a wall thimble must be used. See figure 17 below as well as the separate installation procedure for vent system thru combustible wall, supplied with the combustible wall thimble.

THE VENT TERMINATION MUST BE LOCATED:

- A. At least 12 inches above finished grade, or at least 12 inches above the normally expected snow accumulation level in geographical areas where snow accumulates.
- B. 4 feet away from and not above any doors or windows.
- C. At least 3 feet above any forced air inlet located within 6 feet horizontally.
- D. At least 6 feet from a combustion air intake of another appliance.
- E. At least 4 feet horizontally from electric meters, gas meters, regulators and relief equipment.
- F. Do not locate the vent termination in traffic areas like walkways, unless it is at least 7 feet above finished grade.
- G. Do not locate the vent termination too close to shrubbery as flue products may stunt or kill them.

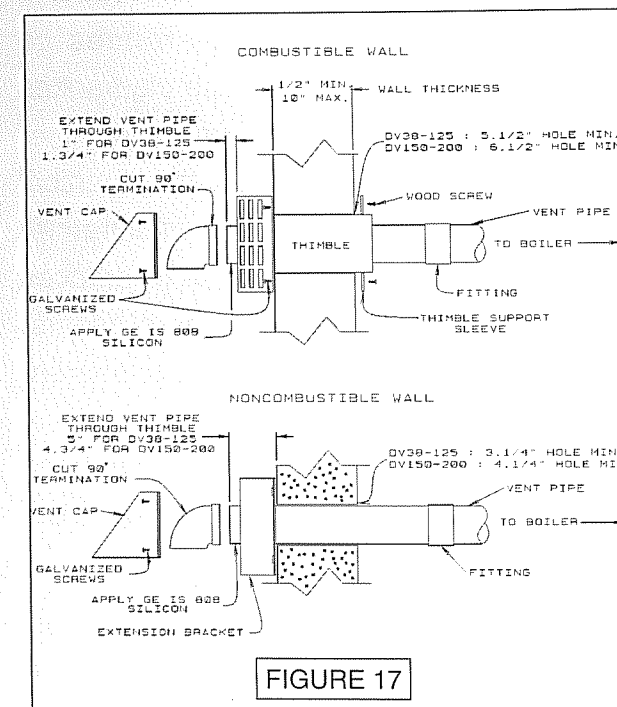
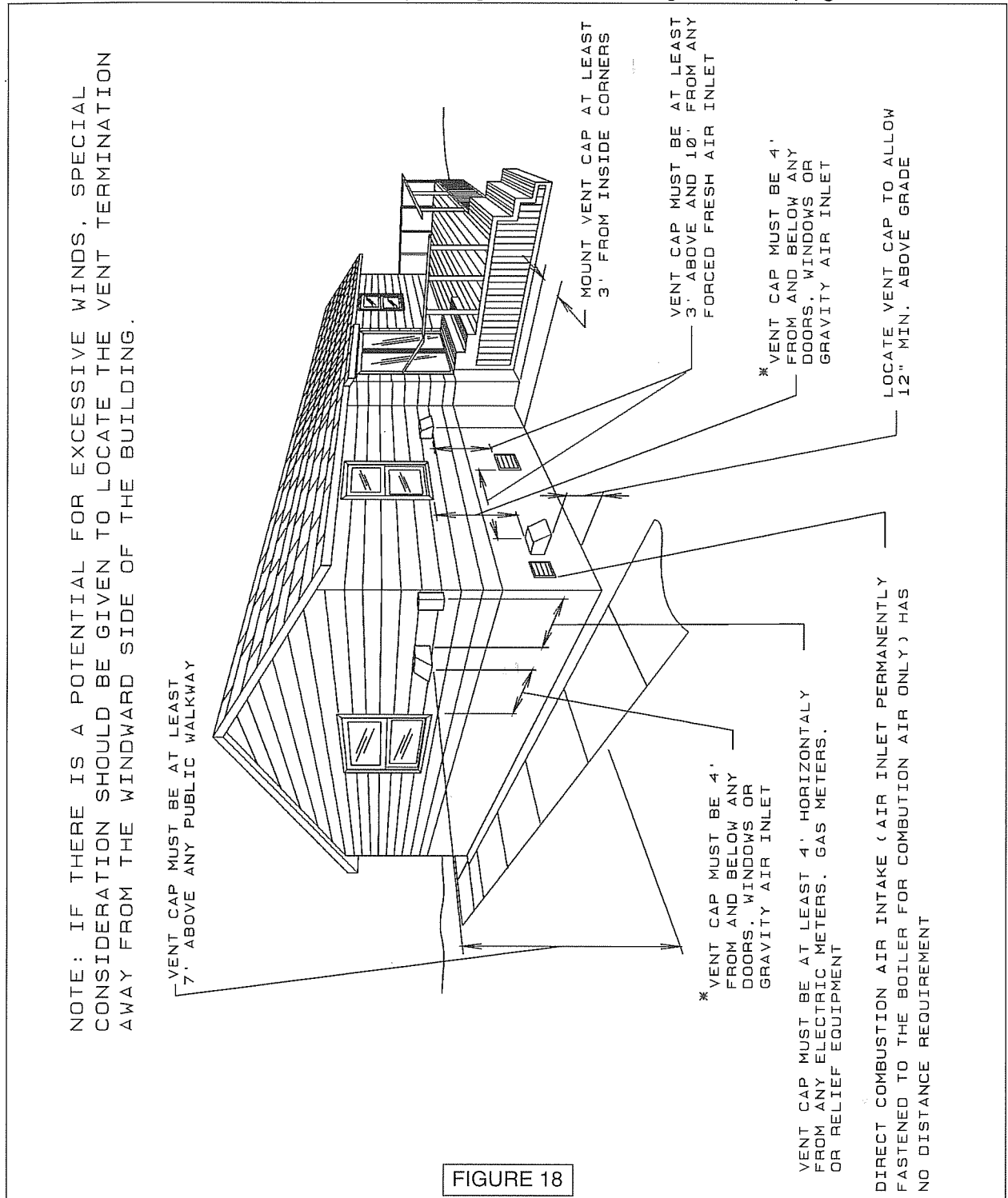


FIGURE 17

H. See the Federal Codes listed at the beginning of these instructions for additional information on termination location. See figure 18 below.

I. Some building materials may be affected by flue products expelled near unprotected surfaces. Sealing or shielding of exposed surfaces with a corrosion resistant material (such as aluminum sheet) may be required to prevent staining or deterioration.

J. When installing vent cap secure it to a noncombustible wall or a combustible wall thimble. Fasten vent cap and seal passage as shown in figure 17 on page 14.



The minimum clearances to any combustible material, electrical wires and building insulation materials are as follows:

HORIZONTAL RUNS - maintain a minimum air space clearance of 6 inches for 3 inch and 4 inch vent pipe.

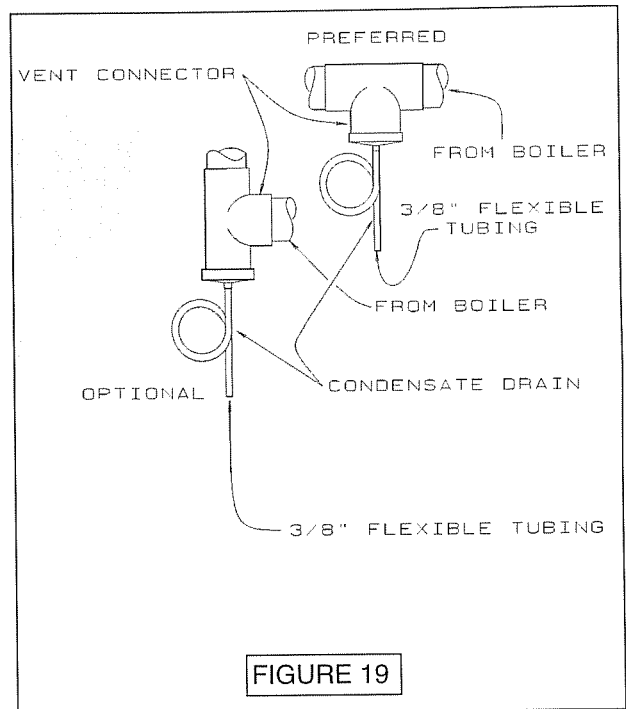
CONDENSATE DRAINS

⚠ WARNING: DO NOT PLACE CONDENSATE DRAIN WHERE FREEZING MAY OCCUR.

CONDENSATE DRAINS ARE REQUIRED IN THE VENT WHEN USING THE 901971 or 906882 TERMINATION TEE. THE CONDENSATE DRAIN FITTING MUST BE PLUMBED TO A SANITARY DRAIN FOR LIQUID CONDENSATE DISPOSAL. (Note: condensate trap is not required on models DV150 thru 200).

Condensate drain 906646 (3") is plumbed with 3/8" inside diameter flexible tubing. See Figure 19 at right.

1. Flexible Tubing Condensate Drain.
In the vent, and close to the appliance, install a tee with either a run outlet or the branch outlet down. Install a 906646 or 903855 condensate drain in the down outlet with high temperature adhesive. Connect the condensate drain outlet to commercially available flexible tubing (minimum length 40"). Below the drain outlet, make a 6" diameter loop in 3/8" ID tubing, or a 9" diameter loop in 5/8" ID tubing. Secure the loop with a plastic cable tie. Run the other end of the flexible tubing to a sanitary drain.



VERTICAL VENT PIPE INSTALLATION INSTRUCTIONS

(PROVIDING FOR PROPER VENTING THROUGH THE ROOF)

Vent boiler using these instructions. Also, meet the requirements of the local utilities and other local code authorities. You must connect boiler to a vent or factory-built chimney. Vent or factory-built chimney must meet a recognized standard. Chimney lining method and material must comply with local code requirements. Use corrosion-resistant material meeting nationally recognized standards for vent construction.



WARNING:

Inadequate vent or chimney could allow combustion products to collect in structure, resulting in injury or death.



WARNING:

Vent this boiler separately from any appliance designed to burn solid fuel, particularly wood burning or coal burning appliances. Improper venting could allow combustion products to collect in the structure, resulting in injury or death.

A. VENTING CATEGORY

The boilers covered by this manual are design-certified as CATEGORY 1 for venting. CATEGORY 1 Appliances have non-positive vent static pressure and rely on the heat content of combustion products to vent. You may common vent CATEGORY 1 boilers.

The boilers covered by this manual are also design certified as CATEGORY 3 for venting, only when they installed with manufacturer specified vent system components and installed practices.

B. DESIGN CONSIDERATIONS

1. Avoid oversizing boiler for your application. Select a boiler model with a rated heating output close to the calculated heating load. This extends the firing period, decreasing the potential for condensate formation in the vent.

2. Too small a vent cannot carry all combustion products outdoors. Too large a vent will not vent combustion products rapidly enough to avoid potential for condensation. Refer to pages 21 thru 24 for correct vent size.

3. Vent height must be a minimum of fifteen feet. Minimize vent connector horizontal runs to the extent possible for best performance.

4. The designer must consider the building's orientation, answering these questions. Will the vent terminate outside the building where its operation could be adversely affected by winds? Could any adjacent buildings adversely affect vent operation? Allowing for these factors can reduce the possibility of downdraft conditions.

5. If your local experience indicated possible condensation problems, provide for draining and disposal of venting system condensate.

C. VENT SIZING

1. Sometimes the horizontal distance from the boiler to the vent or chimney is already given; this is known as the horizontal vent connector run. The vent or chimney height is also usually given as the Btuh input of the gas appliances served by the vent.

Check these parameters to be sure the venting system will work. Use approved engineering practices and part 7 of the current National Fuel Gas Code, ANSI Z233.1/NFPA54.

2. Use this venting addendum for single appliance venting and multiple appliance (common) venting. For multistory installations, refer to current National Fuel Gas Code ANSI Z223.1/NFPA 54.

D. VENT CONNECTOR

1. Vent connectors must be made of noncombustible, corrosion resistant material capable of withstanding vent gas temperatures. They must be thick enough to withstand physical damage and be accessible for inspection, cleaning and replacement.

2. Use Type B 1 vent connector in or through attics, crawl spaces, or other cold areas. Install thimbles that meet local codes when vent connectors pass through walls or partitions of combustible material.

3. Keep vent connectors as short as possible by locating boiler as close as practical to vent or chimney. Avoid unnecessary turns or bends which create resistance to flow of vent gases. Adding an elbow adds resistance. For example, adding a 6" 90-degree elbow would be the equivalent of adding 20 feet of horizontal 6" pipe. (45-degree elbows have lower resistance than 90-degree elbows, and can work for most vent runs).

4. If you join two or more vent connectors before they enter the vertical vent or chimney, see figure 26, on page 23.

5. Do not connect this boiler to any portion of a vent system which operates under positive pressure. Positive pressure would result with CATEGORY 3 and 4 appliances connected to the vent.

6. Do not connect vent connector to a chimney flue serving a fireplace.

E. VERTICAL VENT OR CHIMNEY

1. Vents and chimneys usually extend vertically with offsets not exceeding 45-degrees. Consider vent pipe runs more than 45-degrees as horizontal runs. Include their length in the total horizontal run.

2. Designer and installer must provide an appropriately sized common vent for all appliances connected to it. See figure 26, on page 23.

3. Connect this CATEGORY 1 boiler only to vent systems with other CATEGORY 1 appliances.



Do not connect this CATEGORY 1 boiler to a vent system used

by a CATEGORY 3 and 4 appliance. Do not connect it to vents with mechanical draft systems operating at positive pressure. Improper venting could allow combustion products to collect in the structure during use, resulting in damage, injury or death.

F. CHIMNEY LINING

Use a suitably sized Type B1 vent liner. See Figure 20 below.

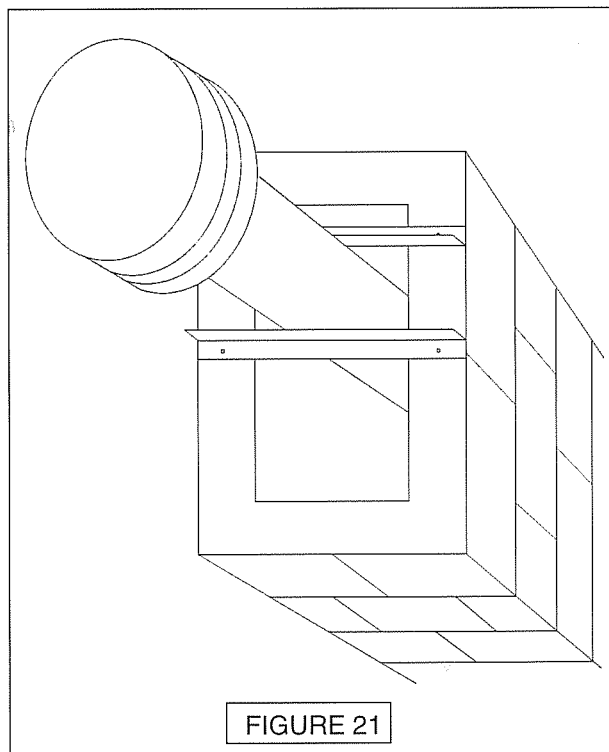
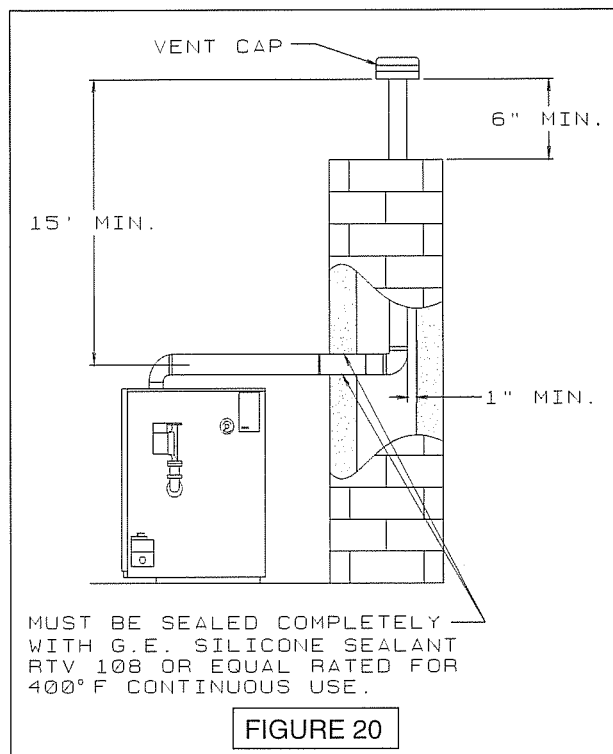
⚠ WARNING: Support Type B1 vent liner in a masonry chimney. Maintain at least 1" clearance on all sides to reduce the possibility of condensate in vent. Condensate may cause vent to deteriorate allowing combustion products to collect in structure, which could result in injury or death. See Figure 21 below.

⚠ WARNING: Vent liner must not block opening where other appliance's vent connectors enter chimney. Blocked openings will cause combustion products to collect in the structure, resulting in damage, injury or death.

⚠ WARNING: Do not use unlined masonry chimneys. These increase risk of condensate formation, which may cause chimney to deteriorate, allowing combustion products to collect in the structure, resulting in damage, injury or death.

G. VENT TERMINATION

1. Terminate all vertical vents with a listed vent cap or roof assembly unless local codes



require otherwise. See vent cap or roof assembly manufacturer's instructions. Locate vent termination (vent cap or roof assembly) in an area without positive pressures or eddy currents. Eddy currents occur when air swirls over roof peaks. They cause down-drafts and adversely affect vent operation. See Figure 22 at right. Some vent terminations or caps protect against eddy currents and down-drafts. Consult their manufacturer's instructions. Vent terminations or caps should usually be at least the same size as the vent. They may be larger if the installation warrants.

2. Vent systems must end at least five feet above the highest gas appliance connection. The vent pipe must extend at least three feet above the point where it passes through the roof. Vent termination must be at least two feet higher than any portion of building within ten feet horizontal and vent termination must be at least two feet higher than roof peaks within ten feet horizontal. See figures 23 and 24 below.

Some vent cap manufacturer's offer vent caps that allow reduced clearances. Consult their instructions.



WARNING:

Failure to properly terminate vent chimney systems could allow combustion products to collect in the structure, resulting in injury or death.

3. Terminate venting system at least three feet above any forced-air building inlet within ten feet. Consider doors, windows and gravity air building inlets. Locate vent termination at

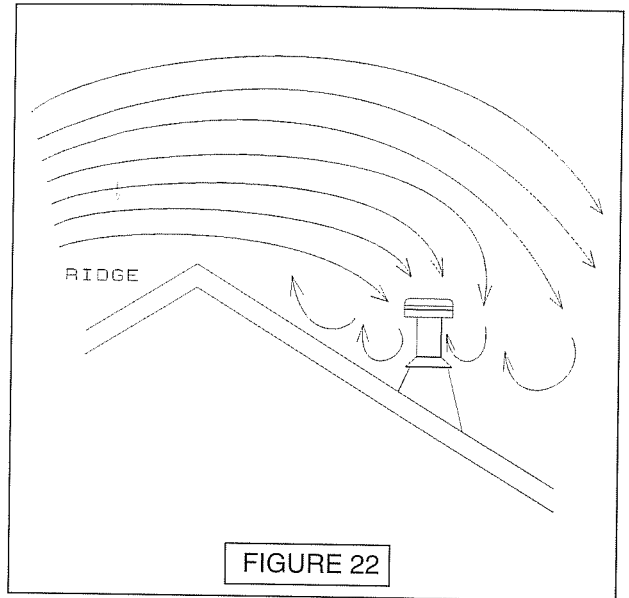


FIGURE 22

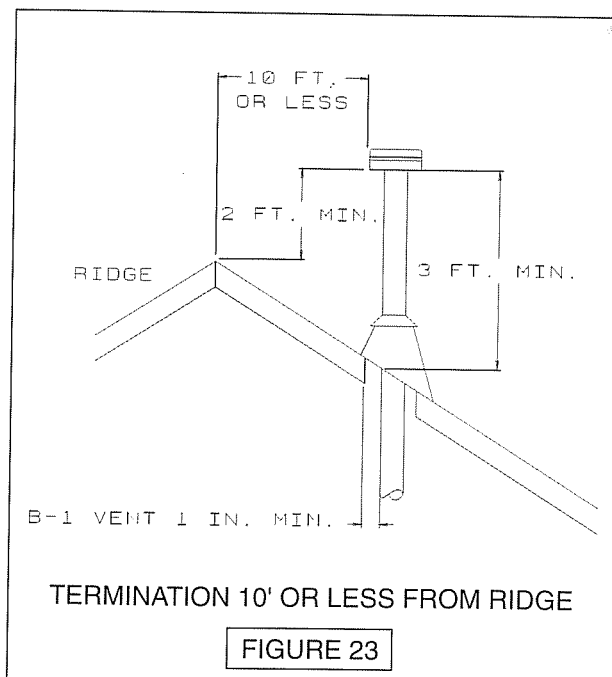


FIGURE 23

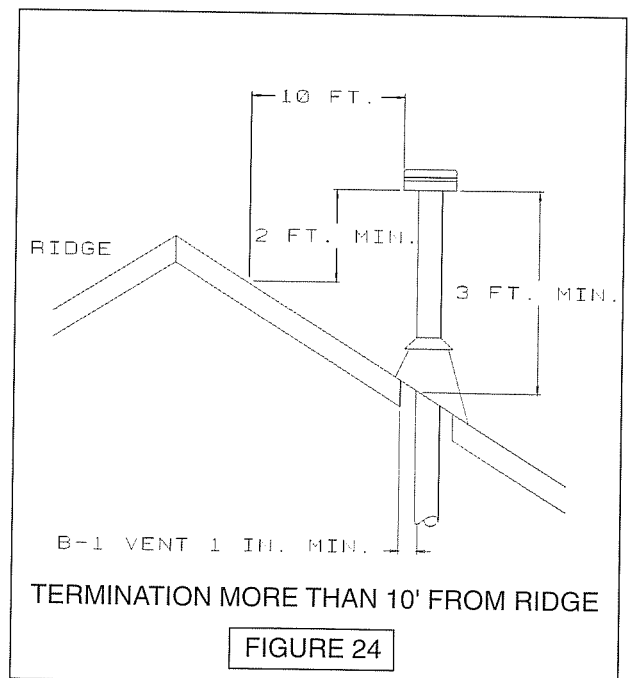


FIGURE 24

ROOF PITCH	HEIGHT ABOVE ROOF	
FLAT TO 7/12	1.0 FT.	
OVER 7/12 TO 8/12	1.5 FT.	
OVER 8/12 TO 9/12	2.0 FT.	
OVER 9/12 TO 10/12	2.5 FT.	BRACE TO ROOF AT TOP
OVER 10/12 TO 11/12	3.3 FT.	
OVER 11/12 TO 12/12	4.0 FT.	
OVER 12/12 TO 14/12	5.0 FT.	BRACE TO ROOF AT TOP AND MID POINT
OVER 14/12 TO 16/12	6.0 FT.	
OVER 16/12 TO 18/12	7.0 FT.	
OVER 18/12 TO 20/12	7.5 FT.	
OVER 20/12 TO 21/12	8.0 FT.	

ROOF PITCH CHART

least four feet below, four horizontal feet from or one foot above any of these openings.

H. INSTALLATION

1. Vent Adaptor.

Attach vent adaptor at draft inducer collar. See figure 27 on page 24. Use Kit # 56111101 for DV 50-125 and Kit # 56111102 for DV 150-200.

! WARNING: Unsecured vent pipe connections may loosen. This can allow combustion products to collect in the structure, resulting in injury or death.

2. Vent Connector.

Install vent connectors without any dips or sags. Slope them upward from boiler at least 1/4" per foot. To prevent sagging, at each joint support vent connectors and horizontal portions using hinges, straps or equivalent. Seal all connections where vent connectors enter chimney. See Figure 20 on page 19.

3. Vertical Vent

Install vent materials following their listing terms, manufacturer's instructions, these instructions and local codes.

A gas vent passing through a roof must extend through roof flashing, jack or thimble. It must terminate above the roof surface.

I. EXISTING VENT CONSIDERATIONS.

MASONRY CHIMNEYS PREVIOUSLY USED FOR VENTING EQUIPMENT SHOULD BE LINED WITH TYPE B1 VENT PIPE. Also provide an accessible clean out per current National Fuel Gas Code ANSI Z223.1/NFPA 54.1

1. INSPECTION OF VENTS

A. Make sure existing vent or chimney is the proper size and construction for appliances that will use it. The best way to do this is to size as if it were a new installation.

Compare the existing vent to your calculations and make necessary corrections.

B. Examine vent or chimney cleanouts to make sure they remain tightly closed when not in use. Make sure vent or chimney passageway is clear and free of obstructions. Look for evidence of condensate or deterioration in vent or chimney. Either of these means an inadequate vent.

C. If you find an inadequate vent or chimney, do not leave it as is. Repair or replace it. A new vent must meet these instructions and current National Fuel Gas Code ANSI Z223.1/NFPA 54.

VERTICAL VENTING INSTALLATION (TYPE B VENT)

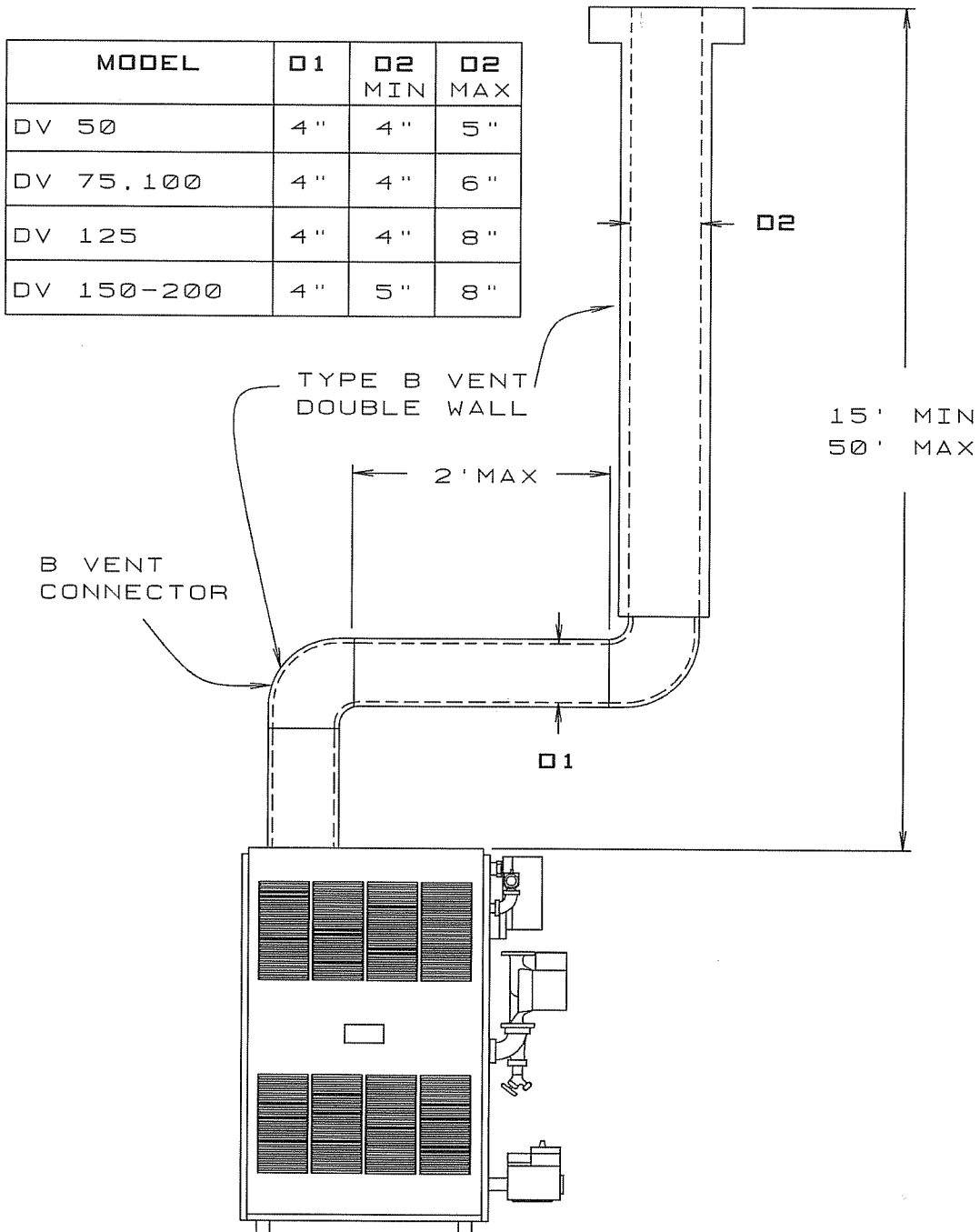


FIGURE 25

VERTICAL VENTING INSTALLATION (TYPE B VENT) W/ NATURAL DRAFT WATER HEATER (40,000 BTU/HR)

MODEL	D1	D2 MIN	D2 MAX
DV 50	4"	4"	4"
DV 75,100	4"	5"	6"
DV 125,150	4"	6"	8"
DV 175,200	4"	7"	8"

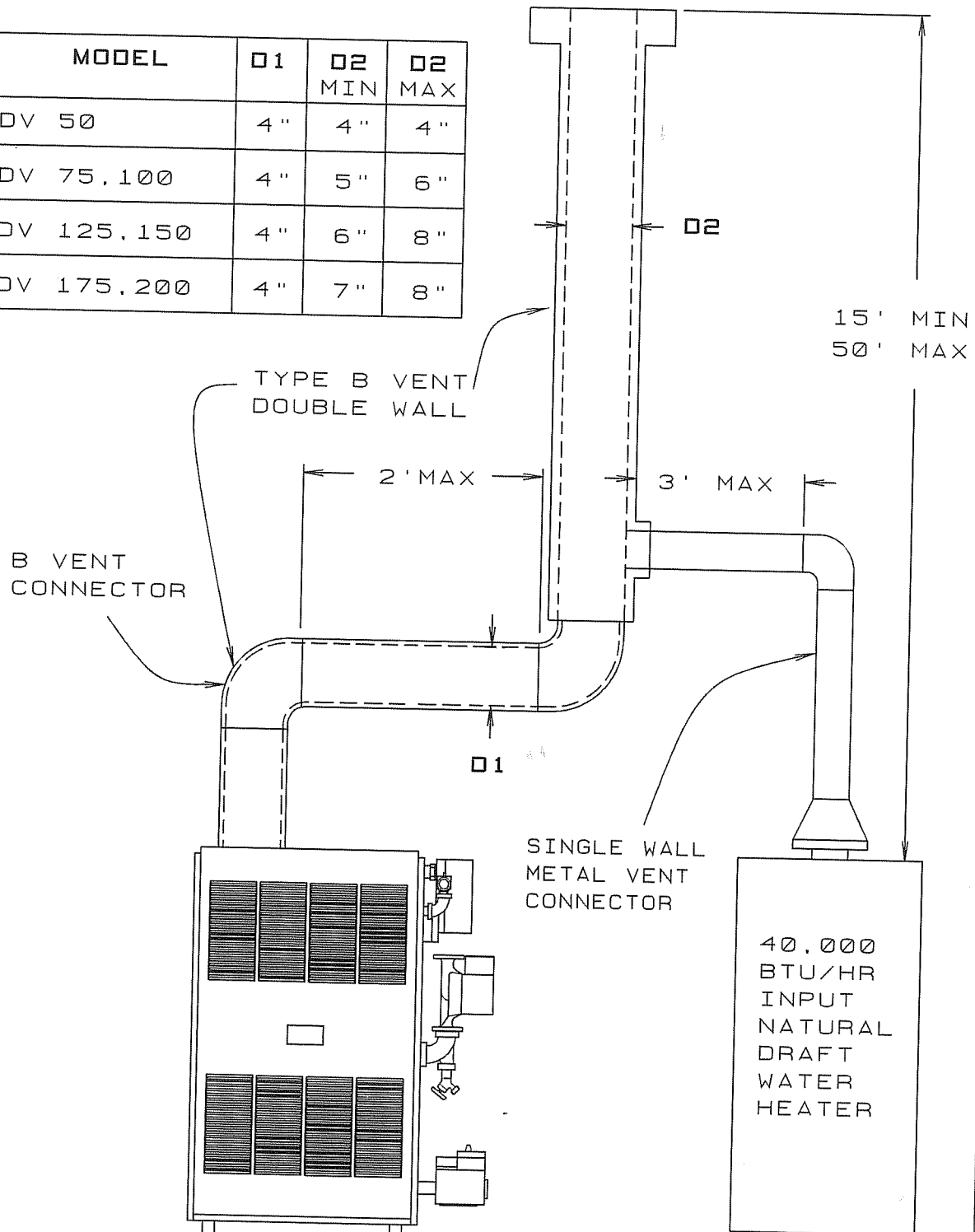


FIGURE 26

CATEGORY I VENT INSTALLATION USING HART & COOLEY TYPE B GAS VENT OR EQUIVALENT

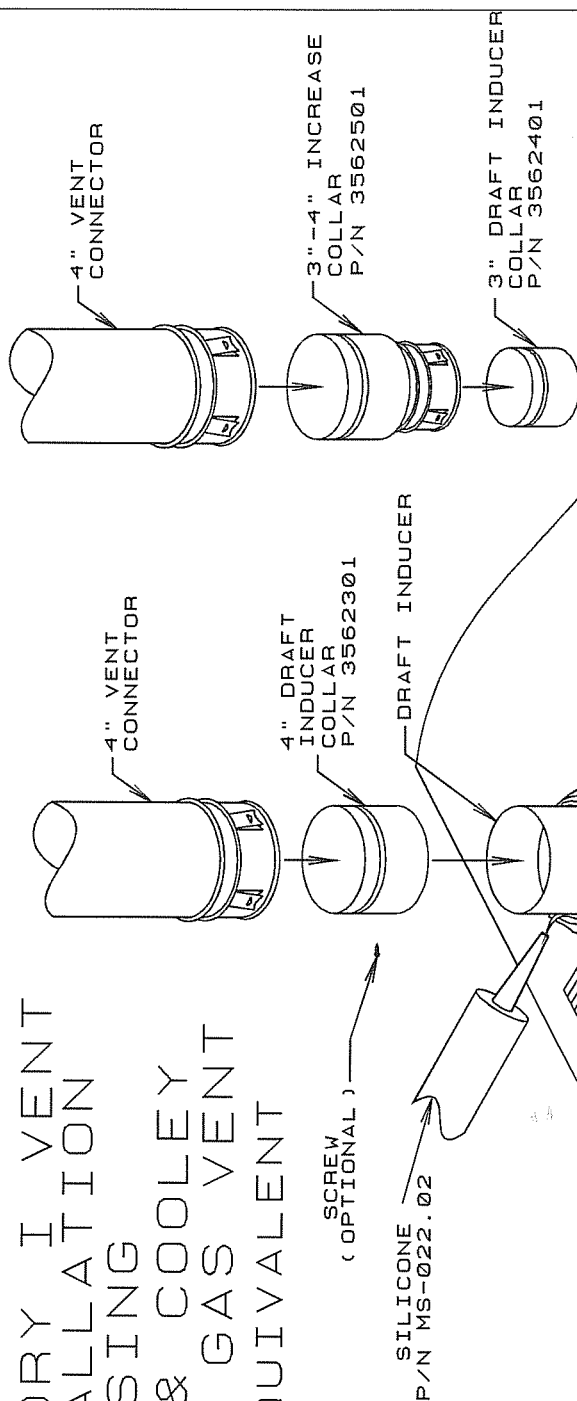


FIGURE 27

KIT CONTENTS:

KIT # 56111101
(MODEL NUMBERS 50 THRU 125)

PART NO.	DESCRIPTION	QTY.
MS-022.02	SILICONE	1
PK-022.01	CARTON (NOT SHOWN)	1
3562501	VENT INCREASE 3"-4"	1
3652401	INDUCER COLLAR 3"	1
37613301	INSTRUCTIONS	1

KIT # 56111102
(MODEL NUMBERS 150 THRU 200)

PART NO.	DESCRIPTION	QTY.
MS-022.02	SILICONE	1
PK-022.01	CARTON (NOT SHOWN)	1
3652301	INDUCER COLLAR 4"	1
37613301	INSTRUCTIONS	1

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:

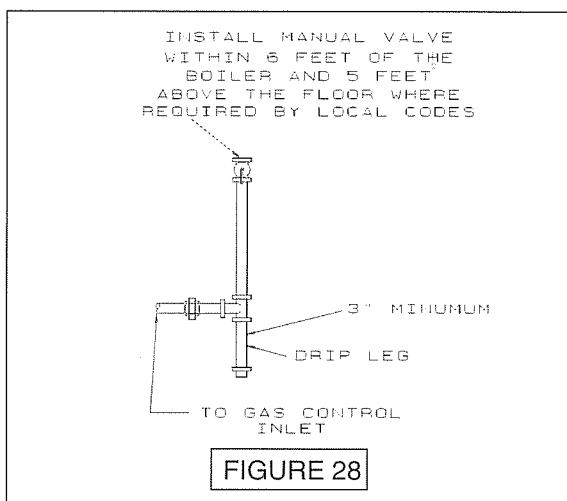
REMOVAL OF BOILER FROM VENTING SYSTEM

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 National Fuel Gas Code, ANSI Z223.1-1988. 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 National Fuel Gas Code, ANSI Z223.1-1988.

CONNECT GAS SERVICE

Connect gas service meter to control assembly in accordance with 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 28 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 "Table C" 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 National Electrical Code, ANSI/NFPA No. 70-1990 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 DV series boiler with fail safe relay. See figure 29 on page 28.

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

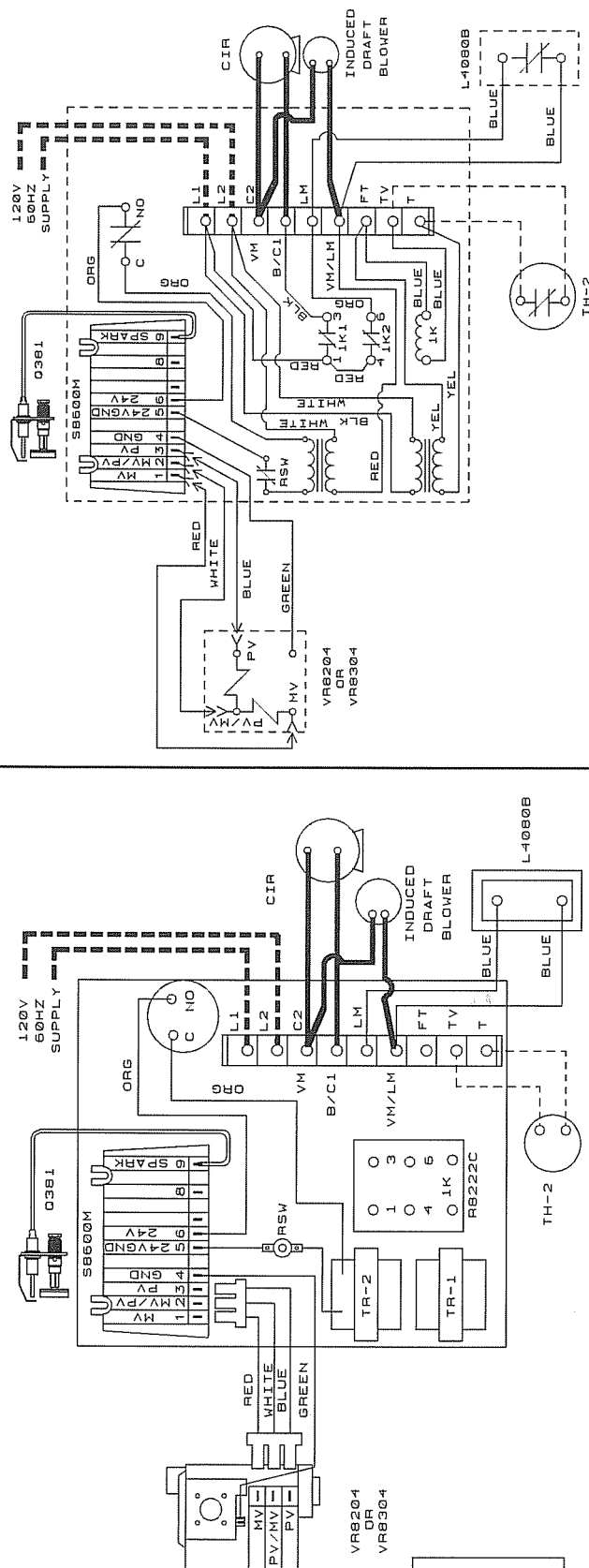


FIGURE 29

COMPONENT CODE

TH-1	TH-2	TH-3	TR-1	TR-2	MGV	LGV-1	PS	MR-PS	SD	1 K	1 K1	1 K2	LS	MS	CIR	ECO	LWCO	EWF	PG	PSC	WIRE CONNECTION	MANUAL SWITCH	CIRCULATOR	ENERGY CUT-OFF	LOW WATER CUT-OFF	ELECTRIC WATER FEEDER	POWER GENERATOR	PILOT SAFETY COIL	WIRE CONNECTION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

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.

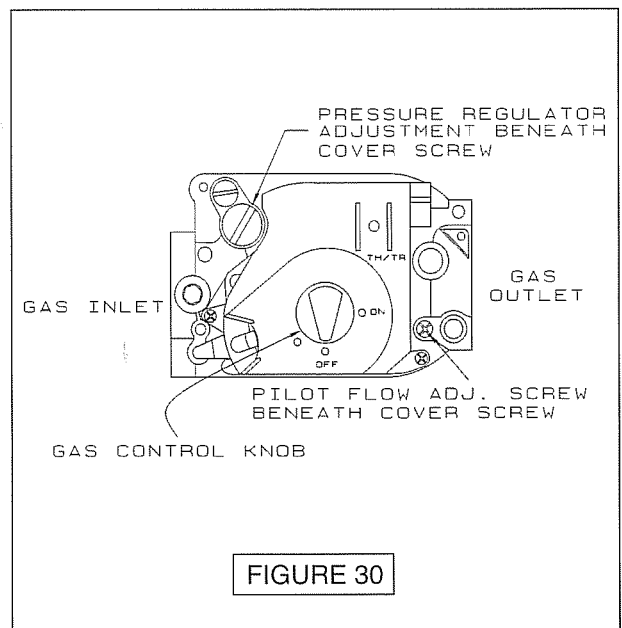
C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician.

⚠ 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. Lubricate venter motor once a month during the heating season with a few drops of non-detergent motor oil (SAE 20 or 30).

! 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 by looking through the transparent fittings, 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 16 on page 13.

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:

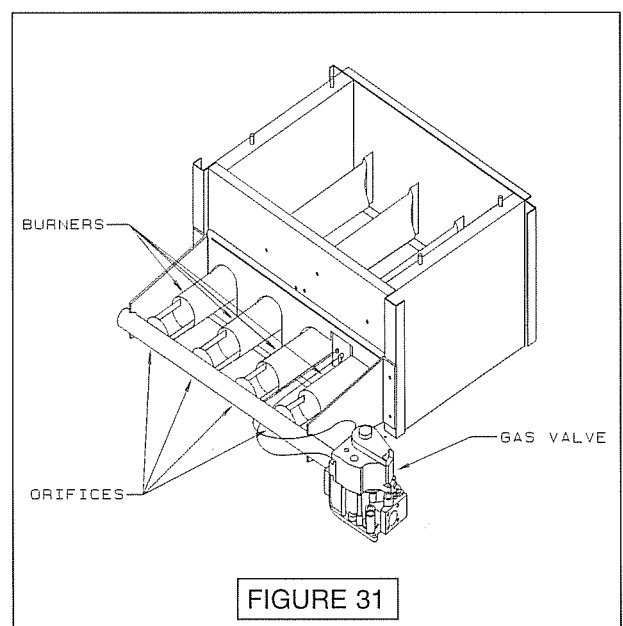
- a. With the boiler off, disconnect the white compression fitting on the pressure switch.
- b. Connect a slope manometer to the compression fitting with additional tubing.
- c. Turn the boiler on and read suction pressure on the manometer. Reading

should be negative (-) $.40 \pm .05$ inches of water column or higher for the DV 38 thru 150 and negative (-) $.60 \pm .05$ inches of water column or higher for the DV 175 & 200.

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 31 at right.



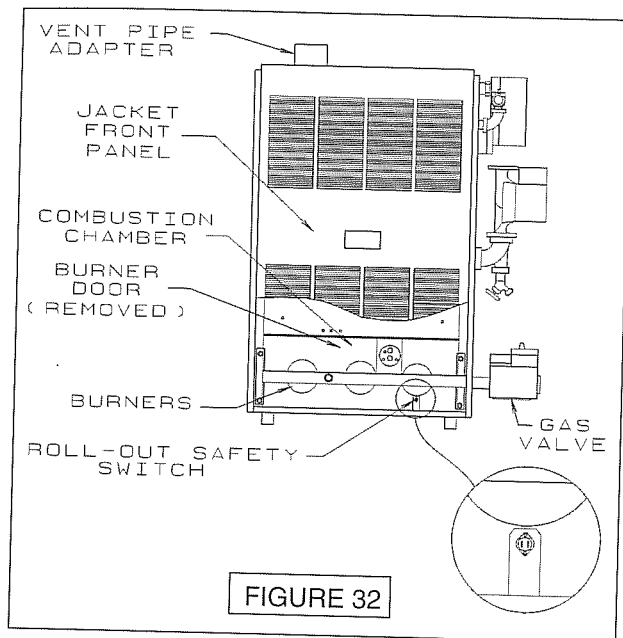


FIGURE 32

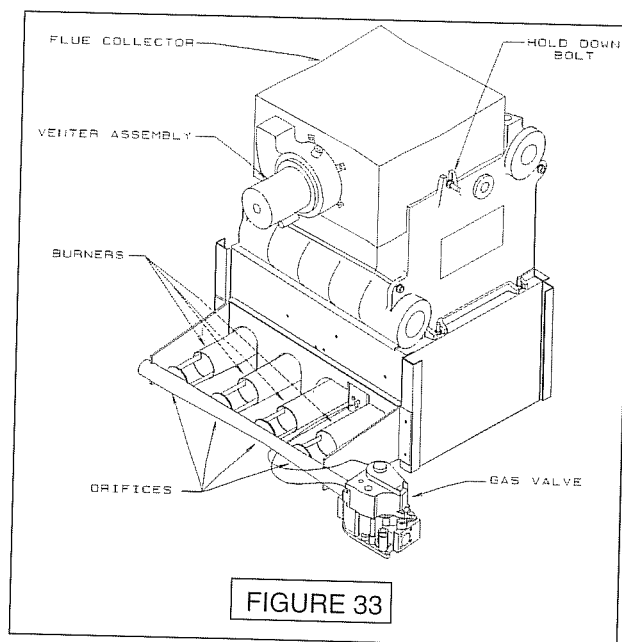


FIGURE 33

- B. Disconnect the vent pipe from the vent adapter
- C. Remove the top jacket panel. See figure 32 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 nuts on the hold-down bolts located on each side of the collector. See figure 32 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. 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.
3. 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 33 above.
 - B. The main burner flame should have a well defined inner blue mantel with a lighter blue outer mantel. See figure 34 on page 34.

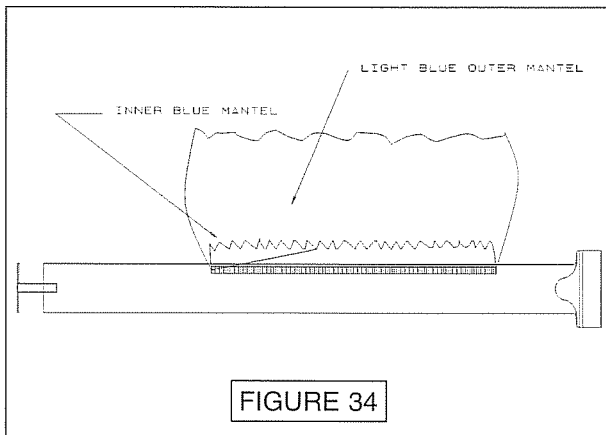


FIGURE 34

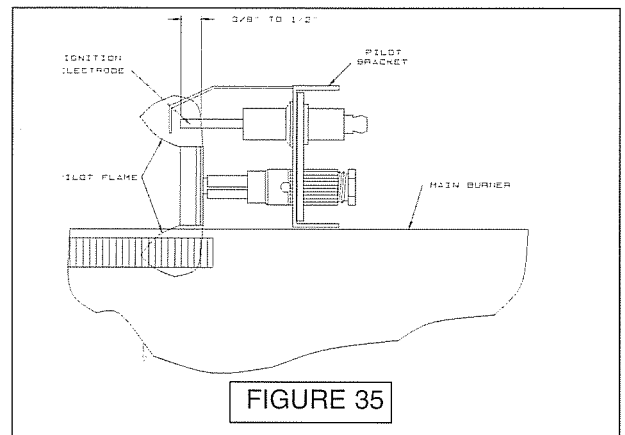




FIGURE 35

C. The pilot flame should envelop $\frac{3}{8}$ to $\frac{1}{2}$ inch of the tip of the pilot sensing device. See figure 35 on page 34.

4. 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 30, on page 30.
- 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, install a shut-off cock in the $\frac{1}{8}$ " pipe tapping provided in the manifold (remove pipe plug). Then attach a manometer to the shut-off cock, be sure the boiler is turned off. With the shut-off cock in the closed position, turn the boiler on. After the boiler has fired, open the cock slowly to prevent any surge of gas pressure that may blow liquid out of the manometer.

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 30 on page 30.

After adjustment has been completed, turn the boiler off and remove the manometer and the shut-off cock. Then replace the pipe plug in the manifold.

E. Relight all the other appliances turned off in step A above. Be sure all pilot burners are operating.

DV SERIES REPLACEMENT PARTS LIST

REFER TO FIGURE 36 ON PAGE 37

ITEM NO	P/N	DESCRIPTION	QTY.
1	3752701-06	BASE ASSY-HW	1
	3752801-06	BASE ASSY-HW LP	1
2	100-2-7.01	BATTERY-MGB 75/100	1
	100-2-7.02	BATTERY-MGB 125/150	
	100-2-7.03	BATTERY-MGB 175/200	
3	32523001	BURNER DOOR 75/100	1
	32523101	BURNER DOOR 125/150	1
	32523102	BURNER DOOR 175/200	1
4	HW-003.03	NUT 5/16-18	4
5	HW-008.01	WASH 5/16	6
6	345-2-19.01	FLUE COLLECTOR DV 38	1
	345-2-19.02	FLUE COLLECTOR DV 50	
	345-2-19.03	FLUE COLLECTOR DV 75	
	345-2-19.04	FLUE COLLECTOR DV 100	
	345-2-19.05	FLUE COLLECTOR DV 125	
	345-2-19.06	FLUE COLLECTOR DV 150	
	345-2-19.07	FLUE COLLECTOR DV 175	
	345-2-19.08	FLUE COLLECTOR DV 200	
6A	DC-003.01	VENTER DV 38/50/75/100/125/150	1
	DC-003.02	VENTER DV175/200	
7	HW-003.02	NUT 1/4-20	2
8	345-1-24.01	STATIC PRES. REDUCER	1
9	MS00310	PILOT TUBE 1/4"	1
10	3162701	RIGHT SIDE PANEL	1
11	3162601	REAR PANEL 38/50	1
	3162602	REAR PANEL 75/100	
	3162603	REAR PANEL 125/150	
	3162604	REAR PANEL 175/200	
12	PF-008.03	PIPE FIT TEE 1-1.1/4	1
13	PF-006.07	PIPE FIT NIPPLE	2
14	HW-058.01	PLASTIC CAP	1
15	GA-001.00	GAUGE	1
16	315-2-12.01	BASE PNL 38/50	1
	315-2-12.02	BASE PNL 75/100	
	315-2-12.03	BASE PNL 125/150	
	315-2-12.04	BASE PNL 175/200	
17	3262001	TEMP SENSOR BKT	1
18	AQ02101	CONTROL FIXED TEMP	1
19	HW06501	SCR 6 X 1/4 HEX HEAD	2
20	HW-006.02	POP RIVET FLUE	2

DV SERIES REPLACEMENT PARTS LIST

REFER TO FIGURE 36 ON PAGE 37

ITEM NO	P/N	DESCRIPTION	QTY.
21	3162702	LEFT SIDE PANEL	1
22	315-2-15.01	SEPARATOR PLATE DV 50	1
	315-2-15.02	SEPARATOR PLATE DV 75/100	
	315-2-15.03	SEPARATOR PLATE DV 125/150	
	315-2-15.04	SEPARATOR PLATE DV 175/200	
23	315-2-9.01	DIVIDER PANEL DV 50	1
	315-2-9.02	DIVIDER PANEL DV 75/100	
	315-2-9.03	DIVIDER PANEL DV 125/150	
	315-2-9.04	DIVIDER PANEL DV 175/200	
24	31522301	CTRL BRT SUB-ASSY 50/75/100/125/150	1
	31522302	CTRL BRT SUB-ASSY 175/200	
25	EF03801	TRANSFORMERS	2
26	PB00604	PLT SPK CTRL S8600M1013	1
27	SS00701	PRESS. SWITCH 38/50/75/100/125/150	1
	SS00702	PRESSURE SWITCH 175/200	
28	RY-002.01	CONTROL R8222C-1008	1
29	37413601	HARNESS MGB/DV CIRCULATOR	1
30	PF-005.11	PIPE FIT NPL 3/4	1
31	PF-002.04	PIPE FIT ELB 3/4	1
32	VR-001.01	R/V #30 3/4	1
33	HW-016.03	DRAIN SHORT	1
34	31521801	TOP PANEL 38/50	1
	31521802	TOP PANEL 75/100	1
	31521803	TOP PANEL 125/150	1
	31521804	TOP PANEL 175/200	1
35	AQ-020.01	WELL 3/4 x 3	1
36	PF-006.01	PIPE FIT NPL 1.1/4 - CLOSE	1
37	315219.01	FRONT PANEL 38/50	1
	315219.02	FRONT PANEL 75/100	
	315219.03	FRONT PANEL 125/150	
	315219.04	FRONT PANEL 175/200	
38	AQ02201	LIMIT CONTROL L40808B-1212 HW	1
39	37512401	HARNESS-MGB/DV CIRCULATOR	1
40	37614501	WIRE-ROLLOUT SWITCH DV	1
41	HW-009.01	SCR 8 X 1/2 SLT HEX HEAD	31
42	3761101	PILOT ASSY SPK HW	1

DV SERIES GENERAL ASSEMBLY

REFER TO THE PARTS LISTS ON PAGES 35 & 36 FOR THIS ASSEMBLY.

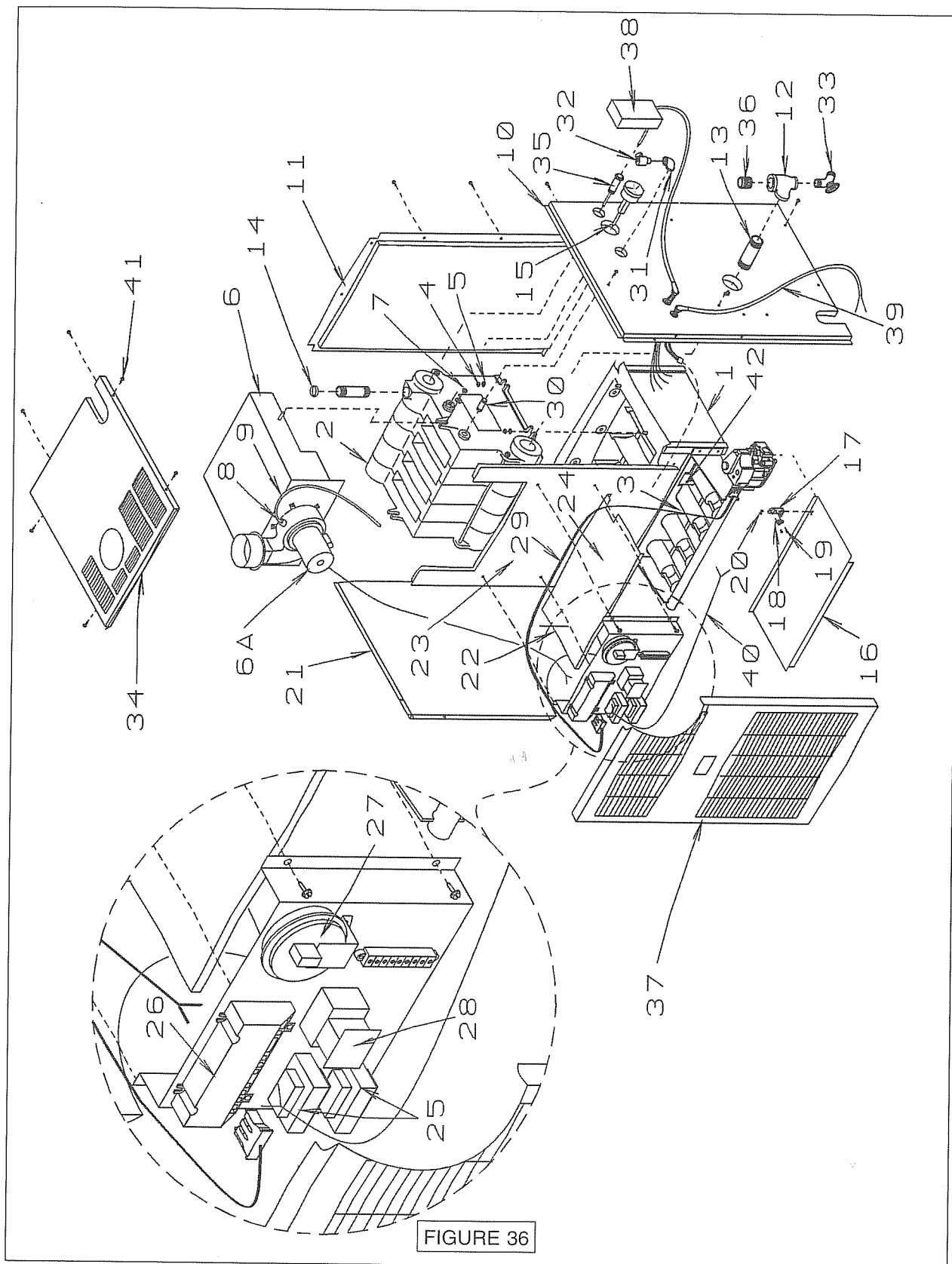


FIGURE 36

DV SERIES

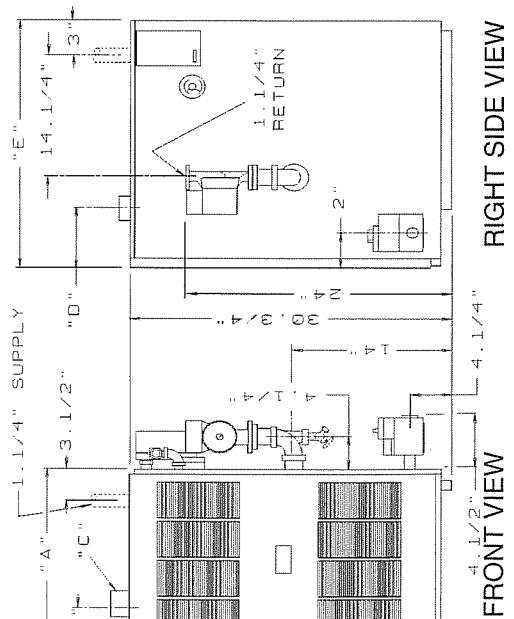
Cast Iron, Direct Vent, Gas-Fired, Hot Water Boiler

RATINGS AND DIMENSION

Boiler No.	A.G.A.* Input Btu/Hr.	Heating Capacity* Btu/Hr.	I=B=R Net Output Btu/Hr.	Natural Gas Inlet	Dimensions				Pump Size Sup. & Ret. Tappings	No. Of Burners	AFUE Ratings
					A	B	C	D			
DV-38	38,000	32,000	28,000	1/2	11.1/4	2.1/8	3	6.3/8	27	1.1/4	84%
DV-50	50,000	42,000	37,000	1/2	11.1/4	2.1/8	3	6.3/8	27	1.1/4	83%
DV-75	75,000	62,000	54,000	1/2	15.1/8	4.1/8	3	6.3/8	27	1.1/4	82%
DV-100	100,000	82,000	71,000	1/2	15.1/8	4.1/8	3	6.3/8	27	1.1/4	82%
DV-125	125,000	103,000	90,000	1/2	19	6	3	6.3/8	27	1.1/4	82%
DV-150	150,000	122,000	106,000	1/2	19	6	4	6.3/8	27	1.1/4	80%
DV-175	175,000	141,000	123,000	1/2	22.7/8	8	4	7	28	1.1/4	80%
DV-200	200,000	160,000	139,000	1/2	22.7/8	8	4	7	28	1.1/4	80%

STANDARD EQUIPMENT Boiler Jacket, Cast Iron Boiler Banery, Combination Aquastat Relay, Theratimometer Gauge, Circulator with return piping to boiler, Main Gas Burners, Electric Ignition System, A.S.M.E relief Valve, Drain Cock, Induced Draft Fan, and Safety Pressure Switch, Vent Cap

DIRECT VENT SERIES BOILER



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

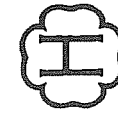
This boiler is a Category III Designed Certified appliance which requires a special horizontal through the wall venting system. Only Plexavent® or Ultravent® vent material products shall be used.

Should a chimney installation be required, contact factory for details.

Consult installation instructions for maximum vent lengths and proper configurations.



A. G. A. Certified for
Natural Gas or Propane



Tested for 100 lbs.
ASME Working Pressure



®