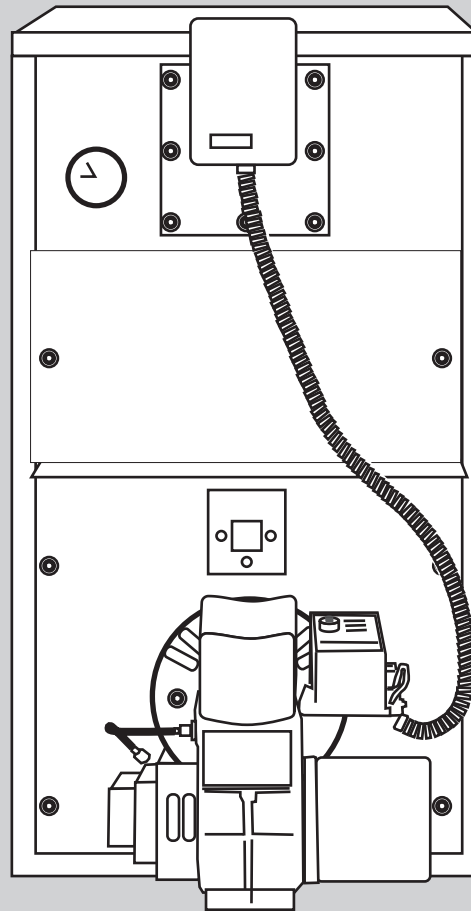


Installation,
Operation and
Maintenance
Instructions for
Horizon
Oil Fired Boiler



FOR YOUR SAFETY: This product must be installed and serviced by a professional service technician, qualified in boiler installation and maintenance. Improper installation and/or operation could create carbon monoxide gas in flue gases which could cause serious injury, property damage, or death. Improper installation and/or operation will void the warranty.

⚠ WARNING

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

Installation and service must be performed by a qualified installer, service agency, or fuel oil supplier.

LAARS
HEATING SYSTEMS

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SECTION 1.

General Information

1A. Freight Claims

Inspection should be made of boiler and components for damage upon arrival. Any claims for damage should immediately be filed against the carrier by the consignee.

1B. General Information

These boilers have been designed and constructed according to the requirements of the relevant ASME Codes using heavy gage steel plate and boiler tubes. They are of the three pass horizontal tube design using a reverse flame technique in the boiler to impart a high heat transfer in the primary heating zone before directing gases into the third pass.

The compact tubular third pass incorporates special stainless steel flue gas baffles with extension rods to allow full insertion of the baffles into the back end of tubes where they are most effective.

A 5 gal/min. domestic hot water coil is located at the top of the boiler in the hottest zone for ample hot water supply. A unique feature of its attachment is the raised coil flange which allows the use of clamping bolts rather than studs, thereby eliminating water leaks caused by broken studs.

Two ceraform lined doors provide easy access for cleaning, the lower door with burner attached remaining in position while the upper door is removed for tube cleaning.

A flame observation port is provided for setting-up burner and a test hole gives access for CO₂ and draft readings.

The boiler is encased in a fully insulated baked enamel jacket and comes completely pre-assembled for easy installation. Alternatively, it can be supplied in knock-down form.

Caution

This boiler is designed for use in closed systems where air is eliminated from the system and no more oxygen is allowed to enter (typical baseboard or radiator system). Do not directly connect this boiler to a system utilizing rubber or plastic tubing which has an oxygen permeation rating greater than 0.1 milligrams / liter / day. Damage to the boiler will result and the warranty will be void (see warranty section 4g).

1C. Boiler Installation

For recommended installation practice reference should be made to the National Fire Protection Standard for Oil Burning Equipment - NFPA 31 - Latest Edition.

1D. Boiler Location

The boiler should be positioned as near to the chimney as possible and have a minimum smoke-pipe connector length of 18".

1E. Boiler Clearances (minimum)

Top - 6"; Front - 24"; Rear - 6"; Sides - 6".

1F. Floor

The boiler must be mounted on a non-combustible masonry or cement floor with no combustibles underneath.

1G. Combustion and Ventilation Air

To insure an adequate supply of fresh air for combustion and ventilation an inlet and outlet opening should be provided at floor and ceiling level. Each opening must have a minimum of one square inch of free area for every 1000 BTU/h of input or 140 square inches per gallon of oil burned per hour. The openings must not be in a position liable to blockage.

1H. Chimney and Draft Requirements

To assure the safe and proper operation of the oil burner the boiler must be connected to a chimney having sufficient draft at all times to evacuate the flue gases to atmosphere. A draft regulator should be installed in the smoke-pipe as near to the flue as possible and adjusted to achieve an over fire draft of 0.01 in. W.C.

1I. Jacket (normally fitted)

If not fitted, assemble panels in accordance with instructions in Figure 2.

1J. Oil Burner (normally fitted)

If not fitted, insert burner tube into boiler so that it is recessed approximately 1/4" back from the inside wall of door insulation, then clamp mounting flange and bolt up to front-plate.

The burner should be wired and connected to the oil line in accordance with the manufacturer's instructions.

1K. Boiler Controls (normally fitted)

If controls are supplied separately, fit them to the boiler in the positions shown in Figure 2, with jacket in place.

Circulator - 1 1/4' return tapping at rear of boiler.
Tridicator - temp./press. gauge - 1/2" tapping at top of boiler.

Relief Valve - 3/4" tapping at top of boiler. Pipe to safe place of discharge.

Aquastat Relief - L8124A - 3/4" tapping.

Fit a drain valve (not supplied) in the hydronic return tee. Check that all connections are made water tight.

1L. Oil

Use only No. 2 Heating Oil. Do not use gasoline, crankcase draining or any oil containing gasoline.

1M. Oil Storage and Pipe Layout

(See Figures 3 and 4)

Figure 3: One-pipe system - pipe and tank layout.

Figure 4: Two-pipe system - pipe and tank layout.

1N. Electrical Connections

All electrical wiring must conform to local codes and/or the National Electrical Code ANSI / NFPA No. 70 - Latest Edition. The system must be electrically grounded in accordance with the requirements of the authority having jurisdiction or, in the absence of such requirements, with the National Electrical Code mentioned above.

1O. Operation

(using Honeywell L.8124A aquastat relay)

A call for heat from the room thermostat causes the relay to “make” the burner circuit and also feed the circulator, provided the boiler water temperature is above the low limit setting (usually 190° to 210°F). The burner and circulator then continue to run until the room thermostat is satisfied.

A high limit switch shuts off burner in the event of water temperature exceeding the high limit setting, usually 20° to 30°F above the low limit setting.

The low limit switch and circulator maintain boiler water temperature for domestic hot water service and prevents circulation of heating system water if domestic water is not hot enough.

1P. Domestic Water Piping

Connect hot water tempering valve (12) “HOT” port to hot water outlet from unit. This valve should be mounted 8" to 12" below the outlet and set for 120°F mixed delivery temperature or as local codes dictate.

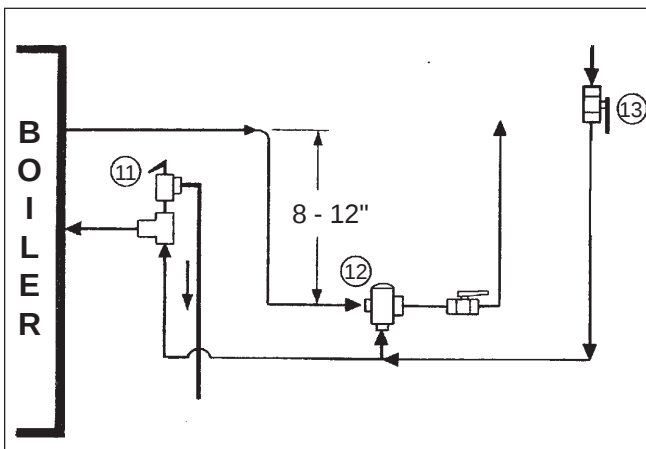


Figure 1.

Connect gate or shutoff valve (13) to tempering valve (12) “MIX” port, and cold water inlet.

Connect pressure relief valve (11) (if required by codes), maximum 150 PSI as close to the unit as possible. No other valves or restrictions may be installed between the DHW coil and the relief valve.

(DO NOT USE A TEMPERATURE/ PRESSURE RELIEF VALVE AS THIS IS NOT A STORAGE HOT WATER HEATER).

SECTION 2. Maintenance

WARNING

Flue gases are dangerous - do not operate boiler if there is an escape of flue gas. Call a qualified serviceman and have the entire flue and venting system inspected.

2A. Cleaning the Boiler

To maintain the high thermal efficiency and a long life from your boiler, it should be cleaned at least once a year, preferably at the end of the heating season. This is particularly important as rusting can occur when the boiler is idle.

It is recommended that a service contract be arranged with a properly equipped serviceman who will be able to do the job efficiently and without mess.

1. Switch off electrical supply to the boiler.
2. Remove front cleaning cover.
3. Remove flue baffles and thoroughly brush out flue tubes.
4. Remove flue deposits from flue collector box using a vacuum nozzle through side cleaning ports.
5. Vacuum out accumulated deposits from combustion chamber through cleaning cover opening.
6. Replace all parts, ensuring flue baffles are correctly located and cleaning cover is tightly sealed.

2B. Cleaning the Chimney

Sweep all soot deposits from chimney and smoke-pipe once a year, preferably at the end of the heating season. It is also advisable to inspect the chimney and smoke-pipe at the beginning of heating season as birds may have built their nest inside or other material may be causing a blockage.

2C. Servicing the Burner

This should only be carried out by a trained and licensed service technician in accordance with the burner maker's instructions.

2D. Maintenance of the Tankless Coil

After several years of use, the water flow through the coil may become restricted by mineral deposits from the water. Mild accumulations may be removed by an acid treatment, but your servicing company can advise on the most satisfactory method of cleaning or whether a replacement coil is necessary.

2E. Coil Removal

1. Switch off electrical supply and turn off water to boiler.
2. Drain the complete system.
3. Disconnect the pipe connections to the coil.
4. Unscrew the eight retaining bolts from coil plate.
5. Pull out coil and clean / fit replacement as necessary.
6. Ensure gasket makes a water tight seal.
7. Refill & purge before returning system to service.

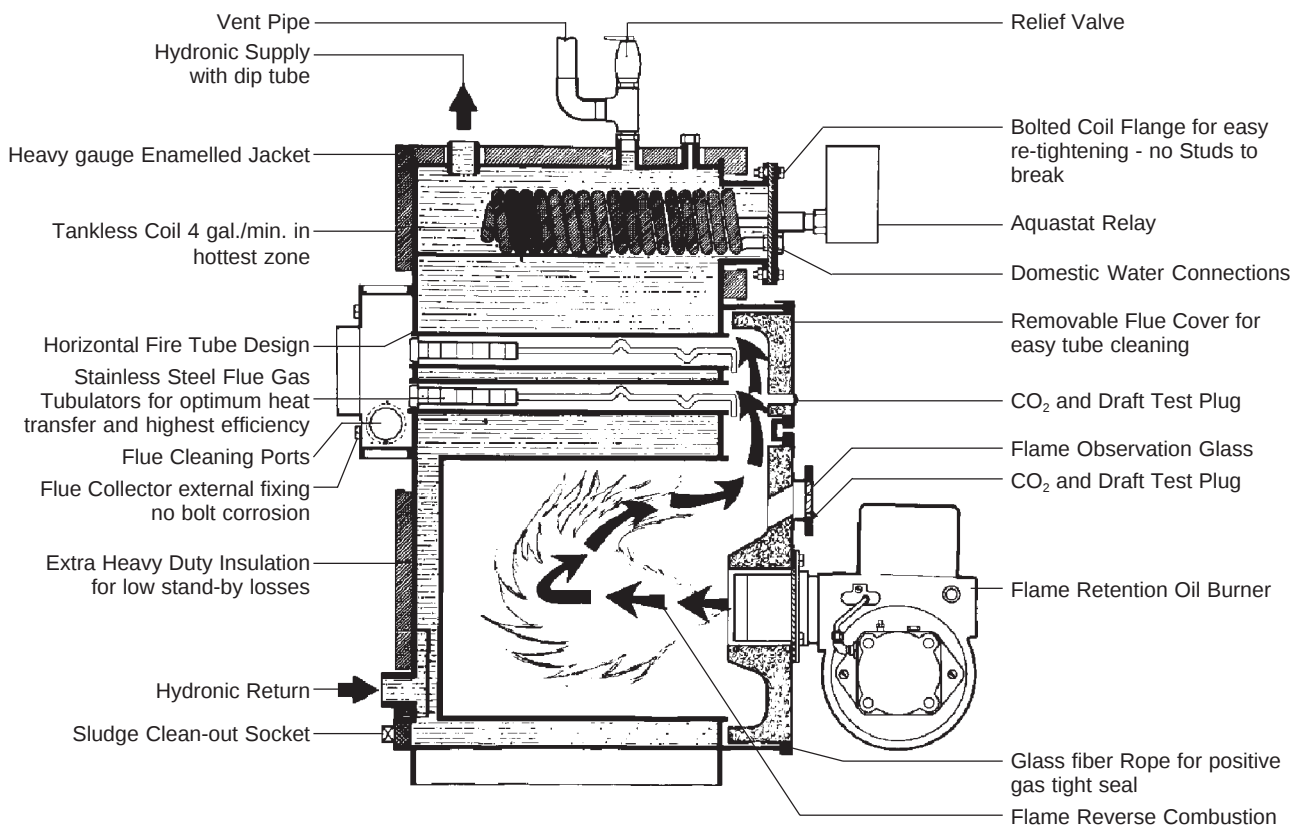
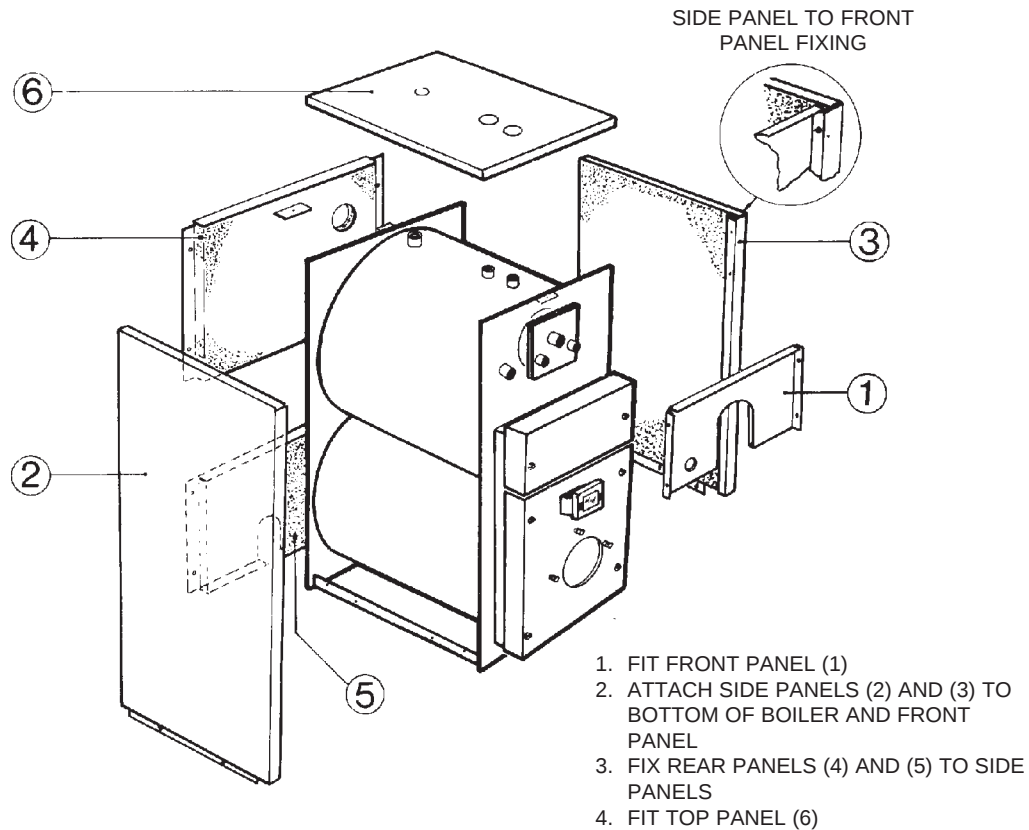
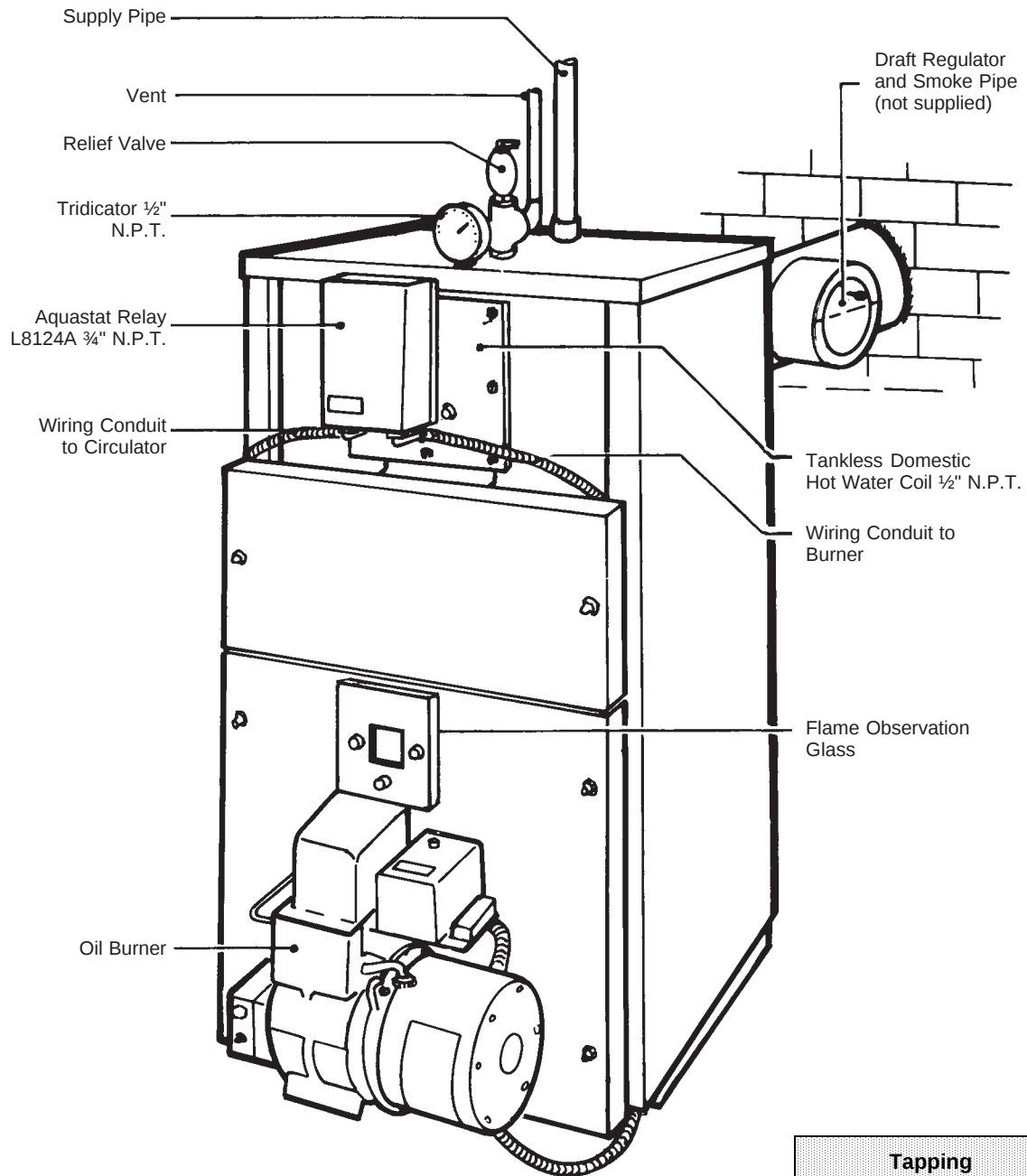


Figure 2.



Tapping	NPT
Tankless Coil	¾"
Tridicator	¼"
Hydronic Return	1¼"
Hydronic Supply	1¼"
Aquastat Well	¾"
Relief Valve Fitting	¾"
Alternate Hydronic Return	1¼"

Figure 3.

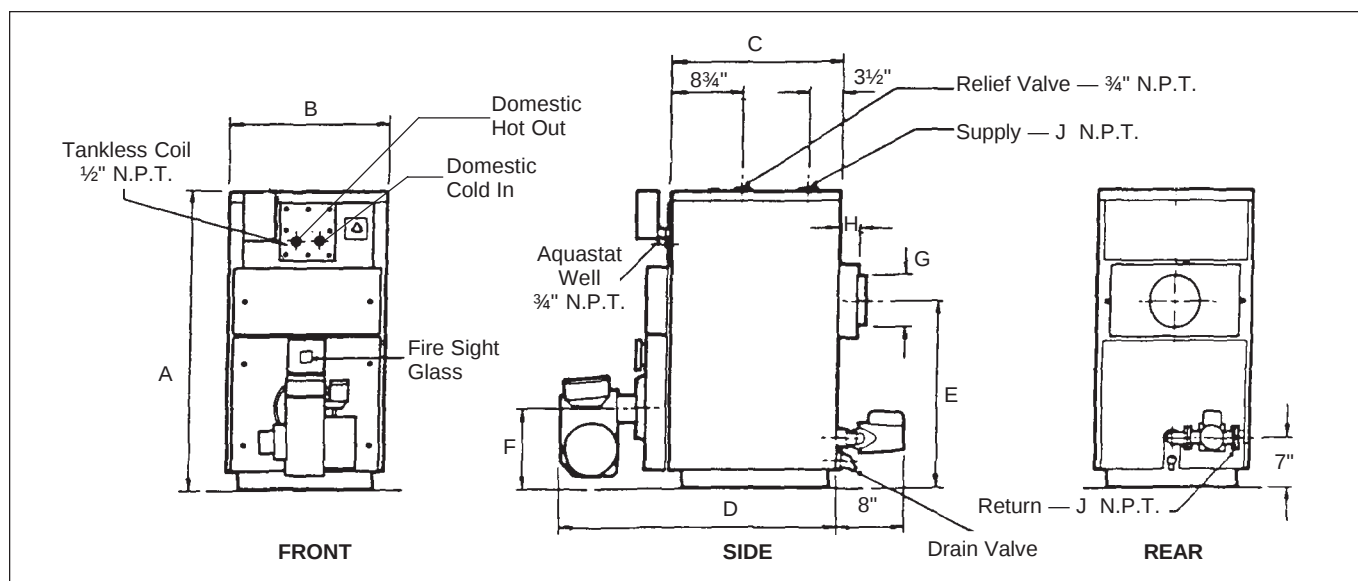


Figure 4.

Dimensions	REF	HC 100	HC 125	HC 145	HC 175	HC 205	HC 240	HC 270	HC 300
Jacket Height	A	39"	39"	42"	42"	45 $\frac{3}{4}$ "	45 $\frac{3}{4}$ "	45 $\frac{3}{4}$ "	45 $\frac{3}{4}$ "
Jacket Width	B	21"	21"	23"	23"	25"	25"	25"	25"
Jacket Length	C	21"	21"	23"	23"	25"	25"	29"	29"
Overall Length	D	32"	32"	34"	34"	36"	36"	40"	40"
Smoke Outlet Height	E	24 $\frac{1}{2}$ "	24 $\frac{1}{2}$ "	27"	27"	29 $\frac{1}{2}$ "	29 $\frac{1}{2}$ "	29 $\frac{1}{2}$ "	29 $\frac{1}{2}$ "
Burner Center Line	F	10 $\frac{3}{4}$ "	10 $\frac{3}{4}$ "	11 $\frac{3}{4}$ "	11 $\frac{3}{4}$ "	12 $\frac{1}{2}$ "	12 $\frac{1}{2}$ "	12 $\frac{1}{2}$ "	12 $\frac{1}{2}$ "
Smoke Outlet Diameter	G	6"	6"	6"	6"	8"	8"	8"	8"
Smoke Box	H	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "
Supply Size Water	I	1 $\frac{1}{4}$ "	1 $\frac{1}{4}$ "	1 $\frac{1}{4}$ "	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
Specification		HC 100	HC 125	HC 145	HC 175	HC 205	HC 240	HC 270	HC 300
D.O.E. Heating Capacity		100	125	145	175	205	240	270	300
Net Output M.B.H.		87	109	126	152	178	209	235	261
A.F.U.E. %		84.2	84	85.8	85.2	85.4	84.2	85.2	84.4
Firing Rate G.P.H.		.85	1	1.25	1.50	1.75	2.00	2.25	2.50
Net Stack Temperature		333	371	319	354	325	350	330	360
Water Capacity Gal.		21	21	34	34	42	42	48	48
Coil Capacity G.P.M.		5	5	5	5	5	5	5	5
Approx. Weight lbs.		494	494	608	608	764	764	810	810

	Burner	Head Type	Static Plate Stop	Blower Wheel	Nozzle Type
HC100	AFG	F3	3 5/8"	4 1/4" x 2 7/16"	.75 x 80°A
HC125	AFG	F3	3 5/8"	4 1/4" x 2 7/16"	.90 x 80°B
HC145	AFG	F6	2 3/4"	4 1/4" x 2 7/16"	1.10 x 80°B
HC175	AFG	F6	2 3/4"	4 1/4" x 2 7/16"	1.25 x 80°B
HC205	AFG	F16	2 3/4"	4 1/4" x 2 7/16"	1.50 x 80°A
HC240	AFG	F16	2 3/4"	4 1/4" x 2 7/16"	1.75 x 80°B
HC270	AFG	F22	2 3/4"	4 1/4" x 2 7/16"	2.00 x 80°B
HC300	AFG	F22	2 3/4"	4 1/4" x 2 7/16"	2.25 x 80°B

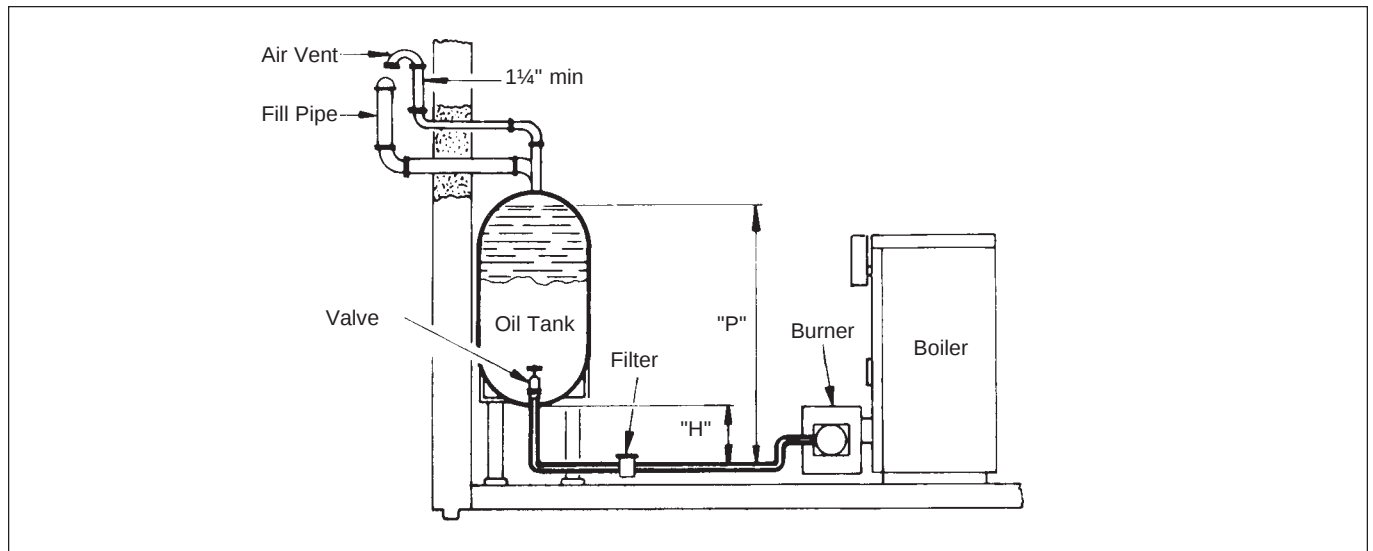


Figure 5. One-Pipe System.

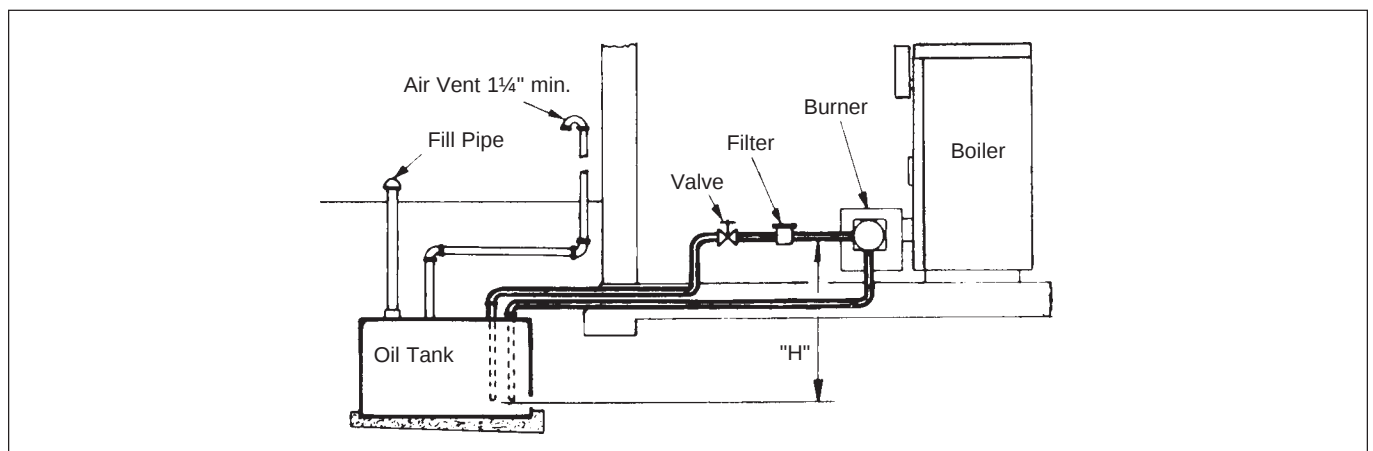


Figure 6. Two-Pipe System.

PIPE LENGTHS		
"H"	One Pipe Gravity System	
	3/8" O.D.	1/2" O.D.
ft	ft	ft
0		
1½	33	65
3	65	130
5	130	260
6½	195	325

PIPE LENGTHS		
"H"	Two Pipe Lift System	
	3/8" O.D.	1/2" O.D.
ft	ft	ft
0	115	330
1½	100	330
3	80	330
5	65	295
6½	50	230
9½	25	100
11	20	65



WARNING

The height should not exceed 13 feet.



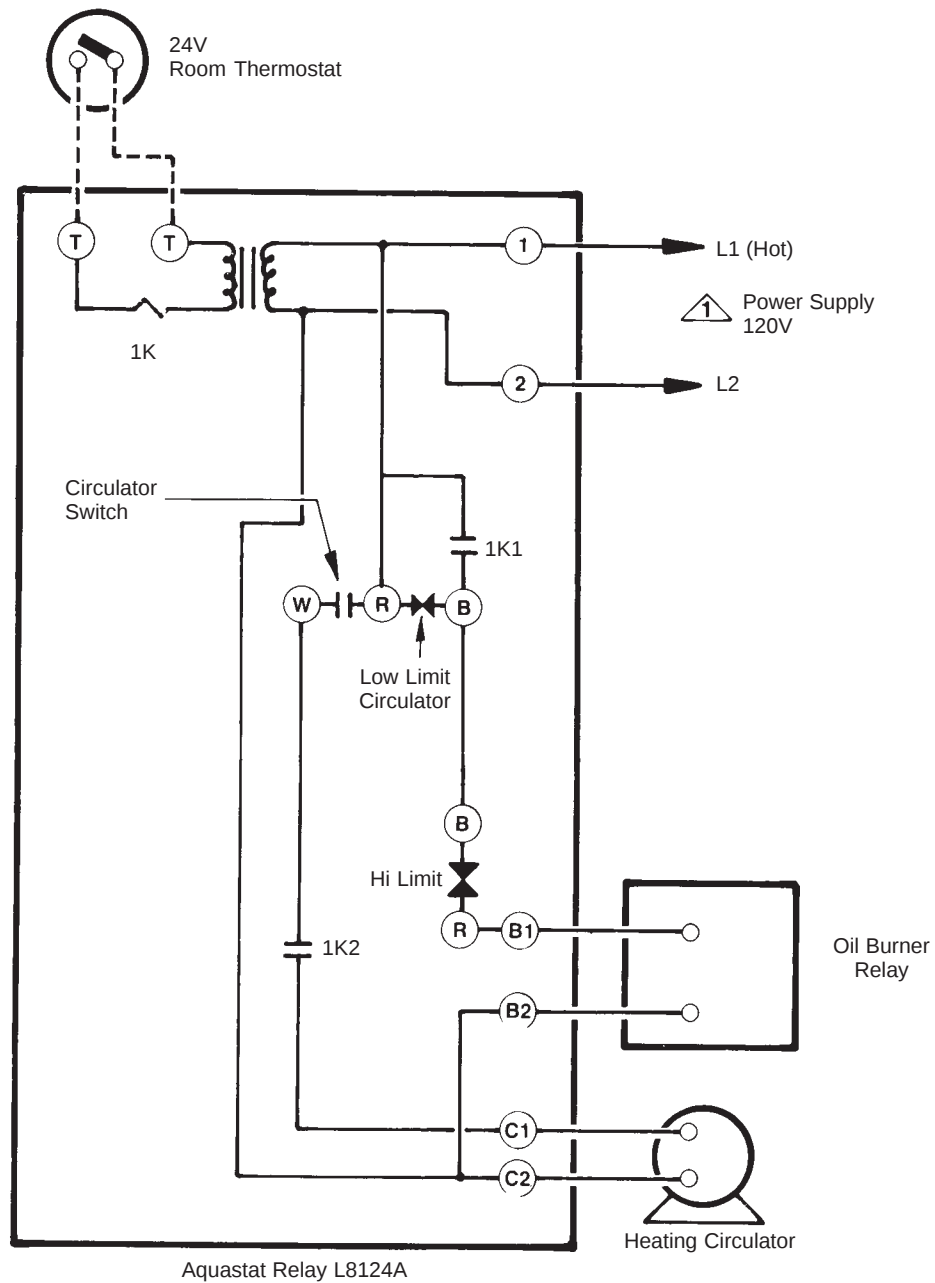
WARNING

The vacuum must not exceed 11.44 HG (11.44 inches of Mercury). Burner is shipped from the factory set up for two pipe system.

Important

An external filter must be placed in the fuel line between the fuel tank and the burner pump.

⚠ Power supply provides disconnect means & overload protection as required.



**Wiring Arrangement for HC Boiler
Controlling Operation of Boiler and Circulator**

Figure 7.

SECTION 3.

Part Numbers

Part Number	Description	Size	Part Number	Description	Size
57-002	Boiler Body	100/125	59-170	Front Panel Assembly	145/175
57-072	Inspection Cover Assembly	100/125	59-164	Left Panel Assembly	145/175
57-090	Burner Door Assembly	100/125	59-154	Right Panel Assembly	145/175
57-136	Flue Cover Assembly	100/125	59-194	Top Panel Assembly	145/175
57-170	Front Panel Assembly	100/125	59-176	Rear Upper Panel Assembly ...	145/175
57-164	Left Panel Assembly	100/125	59-186	Rear Bottom Assembly	145/175
57-154	Right Panel Assembly	100/125	59-145-2	Target Wall	145/175
57-194	Top Panel Assembly	100/125	61-002	Boiler Body	205/240
57-176	Rear Upper Panel Assembly ...	100/125	61-072	Inspection Cover Assembly	205/240
57-186	Rear Bottom Assembly	100/125	61-090	Burner Door Assembly	205/240
57-145-2	Target, Wall	100/125	61-136	Flue Cover Assembly	205/240
57-146	Baffle, 110/125 (13), 145/175 (18), ... All 205/240 (26)		61-170	Front Panel Assembly	205/240
59-002	Boiler Body	145/175	61-164	Left Panel Assembly	205/240
59-072	Inspection Cover Assembly	145/175	61-154	Right Panel Assembly	205/240
59-090	Burner Door Assembly	145/175	61-194	Top Panel Assembly	205/240
59-136	Flue Cover Assembly	145/175	61-176	Rear Upper Panel Assembly ...	205/240
			61-186	Rear Bottom Assembly	205/240
			61-145-2	Target Wall	205/240



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