TECHNICAL INSTRUCTIONS

FCX

MPI

TABLE OF CONTENTS

I - INTRODUCTION

1 - PRODUCT DESCRIPTION

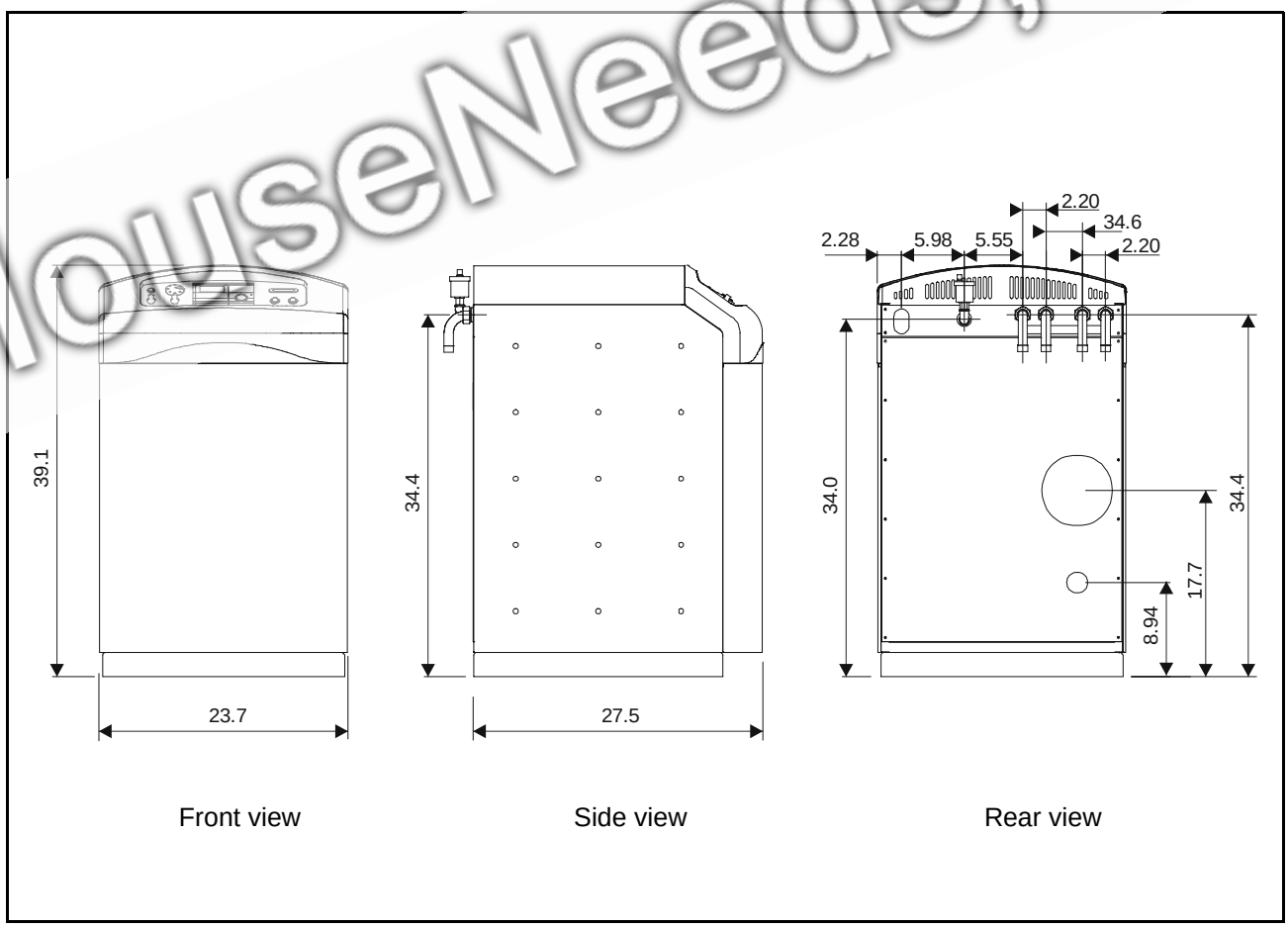
Model FCX oil fired boiler utilizes a sealed combustion system that operates at a temperature at which the flue products will condense. The flue products temperature is so low that the unit is suitable for use with PVC / Polypropylene flue pipes, which are offered as standard options for installation. Model FCX is approved for installation with zero clearance to combustible materials by Intertek Testing Services to the UL Standard for Oil Fired Storage Tank Water Heaters (UL 732).

Model FCX is completely assembled and provides standard parts as follows:

- An enameled steel cabinet with thick insulation
- A completely unitized, thick shelled boiler with combustion chamber and a heat exchanger with a system of removable baffles
- A stainless steel condenser, with condensate drain
- A high efficiency, low emission, gun type oil burner with combustion air fan, integral oil pump, oil heater and primary control
- A control panel assembly and all electrical controls for operation of the boiler, including a water temperature thermometer in circuit 1
- A manual water-mixing valve that can be motorized if desired
- A safety pressure relief valve
- An expansion tank
- A water circulating pump
- Complete internal water piping terminating in connections for two independent water-heating circuits.
- Complete internal air piping terminating in a connection to a coaxial flue/combustion air intake system.

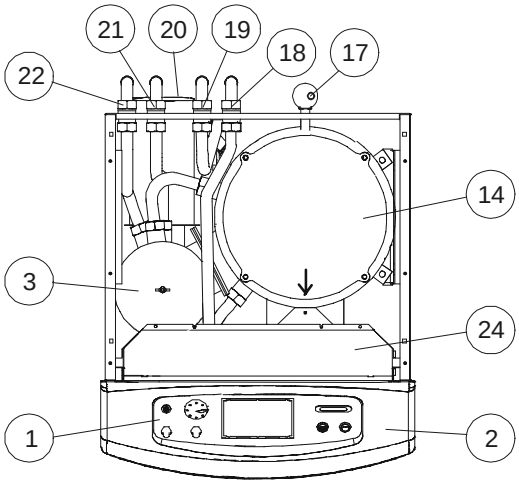
Standard options include:

- Coaxial balanced flue system components for connection to the boiler to provide venting of the flue products and combustion air intake.

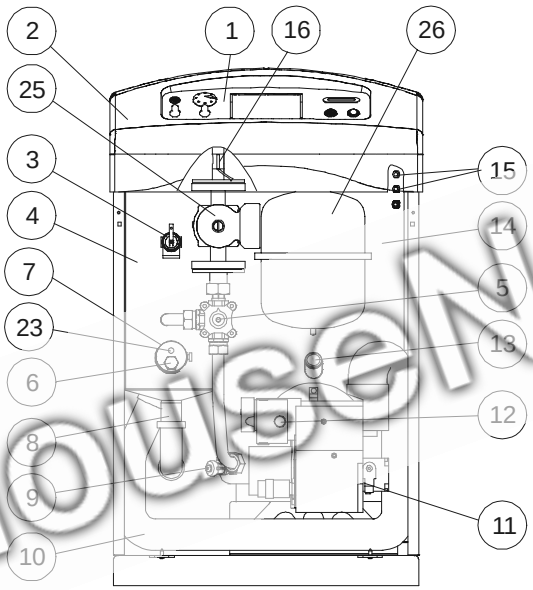


Front view Side view Rear view

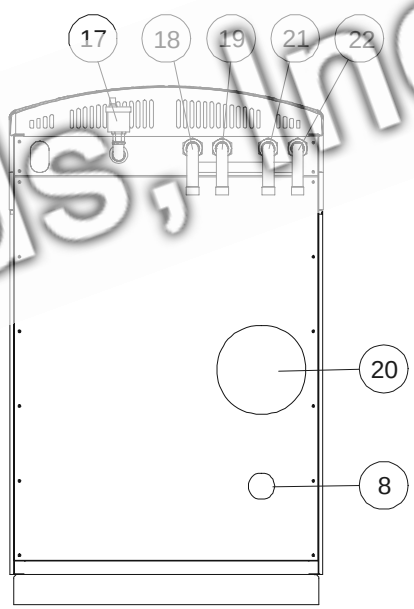
DESIGNATION OF COMPONENTS



View from above



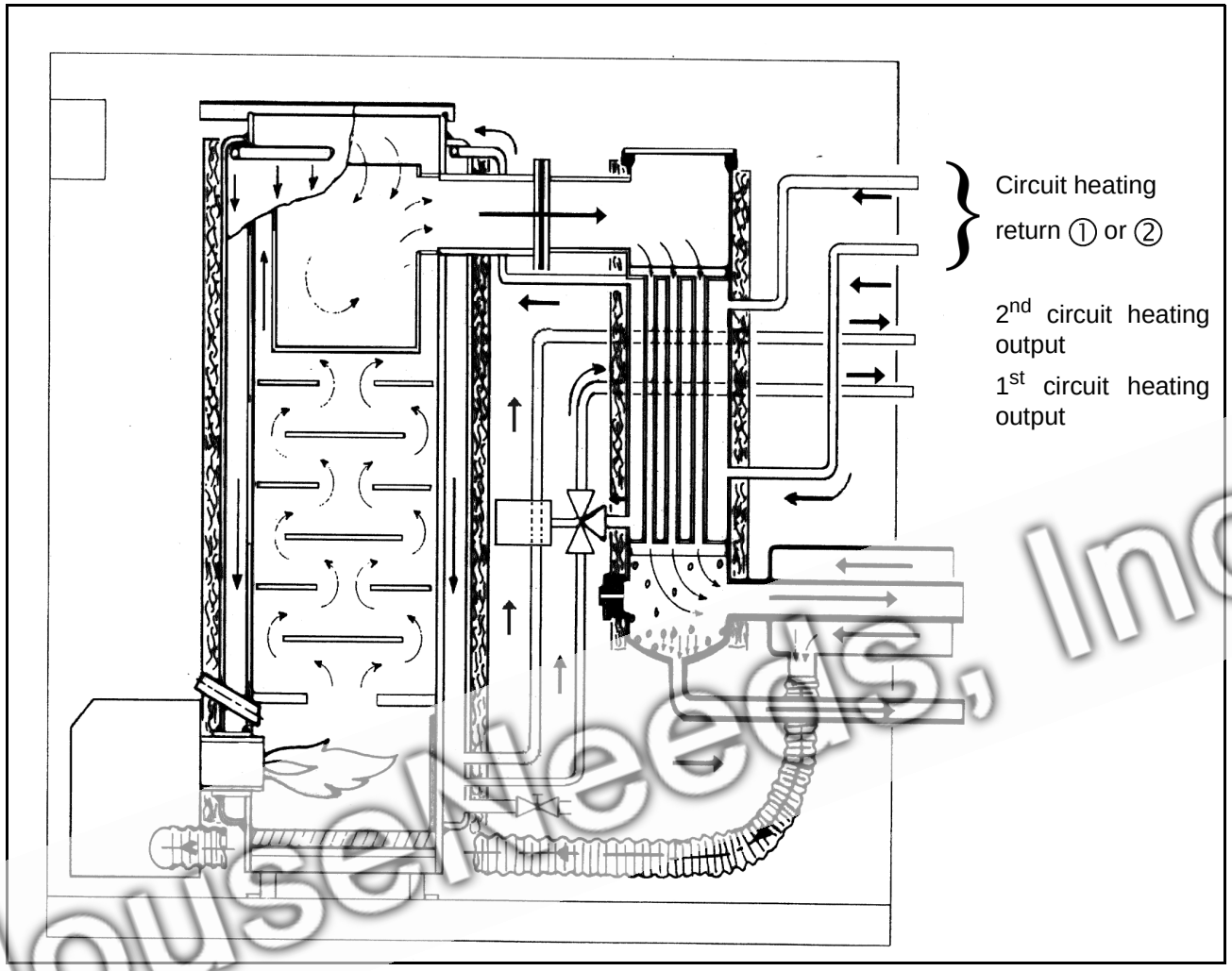
Front view



Rear view

1) *Control Panel*
2) *Control Panel Cover*
3) *Safety Pressure Relief Valve*
4) *Condenser*
5) *Manual Mixing Valve*
6) *Combustion Product Pressure Test Point*
7) *Condenser Inspection Port*
8) *Condensate Drain*
9) *Drain Cock*
10) *Burner Air Inlet Pipe*
11) *Oil Burner*
12) *Safety Light and Reset Button*
13) *Sight Glass*
14) *Boiler Shell*
15) *Pockets for Water Overheating Safety and Thermostat Bulbs Thermostat*
16) *Heating Output Sensor*
17) *Bleed*
18) *First Circuit Heating Output*
19) *Second Circuit heating output*
20) *Combustion Products Flue*
21) *First Circuit Heating Return*
22) *Second Circuit Heating Return*
23) *Well for Combustion Product Overheating Thermostat Bulb*
24) *Protection Plate for Electrical Connections Box*
25) *Circulating pump*
26) *Expansion vessel*

2 - BOILER OPERATION



Combustion air is drawn into the oil burner by the burner fan through the air intake hose connected to the coaxial flue/combustion air intake separator tube assembly. Heated air from combustion of the oil burner cools as it passes through the boiler heat exchanger, then the condenser. Cooled flue products exit the unit through the center of the flue/ combustion air separator tube assembly. Condensate from the flue products is drained from the bottom of the condenser into the condensate drain tube, exiting the unit through the condensate drain system..

Water is circulated through the boiler heat exchanger and condenser circuits where it is heated by the combustion of the oil burner. Two independent water-heating circuits can be connected to the unit:

- The first circuit passes through a three way mixing valve incorporated into the boiler. This valve can either be used manually as supplied or driven by a regulator (option).
- The second circuit can supply another heating circuit and/or a domestic hot water production system.

3 - PRODUCT STANDARD RATINGS

Ratings for Model FCX are provided in the following table:

Performance Parameter	Units	Product Rating
Rated Output	BTUH	76,000
Rated Input	BTUH	81,250
Combustion Chamber Length	Inches	8.98
Combustion Chamber Diameter	Inches	11.5
Combustion Chamber Volume	Cu. Inches	915
Combustion Prod. Circuit Volume	Cu. Inches	3051
Flue Pressure Drop	Inches H2O	0.10
Maximum Heating Service Pressure	Psig	43.5
Max Heating circuit water temperature	Deg. F	176
Water Overheating Safety Thermostat Setting	Deg. F	230
Combustion Prod. Overheating Safety Thermostat Setting	Deg. F	248
Heating Circuit Water Capacity	Gallons	4.23
Primary Water Flow Rate (60/80 deg. C)	Gal/hr	254
Water Pressure Drop (at nominal flow rate)	MCE	1.4
Power Absorbed (with burner, without circulator)	KW	0.22
Packaged Weight	Lb.	267

Ratings are for the boiler when connected to standard option coaxial flue system components.

Electrical Power Supply	115 volts, single phase, 60 Hz
Full Load Current	3.0 Amps FLA
Max Fuse/ Circuit Breaker Size	15 Amps

4 - DIAMETER OF PIPE CONNECTIONS

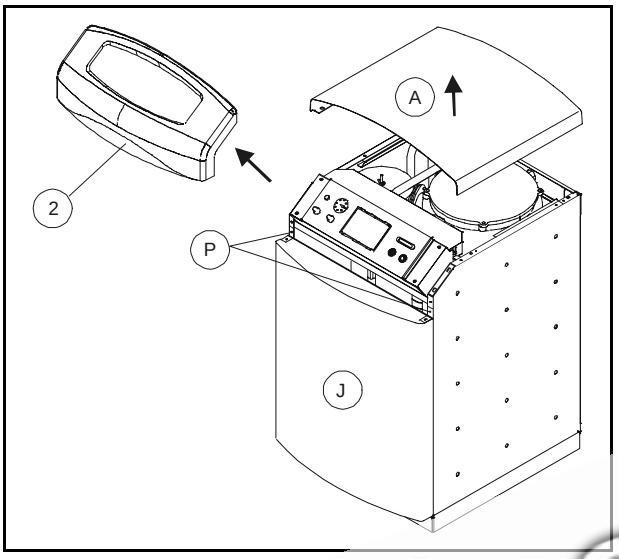
Connection	Diameter	Units
Combustion Products	3.15 / 4.92	Inch
Water Heating Supply/Return	1	Inch
Domestic Hot Water or Second Heating Circuit	1	Inch
Condensate Drain	1 -1/2	Inch
Heating Water Drain	½	Inch
Air Bleed	3/8	Inch
Safety pressure relief valve	3/4	inch

II - INSTALLATION

1 - OPENING THE UNIT

To open Model FCX to access for installation, and/ or service, follow these steps :

- Remove the control panel escutcheon molding (2) by grasping it on both sides and pulling it outward towards you and up. The escutcheon will come free of the attachment clips leaving the control panel exposed.
- Remove the top cover of the unit (A) by lifting the cover at the front and rear to free the attachment clips, and then simply lift the cover straight up and off.
- Remove the front panel attachment screws (P), then pull the front panel (J) outward towards you at the top to free it from the attachment clips. Lift the panel up to free it from the lower attachment pins, and simply lift the panel off.



2 - LOCATION OF THE UNIT

Model FCX is a free standing (floor mounted) appliance suitable for installation on combustible flooring. It is approved for installation with zero clearance to combustible walls, ceiling, doors, etc from the cabinet. Standard option coaxial flue components are suitable for installation with zero clearance to combustible materials.

These are operating clearances and it is recommended that additional clearances be considered:

- Sufficient clearance should be provided in back of the unit to facilitate installation and maintenance of water, electrical, flue and condensate drain connections and components.
- Sufficient clearance over the top of the unit should be provided to allow the top to be removed for service.
- Sufficient clearance from the front of the unit should also be provided to facilitate adjustments and service.

There is no need for additional clearance to either side of the unit since there is no access to the unit from either side.

Alternative access measures such as doors, removable wall panels, etc. may be provided if desired.

Choosing the location should also take into account the total flue length to the outdoors (See Flue Connection and Routing). In addition, the choice of location should consider the location of utilities such as electrical supply and sewer access for condensate drainage. Location and routing of water lines is, of course, a significant part of the choice.

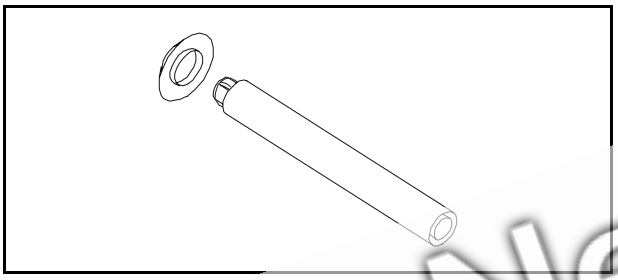
While Model FCX can be installed in an enclosure such as a closet, ventilation or other means must be provided so that the enclosure temperature does not exceed 113 deg. F (45 deg. C).

3 - FLUE CONNECTIONS AND ROUTING

Connection of the coaxial flue/combustion air piping system is in the back of the unit to the separator tube assembly. The combustion products are vented from the boiler and condenser through the center of the coaxial tube, while the combustion air is supplied through the outside ring of the coaxial tube. Since Model FCX is a condensing boiler, flue products exiting the unit are relatively low temperature, from 140 - 185 deg. F (60 - 85 deg C), and saturated with humidity. Consequently, an airtight, corrosion resistant flue system must be provided.

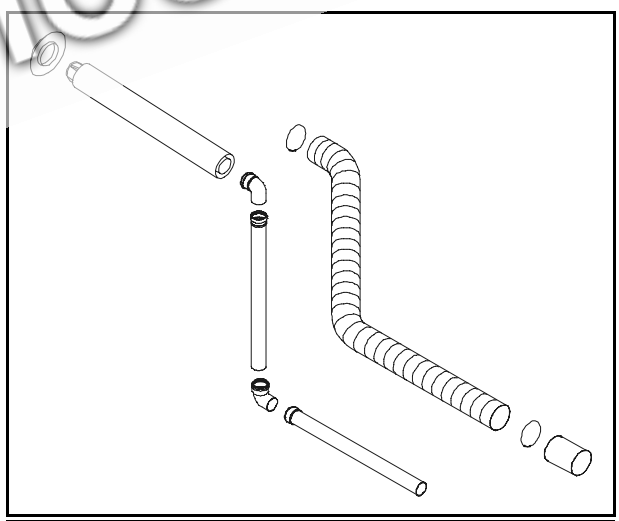
Various standard option flue piping components and packages with which to create the flue system are available.

0.98 m Straight Horizontal Flue Kit



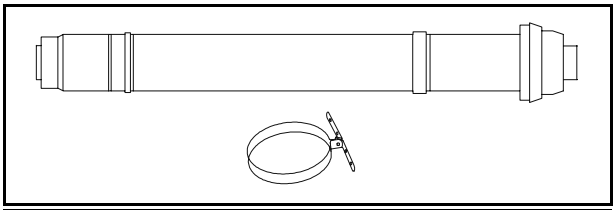
Reference	Length
N40.28399	38.6 inches (980 mm)

3 m Angled Horizontal Flue Kit



Reference	V72.28414

Polypropylene/PVC Concentric Vertical Terminal - For Flat or Sloping Roof

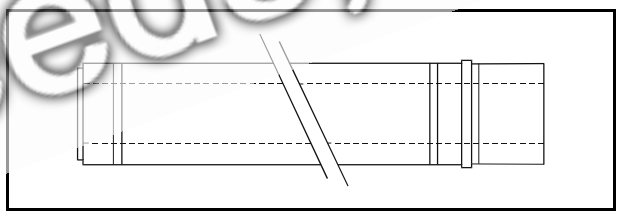


Reference	Color	Length	I.D.	O.D.
N40.28393	Tile	42.5 inches (1080mm)	3.15 inch (80mm)	4.92 inch (125mm)
N40.28394	Black	42.5 inches (1080mm)	3.15 inch (80mm)	4.92 inch (125mm)

Useful length under sleeve tile - 16.9 inches (0.43 m)

Polypropylene/PVC Concentric Horizontal Extension

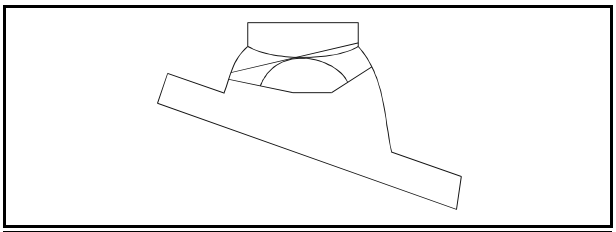
- joint fitting -



Reference	Length	I.D.	O.D.
N40.28397	19.7 inches (500 mm)	3.15 inch (80mm)	4.92 inch (125mm)
N40.28398	39.4 inches (1000 mm)	3.15 inch (80mm)	4.92 inch (125mm)

Useful length after assy. - 17.7 inches (0.45 m) or 37.4 inches (0.95 m)

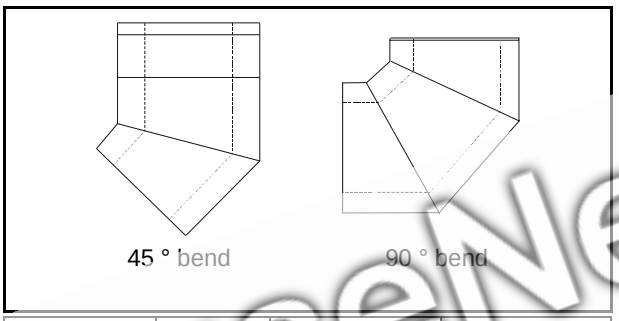
Sleeve Tile with Adaptable Coupling



Reference	Slope	Covering type	Color
N40.12165	25 - 45 deg	Tile	Tile
N40.12166	35 - 55 deg	Tile	Tile
N40.12167	35 - 55 deg	Slate - Shingle	Black

Polypropylene/PVC Concentric Elbow

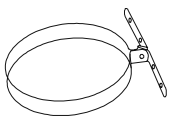
- joint fitting -



Reference	Color	I.D.	O.D.
N40.28395	45 deg	3.15 inch (80mm)	4.92 inch (125mm)
N40.28396	90 deg	3.15 inch (80mm)	4.92 inch (125mm)

Fastening collar (option)

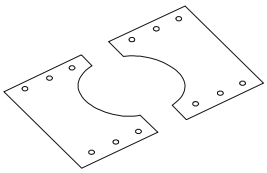
Fig. 1



Reference	Number	∅ mm
B00.29727	3	125

Collars are essential to bear the weight of the vertical extensions so that the boiler does not bear the weight.

Polypropylene Roof Plate

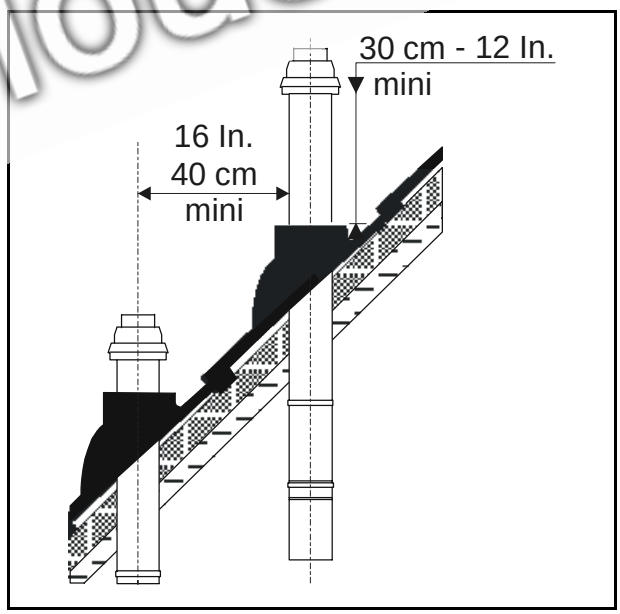


Reference	Color
A90.12172	Black

Typical installation examples :

The flue/combustion air system piping may be either horizontal or vertical or a combination of both, observing the following:

- The maximum unrestricted horizontal or vertical flue length shall not be more than 16.4 ft (5 m).
- For each 90-degree elbow used in the flue system, subtract 3.3 ft (1m) from the total allowable length.
- For each 45-degree elbow used in the flue system, subtract 1.65 ft (0.5m) from the total allowable length.
- Horizontal runs of the flue system must pitch down 3/4 inch per yard (2 cm per m) of length towards the boiler to facilitate proper flue products condensate drainage.
- Termination of a horizontal flue system shall not be less than 5.96 ft(1.8m) above ground unless other provisions are made to minimize the likelihood of flue/combustion air intake blockage.
- Do not place the flue terminal less than 3.3 ft. (1 m) from a ventilation hole or opening in a building.
- Termination of a vertical flue must provide at least 12 inches (30cm) above the roof jack to the combustion air intake collar.
- If there are two units in the installation with vertical flue systems, the termination of the systems must be separated by 16 inches (40cm).

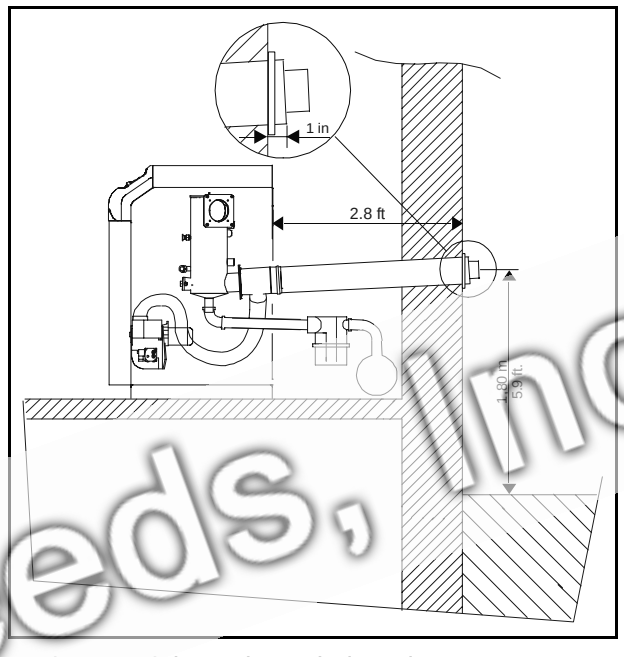


All flue-piping components must be assembled to provide an airtight flue/ combustion air system.

Application of liquid soap over the flue pipes to be joined will aid in assembly of the parts.

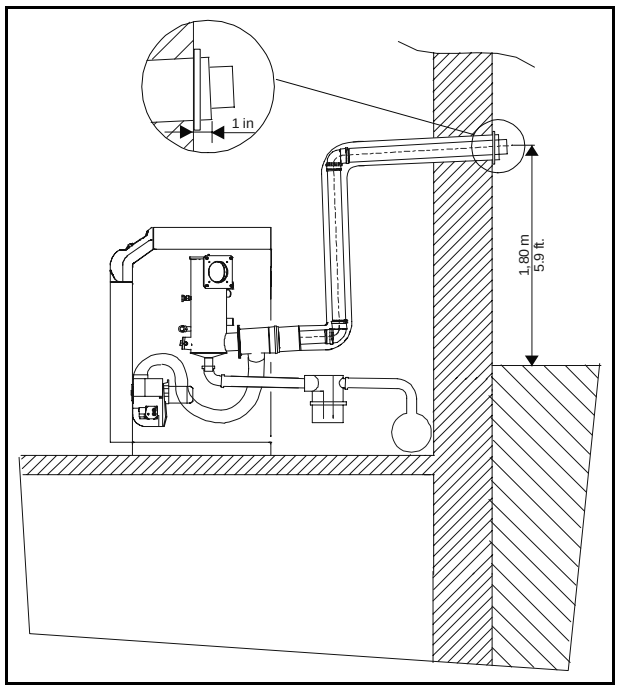
Typical installation examples appear in the illustration that follow.

Straight Balanced Flue Configuration



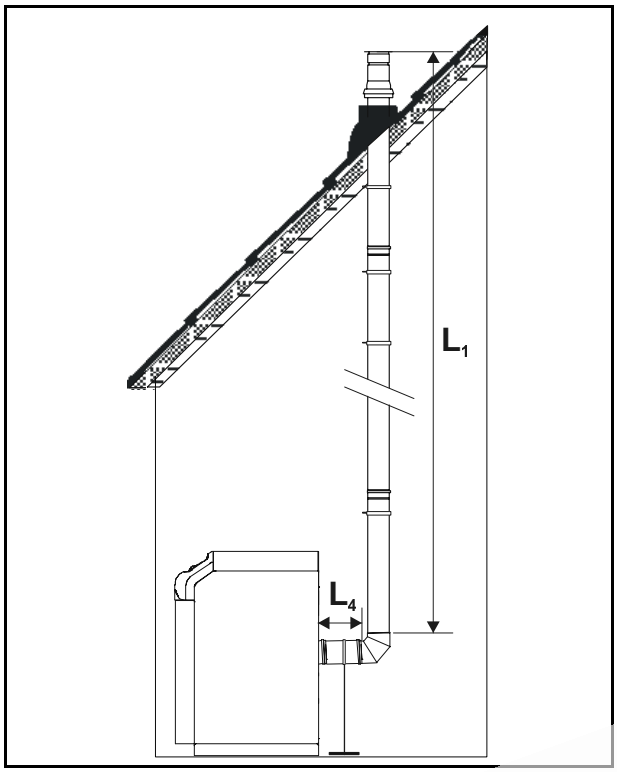
Option: Straight Horizontal Flue Kit

Angled Balanced Flue Configuration



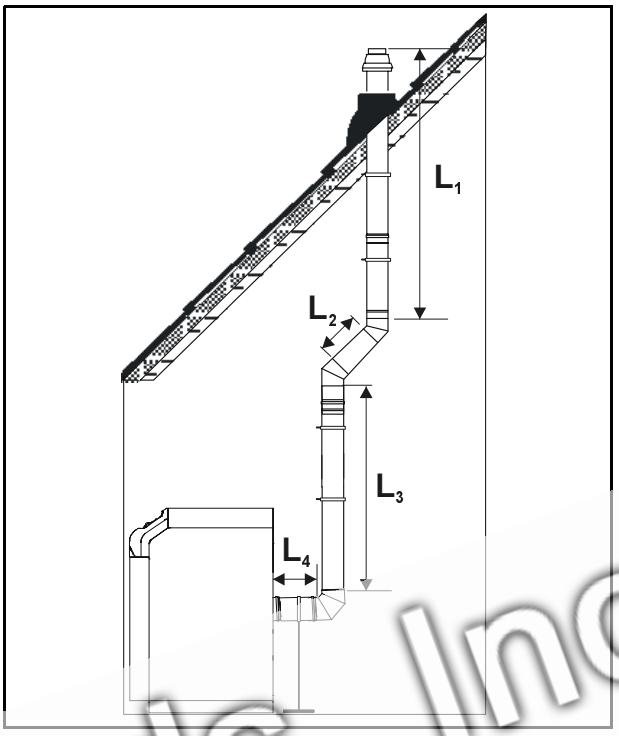
Option: Angled Horizontal Flue Kit

Typical installation examples (cont.)



Options:
- 1 90 deg concentric elbow
- Concentric extensions
- 1 concentric vertical terminal
- 1 sleeve tile roof flange
- 1 roof plate

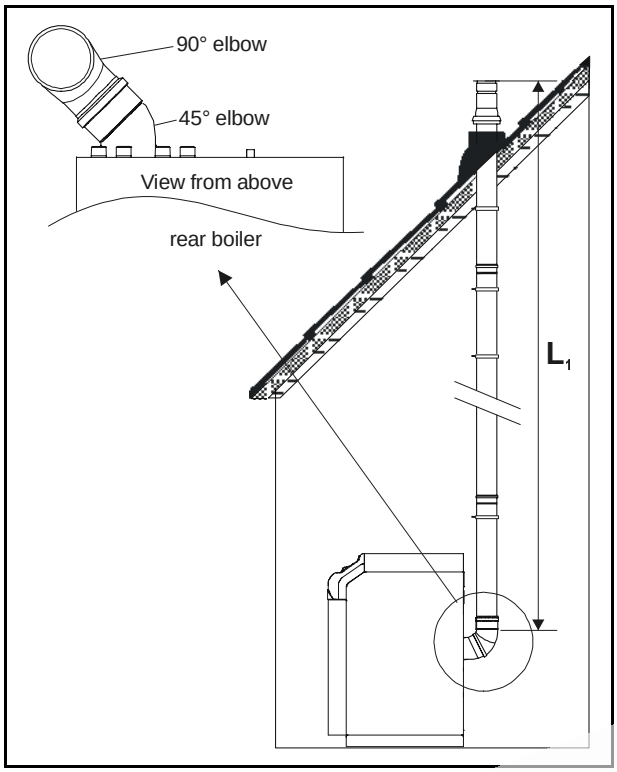
max L = L1 + 3.28 ft (1m) ≤ 16.4 ft (5m)



Options:
- 1 90 deg concentric elbow
- 3 Concentric extensions
- 2 45 deg concentric elbows
- 1 concentric vertical terminal
- 1 sleeve tile roof flange
- 1 roof plate

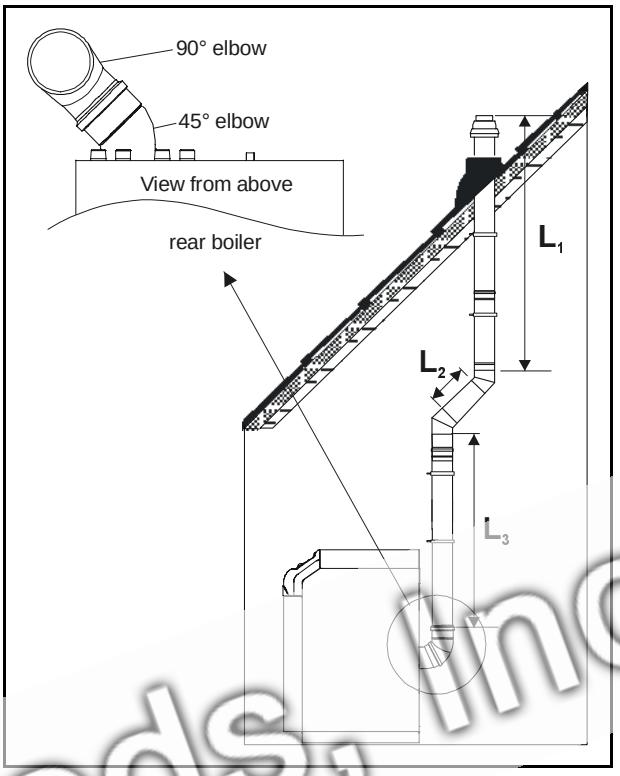
max L = L1 + 1.64 ft (0.5m) + L2 + 1.64 ft (0.5m) + L3 + 3.28 ft (1m) ≤ 16.4 ft (5m)

Typical installation examples (cont.)



Options:
- 1 45 deg concentric elbow
- 1 90 deg concentric elbow
- Concentric extensions
- 1 concentric vertical terminal
- 1 sleeve tile roof flange
- 1 roof plate

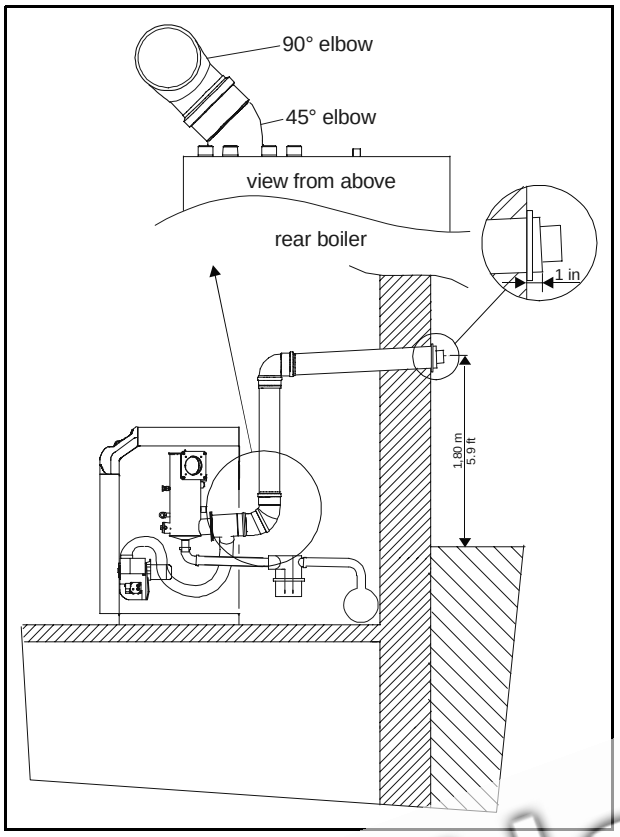
max L = L1 + 1.64 ft (0.5 m) + 3.28 ft (1m) ≤ 16.4 ft (5m)



Options:
- 1 90 deg concentric elbow
- 3 Concentric extensions
- 3 45 deg concentric elbows
- 1 concentric vertical terminal
- 1 sleeve tile roof flange
- 1 roof plate

max L = L1 + 1.64 ft (0.5m) + L2 + 1.64 ft (0.5m) + L3 + 3.28 ft (1m) + 1.64 ft (0.5 m) ≤ 16.4 ft (5m)

Typical installation examples (cont.)



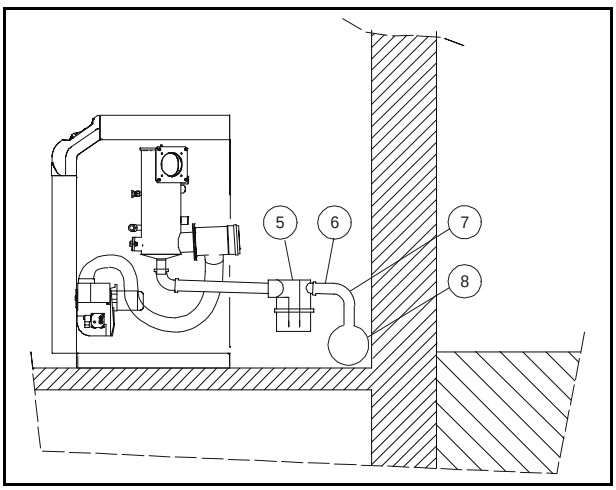
Options:

- 1 45 deg concentric elbow
- 2 90 deg concentric elbow
- 1 concentric extension
- 1 straight horizontal flue kit

4 - CONDENSATE DRAIN CONNECTION

Connection of the condensate drain piping system is to the back of the unit beneath the flue/combustion air separator tube assembly. The condensate drain tube provided in the unit is 1 - 19/32 inches (40 mm) O.D. to which the drain trap assembly supplied with the unit may be connected. The condensate drain outlet connection on the trap is 1 - 19/32 inches (40mm) O.D. to which standard 1 -1/2 inch trade size schedule 40 PVC pipe can be connected to create the rest of the drain system. The drain system must pitch downward towards the sewer.

Note: The condensate will not likely require any specific water treatment because of condensate dilution by normal wastewater use. If, however, local regulations require wastewater to have a neutral pH, a condensate treatment tank can be installed between the trap and the sewer.



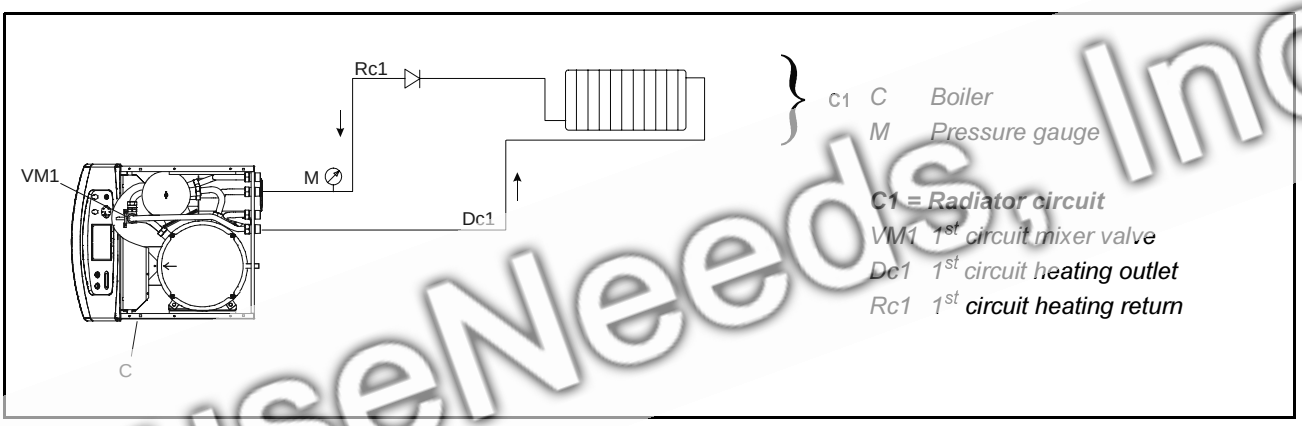
5 - WATER CIRCUIT CONNECTIONS

Water circuit connections are made in the back of the unit utilizing the four 1" male pipe thread couplings provided. Model FCX can be connected to various comfort heating water systems as well as to a domestic hot water heating system if desired, observing that:

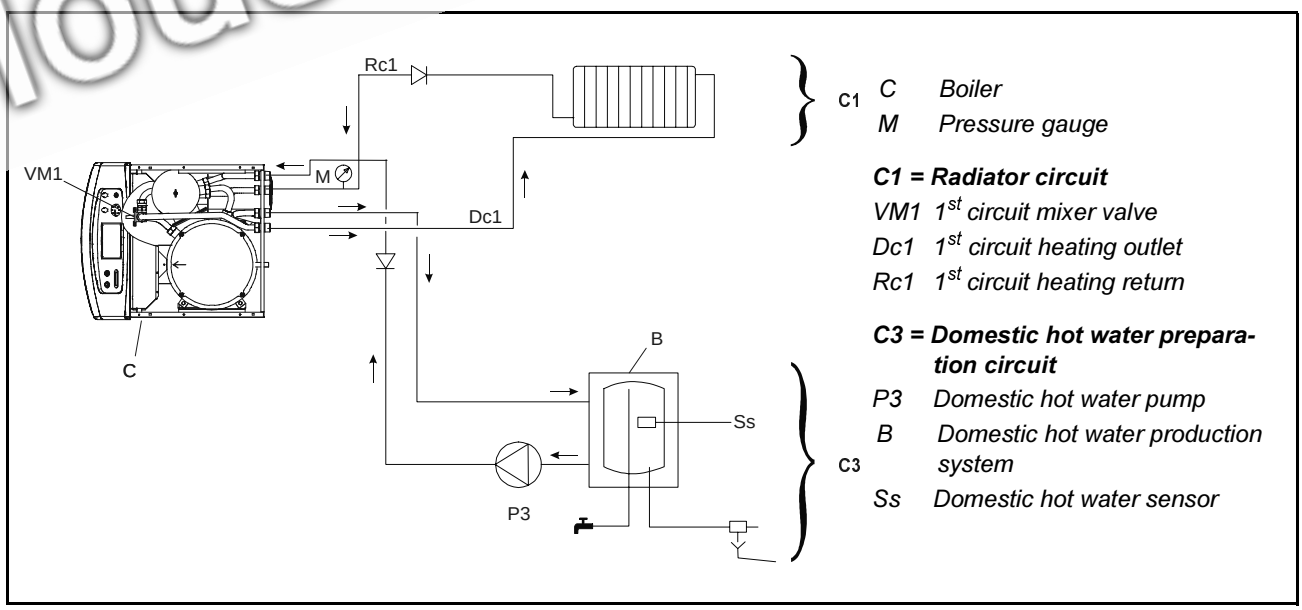
- Water circulating pumps provided in the various circuits must be large enough for each circuit including the pressure drop of the boiler/ condenser in the unit. For optimum sound level and power consumption, set the circulator to the speed that is appropriate for the installation flow rate and pressure drop.
- Isolation valves may be used in the various circuits to facilitate boiler maintenance without having to completely drain each circuit. NEVER place an isolation valve between a pressure relief device and a water tank.
- An expansion tank must be provided in the system to support an expansion of 6 % of the total water capacity of all the circuits employed.
- Safety pressure relief valve must be connected to the drain.
- The water pressure gauge (not supplied) has to be fitted outside the unit.

Various typical water circuits are illustrated below :

Connection to a single heating circuit

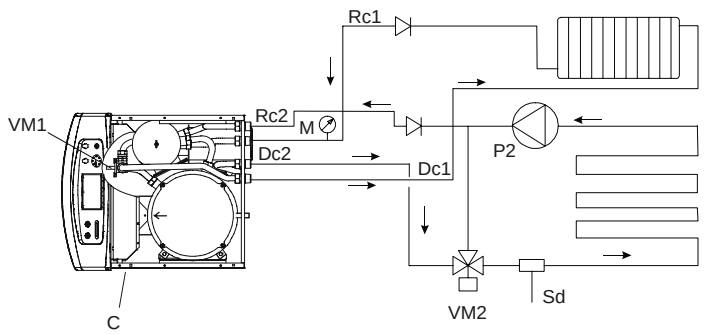


Connection to a heating circuit with a domestic hot water production system



Various typical water circuits (cont)

Connection to a double heating circuit

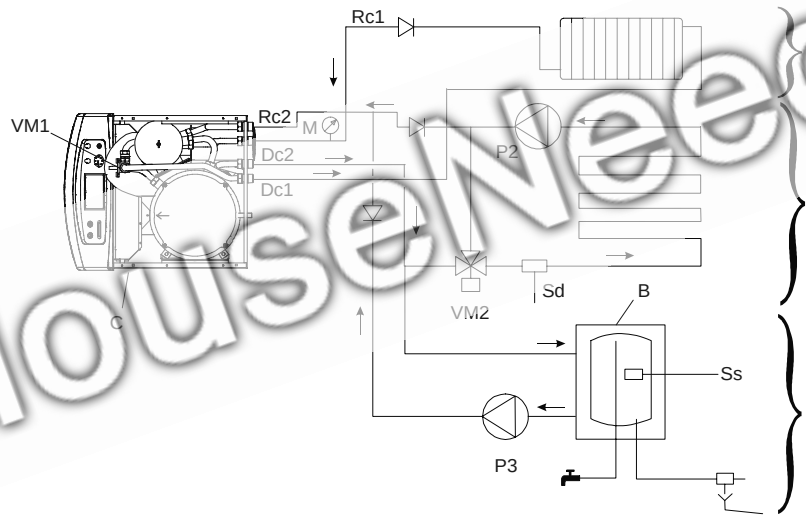


C Boiler
M Pressure gauge

C1 ***C1 = Radiator circuit***
VM1 1st circuit mixer valve
Dc1 1st circuit heating output
Rc1 1st circuit heating return

C2 ***C2 = Underfloor heating circuit***
P2 2nd circuit heating circulator
VM2 2nd circuit mixer valve
Dc2 2nd circuit heating output
Rc2 2nd circuit heating return
Sd Heating output sensor

Connection to a double heating circuit with a domestic hot water production system



C Boiler
M Pressure gauge

C1 ***C1 = Radiator circuit***
VM1 1st circuit mixer valve
Dc1 1st circuit heating output
Rc1 1st circuit heating return

C2 ***C2 = Underfloor heating circuit***
P2 2nd circuit heating circulator
VM2 2nd circuit mixer valve
Dc2 2nd circuit heating output
Rc2 2nd circuit heating return
Sd Heating output sensor

C3 ***C3 = Domestic hot water production circuit***
P3 Domestic hot water pump
B Domestic hot water production system
Ss Domestic hot water sensor

6 - FUEL OIL SUPPLY CONNECTIONS

Flexible fuel oil supply and return lines are supplied with the unit, and connected to the oil burner. Lines are terminated with 3/8-inch reverse flare fittings for connection of the supply and return lines from the fuel oil tank. When connecting the lines, a 10-micron Gerber oil filter must be installed in the oil supply line to minimize burner contamination.

7 - ELECTRICAL CONNECTIONS

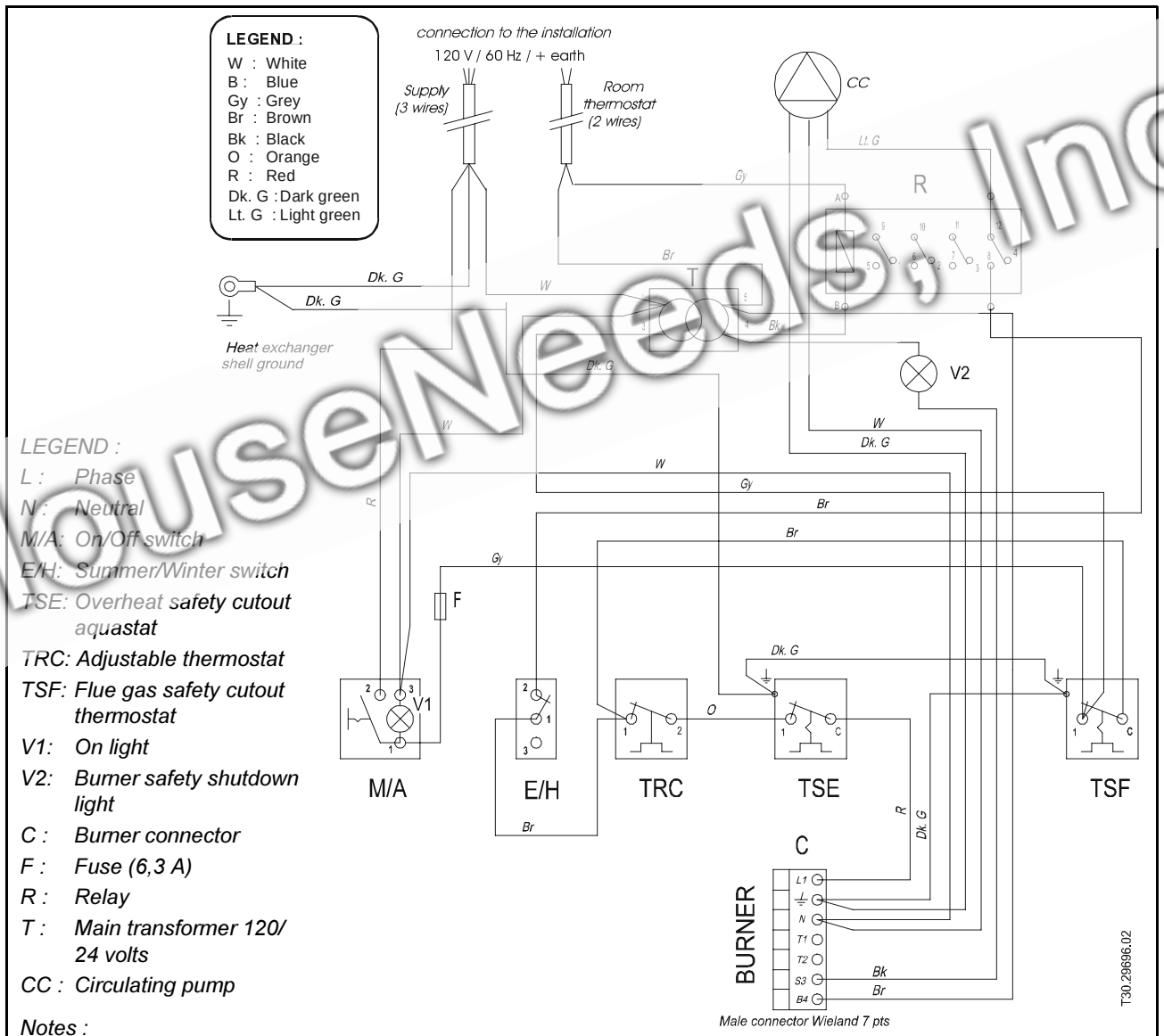
WARNING - ELECTRICAL SHOCK HAZARD!

DISCONNECT THE POWER SUPPLY BEFORE ATTEMPTING ELECTRICAL INSTALLATION OF THE UNIT.

Electrical power and control connections are made to pigtail leads that exit through a hole in the right rear of the unit (facing the front of the unit).

The power connections must be made in a Listed junction box that is not provided with the unit. All wiring should conform to the National Electrical Code and any applicable local codes and standards. To minimize the likelihood of a heating system shut-down caused by an unrelated electrical circuit fault, the unit and any related electrical components should be connected to a separate branch circuit specifically dedicated for that purpose.

The control circuit connections can be in-air splices made to pigtail leads provided. Control circuit connections are NEC Class 2, intended for connection to a typical room thermostat.



LEGEND :

- *L : Phase*
- *N : Neutral*
- *M/A: On/Off switch*
- *E/H: Summer/Winter switch*
- *TSE: Overheat safety cutout aquastat*
- *TRC: Adjustable thermostat*
- *TSF: Flue gas safety cutout thermostat*
- *V1: On light*
- *V2: Burner safety shutdown light*
- *C : Burner connector*
- *F : Fuse (6,3 A)*
- *R : Relay*
- *T : Main transformer 120/ 24 volts*
- *CC : Circulating pump*

Notes :

A. Electric power leads factory provided at right rear of unit. Permanently field splice 120-1-60 field provided power circuit leads in NEC junction box.

B. Control circuit leads factory provided at right rear of the unit are 24 volt, NEC class 2 for connection to a room thermostat.

The hole in the right rear of the unit is a large flat oval. Mount a Listed 2 x 4 inch, "HandiBox" type junction box over the oval hole in such manner that part of the hole is left open. When installing the junction box, center the box vertically over the oval hole by using the center knockout in the box. Install a ½ inch trade size cable connector or insulating bushing in the knockout. Secure the box with screws as required.

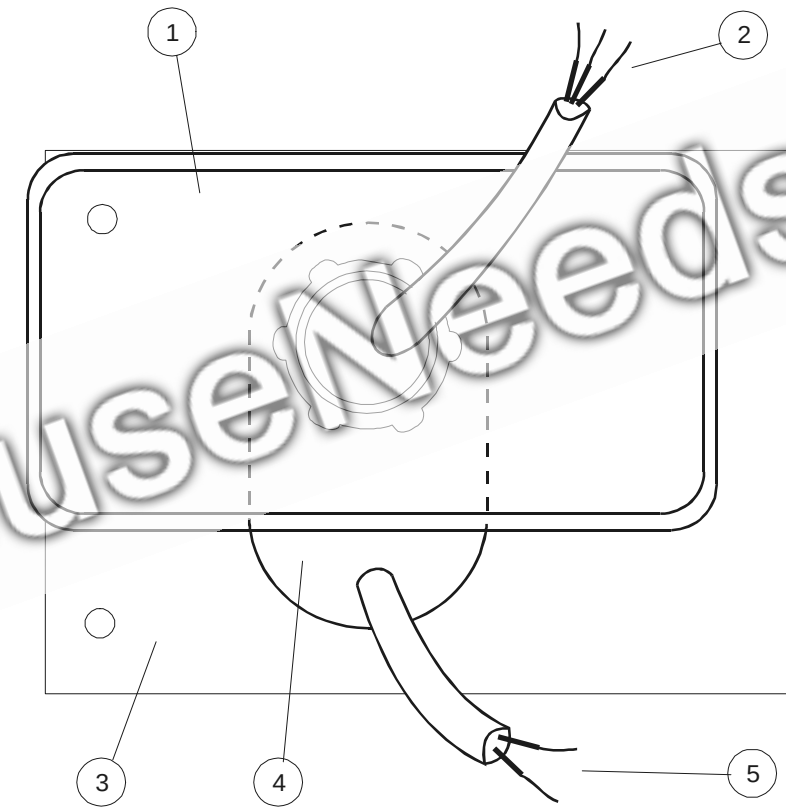
The open part of the oval hole can be either above or below the junction box depending upon the choice of wire routing. The Class 2 control circuit leads will exit the open part of the hole.

Route the factory supplied main power pigtail leads through the connector from inside the unit and secure the connector clamp on the wires.

Install a second cable or conduit connector in another knockout in the box for the power wiring system as required. Connect the power wires and grounding conductors to the pigtail leads in the box using Listed wire connectors and install a cover.

Route the factory supplied control circuit pigtail leads through the open part of the oval hole from inside the unit. Connect the room thermostat wires to the control circuit pigtail leads using a suitable Class 2 wiring connection method.

UPPER LEFT REAR CORNER OF UNIT (Facing rear of unit)



1) Junction box
2) Main Power Pigtail Leads
3) Unit Upper Back Panel
4) Oval Hole
5) Control circuit Pigtail Leads

III - START-UP AND OPERATION

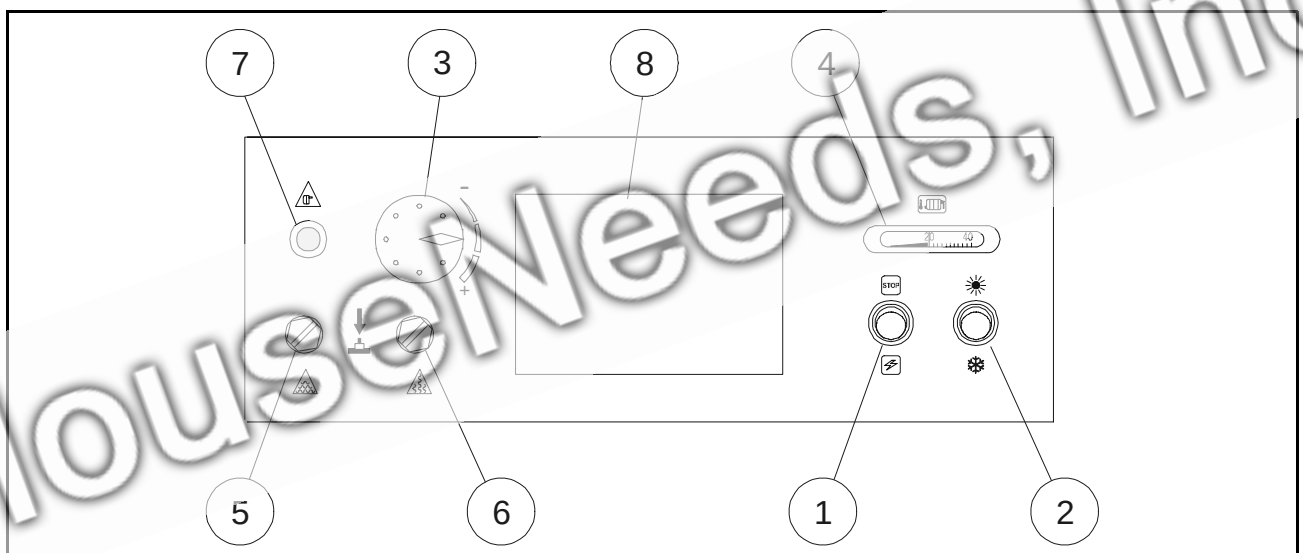
1 - PRE-START FINAL SYSTEM CHECK

Before starting normal operation of the boiler and heating system, perform the following final installation procedures:

- Leak-check the flue/combustion air system to minimize the likelihood of leakage.
- Leak-check the entire water system, repairing any leaks that may be found.
- Fill the entire water system with water, treated as desired for the application, including anti-freeze solution if appropriate. Open any shut-off valves in the system.
- Fill the condensate drain trap with water.
- Leak-check the fuel oil supply system and open any fuel shut-off valves.
- Re-check the power and control circuit connections THEN replace all cabinet access panels.
- Energize the electrical power circuit to the unit.

2 - START-UP AND OPERATION

After completing the pre-start final system checks, the system can be started and run through start-up checks and adjustments as required.



1 ***Start/Stop Switch***

2) ***Summer/Winter Switch***
Circulator control intside the boiler

3) ***Boiler Temperature Control Thermostat***
Boiler Temperature adjusted between 140 - 167 deg. F (60 - 80C)

4) ***Water Outlet Temperature Thermometer (Circuit 1)***

5) ***Water Overheating Safety Thermostat***
Burner Cutout

6) ***Combustion Product Overheating Safety Thermostat***
Boiler Shutdown

7) ***Burner Safety Device Light***

8) ***Slot for Additional Control***

To start the boiler, first make sure the room thermostat is set at a high enough temperature to be closed so that any external water circulating pumps are running. Turn the boiler On-off switch to the "ON" position, and set the Boiler Temperature Control thermostat to its maximum temperature setting.

Turn the Summer-winter switch to "WINTER". This will start the internal circulating pump. After the start time delay set on the oil burner (for the oil heater) has expired, the burner will start.

Reduce the Boiler Temperature Control thermostat setting to make sure the boiler stops properly when controlled by that thermostat. Increase the room temperature thermostat setting to make sure that the circulating pump(s) stop properly.

3 - ADJUSTING THE OIL BURNER

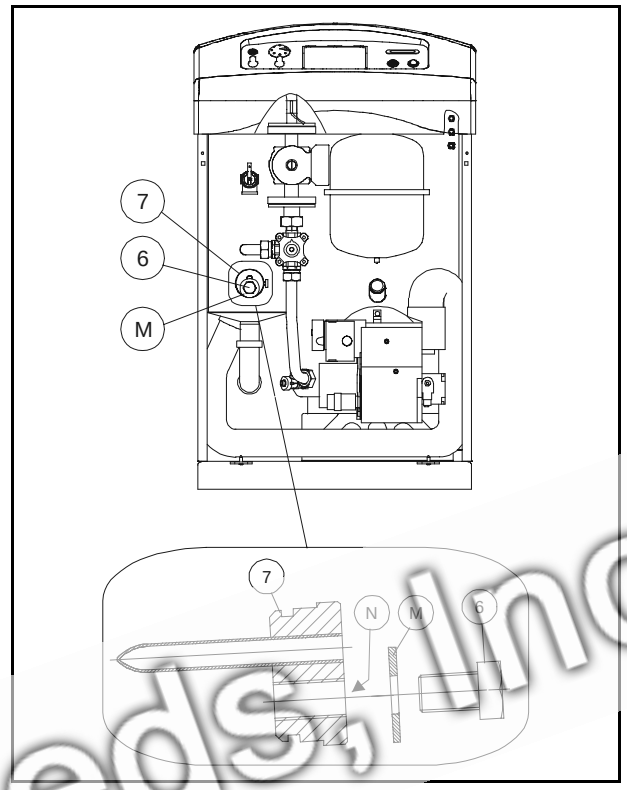
While the oil burner is adjusted at the factory, it is recommended that the operating characteristics of the burner be determined at start-up and readjusted if necessary. Run the unit long enough at the burner maximum firing rate to make sure the burner has reached a stable maximum operating temperature. THEN, check the burner and adjust as follows:

Check to determine that the smoke spot number does not exceed 0.5 with a Bacharach control. Adjust the burner as required to achieve this maximum.

Check to determine that the CO2 rate is from 12 - 13 percent and that there is no CO production. Adjust the burner as required to achieve this operating characteristic.

Measure the temperature of the flue gas exiting the unit to determine that it does not exceed 250 degrees F (120 C).

Combustion inspection can be carried out on the unit through the hole (item N) provided in the inspection port (item 7). Be sure to replace the washer (item M) and the test point screw (item 6) properly after inspection.



4 - CHECKING THE SAFETY DEVICES

At the time of start-up, check the safety and control devices as follows :

- Thermostats :
  - Check to see that the thermostat bulbs are correctly positioned in their housings. This is essential to provide temperature sensing to facilitate burner shut-down in the event of overheating,
- Flame monitoring :
  - Check to make sure that the burner shuts down properly upon the deactivation or disconnection of the flame monitoring device or interruption of the flow of fuel,
- Safety Pressure Relief valve :
  - Check the safety pressure relief valve in the heating circuit for proper operation.

IV - MAINTENANCE

It is recommend that the boiler and flue/combustion air system be inspected and maintained annually by a qualified technician.

DISCONNECT ALL ELECTRICAL CIRCUITS BEFORE SERVICING THE UNIT

CLOSE ANY ISOLATION VALVES THAT MAY BE IN THE WATER SYSTEM

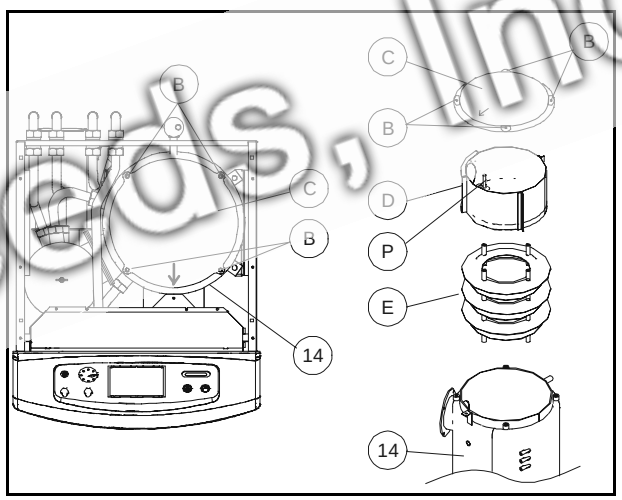
SHUT OFF THE FUEL OIL SUPPLY IF SERVICING THE BURNER

To gain access to the inside of the unit, first remove the control panel cover escutcheon by grasping it on both sides and pulling directly outward towards you and up. Remove any front panel screw(s) and remove the front panel by pulling the top out towards you and then lifting up to free the bottom from the mounting pins. Remove the top cover by simply pulling it up. Remove the electrical terminal block protection plate by removing the screws in the rear and lifting. Remove the control panel cover screws and remove the control panel cover.

The water can be bled from the unit by opening the drain-cock on the base of the boiler shell using the tool supplied.

1 - CLEANING THE BOILER SHELL

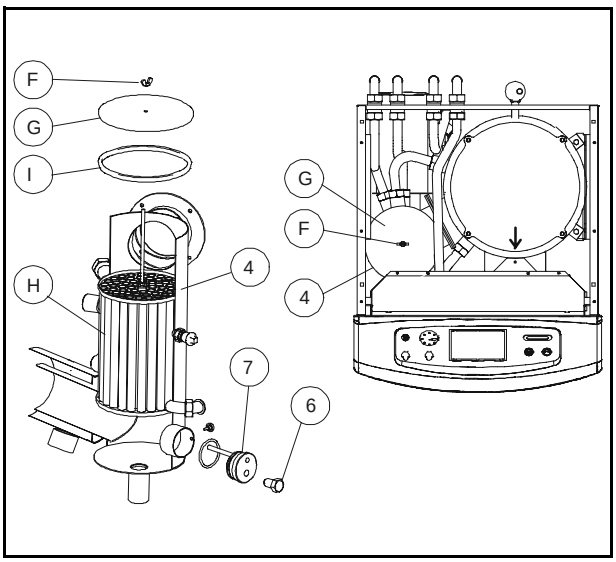
- Remove the screws (B) from the cast-iron boiler shell cover (C)
- Remove the flue outlet baffle (D)
- Remove the combustion baffles (E)
- Clean the inner walls of the boiler shell
- Reassemble all the parts the way they were removed, positioning the flue outlet (D) with its centering screw (P) towards the front of the boiler, then positioning the boiler shell cover (C) arrow marker opposite the centering screw (P)
- Replace the screws (B) in the boiler shell cover.



2 - CLEANING THE CONDENSER

- Remove the wing nut (F) from the condenser top cover (G) and remove the cover
- Remove the condenser access plug (7)
- Clean the condenser tubes (H) using a bottle brush or similar tool
- Observe that the combustion products can flow freely in the condenser tubes
- Replace the condenser access plug (7) and the top cover (G), making sure that the seal (I) is properly positioned when replacing the cover
- Make sure that the seal (I) on the cover and the access plug is in good condition.

NOTE: If after cleaning the condenser, the temperature of the flue gasses still exceeds 250 deg. F (120C), perform a boiler check.



3 - BURNER MAINTENANCE

Once adjusted properly, regular maintenance of the oil burner is not generally required. A routine examination of the burner should include examination of the burner fan and nozzle for dirt and the spark electrodes for proper clearances. Replace the fuel filter if necessary. Cleaning and adjustment is always appropriate during periodic inspection.

If burner firing rate adjustment is required, follow instructions in "Adjusting the Oil Burner".

ALWAYS CHECK FOR AND CORRECT ANY FUEL LEAKS

4 - ADDITIONAL COMPONENT MAINTENANCE

Check to see that the safety and regulation devices (safety relief valve, air bleed valve, control box components, etc.) are operating properly. Check also to see that the condensate drain siphon is clean. If necessary, remove the bottom of the siphon, clean it, replace it and then refill the siphon it with water. Also check to see that neither the installation nor the boiler have any water or fuel leaks (leaks may produce a risk for safety and shorten the lifespan). If it becomes frequently necessary to add water to maintain pressure in the installation, even though no leaks have been discovered, perform an expansion tank check.

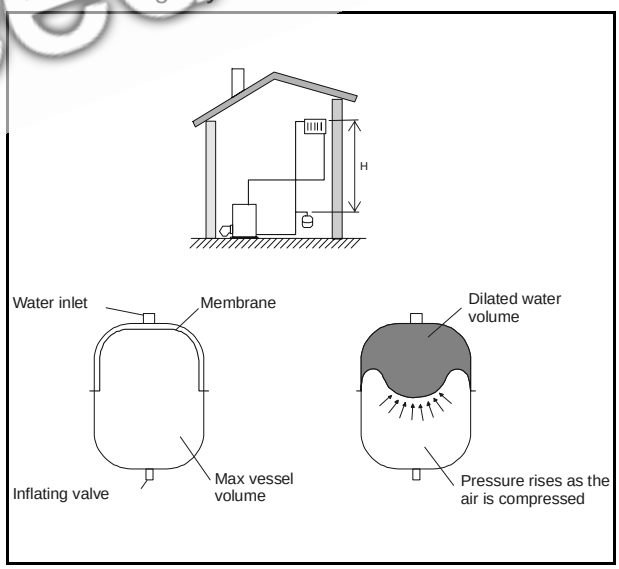
5 - EXPANSION TANK PRE-INFLATION PRESSURE CHECK

Reduce the pressure in the heating installation by opening the drain cock or the safety valve until the pressure gauge reading is less than 7 - 8 psig (0.5 bar)

Check the pressure in the expansion tank and if necessary bring it back up to pressure. Replace the tank if the membrane is punctured (water present in the inflating valve)

To optimize the efficiency of the expansion tank:

- Adjust its pre-inflation pressure in line with the installation. The pressure must correspond to the static height of the installation (H), the height between the highest point of the installation and the expansion tank, as expressed in bars where 10 meters in height = 1 bar.
- Adjust the filling pressure of the installation to a value greater than 3 psig (0.2 bar) above the pre-inflation pressure of the tank after totally bleeding any air from the installation.



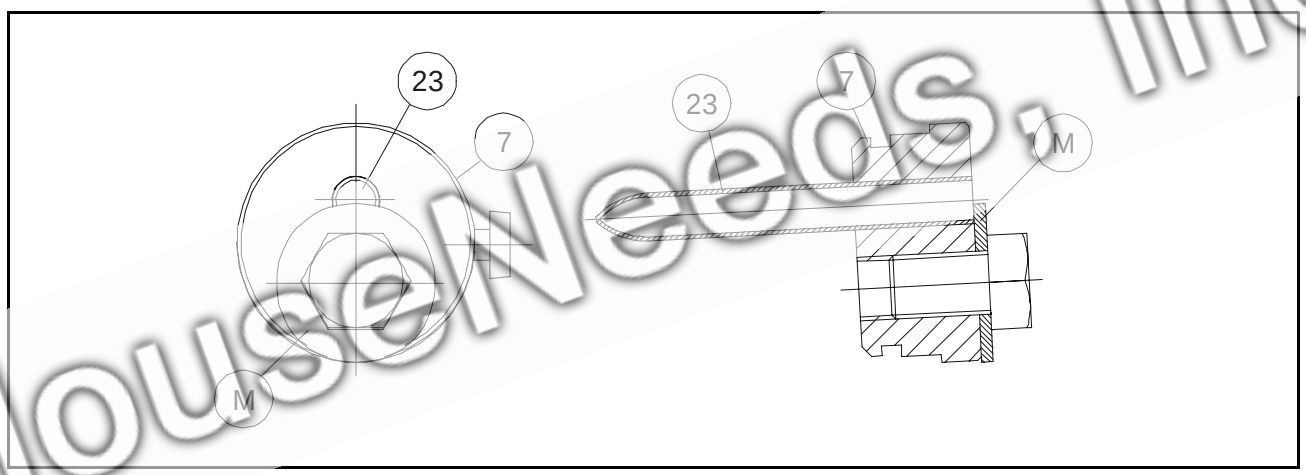
6 - COMBUSTION PRODUCT FLUE

Examine the flue/combustion air system for leaks and obstructions. Leaks can generally be detected by the appearance of condensate stains on the outside of the pipes. Replace any damaged seals if necessary. The flue/combustion air pipe can be cleaned with running water, if necessary, providing that the water flow is not too great to be drained through the condensate drain system. Leave the excess water in the condensate trap when cleaning is completed.

7 - CHANGING A THERMOSTAT OR THE THERMOMETER

Replacement of the thermostats or the thermometer requires removal of the bulb from its location and the control from the control box.

- The bulb for the Boiler Temperature Thermometer is located on the first circuit heating output tube. Remove the bulb from the tube, remove the thermometer mounting screws in the control box and remove the thermometer. Replace the thermometer with another, routing the bulb capillary the same way as the original, replacing the bulb on the tube properly and as securely as possible.
- The bulbs for the Boiler Temperature Control Thermostat and the Water Overheating Safety Thermostat are both located in pockets on the side of the boiler shell. To change either, remove the bulb from the pocket, remove the thermostat mounting screws in the control box and remove the thermostat. Replace the thermostat with another, routing the bulb capillary the same way as the original, replacing the bulb properly into the pocket as far as possible.
- The bulb for the Combustion Product Overheating Thermostat is located in a well provided in the condenser access plug/inspection port. Remove the combustion test point plug and washer from the inspection port to free the thermostat bulb, and remove the bulb from the well. Remove the thermostat mounting screws in the control box and remove the thermostat. Replace the thermostat with another, routing the bulb capillary the same way as the original and replacing the bulb properly into the well as far as possible. Replace the combustion test point plug and washer in the inspection port, securing the bulb in place.



V - OPERATING FAULTS

During the course of seemingly normal operation, there may be operating faults experienced in the system. Some of the more common faults that may be encountered are:

BURNER FAULT SHUT-DOWN - The burner may shut down for any of several reasons, at which point the burner safety device light (red) on the control panel will be ON and the there will be a green fault indicator light lit on the oil burner. This may be caused by a loss of fuel oil (tank empty?), a fouled oil spray nozzle in the burner, or perhaps a fouled or faulty flame sensor. To attempt a re-start after correcting any burner problem and the fuel supply is assured, push the reset button on the burner. The burner should re-start after the preset time delay period expires.

OVERHEATING SAFETY THERMOSTAT SHUT-DOWN - Opening of either the Water Overheating Safety Thermostat or the Combustion Product Overheating Thermostat will result in an oil burner shutdown. In either case, the burner safety device light (red) on the control panel WILL REMAIN OFF, and the green fault indicator light on the oil burner will REMAIN OFF. The only way to tell if either device has opened is to check electrically or check the position of the reset button, located under the screw cap over each device.

- The Water Overheating Safety Thermostat may open if the water temperature exceeds 230 deg. F (110C) in the boiler. ONLY a faulty Water Temperature Control causes this shutdown. The Water Temperature Control probably requires replacement.
- The Combustion Product Overheating Safety Thermostat may open if combustion products exceed 250 deg. F (120C). This may require adjustment of the oil burner to the proper firing rate or cleaning the boiler and/or condenser.

After correcting any fault, either thermostat must be manually reset by removing the screw cap on top and depressing the reset button.

SEPTEMBRE 2001

MPI - P.O. BOX 3408 PRINCETON, NEW JERSEY 08543 - PHONE 800/524-1102 (NJ 732/329-0900) FAX 732/329-0904