

# INSTALLATION

AND

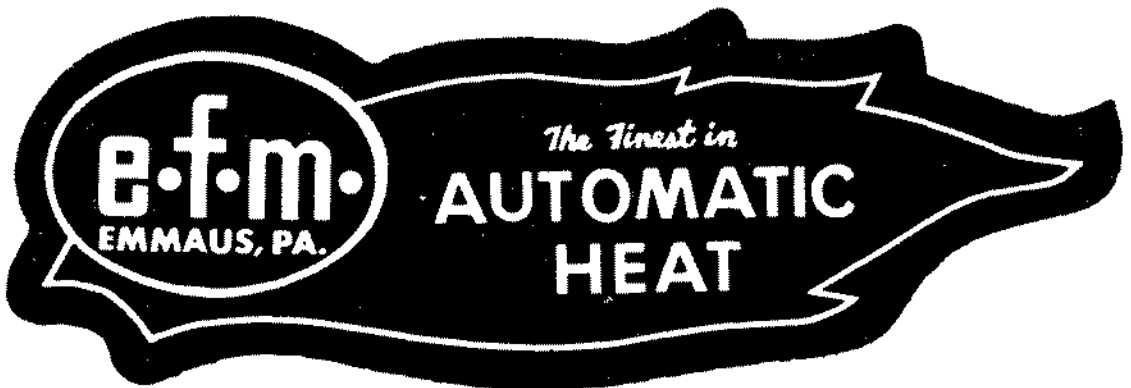
# OPERATION INSTRUCTIONS

FOR

## EFM MODEL PK-210

## PK SERIES OIL FIRED UNIT

**INSTALLATION MUST BE MADE IN  
ACCORDANCE WITH STATE & LOCAL CODES WHICH MAY DIFFER  
FROM THIS INSTALLATION MANUAL.**



INSTALLATION AND OPERATION INSTRUCTIONS  
FOR

PK SERIES OIL FIRED UNIT  
MODEL PK210

ISSUED 9/9/98

**GENERAL**

The EFM Products Model PK210-DVLV is a direct vent oil boiler fired with a Beckett AFII oil burner without the need of a chimney or power venter and uses outside air for combustion. A protective INLET HOOD for the outside combustion air, a VENT HOOD for the direct vent, and a COMBUSTION AIR VACUUM RELIEF are all furnished along with the BECKETT AFII OIL BURNER set up with PRE AND POST PURGE. The PK-210DV OIL BURNER is completely sealed when it leaves the factory, as it will be fired under a positive pressure. (Sketch #1) Pg. 14.

**RECEIVING SHIPMENT**

Upon receipt of shipment of material, inspect all cartons for external damage. If external damage is noted, open the carton and inspect for damage to equipment. Mark the number of cartons received in this condition on the delivering carriers waybill, and request the services of their inspector.

If, upon opening the carton, concealed damage is discovered, open the entire shipment and note all equipment so damaged. Contact the delivering carrier and request inspection of the damaged equipment. Do not destroy the carton. The inspector from the Freight Company will need this to determine reason for the damage.

Normally claims for any and all damages should be filed with the Freight Company within 5 working days.

It is the responsibility of the consignee to file claim with the delivering carrier for material received in a damaged condition.

Permission to return goods must be factory authorized and are subject to a 15% restocking charge.

**LOCATING PACKAGED UNITS**

BEFORE REMOVING CARTON, LOCATE UNIT IN ITS FINAL POSITION.

The carton is plainly marked so as to indicate which is the burner end of the unit. This is the end where the connection to the chimney flue is made. Clearances should be

provided around the boiler for cleaning and servicing. Consult local fire codes for required clearances.

### **REMOVING CARTON**

Once the packaged unit is in its proper place, cut all around the carton on the line as shown on carton. The entire carton may then be lifted from the skids.

If it is found necessary to move the Unit a little more to place it in the exact location ready for piping, do so before removing skids.

**DO NOT PUSH AGAINST ANY PART OF JACKET OR OIL BURNER WHEN MOVING UNIT.**

**TO MOVE UNIT, PUSH AGAINST SKIDS OR FLUE BOX.**

**PUSHING AGAINST JACKET WILL RESULT IN DAMAGE.**

### **MINIMUM CLEARANCES**

Boiler to be installed with clearances in accordance with NFPA 31 Table 4-1 Form II As follows

	STANDARD CLEARANCES	
FRONT	24"	SIDES
REAR	6"	CHIMNEY CONNECTOR

Reduced clearance installations shall comply with NFPA 31 Table 4-4.1 (b) 12" clearance from rear is recommended for ease of service.

## **THE PK-210 DIRECT VENT AN AMERICAN HIGH SPEED ON DEMAND BOILER**

- HORIZONTAL TUBES
- EASY TO SERVICE
- A.S.M.E. APPROVED
- NO COMBUSTION CHAMBER REQUIRED
- WET BASE CONSTRUCTION
- LOW DRAFT REQUIREMENTS
- I.B.R. CERTIFIED
- HIGH EFFICIENCIES WITHOUT CONDENSING
- LIFETIME LIMITED WARRANTY
- SPECIFICATIONS AND DIMENSIONS (Sketch # 2 Pg.15)

**PK210LV PACKAGED UNITS: The shipment consists of three (3) pieces as follows:**

1. A completely assembled boiler with jacket burner and controls except for the following parts, which are packed in the smoke box (above burner) of the unit:
  - 1 – 10-407 ¾" ASME Relief Valve
  - 1 – Boiler Drain
2. Carton with VH1-4 Vent Hood and 5" to 4" reducer.
3. Carton with CAS-1 Combustion Air Intake Kit containing the following:
  - 1 – Vacuum Relief Valve (VRV)
  - 1 – Vacuum Relief Valve Tee
  - 1 – Intake Air Hood

**REMOVING SKIDS**

The skids are specially designed for easy removal. It is necessary however to follow these instructions carefully.

- A. After Unit is in proper place, remove the two cross pieces from skids.
- B. By inserting pinch bar or 2" X 4" underneath the Unit, tilt one side of Unit just high enough to lift lugs out of holes in skid, then knock skid out from underneath Unit. **THE UNIT IS NOT BOLTED TO THE SKIDS.** The ¾" lugs welded to the Unit simply fit into the ¾" holes in skids.

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**IMPORTANT**

**DO NOT TILT UNIT BY PUSHING AGAINST JACKET**

**IT IS NOT NECESSARY**

**AND BY DOING SO THE JACKET WILL BE DAMAGED**

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**LEVELING UNIT**

In the event the floor is uneven, unit may easily be made level by inserting shims under the four (4) shipping lugs. These lugs also keep the jacket  $\frac{3}{4}$ " off the floor protecting it from wet floors and dampness.

## INSTALLATION CODES

Be sure installation is in accordance with the requirements of local authorities having jurisdiction. All boiler installations must also conform to the A.S.M.E. Boiler Code.

If the unit requires National Board approval credit consult factory for special order. Many state and local municipalities require National Board inspection and registration for installation in such buildings used for public assembly, more than four (4) apartments, etc.

## COMBUSTION AIR AND VENTILATION (Non-direct vent application)

The PK210-DVLV units use outside air for combustion utilizing the Field CAS-1 kit.

### CAS-1 Combustion Kit

This product is designed for use on the Beckett AFII Series Oil burner for the purpose of routing combustion air directly to the burner, with the added safety feature of the vacuum relief valve.

### Purpose of the Vacuum Relief Valve (VRV)

The VRV gate operates on changes in the vacuum pressure generated by the inlet to the oil burner. The VRV gate will remain closed during normal burner operation. During an abnormal operation (i.e., blockage of the intake or change in external building pressures), an increased negative pressure on the intake of the burner causes a reduction in burner air flow. Under this condition, the VRV gate opens, stabilizing and maintaining proper air flow to the burner. The VRV gate closes again once the abnormal condition is corrected.

## I. INSTALLATION

### A) Mounting on Beckett AFII Series Burner

- 1) Remove burner inlet cover. (See Figure 1) p. 16
- 2) Mount VRV tee assembly or 90 elbow onto the burner inlet. Fasten using three (3) sheet metal screws on all joints. (Figure 2) p.16
- 3) Assemble VRV balance weight onto the gate. Screw the weight all the way in. Then, attach lock nut and knurl nut. (Figure 3) p. 16

- 4) Mount the VRV assembly into the tee and fasten with a screw and nut in collar tabs. (See Figure 4) p. 16

## **II. TERMINATION LOCATION GUIDELINES**

- 1) Mount Intake Hood 12 inches above finished grade. If mounting on the side of a building prone to drifting snow, mount 12 inches above the snow line.
- 2) Mount Intake Hood on same side of building as VH1-4 Vent Hood.
- 3) Mount Intake Hood as least 2 feet below VH1-4 Vent Hood if mounting within 2 feet.
- 4) Always mount with the inlet vent termination opening pointing down.

## **III. INSTALLATION OF INLET VENT TERMINATION**

- 1) Cut a 4 ¼" diameter hole through the sidewall of the building.
- 2) Slide the inlet vent pipe through the hole and fasten to the with appropriate fasteners. Seal the edges of the mounting plate with a silicone sealant or equivalent.

## **IV. INSTALLATION OF DUCT WORK**

- 1) Duct length distance, a maximum of 15 linear feet of standard duct pipe and two (2) 90 elbows. Subtract 7 feet from the maximum linear feet for every 90 elbow added. Consult manufacturer for equivalent lengths. Flex duct is not recommended.
- 2) Route duct work from the VRV tee to the inlet vent termination with as minimum a number of elbows as possible.
- 3) Secure and support the duct work for the design and weight of the material used to prevent physical damage and separation of joints. For guidelines, refer to recognized national building codes or according to any local codes.
- 4) To reduce uncontrolled air leakage into duct, tape all joints and seams using a good quality metallic adhesive tape.

**NOTE:** To prevent sweating on the outside of the duct, when operating in areas that have -10 F or below design temperatures, insulate the duct work at least 10 feet from the inlet vent termination.

**CONTROL SYSTEM -FORCED CIRCULATION HOT WATER**

A. The following are the controls and recommended settings for a Forced Hot Water installation. Cold start on demand operation:

<u>CONTROLS</u>	<u>NORMAL SETTINGS</u>
L8124C-Triple Acting AquaStat Circ. Relay	Low Limit 100-140 High Limit 200-220
C554A Cad Cell	-----
R8184G-Burner Relay	-----
Post Purge Relay	1 minute

**B. OPERATION SEQUENCE**

Upon a call for heat from the Room Thermostat (room temperature falls below room thermostat setting, the circulating pump will begin to operate and the oil burner will fire after completing the pre-purge sequence until the thermostat setting is reached or until the boiler water temperature reaches the high limit control setting. When the high limit control setting is reached the burner will shut off after completing the post-purge sequence. However, the circulating pump will continue to operate until the room thermostat setting is reached. If the thermostat continues to call for heat after the boiler water temperature falls below the high limit setting, the oil burner will start again and the circulator will continue to run.

**1. PRE PURGE SEQUENCE**

When the oil burner is required to fire, the ignition transformer will energize and the burner motor will start initiating air movement through the boiler and bringing the fuel pump up to pressure. After a few seconds delay from the delayed oil valve, the valve will open allowing oil to flow through the nozzle to be ignited.

**2. POST PURGE SEQUENCE**

When the oil burner is required to stop firing, the delayed oil valve will close, stopping the oil flow to the nozzle. The Post Purge Relay will cause the burner motor and ignition transformer to operate for the period of time the post control is set.

The boiler water should be maintained at 100 F – 140 F. When the boiler water temperature falls below the lo-limit (operating control) setting the oil burner will be started again by this control.

When a PK210-DV unit is operating with a storage water heater it will be operating all year long. However, in the case of our PK-210DVLV being installed with a separate means for heating domestic hot water the L8124C control furnished will maintain enough heat in the unit prolonging its life. This type of system is a modified cold start system as the unit runs a very short time in the summer keeping the unit dry.

The C554A cadmium cell will stop the oil burner if the fuel does not ignite or if the flame goes out during operation within a predator mined number of seconds. To restart the oil burner the red relay button on the R4182D or R8184G control must be pressed down and the burner should start. If the burner does not start do not continue to press down on the red button as there is a problem elsewhere that should be corrected.

### **VENT & BREECHING REQUIREMENTS**

The PK210-DVLV oil units DO NOT require a chimney or power venter as the burner fires at a positive pressure and does not depend on natural draft. It is direct vented as follows:

The PK210-DVLV oil boiler is completely sealed when it leaves the factory as it will be fired under a positive pressure.

The 5" to 4" reducer supplied should be used forming an oval configuration over the smoke box outlet of the PK210-DVLV unit and sealed with Metal tape. Four inch (4") galvanized smoke pipe should be run from the reducer terminating at the VHI-4 Tjernlund Vent Hood. All smoke pipe connections should be completely sealed with Metal tape.

Total length of the four inch (4") smoke pipe must not exceed 15 linear feet and two (2) 90 elbows. Subtract seven (7) feet for every additional elbow added. Use of flex duct is not recommended. Consult manufacturer for equivalent lengths.

Any horizontal runs of four inch (4") smoke pipes should be sloped slightly downward towards the vent hood to allow for any condensation that might form to exit the vent hood opening.

For installation of the VH4-1 Tjernlund Vent Hood, refer to pages 17,18,19 and 20 to the instructions packed in the vent hood carton.

### **CAUTION**

1. Failure to follow these installation instructions may violate applicable national and/or local codes.



The vent system must terminate so that proper clearances are maintained as cited in the National Fuel Gas Code, ANSI Z223.1.:

“The exit terminals of a mechanical vent system shall be located not less than 12 inches above grade or not less than 7 feet above grade when located adjacent to a public walkway. The venting system shall terminate at least 3 feet above any forced air inlet within 10 feet. The venting system shall terminate at least 4 feet horizontally from or 1 foot above any door, window or gravity air inlet into any building.”

The vent terminal shall also not be installed closer than 3 feet from the inside corner of an L shaped structure.

2. Check vent pipe system for leakage. All vent system leaks must be sealed.
3. A vent system incorporating a Tjernlund VH1 series Vent Hood should not exceed 550 degrees F gross.
4. Termination of a sidewall vent system with a device other than the Tjernlund VH1 Vent Hood could affect system performance and result in a possible safety hazard.
5. Plan the vent system layout to avoid the possibility of accidental contact with concealed wiring or plumbing inside of walls.
6. Installation must be done by an experienced heating technician familiar with venting of combustion appliances.

Refer to diagrams A & B on page 19 for proper clearances and installation.

## INSTALLATION

1. Attached the enclosed template to the interior of the wall the Vent Hood will be penetrating. P.19
2. Using a ½” drill bit, drill two pilot holes where noted on the template. The drill bit must be long enough to penetrate to the building exterior.
3. Attach the template to the building exterior aligning the pilot holes noted on the template with the holes drilled in step 2.
4. Using a reciprocating saw, cut a hole through the building siding, wall board, etc., following the appropriate lines of the template.

5. Slide the Vent Hood through the opening and fasten to exterior wall using provided screws.

## MAINTENANCE

The vent system must be inspected regularly. Points of inspection are as follows:

1. Screened opening of the Vent Hood should be free from foreign material and cleaned as necessary.
  2. Structural integrity of the Vent Hood should be maintained so as not to reduce vent discharge opening.
  3. Check all vent system connections for leakage and re-seal where needed. If any vent pipe shows signs of deterioration, replace immediately and check new connections for possible leaks. Re-seal using General Electric RTV 106 Red HiTemp Silicone Sealer or equivalent.
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## PIPING AND WIRING

PK-210PACKAGED UNIT – Once the unit is in its proper location with the packing carton, skids, and packing material removed, it is ready for piping and connection from Room Thermostat and 110V 60Cy A.C. current.

If the unit must be unpackaged before installing, once the weldment is in place and level it is ready to receive jacket, burner, controls, and trim. The jacket to be installed as shown in Figure 6, Page 21. **TOP JACKET PANEL MUST BE IN PLACE BEFORE CONNECTING SUPPLY AND RELIEF VALVE PIPING TO BOILER.**

For the PK210 the suggested location of circulator, expansion tank, relief valve, etc. are illustrated in Figure 7, p.22 and Figure 8 p.23. Please consult the prevailing codes for covering the location of the installation. If they differ, kindling install to their recommendations.

Relief valve and drain valve should be piped so as to discharge safely in accordance to the prevailing codes.

If a unit is to be used with an indirect type domestic hot water system, connect and wire per manufacturer's instructions. A typical piping arrangement is shown in Figure 9, Page 26.

Pages 24 and 25 show typical wiring diagrams for the PK210. The first (p.24) shows a layout using the L8124A aquastat in a single zone post purge mode with the delayed oil valve. If an L8124C is utilized the wiring should be similar. The second diagram (p.25) is suitable for a cold start application or if an indirect hot water is plumbed into the system.

### **DRAFT REGULATOR**

There should be NO draft regulator installed.

### **CHECKING DRAFT OVER FIRE**

The draft can be measured by first removing the top left bolt that attaches the burner to the unit. This bolt will be colored red and will also be tagged. The draft gauge tube can then be inserted in the bolt hole and a reading obtained. The draft can range from minus .02 to positive .15 depending on length of smoke pipe, elbows. Most installations will show a reading of positive .03 to positive .07.

### **FUEL SYSTEM**

Attached to each burner's fuel pump are the pump manufacturer's specifications, which all fuel system piping should conform to. Also refer to burner instructions for additional information.

The burner is designed to burn clean #1 or #2 heating oil using #1 where outside tanks are exposed to temperatures frequently below zero degrees F.

**CRANKCASE OIL, WASTE OIL, OR GASOLINE SHOULD NEVER BE USED!**

### **START-UP PROCEDURE**

1. Make certain service switch is off.
2. Check all fittings and wiring.
3. Be certain the boiler system is completely filled with water. Purge all air from system and ascertain that desired pressure is obtained. (Minimum – 12 PSIG)
4. Make certain that correct voltages have been applied to circuits.
5. Check to make sure the oil storage tank is filled with the proper fuel either #1 or #2 heating oil.
6. Make sure all manual shut-offs are open in the system.

7. Set operating controls to desired settings.
8. Follow instructions in Burner Manual for oil burner start-up and adjustment. With proper adjustments using the proper instruments maximum efficiency will be obtained yielding the lowest possible fuel costs.
9. Homeowners Instructions and information are in the Burner manual. Be sure the Homeowner is aware of them.

### **SERVICE INFORMATION-HOMEOWNER**

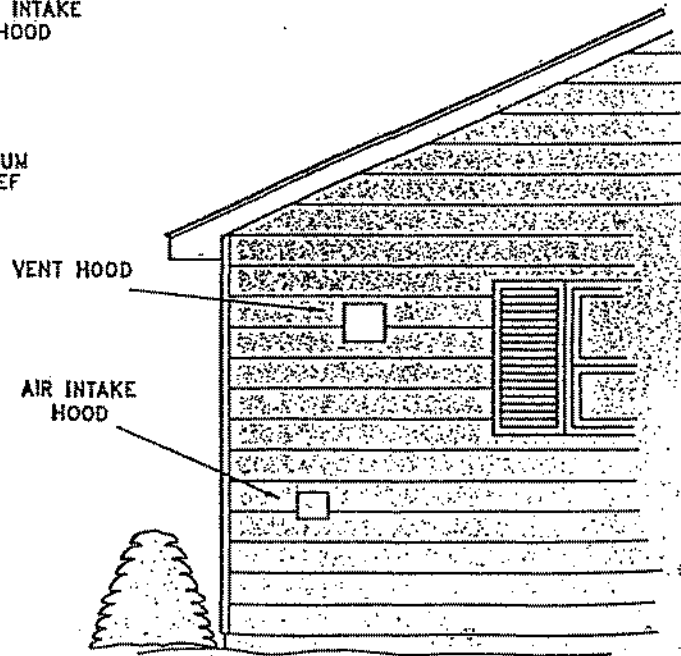
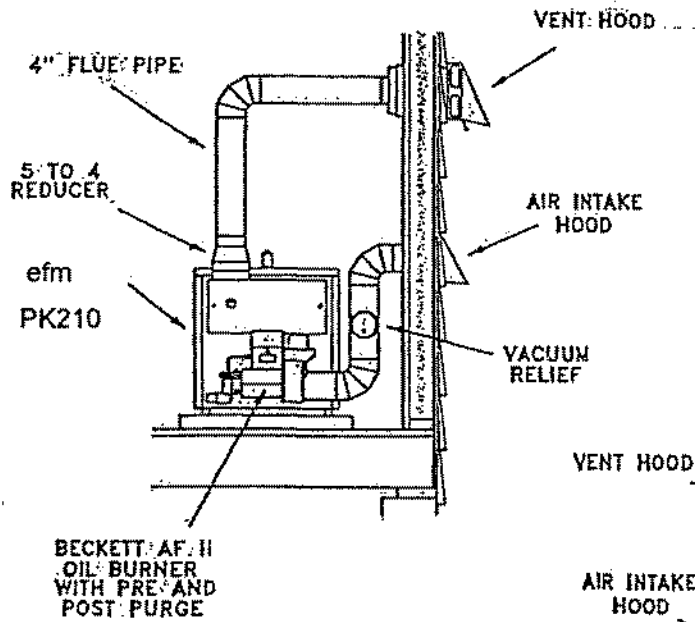
1. Have your heating system, burner, flue and venting system inspected at regular intervals (at least once a year) by a qualified service man.
2. If a problem occurs, please check the following before calling a service man:  
**DO NOT TAMPER ANY FURTHER WITH THE UNIT, UNIT PIPING, OR CONTROLS AFTER CHECKING THE FOLLOWING:**
  1. Be sure there is oil in the tank and valve is open.
  2. Be sure the thermostat is set above room temperature.
  3. Be sure main line switch is "ON" and fuses are not blown.
  4. Reset safety switch of burner primary control. (DO NOT REPEAT)
  5. Press Thermal Protector button of burner motor.
  6. If installation is equipped with manual reset limit control... Press Reset Button.

### **MAINTENANCE**

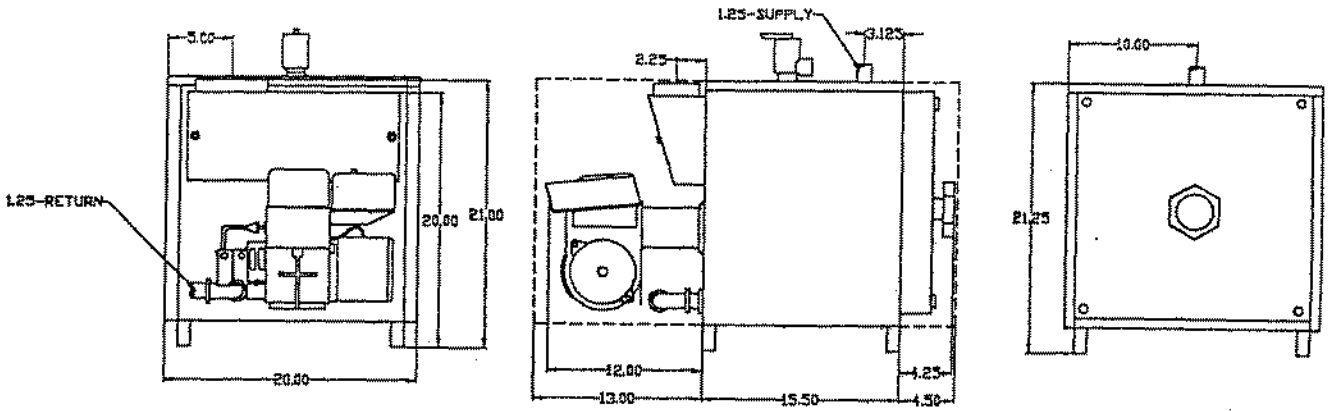
- I. Clean Boiler – Boiler must be cleaned once a year by a qualified technician to maintain efficient operation.
  1. Turn off all electrical power to unit.
  2. Remove flue box and insulation.
  3. Wire brush tubes and vacuum tubes and firepot.
  4. Replace insulation and flue box.
  5. Remove smoke pipe from collar, vacuum can now be used to pick up any excess soot not gotten from front vacuuming.
  6. Replace smoke pipe and seal all joints.

- II. For maintenance of burner refer to manual and instructions for particular burner installed in the PK-210 boiler.
  
- III. An expanded isometric nomenclature detail is shown in Figure 10 p.27 for a qualified technician's information on a composite assembly and/or disassembly. P.27A identifies the components.

# PK 210 TYPICAL INSTALLATION



SKETCH #1



GENERAL MACHINE CORP. EMMAUS 302 SOUTH 4TH ST PENNSYLVANIA 18049 PK210		
SCALE: 1:1	DATE: 2/8/99	
DRAWN-VEH MATERIAL	APRVD CHECKED	DRAWING#

**SPECIFICATIONS**

The net I.B.R. water ratings shown are based on a piping and pick-up allowance of 1.15. For installations having unusual piping and pick-up requirements, consult efm.

	NET I.B.R.	DOE ANNUAL		@ 140 PSI				
HEATING	RATING	EFFICIENCY %		I.B.R.	HEATING	WATER	NOZZLE	SHIPPING
CAPACITY	WATER	LESS	WITH	INPUT	SURFACE	CONTENT	SIZE	WEIGHT
M.B.T.U.H.	M.B.H.	DAMPER	DAMPER	GPH	SQ. FT.	GALLON	GPH	LBS.
80	70	86.4	88.0	0.65	12	9	0.60	245
103	90	83.9	86.4	0.85	12	9	0.75	245

**SKETCH #2**

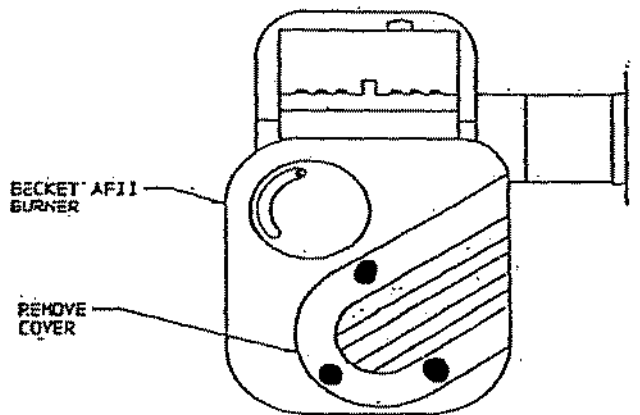


FIGURE 1

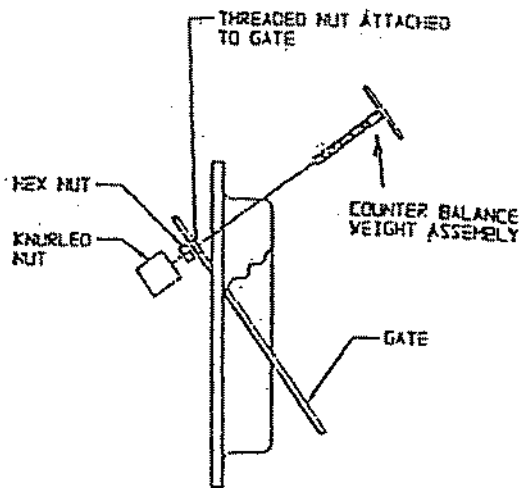


FIGURE 3

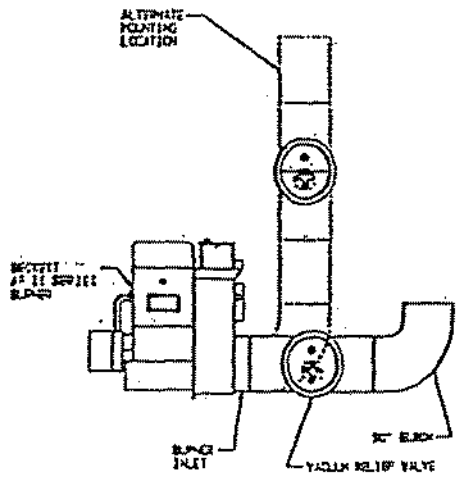


FIGURE 2

LEVEL ACROSS  
PIVOT POINTS

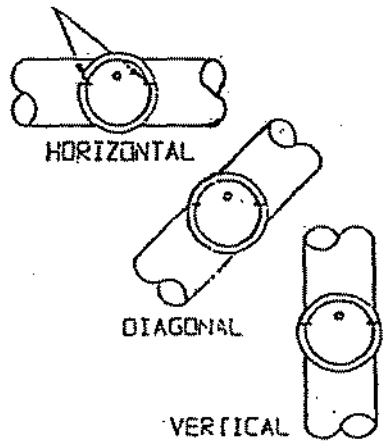


FIGURE 4





**VH1- SERIES VENT HOODS  
MODELS VH1-3" AND VH1-4"**

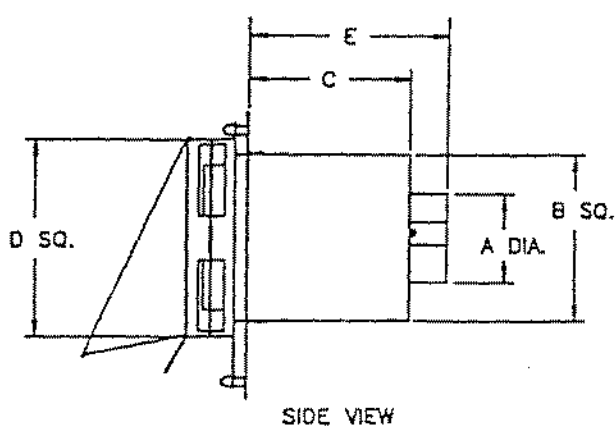
**WARNING**

These Vent Hood Installation Instructions supersede all previous editions. They contain substantial changes from earlier versions. The Vent Hood must be installed in strict compliance with these instructions. Before attempting installation, you must read and fully understand these instructions. Call your distributor or Tjernlund Products, Inc. if you have any questions regarding proper installation.

**OWNERS INSTRUCTIONS  
THESE INSTRUCTIONS MUST REMAIN  
WITH EQUIPMENT  
DO NOT DESTROY**

**CAUTION**

1. Failure to follow these installation instructions may violate applicable national and/or local codes.  
The vent system must terminate so that proper clearances are maintained as cited in the National Fuel Gas Code, ANSI Z223.1.:  
"The exit terminals of a mechanical vent system shall be located not less than 12 inches above grade or not less than 7 feet above grade when located adjacent to a public walkway. The venting system shall terminate at least 3 feet above any forced air inlet within 10 feet. The venting system shall terminate at least 4 feet below, 4 feet horizontally from or 1 foot above any door, window or gravity air inlet into any building."  
The vent terminal shall also not be installed closer than 3 feet from the inside corner of an L shaped structure.
2. Check vent pipe system for leakage. All vent system leaks must be sealed prior to installation of a power venter.
3. A vent system incorporating a Tjernlund VH1 series Vent Hood should not exceed 550° F gross.
4. Termination of a sidewall vent system with a device other than the Tjernlund VH1 Vent Hood could affect system performance and result in a possible safety hazard.
5. Plan the vent system layout to avoid the possibility of accidental contact with concealed wiring or plumbing inside of walls.
6. Installation must be done by one experienced and familiar with venting of combustion appliances.



MODEL	DIMENSIONS					ROUGH-IN DIMENSIONS
	A DIA.	B SQ.	C	D SQ.	E	
VH-1-3"	3"	6 1/4"	8 1/2"	6"	10"	6 3/4" SQ
VH-1-4"	4"	7 1/2"	7 1/8"	9"	8 7/8"	8" SQ.

## INSTALLATION

1. Attach the enclosed template to the interior of the wall the Vent Hood will be penetrating.
2. Using a 1/2" drill bit, drill two pilot holes where noted on the template. The drill bit must be long enough to penetrate to the building exterior.
3. Attach the template to the building exterior aligning the pilot holes noted on the template with the holes drilled in step 2.
4. Using a reciprocating saw, cut a hole through the building siding, wall board, etc., following the appropriate lines of the template.
5. Slide the Vent Hood through the opening and fasten to exterior wall using provided screws.

## MAINTENANCE

The vent system must be inspected regularly. Points of inspection are as follows:

1. Screened opening of the Vent Hood should be free from foreign material and cleaned as necessary.
2. Structural integrity of the Vent Hood should be maintained so as not to reduce vent discharge opening.
3. Check all vent system connections for leakage and re-seal where needed. If any vent pipe shows signs of deterioration, replace immediately and check new connections for possible leaks. Re-seal using General Electric RTV 106 Red HiTemp Silicone Sealer or equivalent.

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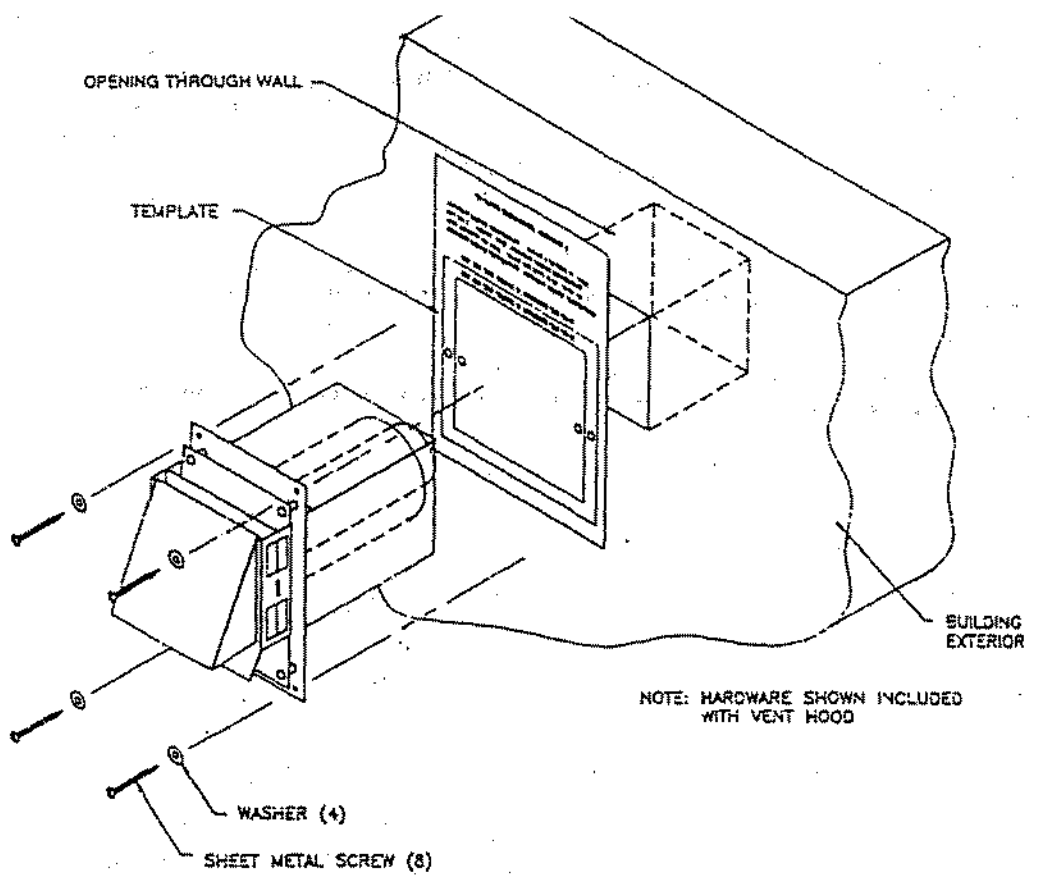
## TJERNLUND LIMITED ONE YEAR WARRANTY

Tjernlund Products, Inc. warrants to the original purchaser of this product that the product will be free from defects due to faulty material or workmanship for a period of one (1) year from the date of original purchase or delivery to the original purchaser, whichever is earlier. Remedies under this warranty are limited to repairing or replacing, at our option, any product which shall, with the above-stated warranty period, be returned to Tjernlund Products, Inc. at the address listed below, postage prepaid. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, AND TJERNLUND PRODUCTS, INC. EXPRESSLY DISCLAIMS LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF THIS PRODUCT. THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES, AND NO AGENT IS AUTHORIZED TO ASSUME FOR US ANY LIABILITY ADDITIONAL TO THOSE SET FORTH IN THIS LIMITED WARRANTY. IMPLIED WARRANTIES ARE LIMITED TO THE STATED DURATION OF THIS LIMITED WARRANTY.

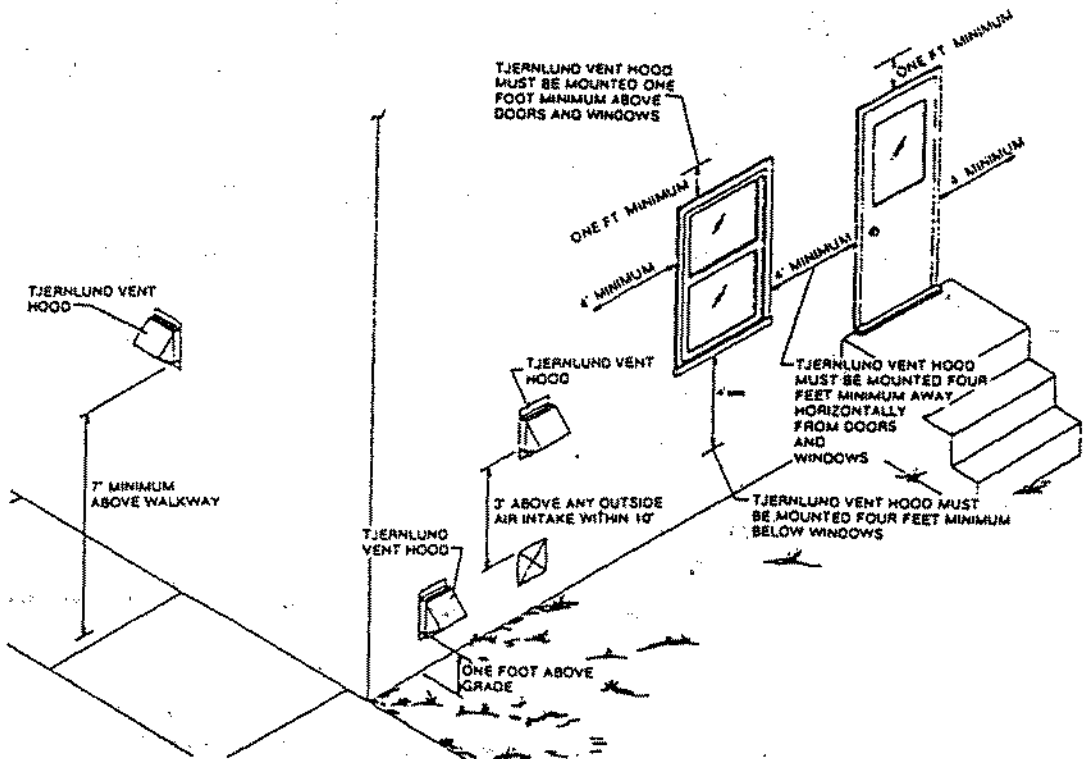
Some states do not allow limitation on how long an implied warranty lasts, so that limitation may not apply to you. In addition, some states do not allow the exclusion or limitation of incidental or consequential damages, so that above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

Send all inquiries or products requiring warranty work to: Tjernlund Products, Inc., 1601 9th Street, White Bear Lake, MN 55110-6794, (612) 426-2993.

A



B

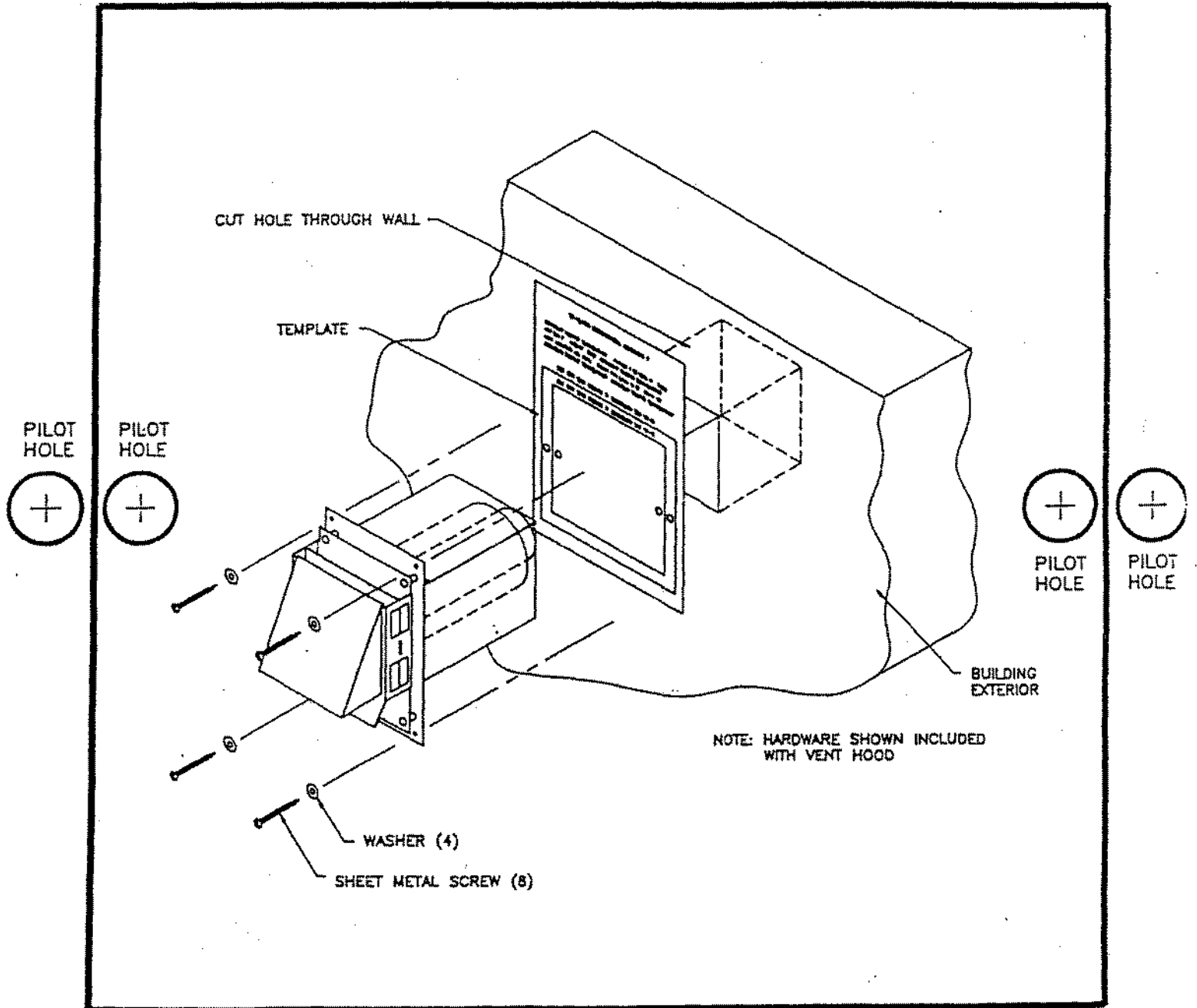


# VH1-3/VH1-4, VENT HOOD INSTALLATION TEMPLATE

- 1) Attach this template to the interior of the wall the Vent Hood will be penetrating.
- 2) Using a 1/2" drill bit, drill two pilot holes where noted on this template. The drill bit must be long enough to penetrate to the building exterior.
- 3) Attach this template to the building exterior aligning the pilot holes on the template with the pilot holes drilled in step 2.
- 4) Using a reciprocating saw, cut a hole through the building siding, wall board, etc., following the appropriate lines of this template.
- 5) Slide the vent hood through the opening and fasten to exterior wall using provided screws.

CUT OUT THIS SQUARE IF INSTALLING THE VH1-4

CUT OUT THIS SQUARE IF INSTALLING THE VH1-3



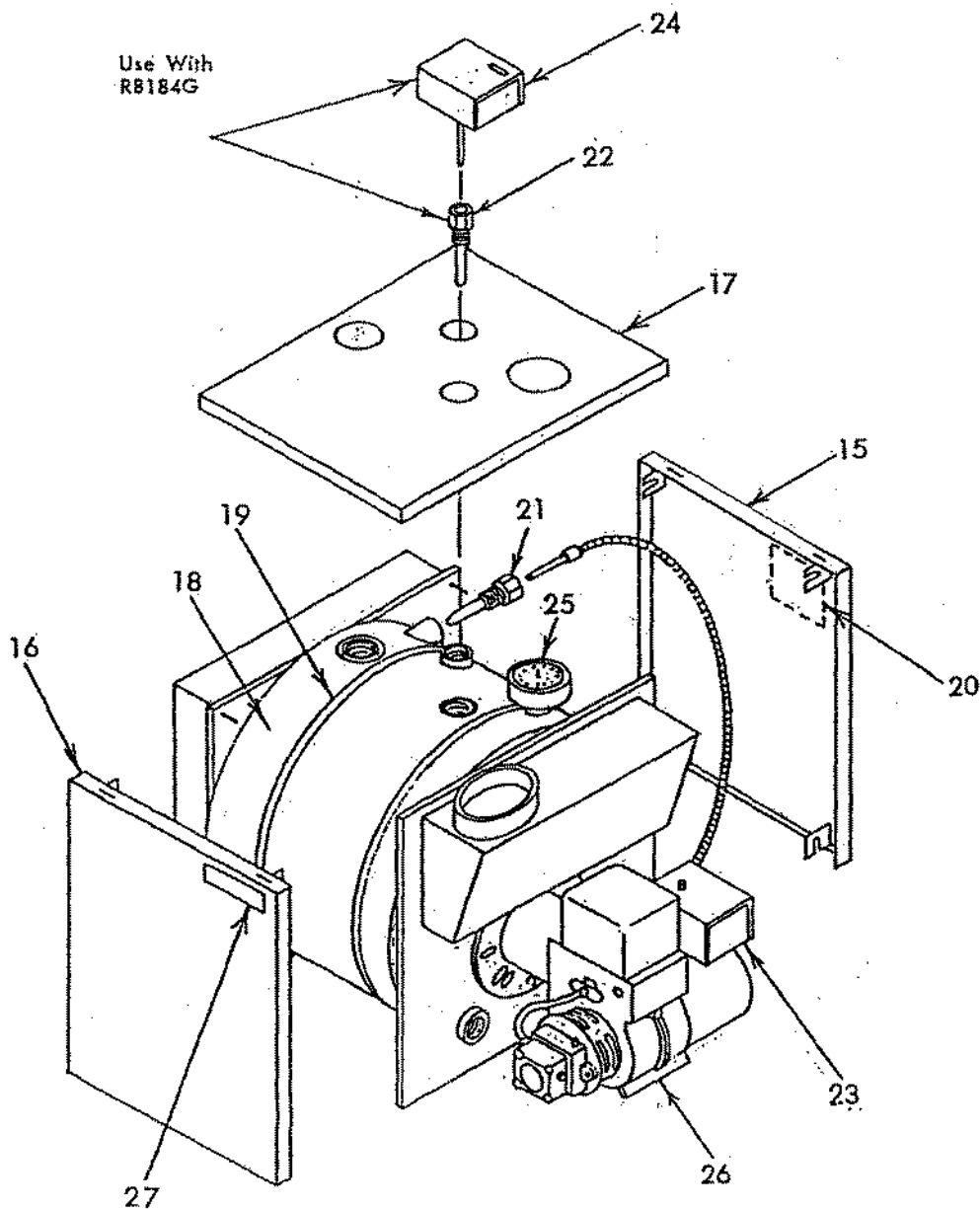
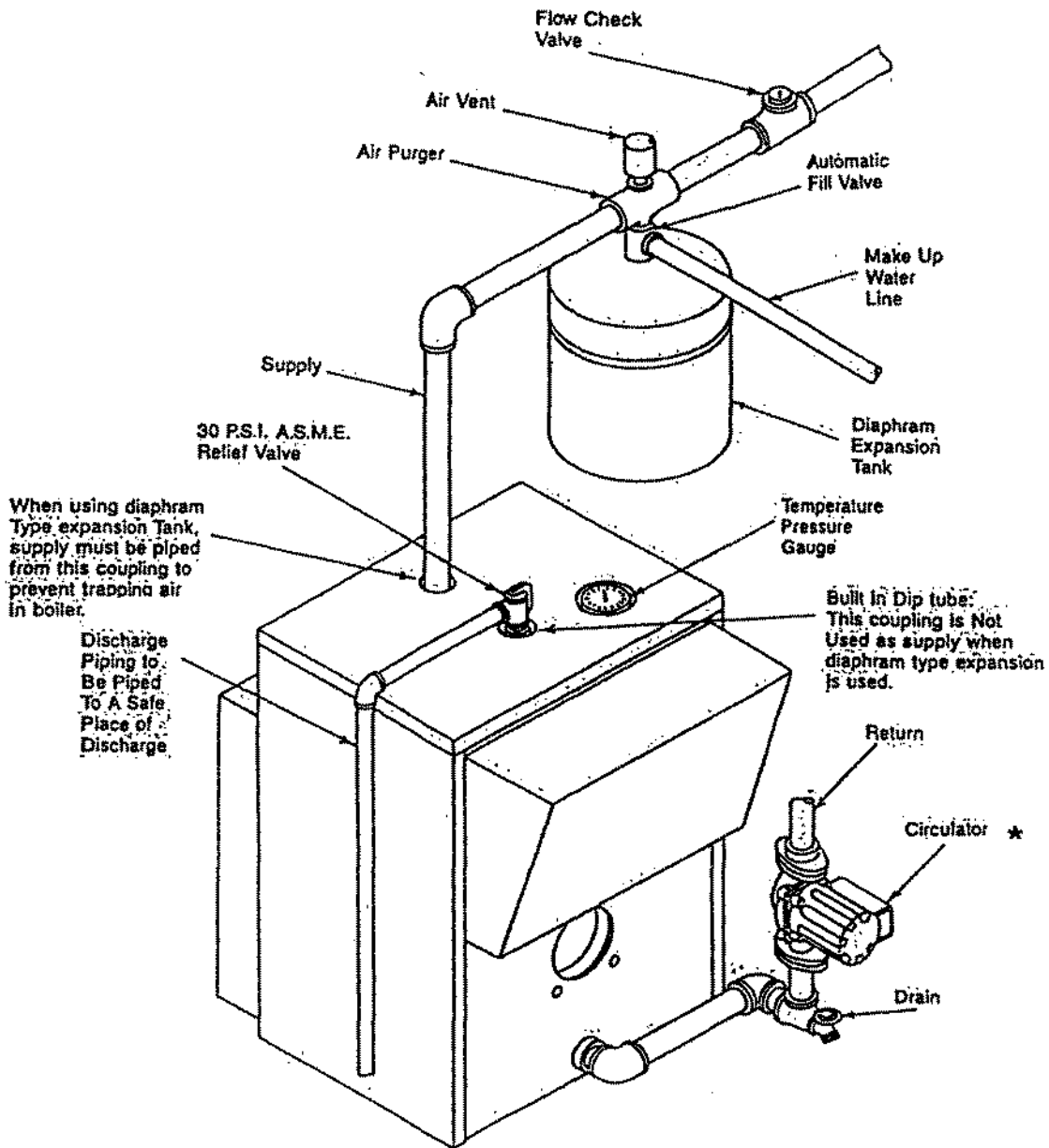


FIGURE 6



\*ASME recommends that the circulator be placed on the supply side.

FIGURE 7  
DIAPHRAM TYPE EXPANSION TANK

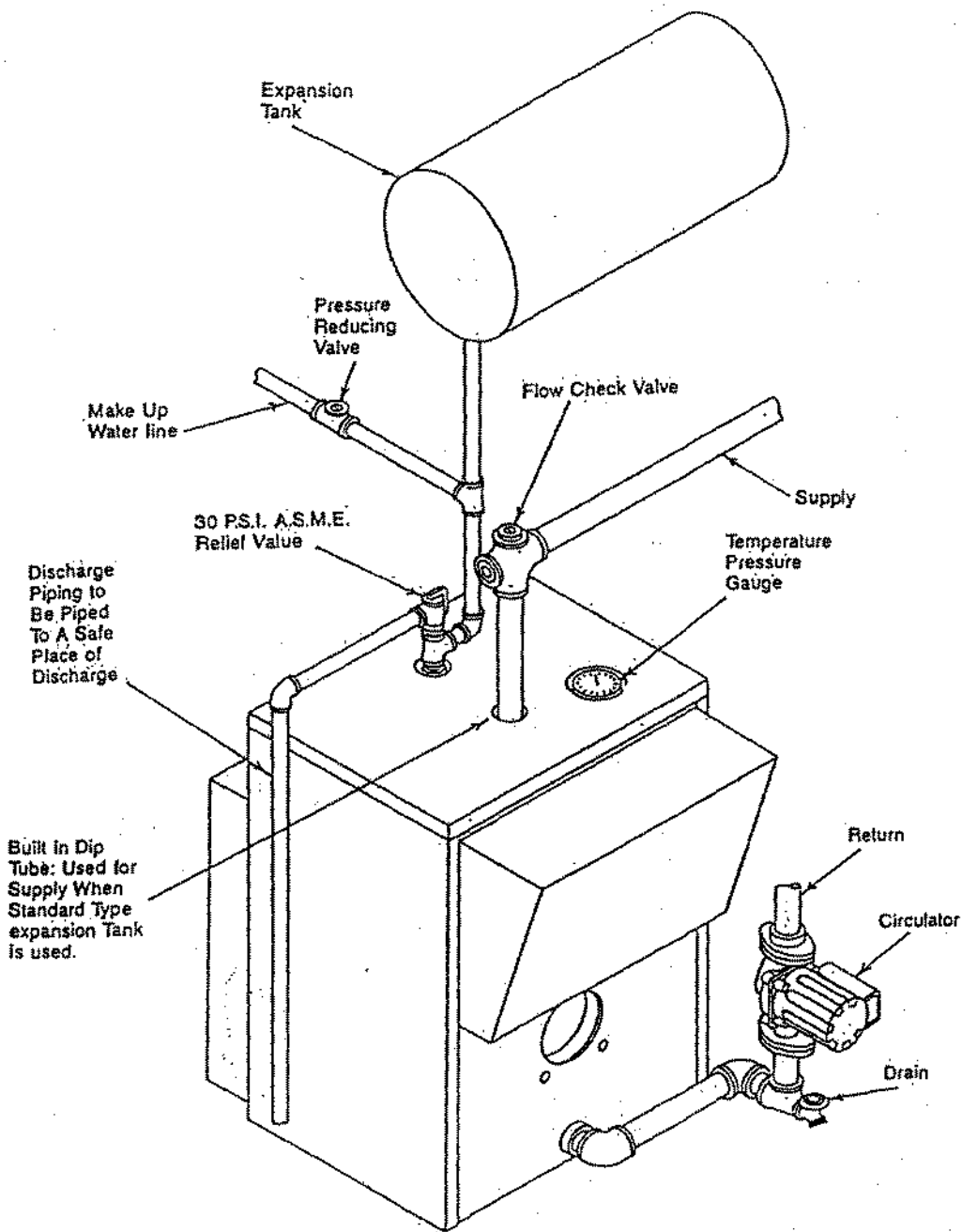
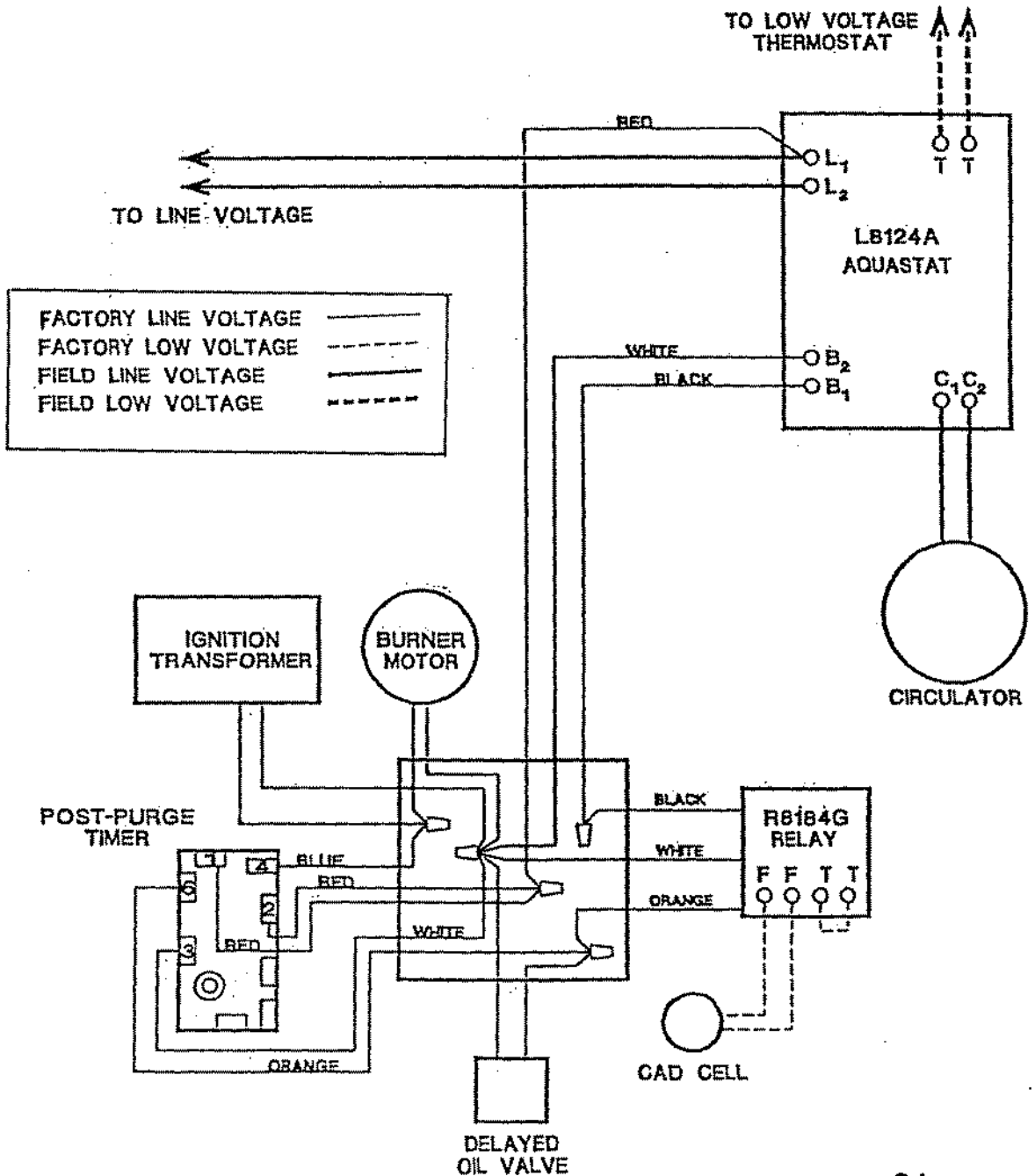


FIGURE 8  
STANDARD EXPANSION TANK

# WIRING DIAGRAM

## SINGLE ZONE POST-PURGE WITH DELAYED OIL VALVE

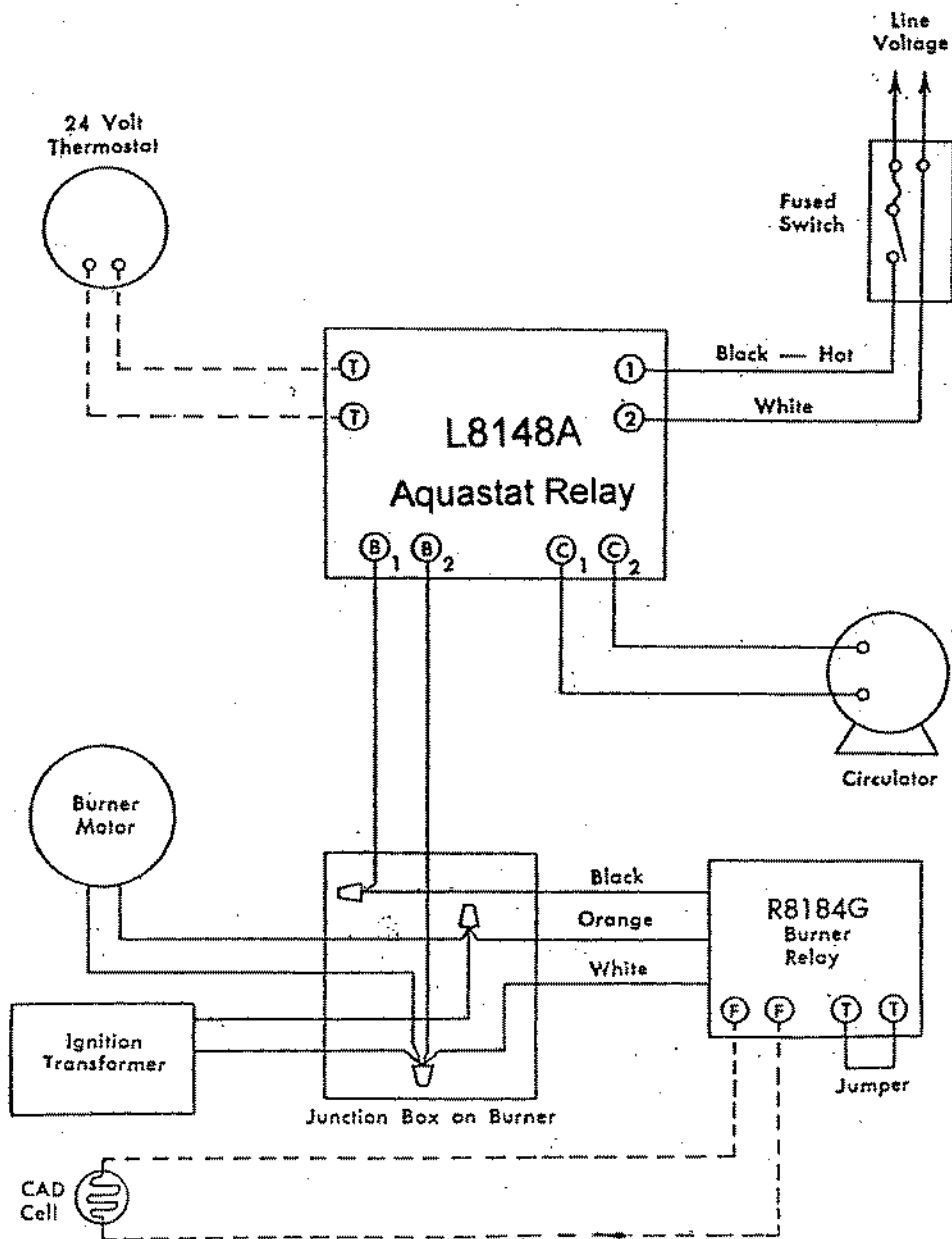




# WIRING DIAGRAM

SINGLE ZONE WITH L8148A & R8184G

----- Low Voltage  
————— Line Voltage



TYPICAL INSTALLATION

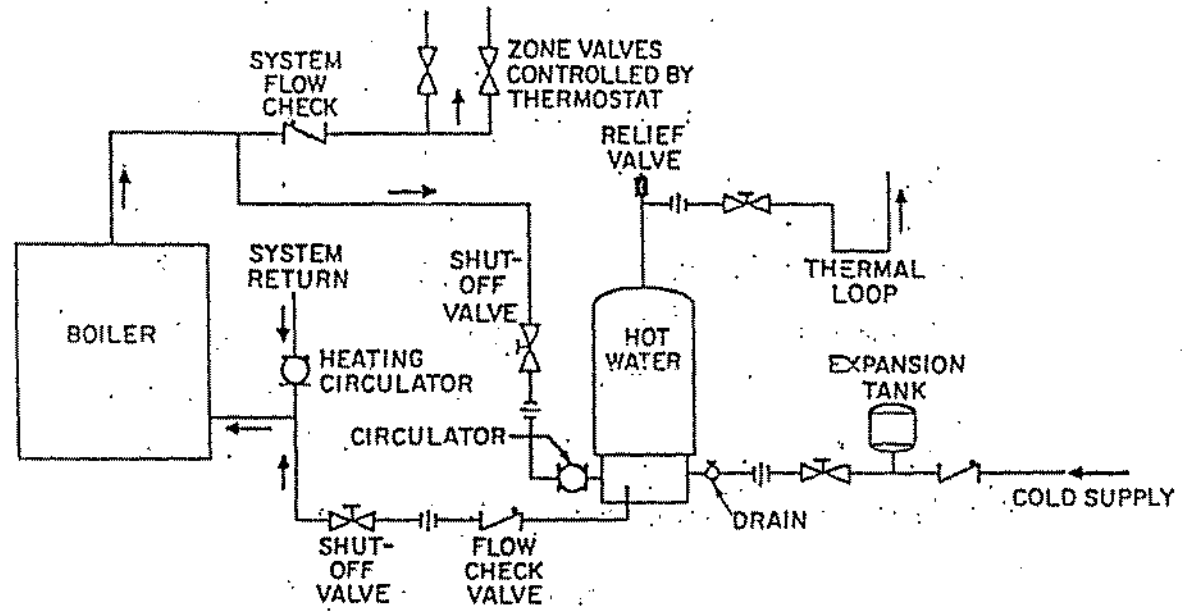


Figure 9

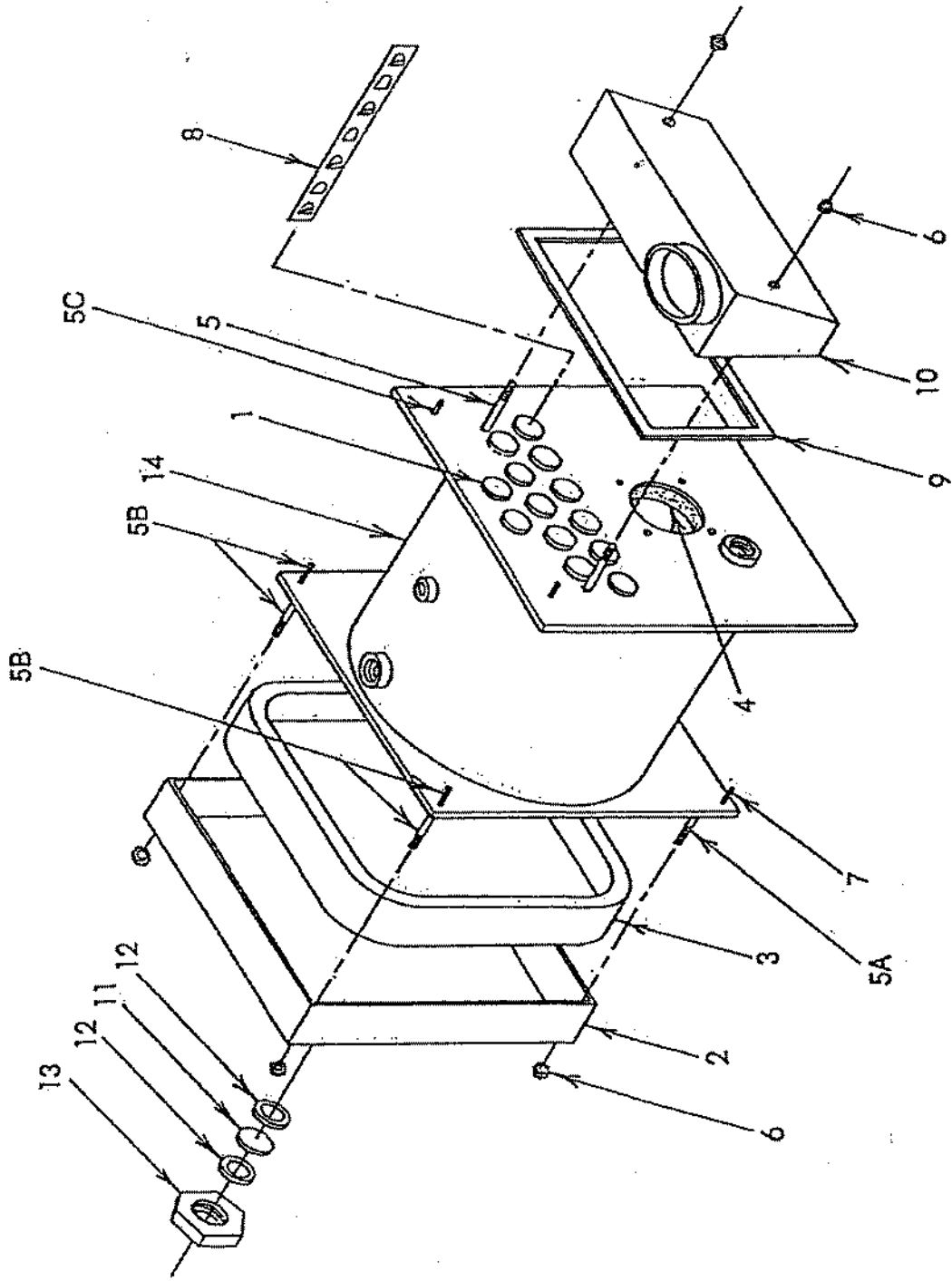


Figure 10

NOMENCLATURE  
(Fig. 10 Page 27)

1. Tube sheet of 13 fire tubes 1 ½" Sch. 40 pipe
2. Heat transfer box
3. Transfer line
4. Oil burner gun port
- 5A. Transfer box studs
- 5B. Jacket studs (if applicable)
- 5C. Smoke hood pins
6. Transfer and smoke hood box nuts
7. Jacket hangers (if applicable)
8. Turbulator (13 ea.)
9. Smoke hood gasket
10. Smoke hood box with flue collar
11. Sightglass (peep)
12. Sightglass gasket
13. Sightglass nut
14. Water drum (Heat exchanger)