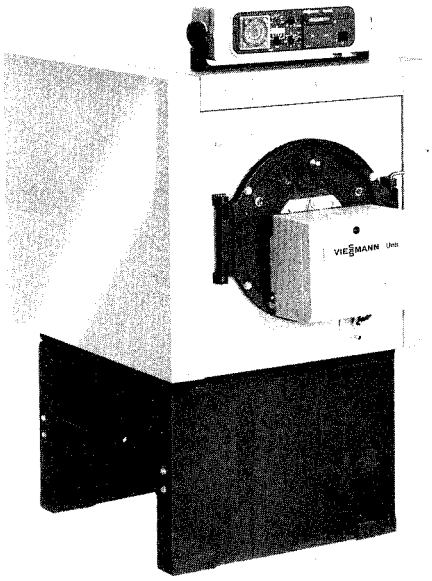
Installation/Service Manual for Vitola-biferral-e oil/gas boiler Series BEA

VIESMANN

IMPORTANT: READ AND SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE



Vitola-biferral with optional electronic indoor/outdoor control Trimatik

This boiler is for use with Riello burners for oil (#2 fuel oil) or gas (natural gas or propane gas). One burner is standard equipment.

For detailed wiring instructions, please refer to wiring schematics provided with control systems. Venting and burner instructions are packaged in the respective burner cartons.

The installation of the unit shall be in accordance with the regulations of the authorities having jurisdiction. Reference CSA Standard B-139, Installation Code for Oil Burning Equipment, or reference CAN/CGA - B 149.1 or 2, Installation Codes for Gas Burning Appliances and Equipment.

The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1 -latest edition for gas boiler installations.

For oil installations, install in accordance with the latest edition of NFPA 31 "Standard for the Installation of Oil Burning Equipment" and/or in accordance with the local jurisdiction.

Where required by the authority having jurisdiction, the installation must conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1.

All electrical wiring is to be done in accordance with the latest edition of the National Electrical Code ANSI Z223.1/NFPA 70. In Canada use CSA C22.1 Part 1 and/or local codes.

If boiler is equipped with boiler control E/KR or Trimatik, two safety high limits are already factory-installed, (1-manually adjustable max. up to 90° C [194°F], 1-fixed at 110° C [230 °F] with manual reset).

Max. boiler operating pressure 30 psi (207 kPa).
Max. boiler temperature 250°F (121°C).

Any damages caused by operation in excess of the above mentioned temperature and pressure are not the responsibility of Viessmann Manufacturing Company Inc.

Standard equipment:
Boiler shell with stainless steel combustion chamber.
Boiler mounting stand packed in separate carton.
Boiler enclosure, insulation, and boiler control packed in separate carton with cleaning brush.
Accessory hardware, cast-iron safety header, pressure relief valve, pressure gauge, and air vent are plastic-bagged in combustion chamber.
Combustion chamber door packed in separate carton.
Burner (oil or gas) packed in separate carton complete with barometric draft control.

Attention:
Permits from local authorities should be obtained before installing the boiler.
For boiler assembly please follow the step by step assembly instructions starting on page 4 of this manual.
Installation must be made in accordance with local ordinances which may differ from this Installation Manual.

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5302 561 02/94 Printed in Canada

CANADIAN GAS ASSOCIATION APPROVED

I=B=R

DOE

DESIGN AMERICAN GAS ASSOCIATION CERTIFIED

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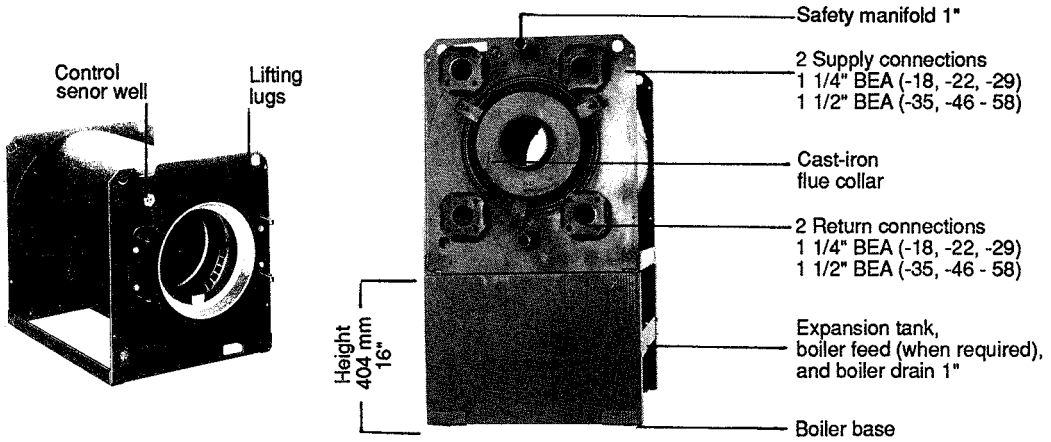


Heating connections and control unit openings. ***Note:*** *Pipe connections may be flanged or threaded nipples*

TECHNICAL DATA

Boiler Model No.		**BEA-18**	**BEA-22**	**BEA-29**	**BEA-35**	**BEA-46**	**BEA-58**
Oil Burner		**F3-BEA-18**	**F5-BEA-22**	**F5-BEA-29**	**F5-BEA-35**	**F5-BEA-46**	**F 10-BEA-58**
Input	kW	24	31	39	50	64	88
	Btu/h	83.000	107,000	135,000	170,000	219,000	300,000
DOE output	kW	21	27	34	43	55	76
	Btu/h	72,000	92,000	116,000	147,000	189,000	258,000
Net I=B=R rating*	Btu/h	63,000	80,000	101,000	128,000	164,000	224,000
Annual Fuel Utilization Efficiency, A.F.U.E.**		87.4%	87.4%	87.4%	87.3%	87.3%	87.1%
Nat. Gas Burner		**G120-NBEA-18**	**G120-NBEA-22**	**G200-NBEA-29**	**G200-NBEA-35**	**G400-NBEA-46**	**G400-NBEA-58**
Input	kW	26	34	42	54	69	88
	Btu/h	90,000	116,000	146,000	185,000	238,000	300,000
DOE output	kW	22	28	35	45	57	73
	Btu/h	74,000	96,000	120,000	152,000	196,000	249,000
Net I=B=R rating*	Btu/h	64,000	83,000	104,000	132,000	170,000	216,000
Annual Fuel Utilization Efficiency, A.F.U.E.**		83.7%	83.7%	83.7%	83.7%	83.8%	83.9%
Propane Gas Burner		**G120-PBEA-18**	**G120-PBEA-22**	**G200-PBEA-29**	**G200-PBEA-35**	**G400-PBEA-46**	**G400-PBEA-58**
Boiler shell dimensions							
Length	589 mm	23 1/4"	655 mm 25 3/4"	753 mm 29 3/4"	795 mm 31 1/4"	927 mm 36 1/2"	1031 mm 40 1/2"
Width	521 mm	20 1/2"	573 mm 22 1/2"	573 mm 22 1/2"	607 mm 24"	658 mm 26"	658 mm 26"
Height	598 mm	23 1/2"	625 mm 24 1/2"	657 mm 25 3/4"	685 mm 27"	729 mm 28 3/4"	729 mm 28 3/4"
Overall dimensions							
Total length	834 mm	32 3/4"	900 mm 35 1/2"	998 mm 39 1/4"	1040 mm 41"	1172 mm 46 1/4"	1276 mm 50 1/4"
Total width	615 mm	24 1/4"	667 mm 26 1/4"	667 mm 26 1/4"	701 mm 27 1/2"	752 mm 29 1/2"	752 mm 29 1/2"
Total height	664 mm	26 1/4"	691 mm 27 1/4"	723 mm 28 1/2"	751 mm 29 1/2"	795 mm 31 1/4"	933 mm 36 3/4"
Weight with jacket	141 kg	310 lbs.	164 kg 361 lbs.	192 kg 422 lbs.	250 kg 550 lbs.	304 kg 669 lbs.	359 kg 790 lbs.
Content boiler water	ltr. 64	US gal. 16 3/4	ltr. 88 US gal. 23 1/4	ltr. 104 US gal. 27 1/4	ltr. 104 US gal. 27 1/4	ltr. 133 US gal. 35	ltr. 151 US gal. 41 3/4
Maximum operating pressure	207 kPa	30 psi	207 kPa 30 psi	207 kPa 30 psi	207 kPa 30 psi	207kPa 30 psi	207 kPa 30 psi
Boiler connections							
Supply & return connections		1 1/4"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"
Safety supply &		1"	1"	1"	1"	1"	1"
Safety return		1"	1"	1"	1"	1"	1"
Smoke pipe connections ØID	130 mm	5"	130 mm 5"	150 mm 6"	150 mm 6"	180 mm 7"	180 mm 7"
Draft requirement With positive pressure in combustion chamber	.005 kPa.	.02" w.c.	.005 kPa. .02" w.c.	.005 kPa. .02" w.c.	.005 kPa. .02" w.c.	.005 kPa. .02" w.c.	.005 kPa. .02" w.c.

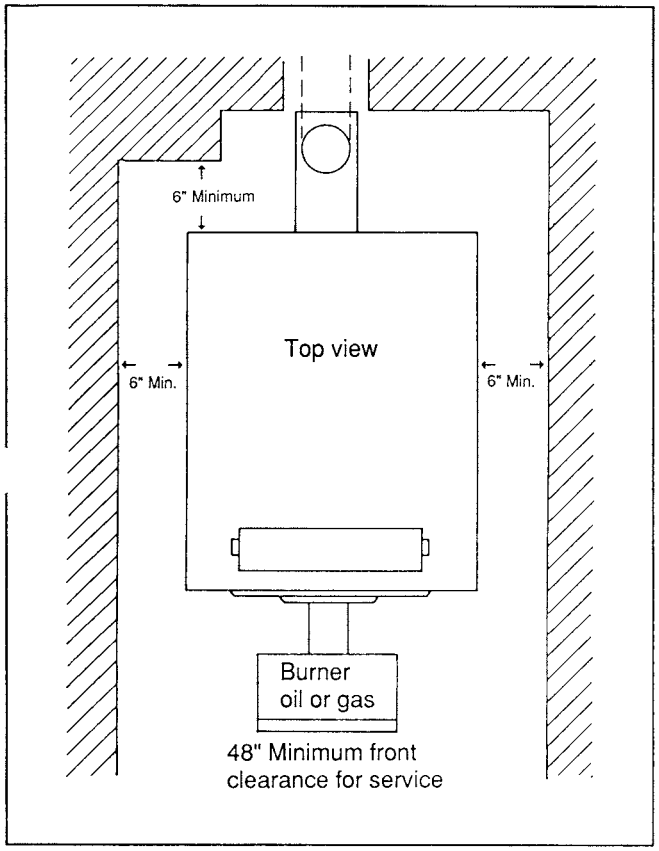
Propane burners have same input and output as natural gas burners. All kW figures are approximate.
*Net I=B=R rating based on piping and pick-up allowance of 1.15 **With optional stack damper.

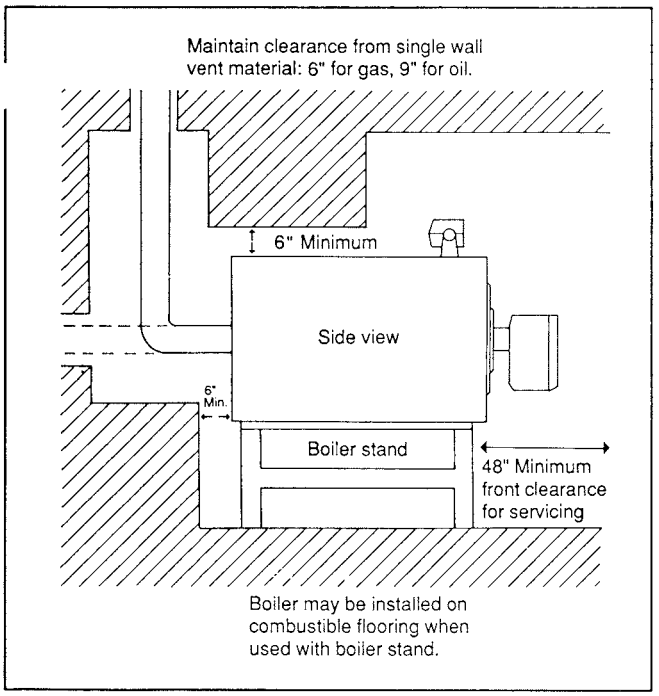
Boiler Location

Boiler is for installation on combustible floor without additional base requirements. Boiler must not be installed on carpeting.

Use the four levelling bolts provided on boiler base to level boiler on uneven floor.

Alcove installation - minimum clearances





Minimum clearances to combustible construction
(All measurements from boiler enclosure)

Recommendation:

If boiler is located in a confined space, install oil shut-off valve or main gas shut-off valve (gas cock) and main power supply switch in easily accessible location outside the confined space.

Combustion air supply

This boiler needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air.

Canada

Refer to the Installation Code For Oil Burning Appliances (CSA B139-1976 and Addenda) for oil burners, and the Natural Gas Installation Code (CAN/CGA-B149.1) for gas burners.
Always use latest edition of installation codes.

USA

Provisions for combustion and ventilation air in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1 (latest edition), or applicable provisions of the local building codes.

Recommended Air Supply Duct Size						
Boiler Model No.	BEA - 18	BEA - 22	BEA - 29	BEA - 35	BEA - 46	BEA - 58
Round duct	3" Ø	4" Ø	4" Ø	5" Ø	6" Ø	7" Ø

Provide ample clearance at the boiler front to allow for easy removal of the boiler combustion chamber.

Boiler model number	Length of combustion chamber	
BEA - 18	620 mm	24 1/2"
BEA - 22	680 mm	26 3/4"
BEA - 29	770 mm	30 1/4"
BEA - 35	810 mm	32"
BEA - 46	910 mm	35 3/4"
BEA - 58	1040 mm	41"

Minimum clearances to combustibles		
Back	150 mm	6"
One Side	150 mm	6"
Flue (gas-fired)	150 mm	6"
(oil-fired)	230 mm	9"
Alcove Installation		
Top	150 mm	6"
Back and Sides	150 mm	6"
Flue (gas-fired)	150 mm	6"
(oil-fired)	230 mm	9"

For proper maintenance and service we recommend maintaining a front clearance of 1200 mm (48") on all models.

ATTENTION:

The boiler must not be located in areas or rooms where chemicals are stored, or aggressive vapors (for example hair spray, perchloroethylene or carbon tetra chloride), high dust levels or high humidity levels are present.
Heat exchanger corrosion might occur and reduce the lifetime of the boiler significantly. If above criteria are not properly observed and boiler damage results, any warranty on the complete boiler and related components will be null and void.
Be aware that best overall system performance is achieved when all components are properly sized. Sizing of the required circulating pump according to the pipe layout and calculation of a proper volume expansion tank is vital to obtain the system's peak performance.

Excerpt from our warranty terms

Boiler is not covered under any warranty terms for damages resulting from the following:

Improper application and installation, installation by unqualified personnel, ignorance of instructions, improper service and maintenance work, incorrect replacement component selection or application, incorrect field wiring.

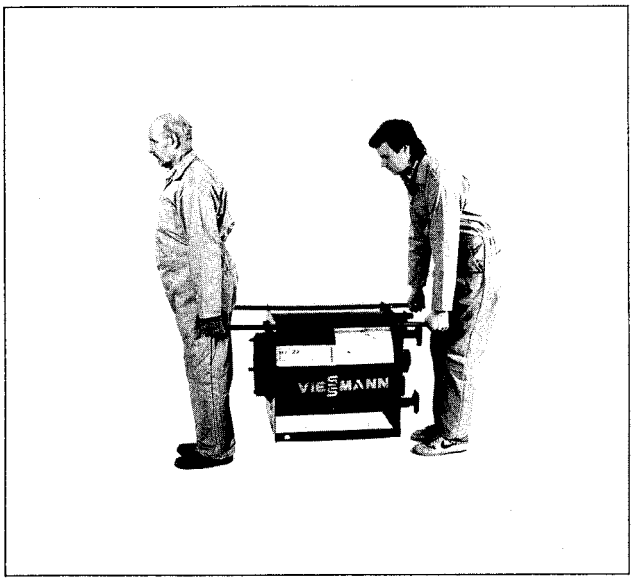
Full warranty applies only when boiler is installed and operated according to instructions and used only with the proper gas and the applicable gas pressures.

For details, refer to boiler warranty certificate.

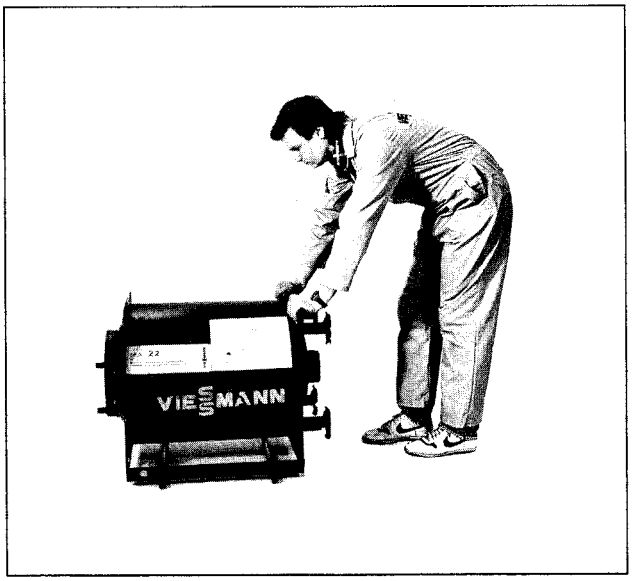
Step by Step Installation Instructions - Summary Vitola-biferral Boiler

Boiler transport and handling

Remove all packaging from stainless steel combustion chamber, and chamber itself from boiler.



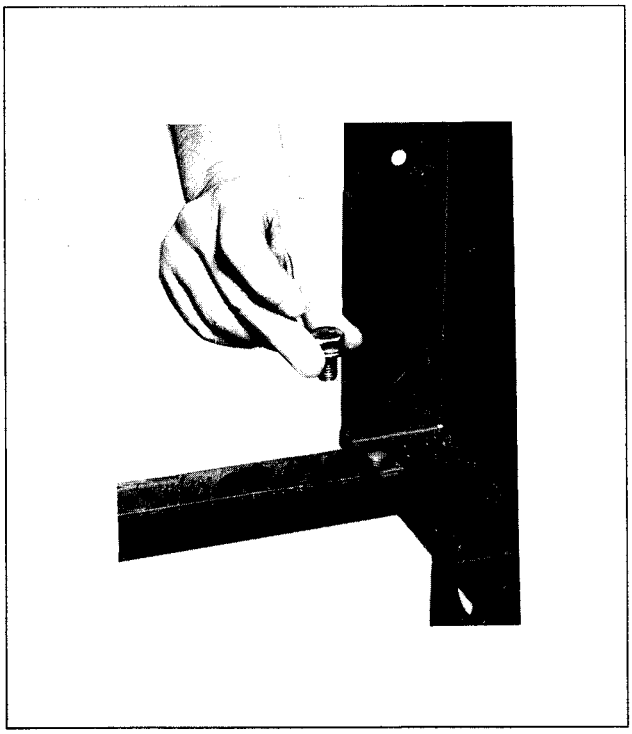
The boiler shell may be handled by a single person by means of a fridge cart, or carried by two people using 3/4" steel pipe through the lifting lugs.



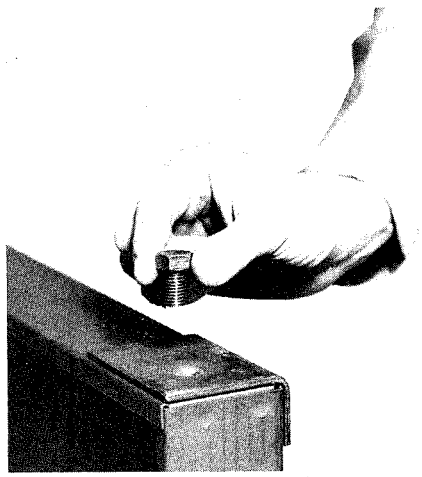
Pipes may be used as rollers.

Mounting of boiler stand.

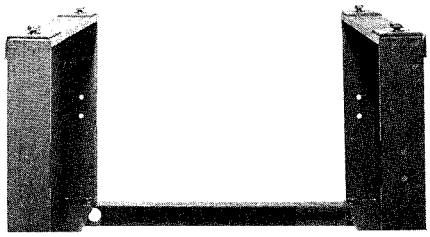
Turn boiler upside down (skids face upwards). Boiler stand front and rear panels are alike.



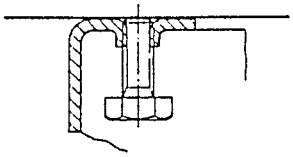
For attachment use the four 12 mm hex. bolts with washers provided.

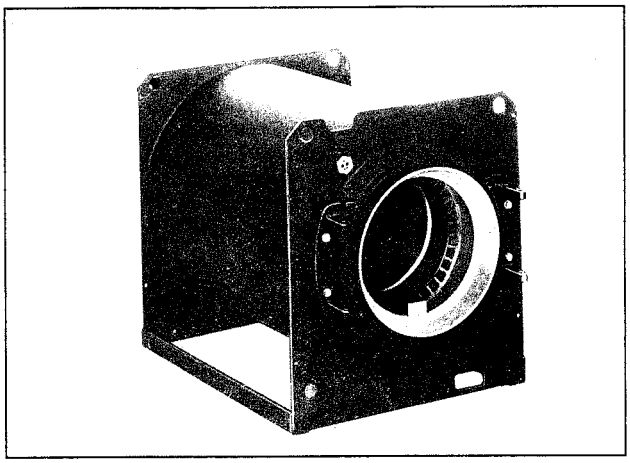


Install floor levelling bolts in front and rear panels when floor is uneven.



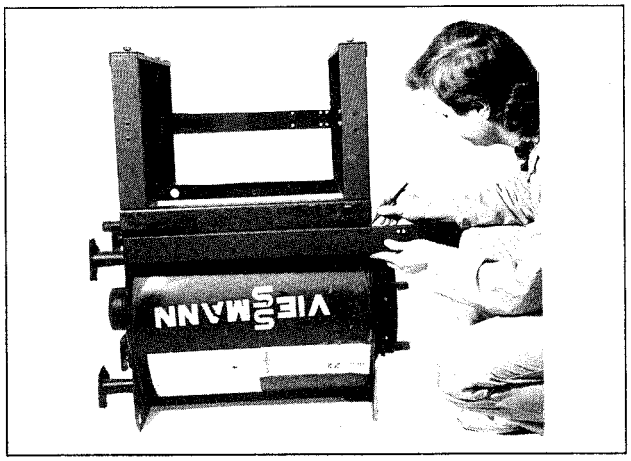
Note: Floor levelling bolts may also be installed in the opposite way as shown above if this provides better wrench access.



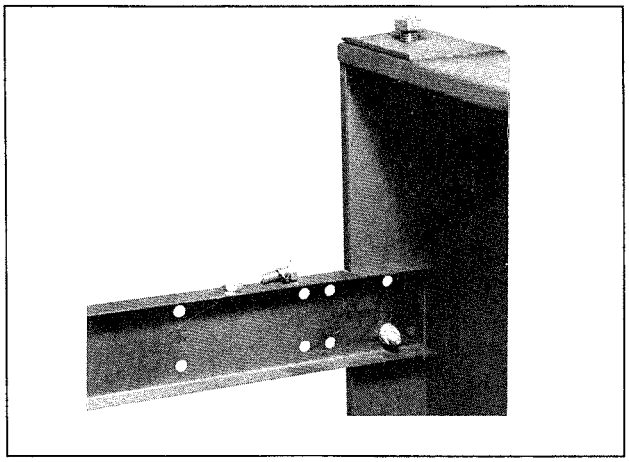


Cut predrilled spacing support bars (if not already supplied precut), so that the bar length is 5/16" shorter than the total boiler skid length.

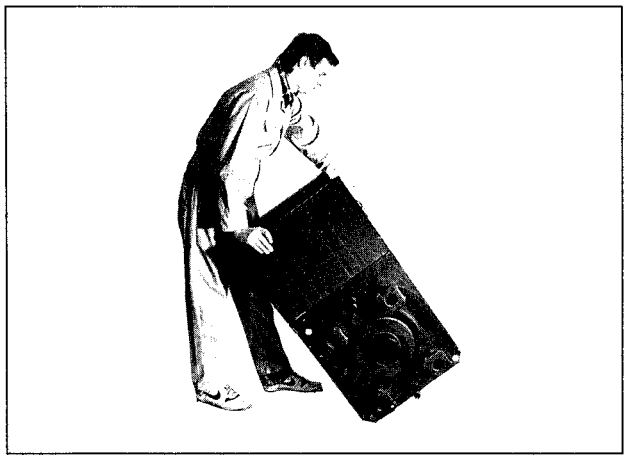
Attention: Cut off bars at the side where the predrilled hole pattern is present.



Tip: Align bar inside boiler plate - mark opposite side again inside boiler plate and cut.



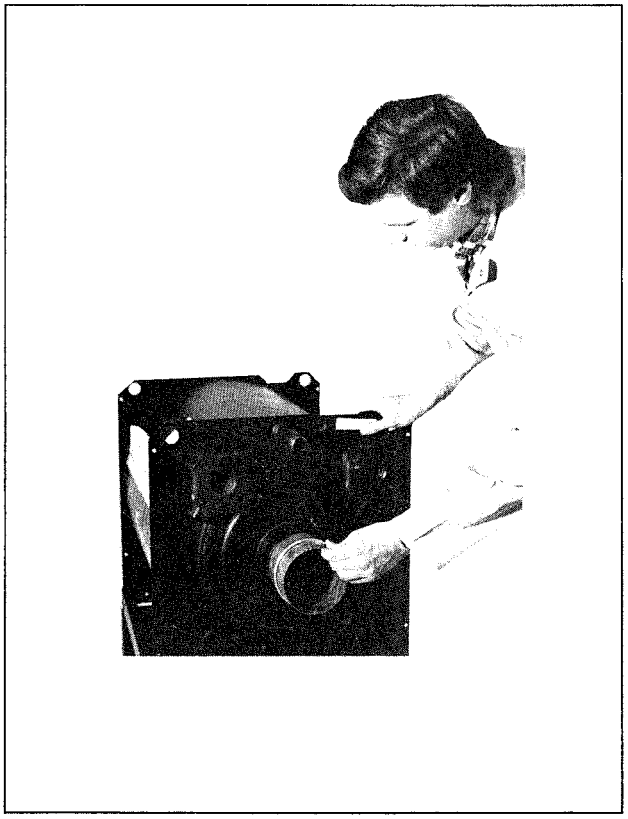
Insert bars in front and rear panels and secure in place by using the eight 8mm hex. bolts, washers and nuts provided. Tighten all bolts!



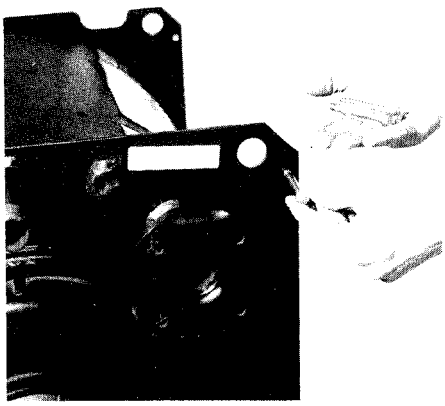
Turn boiler assembly.

Use 3/4" steel pipe in lifting lugs to set boiler in place.

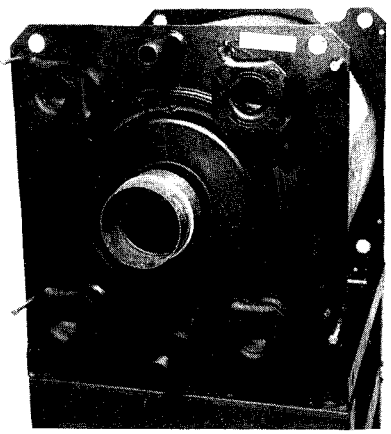
Position boiler and adjust floor levelling bolts if necessary. When required, a vent pipe adapter fitting is factory-supplied. Attach to cast-iron flue collar and secure in place with 3 self-tapping screws.



Attaching the insulation on enclosure panels. All parts are packaged in insulated enclosure carton.



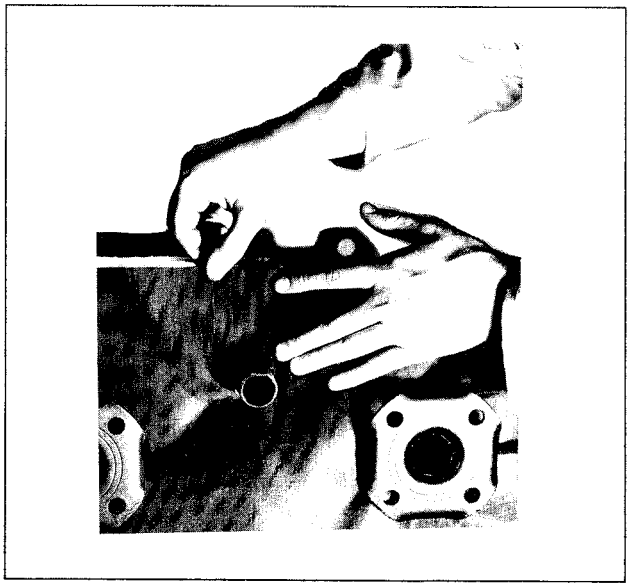
Install the four 8 mm hexagon bolts (extended neck) in the prethreaded openings in boiler rear plate.

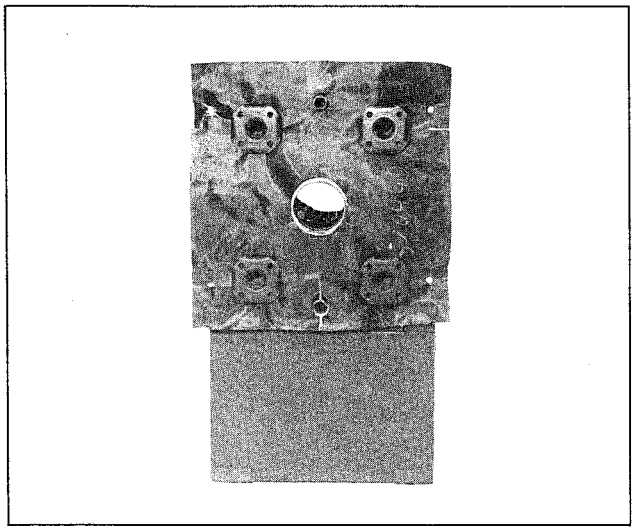


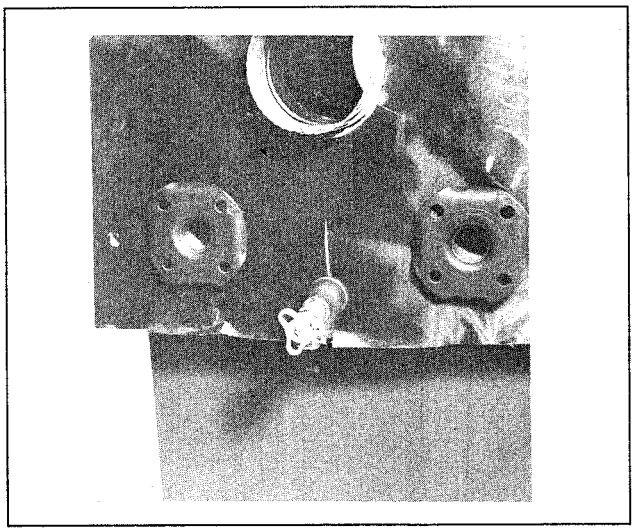
4 Bolts installed.

Attach rear insulation blanket - all knock-outs provided.

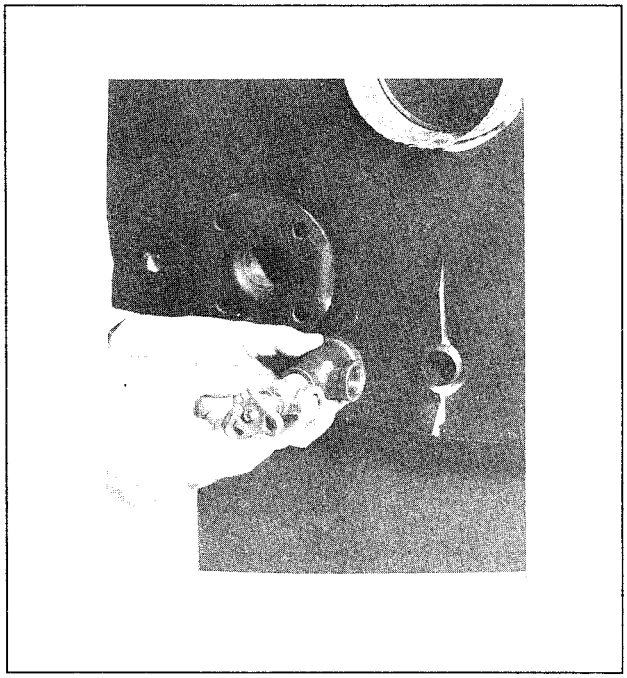
Slots in rear insulation blanket may be covered with self-adhesive nylon strips, factory-supplied.



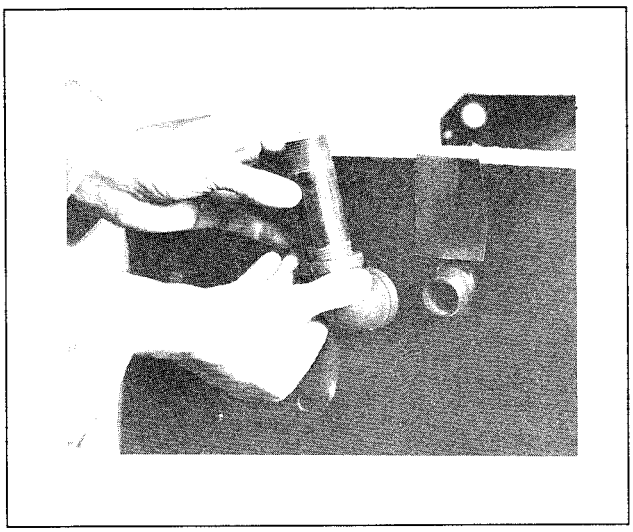




Reducing tee and drain valve installed.



Install reducing tee for expansion tank connection (and automatic fill when required), and boiler drain valve on bottom 1" boiler tapping.



Install 1" 90° elbow and 1" pipe nipple supplied to boiler top tapping 1".

Boiler pressure test

The boiler must be leak tested before being placed in operation.

Before boiler is connected to piping or electrical power supply, it must be hydrostatically pressure-tested with a max. of 45 psi (310 kPa).

1. Install safety manifold with pressure gauge and air vent. Install temporary cap on 3/4" nipple extension (nipple for pressure relief valve mounting).

ATTENTION:

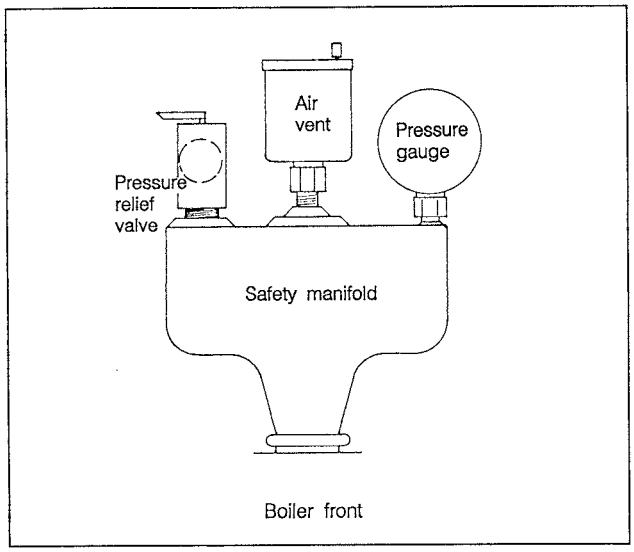
No boiler isolation valve must be installed between boiler supply and safety manifold (see boiler piping section).

2. Cap supply and return pipe.
3. Connect 1/2" garden hose to boiler drain valve and fill boiler slowly until pressure gauge indicates max. 45 psi (310 kPa).
4. Maintain pressure for 15 minutes. During time of pressure testing, do not leave boiler unattended.
5. Inspect all pipe joint connections, the safety manifold and boiler base with flashlight for leaks.

6. After 15 minutes, release water pressure from boiler by opening boiler drain valve slowly, remove caps from supply and return pipe as well as 3/4" cap from safety manifold nipple and install pressure relief valve immediately instead of 3/4" cap.

After boiler has passed pressure test, proceed with installation.

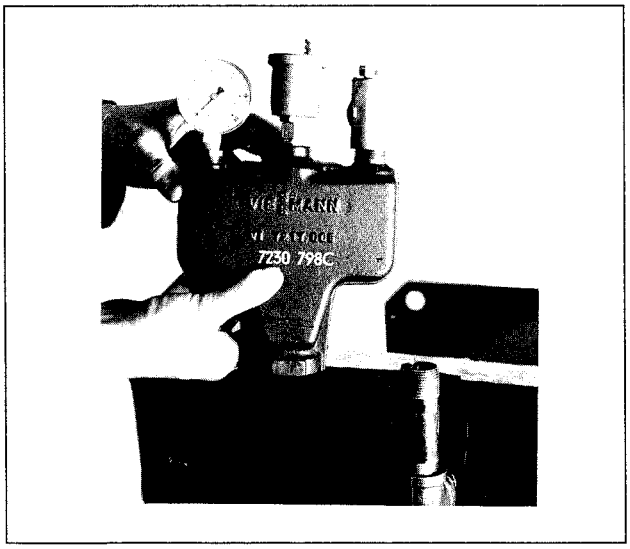
Boiler water piping



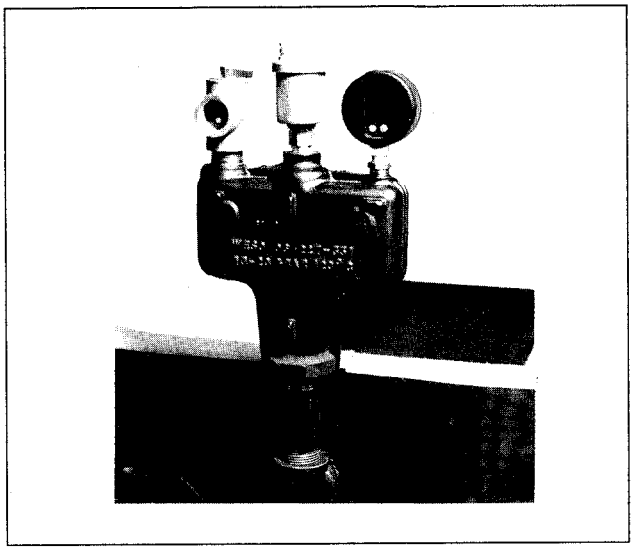
ATTENTION:

Install safety manifold with pressure relief valve, pressure gauge and air vent to boiler supply directly. No isolation valve must be installed between boiler supply and safety manifold. Before boiler is connected to a piping/heating system which has previously been in service (boiler is a replacement boiler), piping system should be flushed thoroughly with water in order to remove sludge or other contaminants, especially in large piping systems such as old gravity pipe layouts.

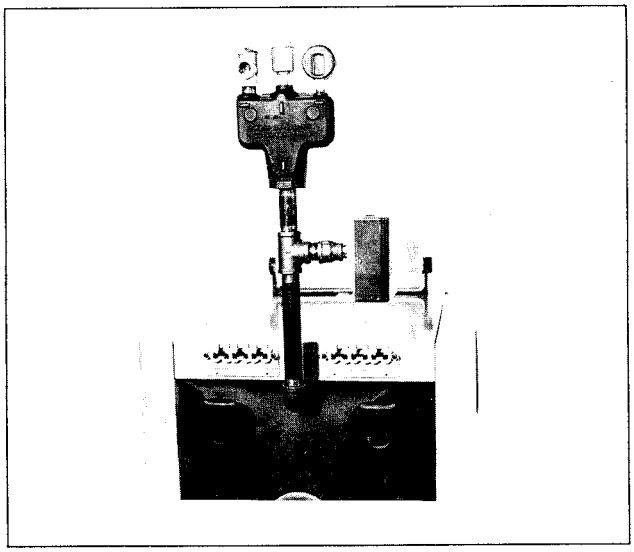
Check system for pipe leaks, defective valves, etc. and make required corrections immediately.



Once pressure test is finished, remove 3/4" cap and install 30 psi pressure relief valve.



In case a low water cut-off is required by local codes, install probe type (as shown below) or float type in pipe connection to safety header.

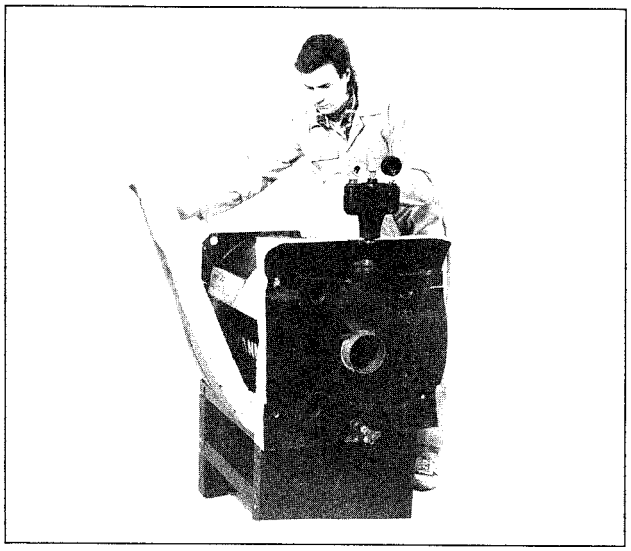


Low water cut-off

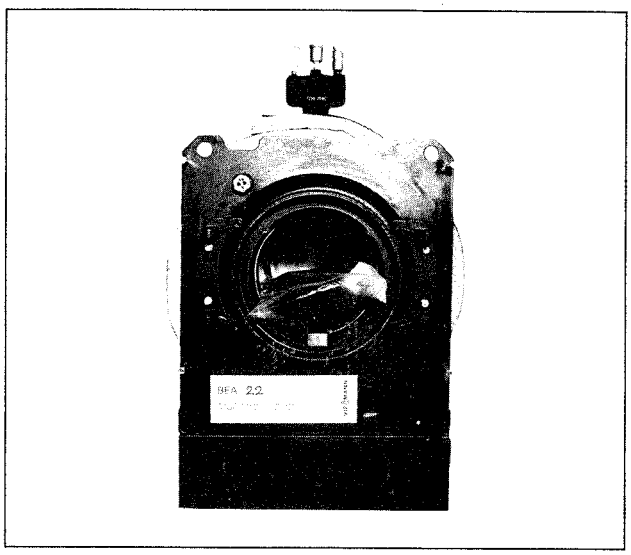
If boiler is installed above radiation level, a low water cut-off device of approved type must be installed in all instances. An approved low water cut-off device must be supplied and installed by the mechanical contractor where required by local codes.

This boiler does not require a flow switch.

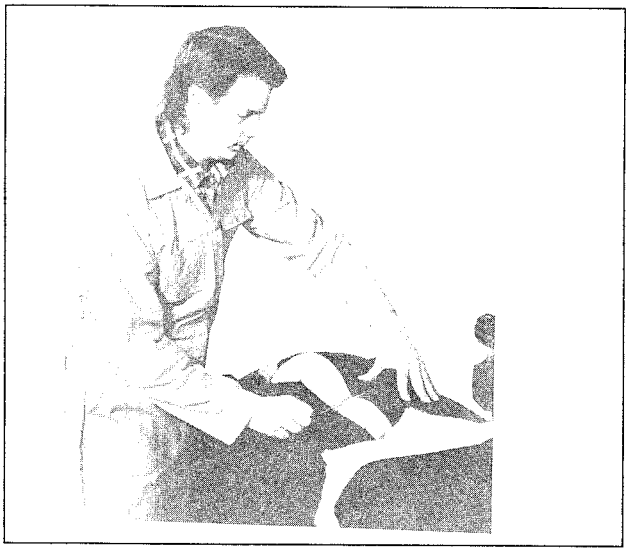
Installation of wrap-around boiler shell insulation blanket, sliding one end of blanket under boiler shell.



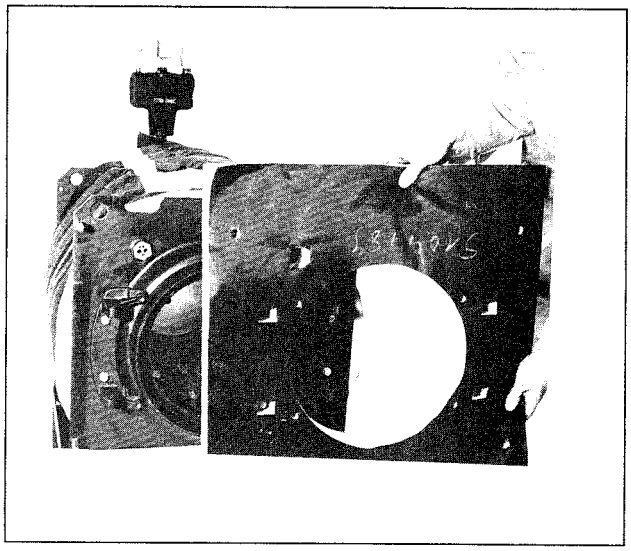
Pull both ends to the top.



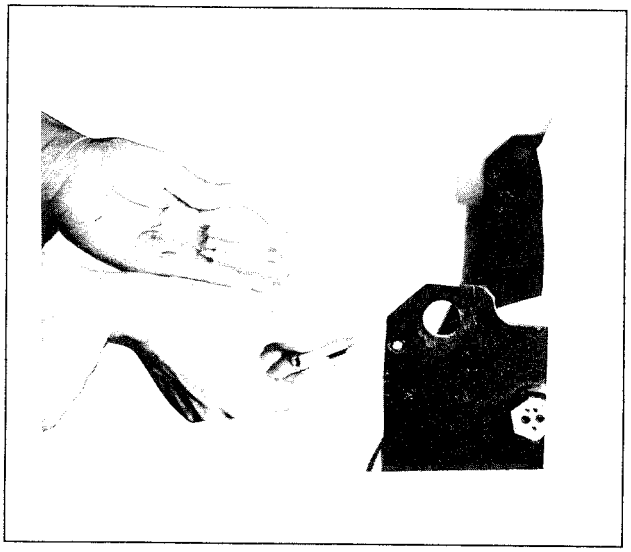
Spacers in place.



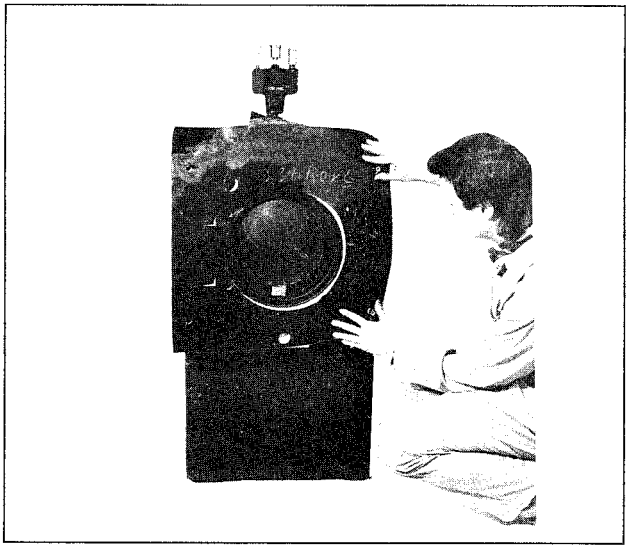
Overlap and use spring clips provided to secure in place.



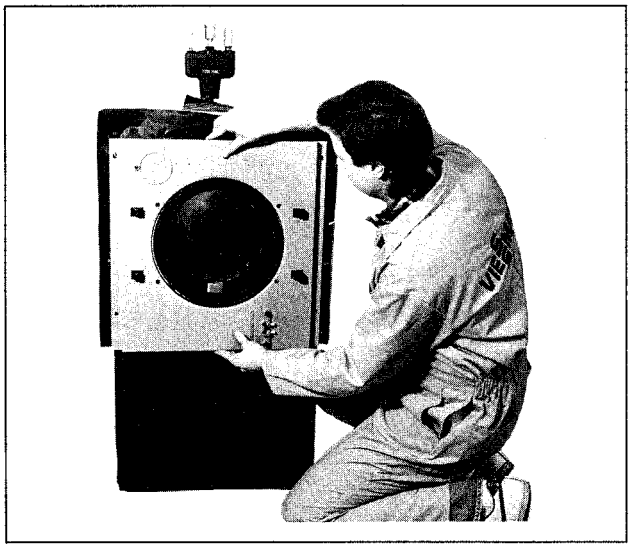
Attach front insulation pad - knock out all prepunched openings with fingers.



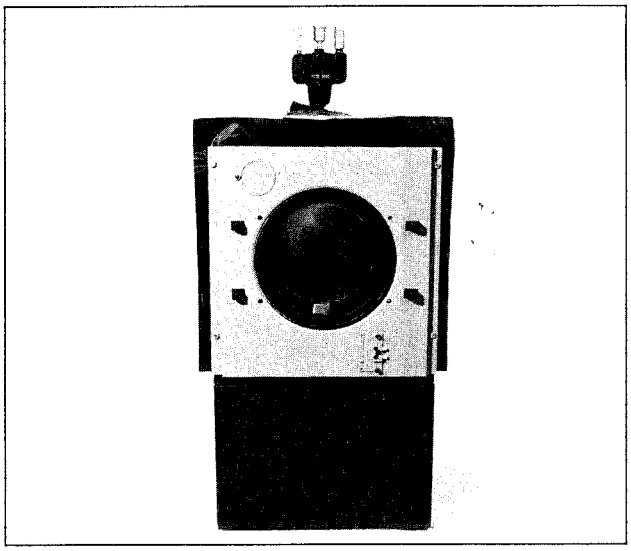
Attach 4 hex. spacers in prethreaded openings in boiler front plate.



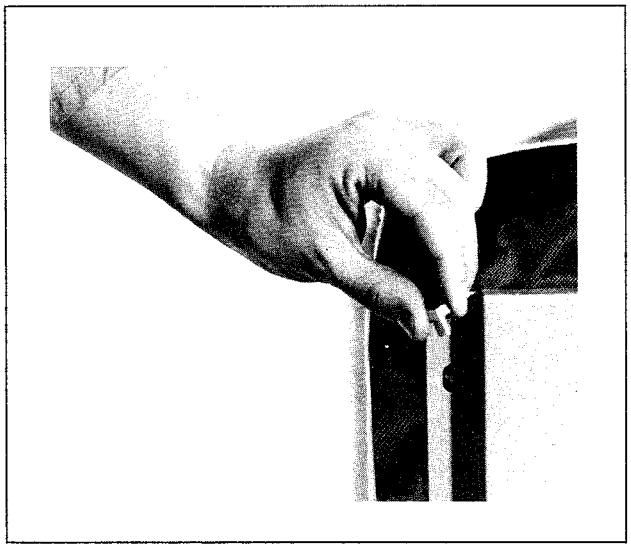
Ensure that all openings protrude.



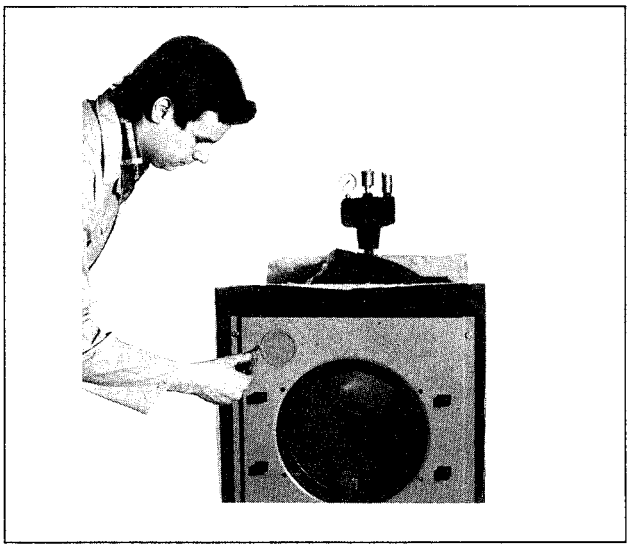
Align front enclosure panel.



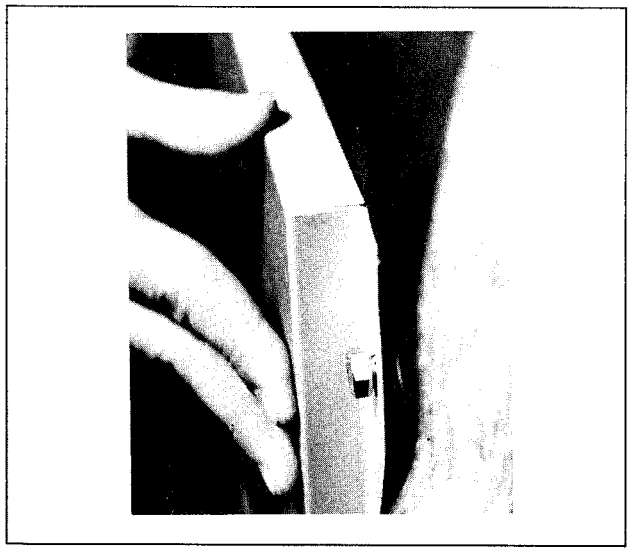
Front panel mounted.



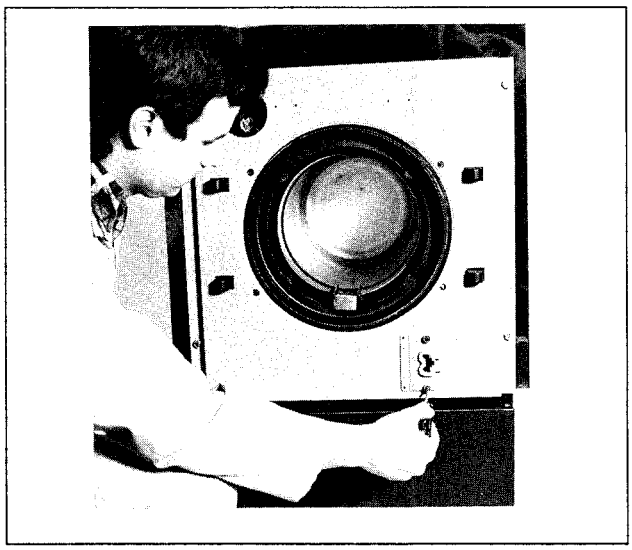
Secure front panel in place with four 1/2" hex. bolts.



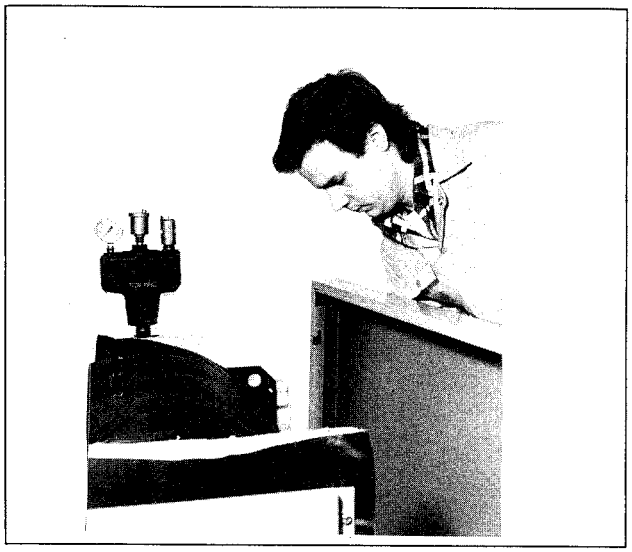
Remove cover plate over 5-point stainless steel well.



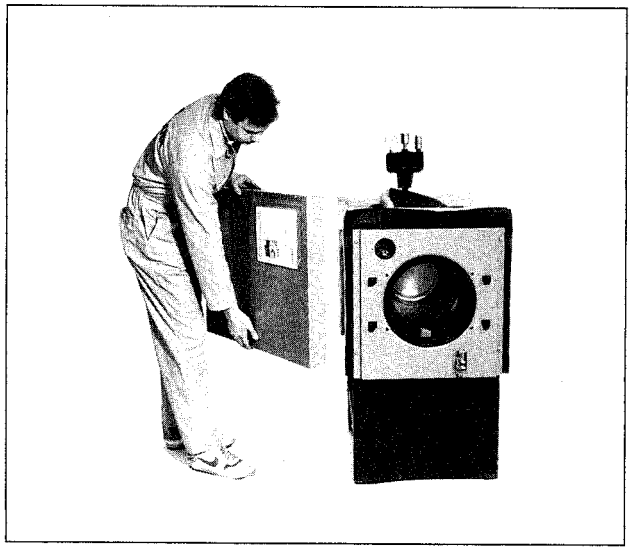
Do not tighten bolts - press against front panel. Ensure that the bolt head has a gap of approx. 1/16" to accommodate clip-in of side panels.



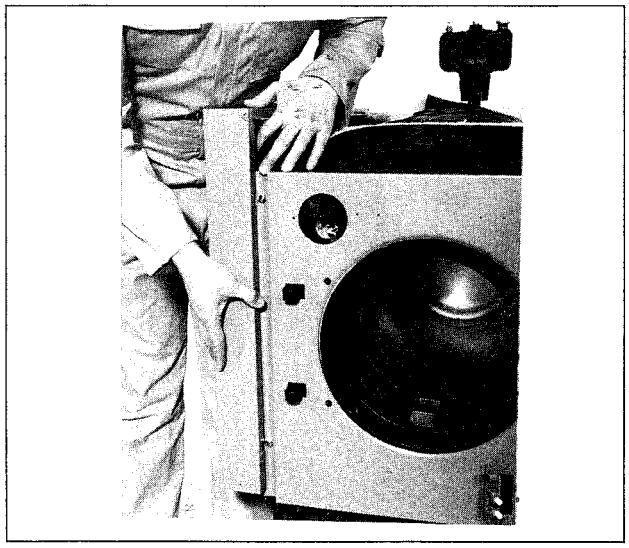
Well cover plate removed - opening wire gate.



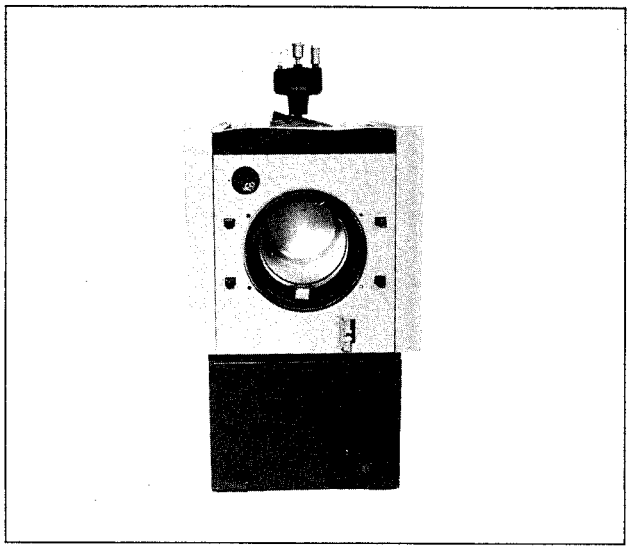
Installation of right side panel - hook rear side first into hex. bolts with extended neck.



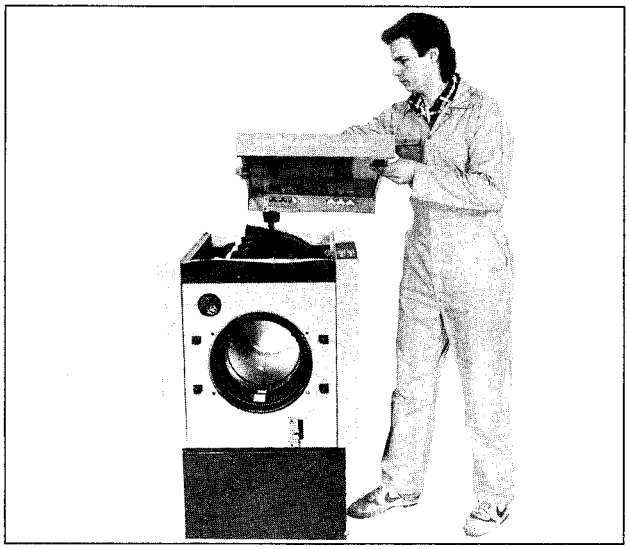
Mounting of left side panel with instruction pocket mounted.



Align panel slots with hex. bolt heads. Push side panel towards boiler - press panel towards boiler rear and down to hook in place.

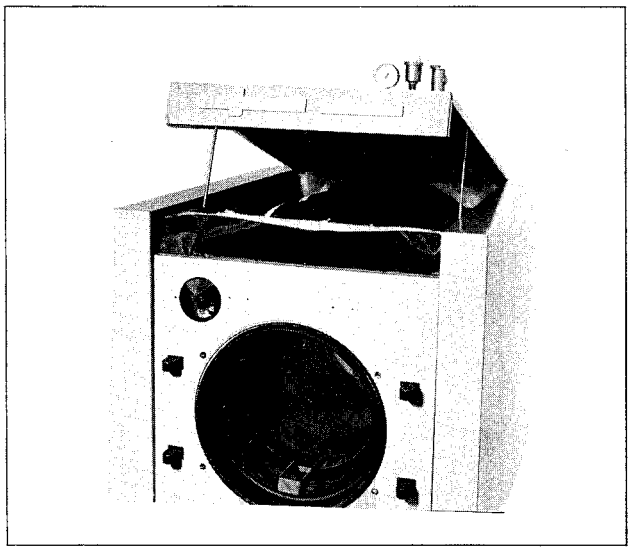


Note: Side panels will only be tight once top panel is in place - if they feel too loose, remove panels and tighten the 4 hex. bolts by another 1/2 or full turn.
Side panels and front panel attached.

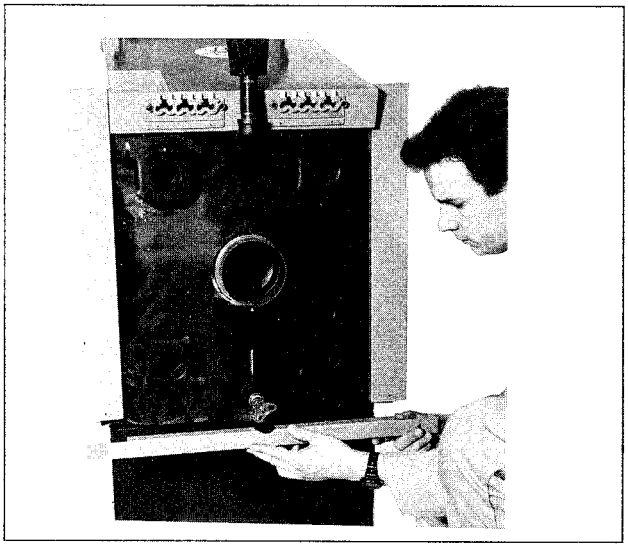


Insert top enclosure panel

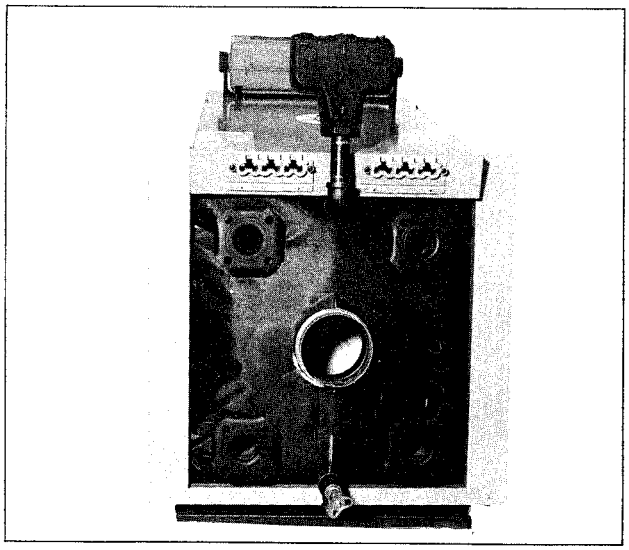
As installation help, two spacer rods are factory-supplied in the service pocket - remove and use to support top enclosure panel. Panel is secured in the back by the safety header.



Spacers in place.



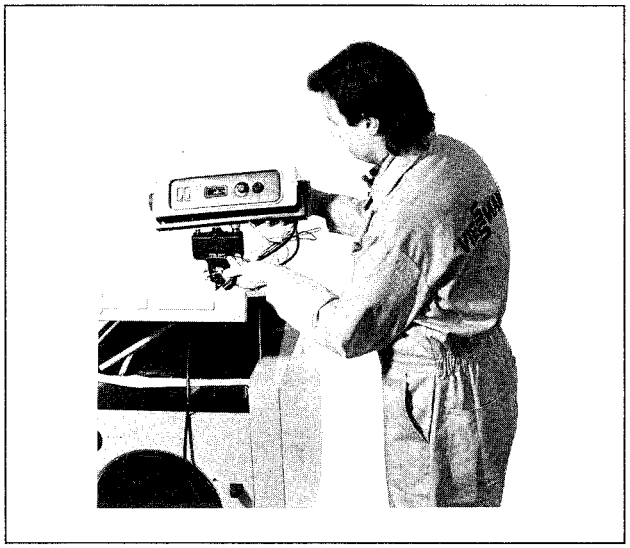
Installation of rear spacer strip.



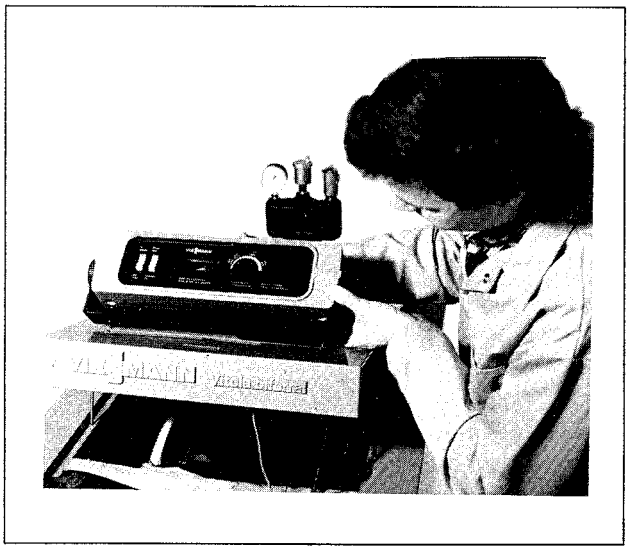
Enclosure panel in place.

Mounting of control package -

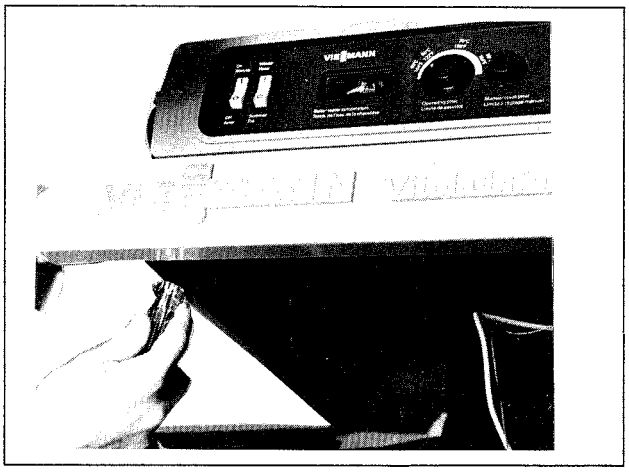
Standard boiler equipment E/KR. Installation as demonstrated. Following also applies to optional boiler control Trimatik.



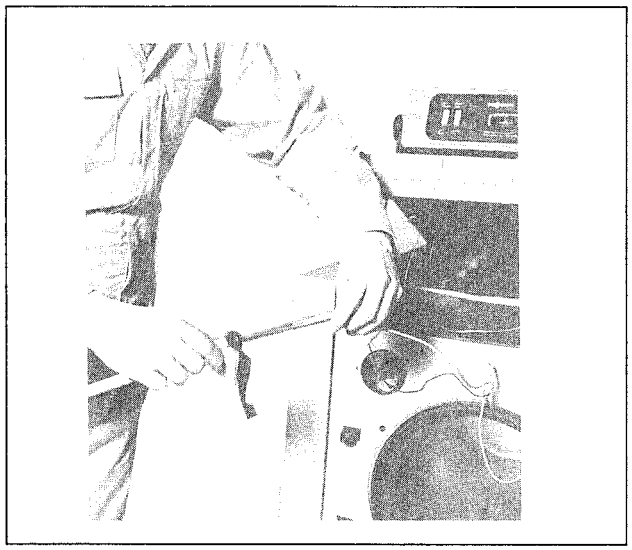
Slide all capillaries and wire connections through opening in top enclosure panel.



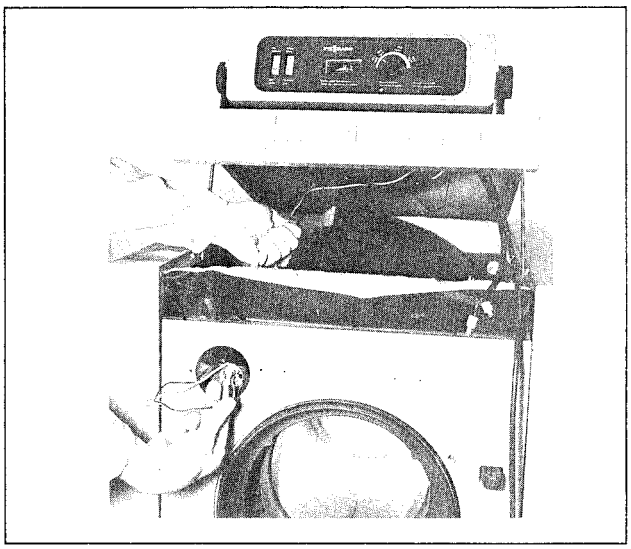
Align control mounting base (3 screws) with prepunched openings in the top enclosure panel, insert and push control panel backwards to set screws in place in narrow slots.



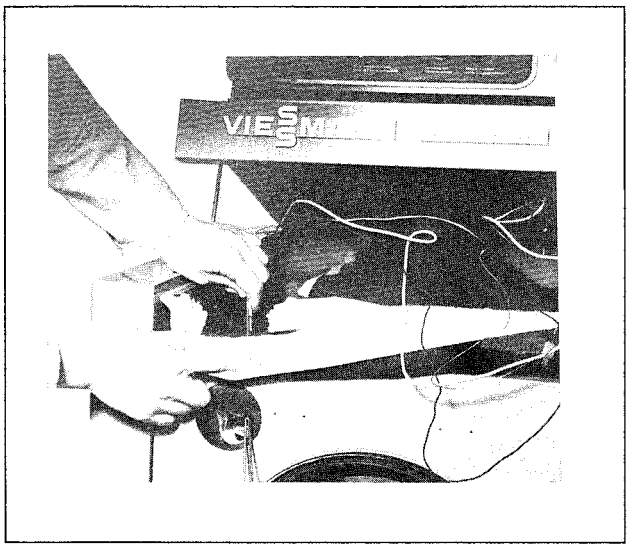
Tighten from below with Phillips screwdriver - do not overtighten!



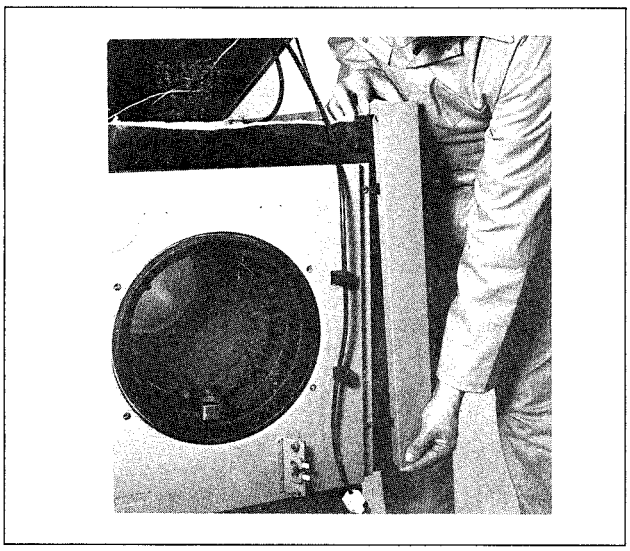
Remove capillary sensor from protective cover and extend the capillary wire carefully without kinking.



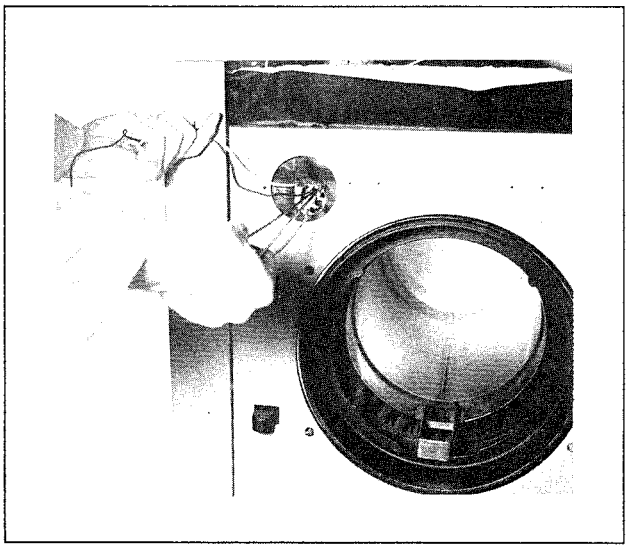
Insert all sensors to the end and pull back extra capillary into boiler enclosure. **Do not kink capillaries.**



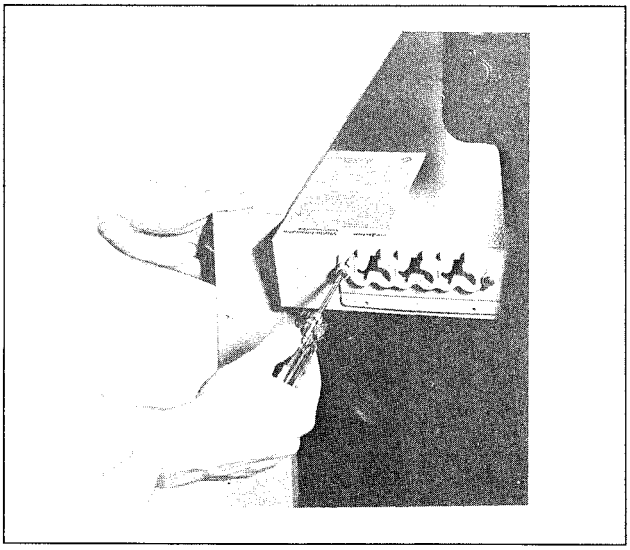
Slide capillaries diagonally from inside the enclosure through well cover opening.



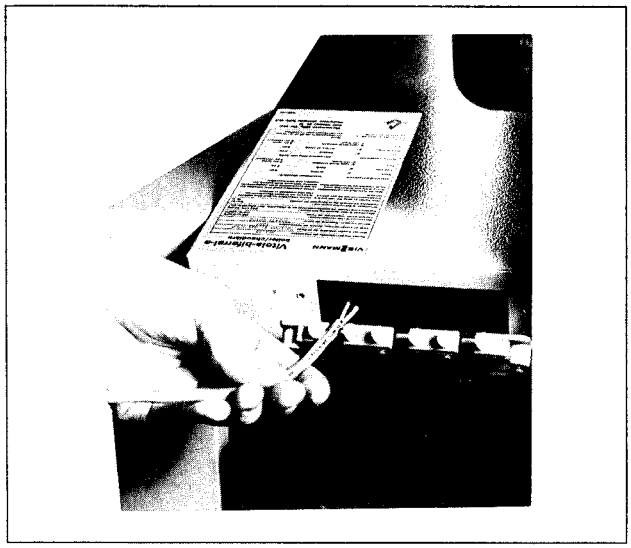
Unclip right enclosure panel in front only. Extend burner plug (plugs Trimatik) 41 down and behind enclosure panel - clip side panel in place again.



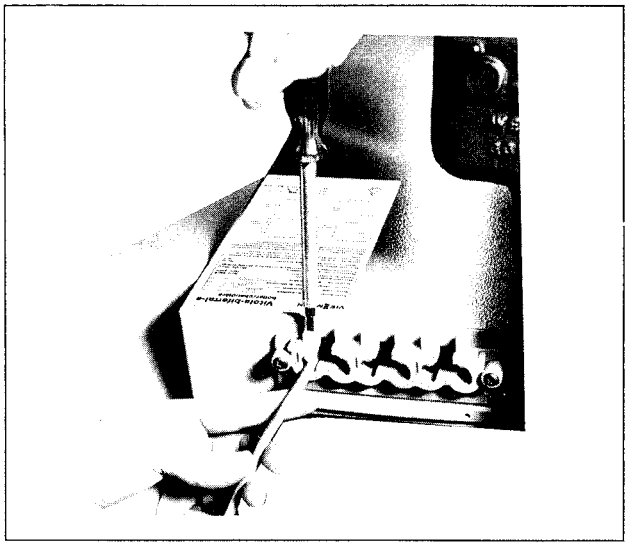
Turn sensors around and insert capillary tubes into stainless steel well - there is no specific location for each capillary tube in the 5-point stainless steel well.



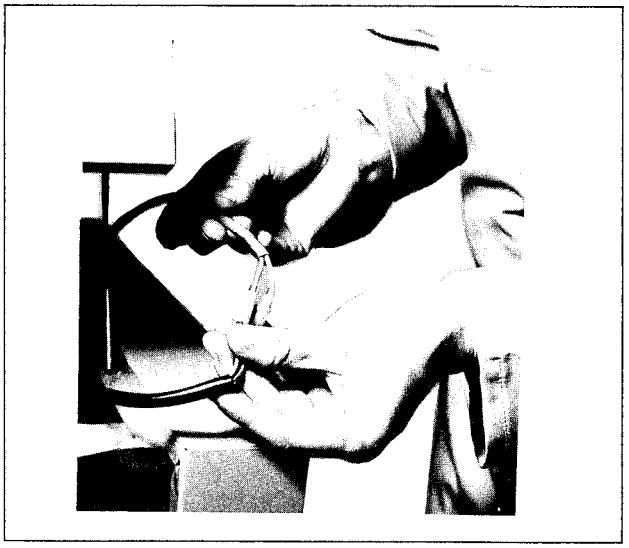
Open wire gate(s) at rear of top enclosure panel to feed all low voltage wires required to boiler control (room thermostat, operating control, etc.).



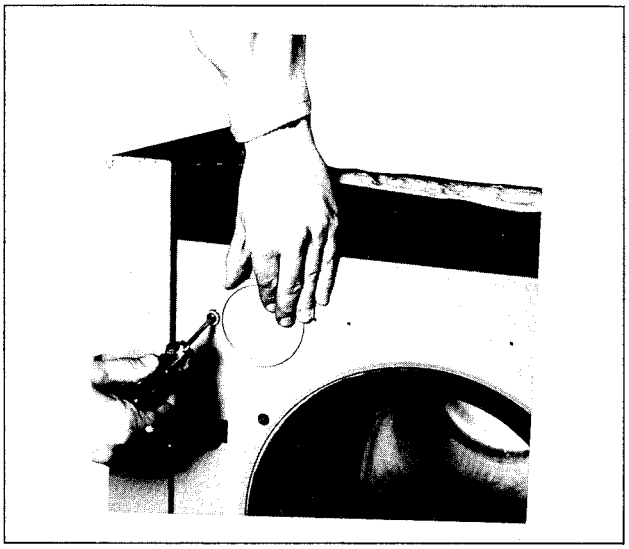
Introduction of low voltage wiring.



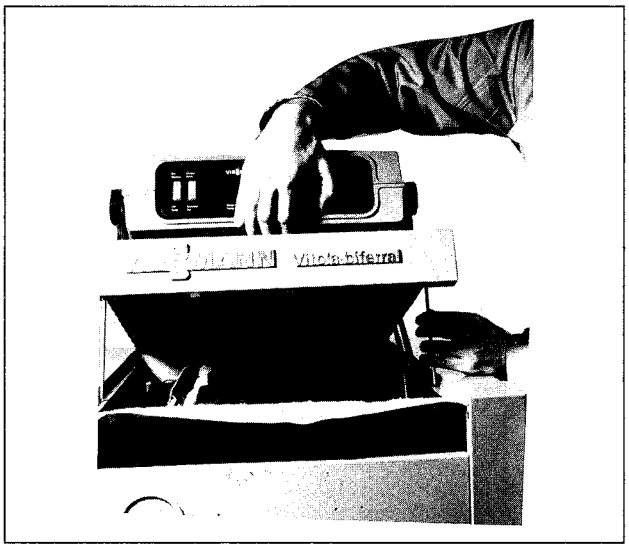
All wires can be secured in place by means of strain reliefs.



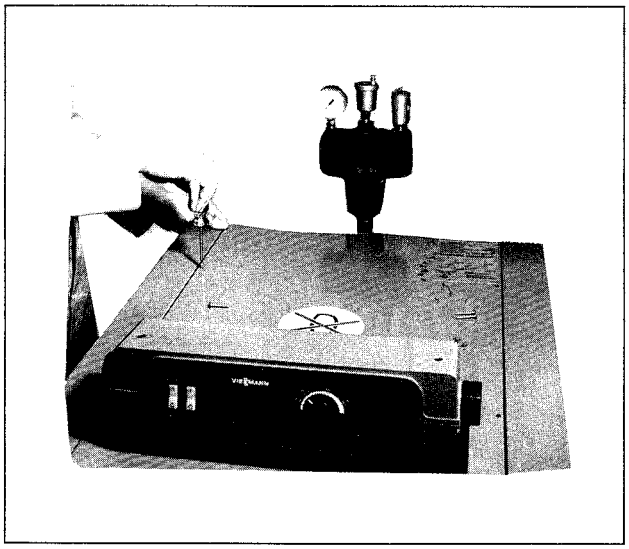
Making the operating control connection (room thermostat, indoor/outdoor control, etc.).



Securing the capillary sensors by re-installing the cover plate over the 5-point stainless steel well.

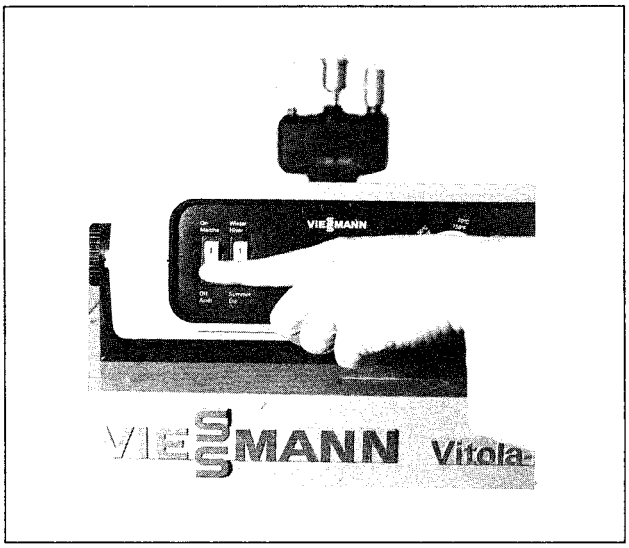


Lifting up top enclosure panel - removal of the 2 spacer rods.

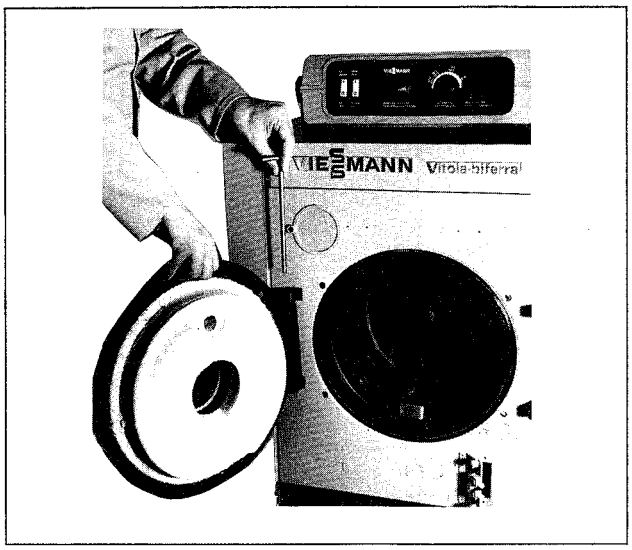


Securing top enclosure panel in place with left and right side enclosure panels, with 4 Phillips screws supplied.
All low voltage wiring is now within the boiler enclosure jacket and out of sight.

Storing of 2 spacer rods in service pocket.

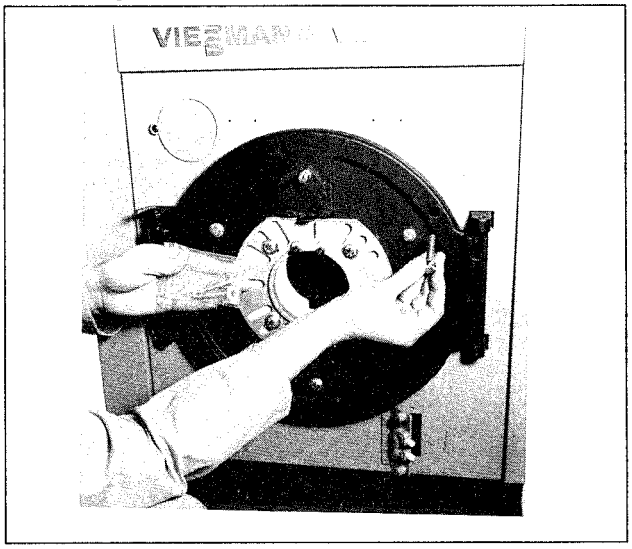


Switch off low voltage power switch on boiler control.

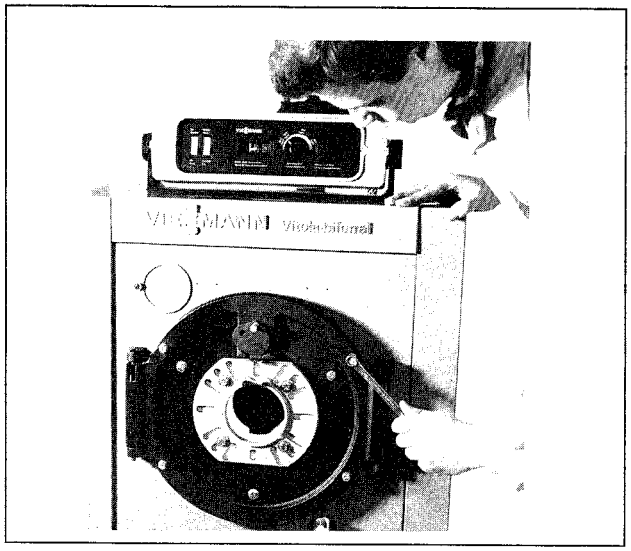


Remove combustion chamber door from carton. Use hinge pin to attach to boiler door hinges left or right, whichever side the door swings open to. Enough wall clearance must be there in order to pull out the combustion chamber during service.

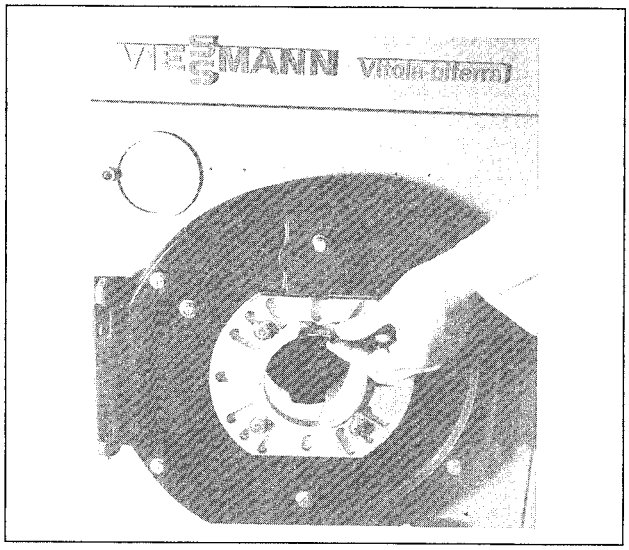
Tip: Maintain 15" clearance from wall to boiler side where door is hinged.



Before closing combustion chamber door, ensure that combustion chamber is inserted completely, handle facing down, and that all equipment has been removed from combustion chamber. Slightly lift cast-iron door on opposite side of hinge, close door and secure in place with four or six 8mm hexagon bolts.



Tighten bolts diagonally with wrench.

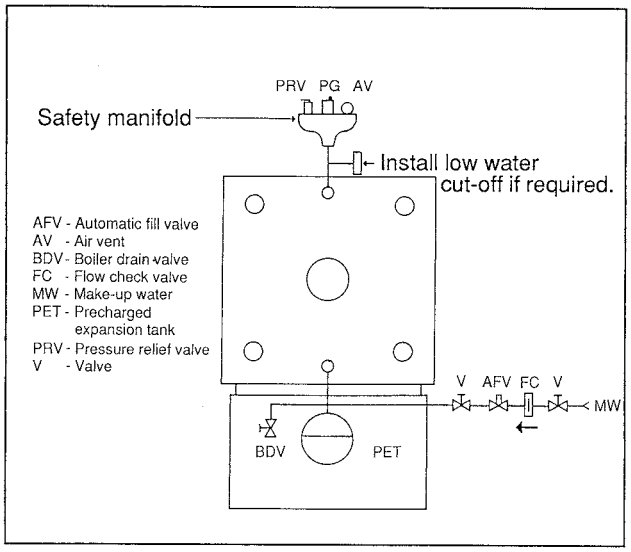


Burner flange is already factory-installed on combustion chamber door. Remove the two hexagon bolts.

For mounting and installation instructions on oil or gas burner, follow burner installation manual packed and shipped in burner carton.

Boiler piping:

Pressure relief valve (mounted on safety manifold). A discharge pipe in the same diameter as the pressure relief valve discharge opening must be rigidly installed directly onto the pressure relief valve. This discharge pipe should extend to a floor drain and end approx. 150mm (6") above floor vertically for proper discharge. Do not install any shut-off valve in this discharge pipe or reduce pipe diameter. Do not pipe discharge to outdoors!



Location of safety manifold, make-up water and expansion tank connections.

ATTENTION:

The Vitola-biferral boiler is a special low temperature heating boiler which is designed to "cold-start" and operate without low water temperature limit.

The following piping system schematics are recommended.

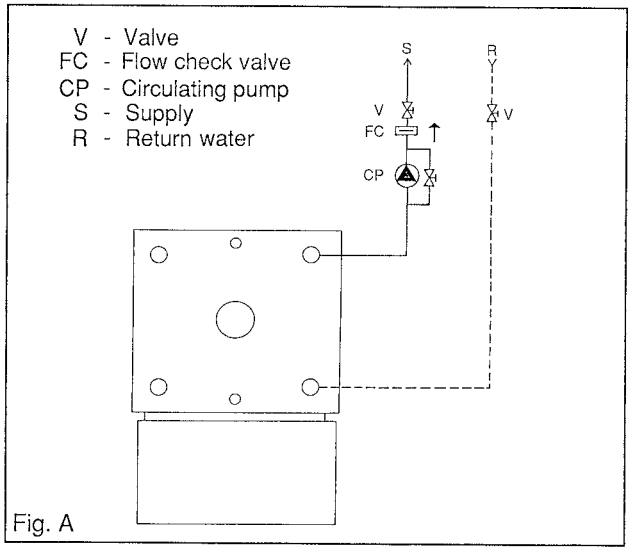


Fig. A

1 Heating zone - 1 Operating control

Circulating pump running continuously. System is not zoned. Boiler operating control is a single room thermostat or independent indoor/outdoor control system, boiler water temperature therefore fully modulated. Recommended boiler operating control: Viessmann Trimatik.

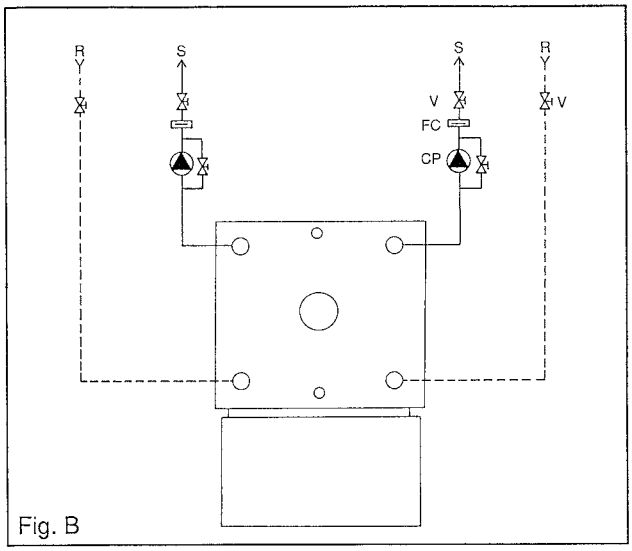


Fig. B

2 Heating zones - 1 Operating control

One circulating pump running continuously on one zone, system has two zones. Second zone pump is activated on demand by individual thermostat, only on/off. Main zone where circulating pump runs continuously also operates boiler with room thermostat (larger one of the two loops), or independent indoor/outdoor control. Recommended boiler operating control: Viessmann Trimatik.

Option:

The two circulating pumps are controlled individually by room thermostats on/off, boiler is independently controlled by an indoor/outdoor control system. Recommended boiler control: Viessmann Trimatik.

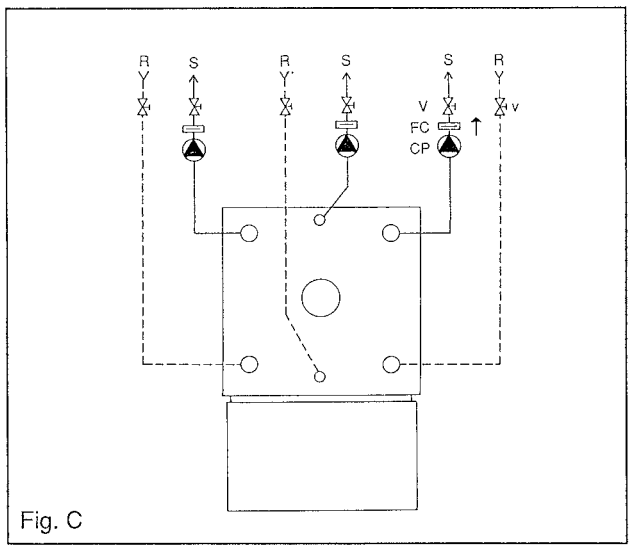


Fig. C

3 Heating zones - 1 Operating control

Same as "B", except three zones. (Third zone may be domestic hot water storage tank). Recommended boiler operating control: Viessmann Trimatik.

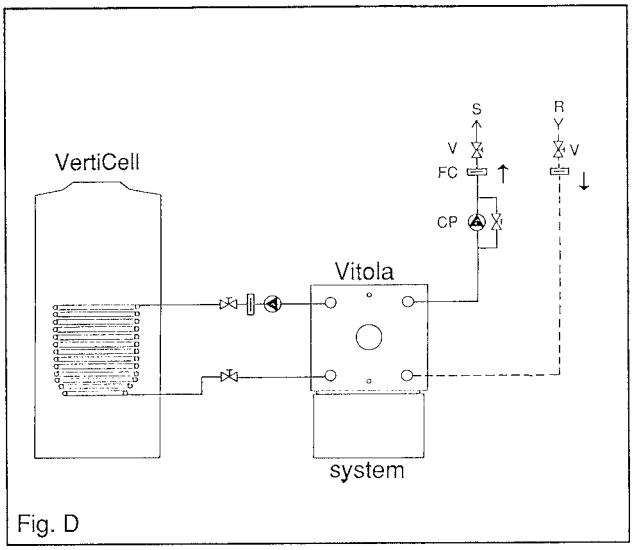


Fig. D

2 Heating zones - Space heating and domestic hot water

Circulating pump for heating system running continuously. System is not zoned, or, if zoned, a pump pressure activated bypass should be installed, or end switch shuts down circulating pump when all zones are closed. Recommended boiler operating control: Viessmann Trimatik. Boiler water temperature fully modulating.

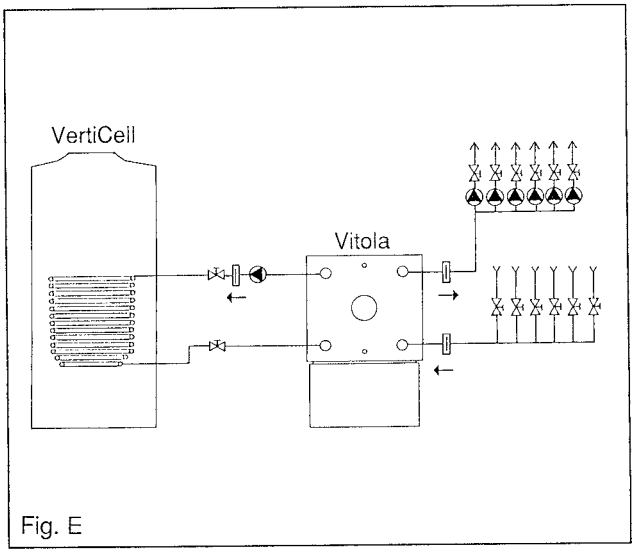


Fig. E

Multi-zone system with individual pumps

Individual zone pumps on/off operated by individual room thermostats Recommended boiler control: Viessmann Trimatik.

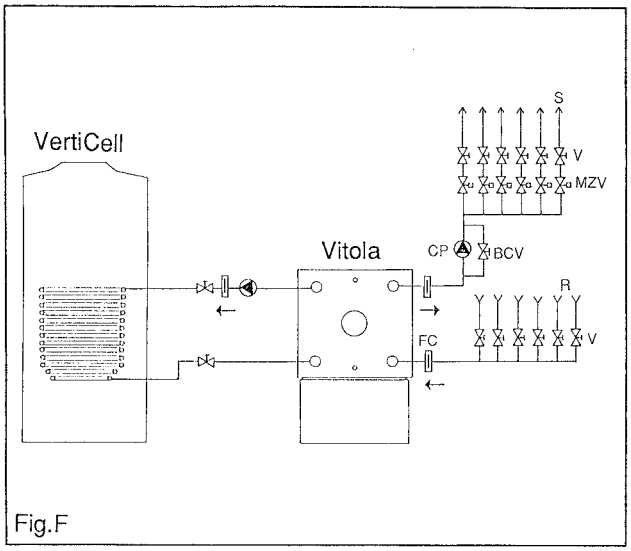


Fig.F

BCV - Bypass control valve pressure-activated, or pump could be deactivated by additional relay when all motorized zone valves are closed.
CP - Circulating pump
FC - Flow check valve
MZV - Motorized zone valve
R - Return
S - Supply
V - Valve

Multi-zone system with pumps and zone valves

Individual zone valves operated by the individual room thermostats open/close. Recommended boiler control: Viessmann Trimatik. Boiler water temperature fully modulating. Use pump pressure activated bypass, or end switch shuts down circulating pump when all zones are closed.

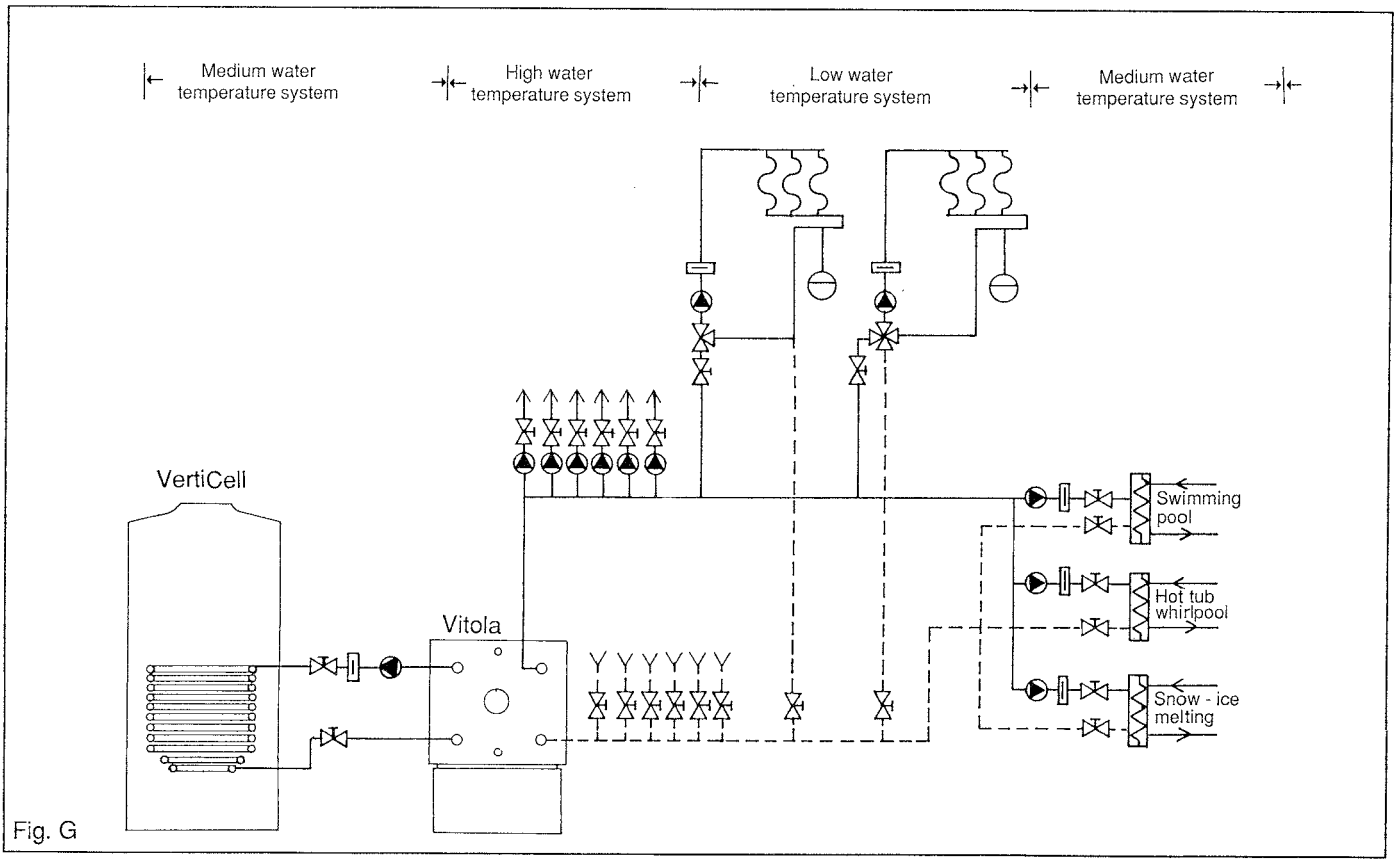


Fig. G

Multi-zone variable temperature system

For multi-zone variable temperature systems, please consult Viessmann sales representative office for control options.

The preceding system schematics, A - G, do not necessarily reflect all system components required to construct the system to make it fully functional. These schematics are to be seen as guidelines only. They further do not display all system varieties or concepts possible.Specific system layouts may be further discussed with the local Viessmann sales representative office.

A minimum of 2" circumferential clearance from non-insulated hot water pipes to combustible construction must be maintained. In cases where the pipes are insulated with pipe insulation of appropriate and sufficient thickness and insulation value, the above clearance may be reduced to 0".

ATTENTION:

Do not at any time store any chemical substances in close vicinity of hot water pipes!

Boiler piping in heating/cooling application

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

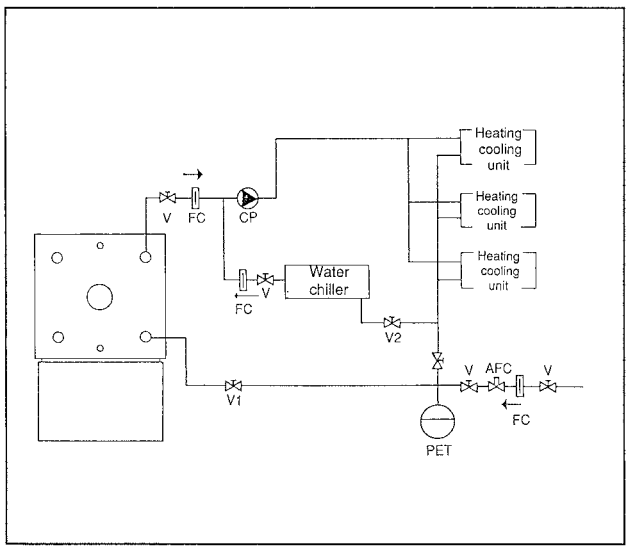
The boiler piping system of a hot water heating boiler connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling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

Check installation instructions of chiller manufacturer carefully for additional requirements.

Cooling season starts: Close valve V1 and open valve V2.

Heating season starts: Close valve V2 and open valve V1.

A metal tag should be attached to these valves as to purpose.



Initial system fill

Treatment for boiler feed water should be considered in areas of known problems, such as high mineral content and hardness. In areas where freezing might occur, an antifreeze may be added to the system water to protect the system. Please adhere to the specifications given by the antifreeze manufacturer.

Warning:

Use an antifreeze make which is non-toxic and, if plastic pipes are used in heating system, consult pipe manufacturer for type of antifreeze. **Do not use automotive Glycol.** Please observe that an antifreeze/water mixture may require a backflow preventer within the automatic water feed, influence components such as diaphragm expansion tanks, radiation etc. A 40% antifreeze content will give freeze-up protection to -25 C (-31°F). Do not use antifreeze other than specifically made for hot water heating systems. Systems also may contain components which might be negatively affected by antifreeze. Check total system frequently when filled with antifreeze. A non-toxic antifreeze is recommended.

Additional attention must be given to the following paragraphs:

1. Once system water is heated, disconnect circulating pump and vent system of any remaining air within piping, radiation and boiler.
2. Check for proper boiler circulation, pump, zone valve, thermostat or operating control function.
3. Check high limit aquastat by adjusting it to a setting below the water temperature in the boiler. The gas burner must be shut off. Turning the dial back to a setting higher than the present boiler water temperature must result in ignition of the main burner.
4. Cycle boiler on/off with the operating control (thermostat or indoor/outdoor control) to verify proper operation.

Annual shut-down

If boiler is used for comfort heating only and not for domestic hot water as well, the boiler/heating system should be shut down during the summertime.

1. Turn down operating control (thermostat).
2. If boiler control E/KR or Trimatik is installed only: Push control switch to "off" ("O") position.
3. Disconnect main power switch.
4. Close main gas shut-off valve and turn gas valve knob on gas valve to "off" position.

ATTENTION:

If system is subject to freezing temperatures and is not filled with antifreeze for protection, the system including the boiler must be drained of water. Valve before automatic feed valve (if installed) must be closed; all other valves, air vents and drain valves must stay open.

Advise the user(s) or ultimate owner

1. of the proper system operation sequence.
2. Explain the equipment as well as the need for combustion air.
3. Demonstrate an emergency shut-down, what to do and what not.

Before leaving jobsite

Fill in and sign warranty card for boiler and hand over to owner for record keeping.

Maintenance

ATTENTION:

Keep boiler clear and free from combustible materials, gasoline and other flammable vapors and liquids.
Do not obstruct the flow of combustion and ventilation air.
All following inspection-, maintenance-, service- and cleaning work must be performed by a qualified service agency.

Inspections during heating season - Periodically:

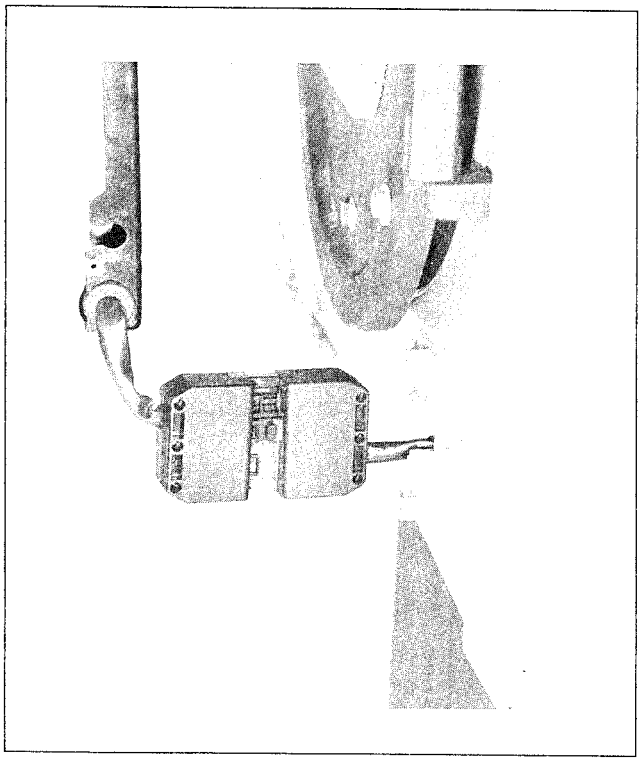
Inspection of low water cut-offs, including flushing of float types (if used).
Inspect flow switch (if used).
Inspect main burner flame and follow burner manufacturer's instruction manual for detailed service and maintenance guidelines. Manual shipped with burner.

Annually:
Boiler servicing - heat exchanger cleaning

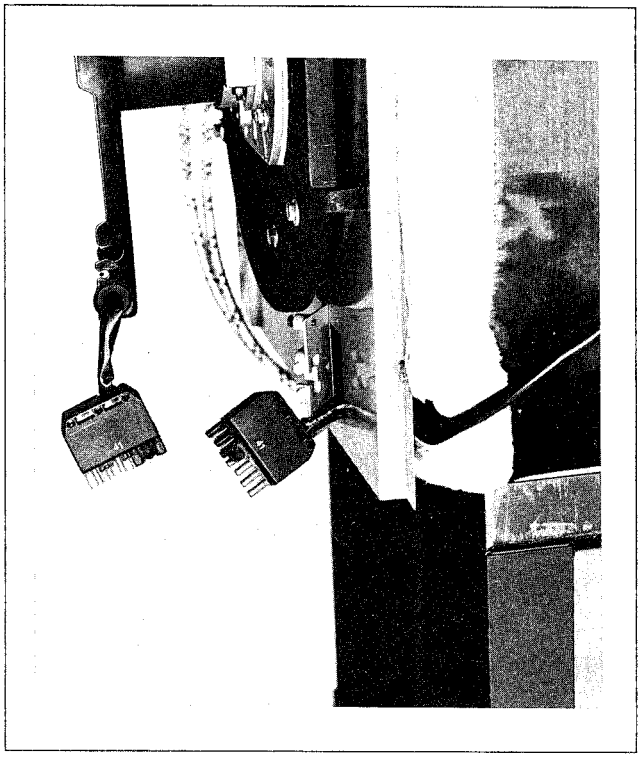
A service/inspection of the boiler, burner and the system is recommended once a year, before the heating season starts.

Cleaning the heat exchanger (flue gas passages)

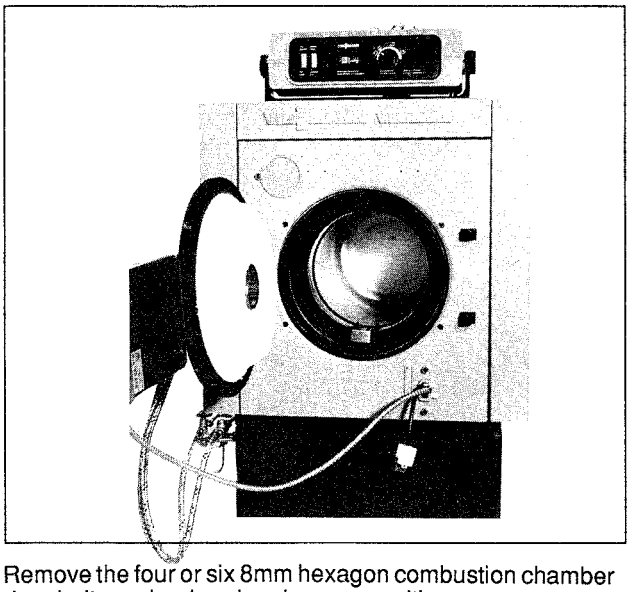
1. Disconnect main power supply to boiler and all heating related components.
2. Close main oil or gas shut-off valve. (On gas burner open gasoline union and remove gas pipe).
3. Allow boiler to cool down if necessary.
4. Ensure that combustion chamber door hinge pin is in place.



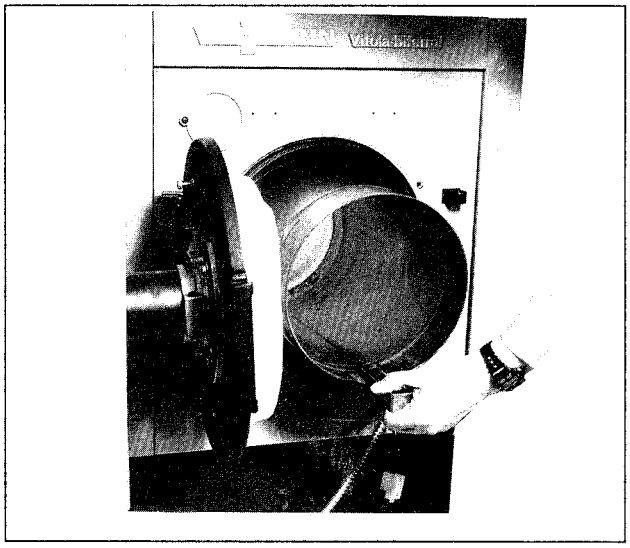
Disconnect 7-pole 41 plug at burner connection.



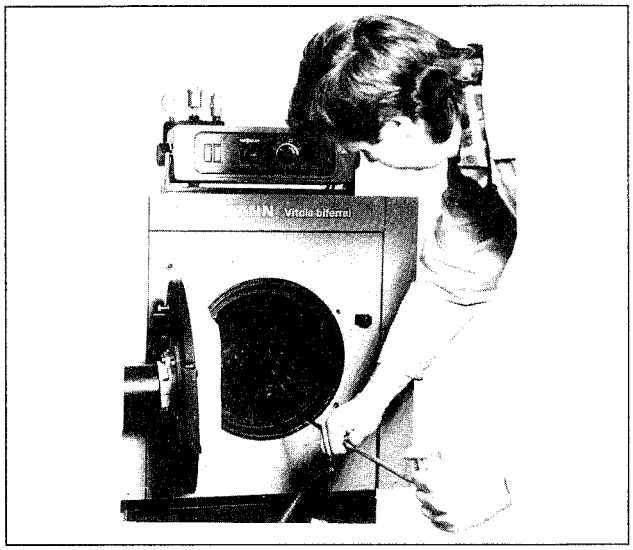
Cable for 41 plug from E/KR 120-V runs behind side panel and through strain relief.



Remove the four or six 8mm hexagon combustion chamber door bolts and swing door in open position.



Pull out stainless steel combustion chamber.



Brush heat exchanger with cleaning brush supplied and, if necessary, use vacuum cleaner to remove loose deposits. Re-assemble unit in reverse sequence.

Additional check points of annual service inspection

Check flue pipe condition, chimney connection and chimney itself.

Check pressure relief valve, system pressure and verify proper operation of automatic feed if installed.

Check heating pipe joints, valves, air vents, etc. System leaks must be corrected immediately to avoid further defects. The cause of defect must also be determined in order to avoid further problems.

Check for proper combustion air supply and ventilation for the boiler.

Check for combustible materials or chemicals stored too close to the boiler. Operate high limits by dialing lower settings, switching burner on/off to verify functioning of same. If low water cut-off is installed, check and verify proper function according to manufacturer's instructions.

When circulating pump is field-installed or existing, check requirements for maintenance or lubrication according to manufacturer's specifications.

Check for oil tight fuel lines; clean or exchange fuel oil filters annually. Check and inspect oil tank.

Check for gas-tight connection of gas piping, unions, gas valve and manifold.

Check proper ignition and oil or gas burner operation.

Combustion test must be performed by a competent service technician.

Do not use gasoline crankcase drainings or any oil containing gasoline.

Do not attempt to start the burner when excess oil has accumulated, when the unit is full of vapour, or when the combustion chamber is very hot.

Always keep the manual fuel supply valve shut off if the burner is shut down for an extended period of time.

Do not start the burner unless all cleanout doors are secured in place.

Do not tamper with the unit or controls.

Never burn garbage or paper in the unit and never leave combustible material around it.

Removal of existing boiler

(Applies to gas fired boilers)

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

At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the venting systems 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, or any other deficiency 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 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 a candle, or smoke from a cigarette, cigar or pipe.

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

(g) Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1. When resizing, any portion of 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.

Chimney

With this boiler installation, a corrosion resistant approved liner must be installed in masonry or unlined chimneys must be insulated to prevent condensation of flue gases in cold weather.

Proper consideration must be given to shortest possible vent connection, type of vent, chimney size.

Before connecting boiler to existing chimney, inspect chimney for inside and outside conditions.

Side wall vent system

A side wall power vent system can be ordered from the manufacturer. This package includes the appropriate power venter, vent terminal and adapter fittings for each Vitola-biferral boiler model, as well as installation instructions.

The vent system must terminate so that proper clearances are maintained as cited in the National Fuel Gas Code, ANSI Z223.1, Section 7,14 as detailed in the Side Wall Vent System Installation Instructions. Observe and follow these instructions carefully.

Note:

Boiler must be installed in such a way that gas ignition system components are protected from water (dripping, spraying, rain, etc.) during boiler operation and service (circulator replacement, control replacement etc.).

The boiler and its gas connection must be leak tested before placing the boiler in operation.

For boilers for connection to gas vents or chimneys, vent installations shall be in accordance with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1, or applicable provisions of the local building codes.

Vent connectors serving appliances vented by natural draft shall not be connected into any portion of mechanical draft systems operating under positive pressure.

The horizontal portions of the venting system shall be supported to prevent sagging. Support must be achieved every 3 ft. of horizontal run using metal plumber's strapping. The horizontal run shall slope not less than $^1/_4$" per ft. from the boiler to the end of the horizontal run.

Safe lighting and other performance criteria were met with the gas manifold and control assembly provided on the boiler when the boiler underwent tests specified in ANSI Z21.13 boiler standard.

BEA-18 PARTS LIST

PART	DESCRIPTION	QUANTITY
7303-624	Combustion Chamber Door	1
7230-798	Safety Header	1
9302-054	Pr. Rel. Valve, FF 3/4" - 30 lb. #335/30 psi	1
9302-118	Nipple, 1" x 4" Blk	1
9302-128	Hex Bushing, 3/8" x 1/4" BMI	1
9302-130	Elbow, 90°, 1" BMI	1
9503-363	Automatic Air Vent 108 83 03	1
9302-136	Sediment Faucet, 3/4" NPT	1
9302-022	Pressure Gauge, 0-100 psi	1
7087-305	Stand for BEA-18, -22, & -29	1
7307-058	Boiler Shell, BEA-18/ASME	1
7232-056	Insulation Carton, BEA-18/ASME	1
	Burner:	1
G120N-BEA-18	Select one: Nat. Gas - G120-NBEA-18	
G120P-BEA-18	LP Gas - G120-PBEA-18	
F3000-BEA-18	Oil - F3-BEA-18	
7302-034	Boiler Control E/KR-120-V	1
9589-467	Adjustable Hi-Limit Aquastat	1
9503-503	Manual Reset (248°F) Aquastat	1
9506-884	Thermometer	1

BEA-22 PARTS LIST

PART	DESCRIPTION	QUANTITY
7303-625	Combustion Chamber Door	1
7230-798	Safety Header	1
9302-054	Pr. Rel. Valve, FF 3/4" - 30 lb. #335/30 psi	1
9302-118	Nipple, 1" x 4" Blk	1
9302-128	Hex Bushing, 3/8" x 1/4" BMI	1
9302-130	Elbow, 90°, 1" BMI	1
9503-363	Automatic Air Vent 108 83 03	1
9302-136	Sediment Faucet, 3/4" NPT	1
9302-022	Pressure Gauge, 0-100 psi	1
7087-305	Stand for BEA-18, -22, & -29	1
7307-059	Boiler Shell, BEA-22/ASME	1
7232-057	Insulation Carton, BEA-22/ASME	1
	Burner:	1
G120N-BEA-22	Select one: Nat. Gas - G120-NBEA-22	
G120P-BEA-22	LP Gas - G120-PBEA-22	
F3000-BEA-22	Oil - F3-BEA-22	
7302-034	Boiler Control E/KR-120-V	1
9589-467	Adjustable Hi-Limit Aquastat	1
9503-503	Manual Reset (248°F) Aquastat	1
9506-884	Thermometer	1

BEA-29 PARTS LIST

PART	DESCRIPTION	QUANTITY
7303-626	Combustion Chamber Door	1
7230-798	Safety Header	1
9302-054	Pr. Rel. Valve, FF 3/4" - 30 lb. #335/30 psi	1
9302-118	Nipple, 1" x 4" Blk	1
9302-128	Hex Bushing, 3/8" x 1/4" BMI	1
9302-130	Elbow, 90°, 1" BMI	1
9503-363	Automatic Air Vent 108 83 03	1
9302-136	Sediment Faucet, 3/4" NPT	1
9302-022	Pressure Gauge, 0-100 psi	1
7087-305	Stand for BEA-18, -22, & -29	1
7307-060	Boiler Shell, BEA-29/ASME	1
7232-058	Insulation Carton, BEA-29/ASME	1
	Burner:	1
G200N-BEA-29	Select one: Nat. Gas - G200-NBEA-29	
G200P-BEA-29	LP Gas - G200-PBEA-29	
F5000-BEA-29	Oil - F5-BEA-29	
7302-034	Boiler Control E/KR-120-V	1
9589-467	Adjustable Hi-Limit Aquastat	1
9503-503	Manual Reset (248°F) Aquastat	1
9506-884	Thermometer	1

BEA-35 PARTS LIST

PART	DESCRIPTION	QUANTITY
7303-627	Combustion Chamber Door	1
7230-798	Safety Header	1
9302-054	Pr. Rel. Valve, FF 3/4" - 30 lb. #335/30 psi	1
9302-118	Nipple, 1" x 4" Blk	1
9302-128	Hex Bushing, 3/8" x 1/4" BMI	1
9302-130	Elbow, 90°, 1" BMI	1
9503-363	Automatic Air Vent 108 83 03	1
9302-136	Sediment Faucet, 3/4" NPT	1
9302-022	Pressure Gauge, 0-100 psi	1
7087-306	Stand for BEA-35, -46, & -58	1
7307-061	Boiler Shell, BEA-35/ASME	1
7232-059	Insulation Carton, BEA-35/ASME	1
	Burner:	1
G200N-BEA-35	Select one: Nat. Gas - G200-NBEA-35	
G200P-BEA-35	LP Gas - G200-PBEA-35	
F5000-BEA-35	Oil - F5-BEA-35	
7302-034	Boiler Control E/KR-120-V	1
9589-467	Adjustable Hi-Limit Aquastat	1
9503-503	Manual Reset (248°F) Aquastat	1
9506-884	Thermometer	1

BEA-46 PARTS LIST

PART	DESCRIPTION	QUANTITY
7303-628	Combustion Chamber Door	1
7230-798	Safety Header	1
9302-054	Pr. Rel. Valve, FF 3/4" - 30 lb. #335/30 psi	1
9302-118	Nipple, 1" x 4" Blk	1
9302-128	Hex Bushing, 3/8" x 1/4" BMI	1
9302-130	Elbow, 90°, 1" BMI	1
9503-363	Automatic Air Vent 108 83 03	1
9302-136	Sediment Faucet, 3/4" NPT	1
9302-022	Pressure Gauge, 0-100 psi	1
7087-306	Stand for BEA-35, -46, & -58	1
7307-062	Boiler Shell, BEA-46/ASME	1
7232-060	Insulation Carton, BEA-46/ASME	1
	Burner:	1
G400N-BEA-46	Select one: Nat. Gas - G400-NBEA-46	
G400P-BEA-46	LP Gas - G400-PBEA-46	
F5000-BEA-46	Oil - F5-BEA-46	
7302-034	Boiler Control E/KR-120-V	1
9589-467	Adjustable Hi-Limit Aquastat	1
9503-503	Manual Reset (248°F) Aquastat	1
9506-884	Thermometer	1

BEA-58 PARTS LIST

PART	DESCRIPTION	QUANTITY
7212-936	Combustion Chamber Door	1
7230-798	Safety Header	1
9302-054	Pr. Rel. Valve, FF 3/4" - 30 lb. #335/30 psi	1
9302-118	Nipple, 1" x 4" Blk	1
9302-128	Hex Bushing, 3/8" x 1/4" BMI	1
9302-130	Elbow, 90°, 1" BMI	1
9503-363	Automatic Air Vent 108 83 03	1
9302-136	Sediment Faucet, 3/4" NPT	1
9302-022	Pressure Gauge, 0-100 psi	1
7087-306	Stand for BEA-35, -46, & -58	1
7309-557	Boiler Shell, BEA-58/ASME	1
7232-957	Insulation Carton, BEA-58/ASME	1
	Burner:	1
G400N-BEA-58	Select one: Nat. Gas - G400-NBEA-58	
G400P-BEA-58	LP Gas - G400-PBEA-58	
F10-BEA-58	Oil - F10-BEA-58	
7302-034	Boiler Control E/KR-120-V	1
9589-467	Adjustable Hi-Limit Aquastat	1
9503-503	Manual Reset (248°F) Aquastat	1
9506-884	Thermometer	1

Contact your local Viessmann Dealer for parts.

NOTES

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