

KEYSTOKER BOILER INSTALLATION INSTRUCTIONS

Through these instructions, we will try to guide you on a step by step procedure for installing, adjusting and operating of your new KEYSTOKER stoker boiler unit.

Selection of location. Keystoker boilers are available with fire door on the right or left side. When you stand at the stoker end of boiler and look directly over top of boiler toward stack end, you may choose to have fire door on the right or left side of boiler. Selecting a position to make this door accessible is important. When door side must be placed toward a wall, 30" clearance is recommended for easy access to fire door and for ash removal. Clearance from wall at stack end should be 18" to allow removal of water heating coil if necessary.

Setting Up Boiler. Place boiler in desired position. We strongly recommend placing steel shims or bricks under each corner of boiler to allow an air space, to prevent moisture from accumulating and rusting base of boiler. Using a level, plumb stoker end of boiler, adding steel shims as necessary to plumb the stoker end of the boiler. Failure to do this will change pitch on stoker unit and may have adverse effects when burning coal. Again with level, check top of boiler from side to side, adding shims as necessary to level boiler. Do not place shims completely under boiler. Allow 1" to 2" of shims to extend out from under the boiler. Shims will then be used as a base to rest insulated jacket upon.

Hot water piping system. The top of boiler has at least 4 openings. The largest opening is feed line to your radiation. Since this outlet has a drop tube welded inside the boiler, you must use it for your radiation supply line. Even though it may be necessary to bush down to a smaller size, we recommend starting with 1 1/4" pipe and installing an 1-1/4" x 1-1/4" x 1" tee in supply line to be used for a by-pass loop. (See Installation Diagram) You may now make your piping connections from feed outlet on boiler to flow valve.

You may use either of large openings on bottom of stack end of boiler as your return. Select side that will allow convenient access to circulator for future servicing. Install return piping and circulator, again referring to (Installation Diagram) for location of by-pass loop. Your 1-1/4" x 1-1/4" x 1" tee must be installed below circulator.

Install by-pass loop as per (Installation Diagram) with 1" pipe size. Place a tee 1" x 1/2" x 1" in by-pass loop to allow installation of immersion well for the 4006B Honeywell Hi Limit Control to extend into full water flow.

Over 50 years of installation experience has proven to us that the above mentioned by-pass loop is absolutely necessary for optimum performance of you heating system.

Install a boiler drain valve in the other large opening at bottom of boiler. (See Diagram)

Boiler feed and domestic water piping. Refer to (Installation Diagram) Install 1/2" male adapters in both fittings on domestic water coil. Install a 1/2" male adapter in either of the 1/2" fittings on top of boiler to be used for a boiler water feed. Plug all other fittings on stack end of boiler using teflon tape or pipe joint compound.

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NOTE: Before proceeding with connections for piping of boiler feed and domestic water, **INSTALL** stack end of insulated steel jacket **NOW**. Then you may proceed with completion of domestic piping and installation of necessary valves. (See Diagram)

If a domestic water tempering valve or an automatic fill valve is desired, install as per manufacturers instructions.

Installation and piping of accessories. A $\frac{1}{2}$ " 30 Lb. Relief valve must be installed in $\frac{1}{4}$ " fitting on top of boiler, turning discharge to the side. Install a pipe into relief valve so that it extends past the side of boiler. Solder an elbow and a nipple on pipe, point toward floor in an area that is safe and free from normal household traffic.

Install altitude gauge. (Temperature/Pressure gauge)

Connect expansion tank directly to remaining fitting on top of boiler, **NOT** to any other part of heating system. Install a stop and waste valve in pipe going to expansion tank with direction marker on valve pointing toward expansion tank. (See Diagram)

Install immersion well for triple aquastat relay in $\frac{1}{4}$ " fitting on side of boiler above fire door. (See Diagram)

Place fire door into boiler opening and secure by tightening screws in frame of fire door.

Jacket and stoker installation. Install hopper end of jacket, then blank side, then fire door side. Secure with #8 x 1 sheet metal screws provided. Install jacket top, and secure with #8 x $\frac{3}{8}$ sheet metal screws.

Stoker units are shipped entirely assembled. Lift stoker into opening, bottom of stoker unit has a $\frac{1}{4}$ " rod welded in place which must go inside stoker opening. Place a thick smear of furnace cement on flange of stoker and tilt into place, securing with $\frac{3}{8}$ " x 1- $\frac{1}{4}$ " machine screws, washers and nuts as provided.

Set hopper into place. Bottom of hopper should lap over stoker throat approximately 1" Since one hopper is used for several size stokers, it may be necessary to trim the opening. Bend flange down to fit inside throat of stoker. Be sure mechanism is free to operate.

Control installation and electrical wiring. Install triple aquastat into its well, being careful not to kink this capillary tube. Screw timer to jacket next to triple aquastat.

Install 4006B Hi Limit into well in by-pass loop. (See Diagram)

Your stoker boiler should be on its own circuit. From main breaker to boiler, use 12-2 wire with ground on a 20 Amp fuse. Follow wiring diagram and any applicable UL and local codes.

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Stack pipe and Draft Control installation. Stack pipe may now be connected from boiler to chimney, using as few elbows as possible. If stack pipe must be reduced in size, reduce stack at thimble. It is important to run full size stack from boiler to chimney thimble. Install barometric draft control in first full section of stack closest to boiler. Follow instructions packed with draft control, making sure draft control bearings are level, and face of draft control is perpendicular to floor.

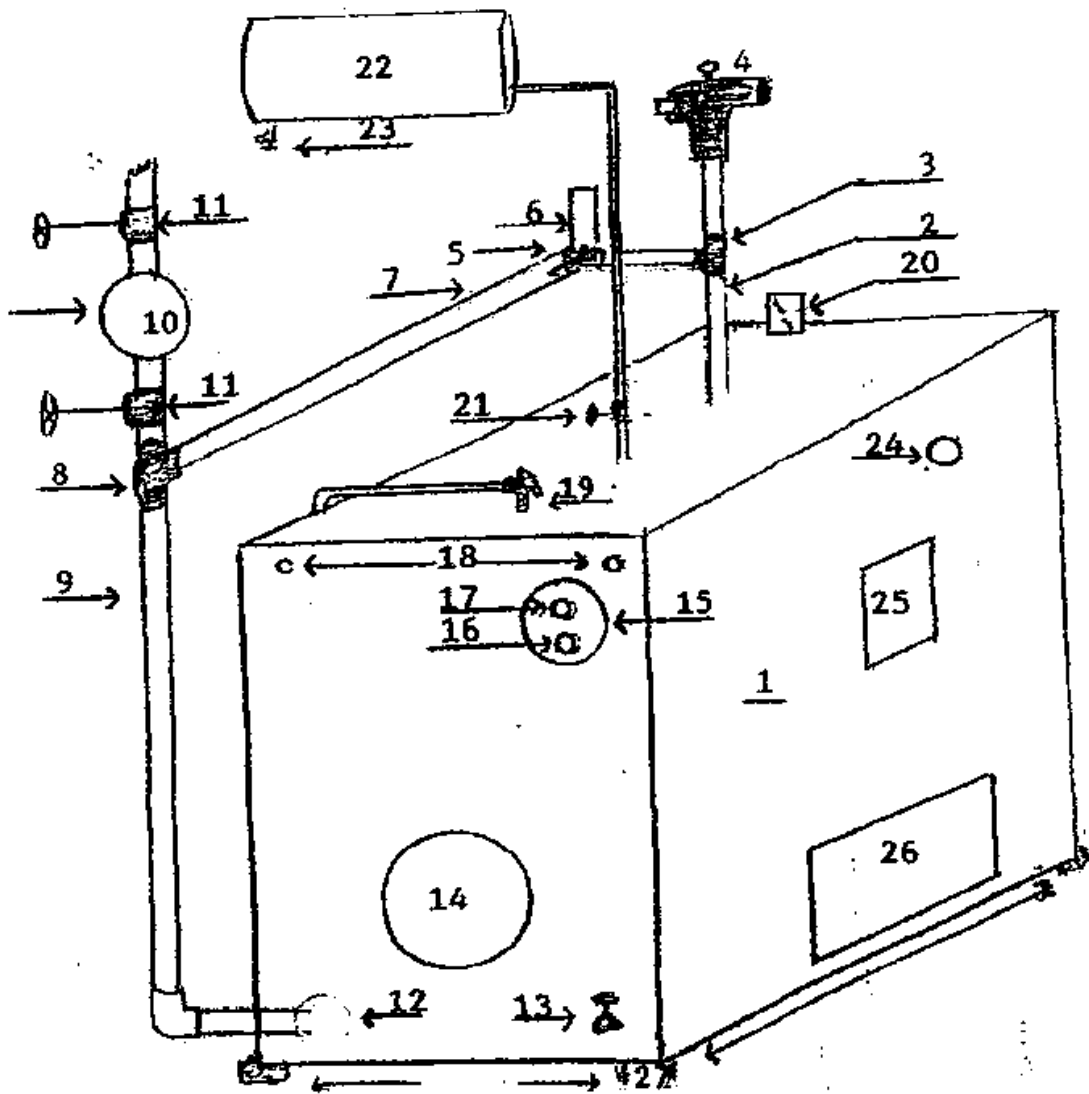
Initial start up. Fill system by opening boiler feed valve. Open air vents on radiation one at a time until air is removed from system. Normal operating pressure on most heating systems is between 10 and 20 PSI. Automatic fill valves are factory set at 12 PSI. If an automatic fill valve is not used, then boiler feed valve must remain in normally closed position.

Open valve supplying water to domestic hot water coil, this valve must remain in the normally open position.

Open valve supplying water to expansion tank, this valve must remain in the normally open position.

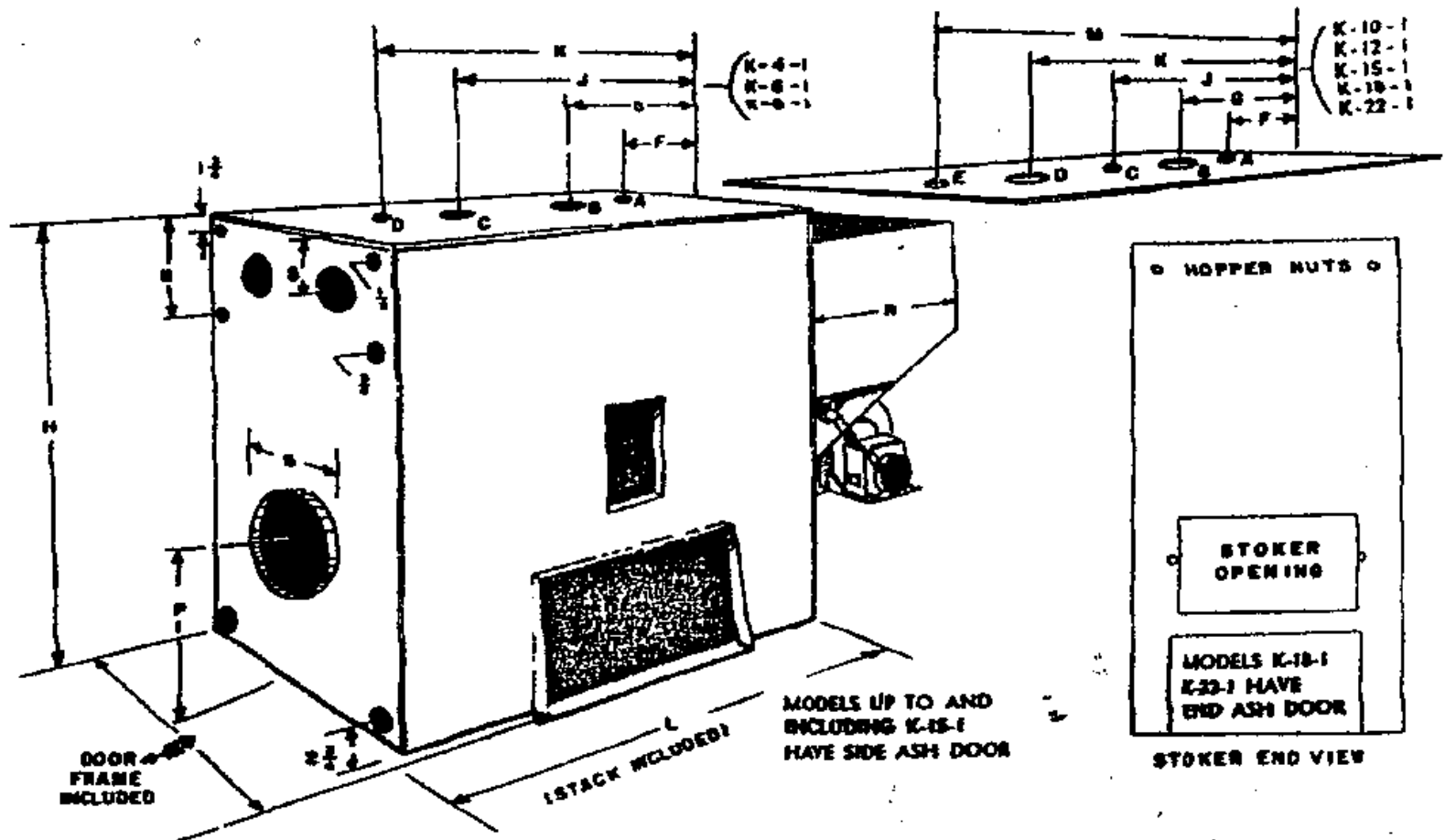
Starting Coal Fire. Put coal in hopper. By reaching through fire door, pull coal down to cover entire grate. Crush several charcoal briquets into smaller pieces, crumble newspaper and dig it through the coal, so it touches grate. Lay charcoal on top of newspaper. Turn on switch. When charcoal turns red, place a few handfuls of coal on top of charcoal. If fire moves toward bottom of grate before fire is established, coal feed can be slowed down by turning red nut CCW or by flipping feed bolt to a sideward position. (Part #22 on Unit specification sheet)

After Starting Coal Fire. Allow stove and chimney to warm up. Insert draft gauge through pre-drilled hole in upper portion of fire door. Shut stoker unit off with switch. Adjust barometric damper until draft gauge reads (-.02). Turn stoker unit on. Open combustion air intake shutter (located on bottom of scroll between stoker motor and gear box.) until draft gauge reads (-.01 to -.02). Shut stoker unit off, recheck draft readings, then restart stoker.



- | | |
|--------------------------------|-------------------------------|
| 1. Boiler | 15. Domestic Hot Water Coil |
| 2. 1½" Supply Line | 16. Cold water to coil |
| 3. 1½ x 1½ x 1 Tee | 17. Hot water from coil |
| 4. Flow Valve | 18. Optional boiler feed port |
| 5. 1 x ½F x 1 Tee | 19. Relief valve |
| 6. 4006B Safety Control | 20. Altitude Gauge |
| 7. By-Pass loop | 21. Valve to Expansion Tank |
| 8. 1½ x 1½ x 1 Tee | 22. Expansion Tank |
| 9. 1½" Return Line | 23. Tank Drain Valve |
| 10. Circulator | 24. Triple Acquastat Port |
| 11. Valves above & below Circ. | 25. Fire Door |
| 12. Return Line Port | 26. Ash Door |
| 13. Boiler Drain valve | 27. Boiler Shims |
| 14. Stack Outlet | |

DIMENSIONS



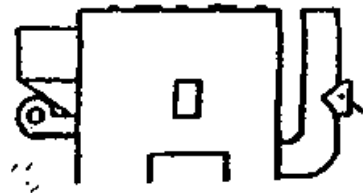
MODEL	A	B	C	D	E	F	G	J	K	M	P	R	W	L	H	S	LOW WATER LEVEL
KA-4-1	1/2	1 1/2	1/2	3/4	—	5 1/2	12	18 3/4	22 3/4	—	15 1/2	21 1/8	22	34	47	8	42
KA-6-1	1	1 1/2	1/2	3/4	—	6	14	21	25	—	16 1/2	21 1/8	23	38 1/2	52	8	47
KB-8-1	1	3	1/2	3/4	—	5	11 1/2	17	23	—	16 1/2	22 1/4	28	40 1/2	54 1/2	9	48 7/8
KC-10-1	3/4	3	1	3	3/4	4	10	19 1/2	29	35	16 1/2	23 1/2	30	42 1/2	55 1/2	10	49 7/8
KD-12-1	3/4	3	1	3	3/4	6	13	22 1/2	32	39	16 1/2	23 1/2	30	48 1/2	54 1/2	10	48 7/8
KE-15-1	3/4	4	1	4	3/4	6	15	26	37	46	17 1/4	23 1/2	32	53 1/2	56 1/2	12	50 7/8
KF-18-1	3/4	4	1	4	3/4	7 1/2	15 1/2	25 1/2	35 1/2	43 1/2	17	24	32	53	60 1/2	12	54 7/8
KG-22-1	3/4	4	1	4	3/4	8	16	26	35	53	13 1/2	26 1/2	36	61	60 1/2	14	54 7/8

THESE MEASUREMENTS TAKEN FROM UNJACKETED BOILER.

LEFT HAND BOILER



RIGHT HAND BOILER



SPECIFICATIONS

**a RIGHT size
for every need
K-1 SERIES**

Model No	TOTAL CAPACITY SQ. FT.		RECOMMENDED LOAD FEET OF RADIATION		BTU PER HR TO NEAREST THOUSAND		WEIGHT IN POUNDS		CAPACITY	
	STEAM	HOT WATER	STEAM	HOT WATER	NET	GROSS	BOILER	JACKET	GALLONS WATER	POUNDS COAL
									BOILER	HOPPER
KA-4-1	400	640	280	450	67	96	750	65	40	225
KA-6-1	600	960	420	675	101	144	925	75	55	275
KB-8-1	800	1280	560	900	134	192	1125	94	74	315
KC-10-1	1000	1600	700	1125	168	240	1200	98.5	86	450
KD-12-1	1200	1920	840	1350	202	288	1575	104.5	96	525
KE-15-1	1500	2400	1050	1687	252	360	1922	150	122	525
KF-18-1	1800	2880	1260	2025	302	432	2175	165	154	525
KG-22-1	2200	3520	1540	2475	371	528	2250	190	188	585

SQUARE FEET OF HEATING SURFACE EQUAL TO SIX TIMES MODEL NO.

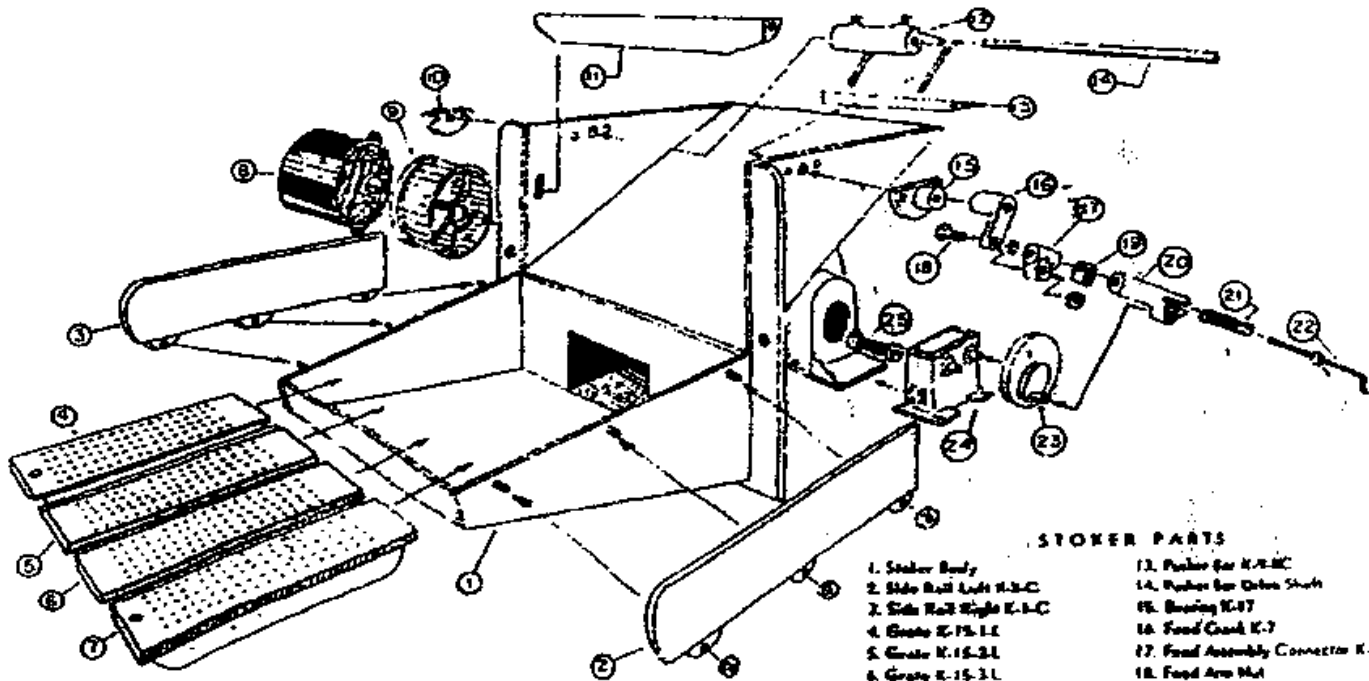
Tankless Water Heater Capacity - 200 G.P.H. (ALL MODELS)

Provision is made for an additional Heater in all Models EXCEPT KA-4-1

KEYSTOKER UNIT

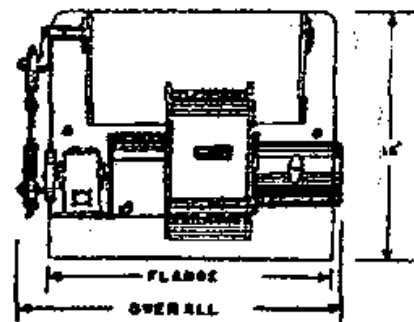
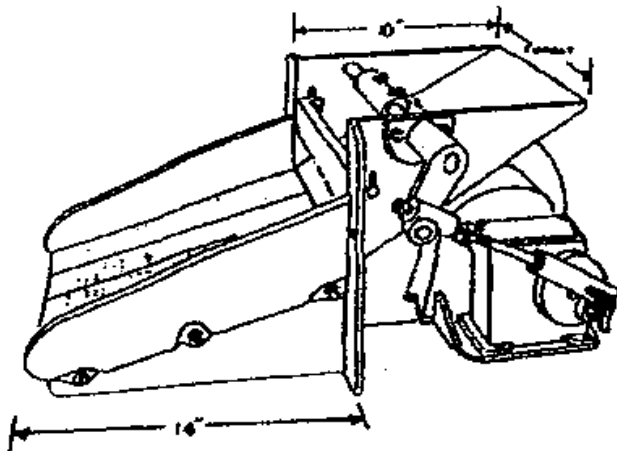
Ratings and Specifications

Stoker Size	No. of Grates	Couplings	14" Grate Width	Flange Width	Overall Width	Throat	Motor H. P.	Gross R. T. U. Thousand	Coal Lb./Hr.	Unit Wt. Lbs.
A	3	5"	9"	13"	20 $\frac{1}{2}$ "	9"	1/6	169	20	110
B	4	6"	12"	16"	21 $\frac{1}{2}$ "	12"	1/6	270	30	126
C	5	6"	15"	19"	21 $\frac{1}{2}$ "	15"	1/6	338	40	132
D	6	8"	18"	22"	26"	18"	1/6	405	48	148
E	7	7 $\frac{1}{2}$ "	21"	25"	27"	20 $\frac{1}{4}$ "	1/4	500	60	164
F	8	7 $\frac{1}{2}$ "	24"	28"	29"	23 $\frac{1}{4}$ "	1/4	585	70	180
G	9	7 $\frac{1}{2}$ "	27"	30 $\frac{1}{8}$ "	30 $\frac{1}{8}$ "	26 $\frac{1}{8}$ "	1/4	NT	85	196



STOKER PARTS

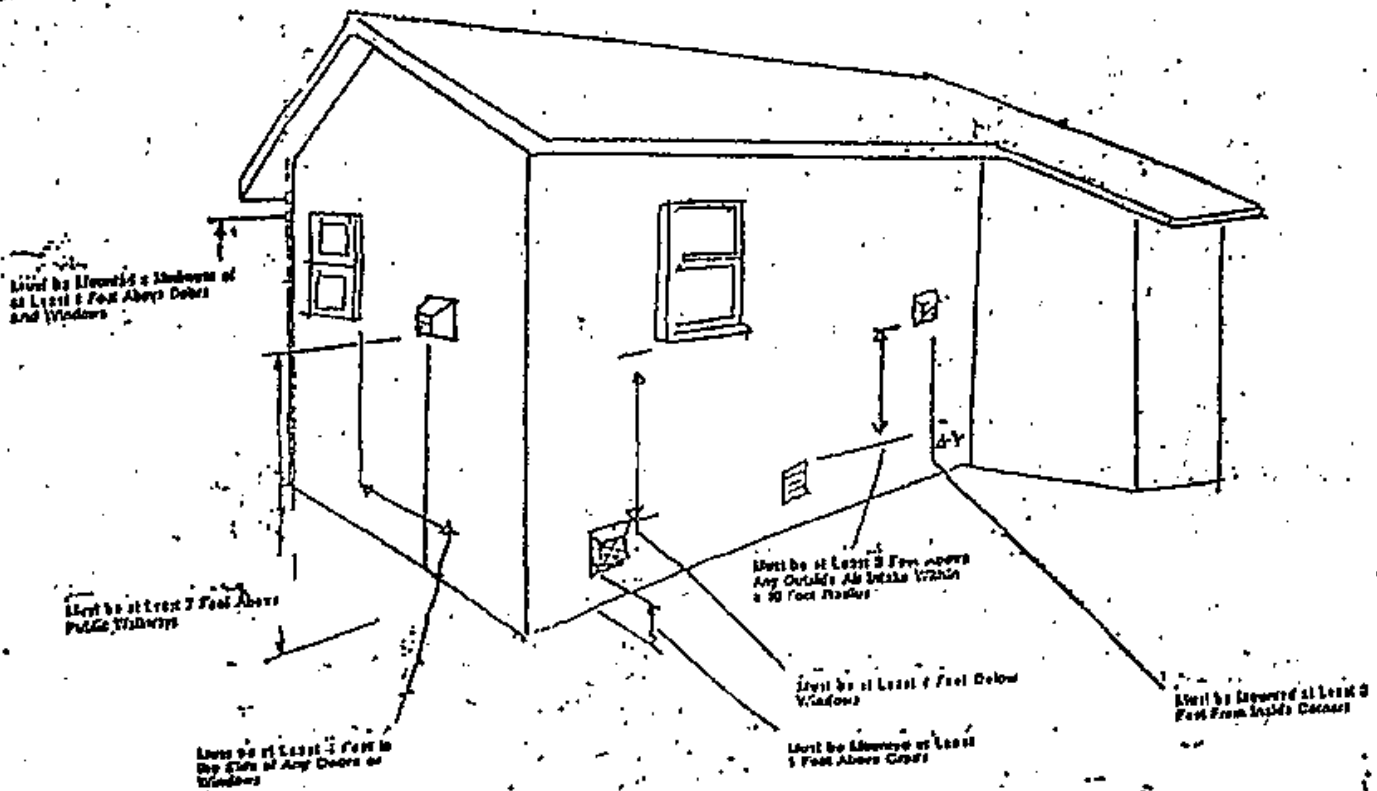
- | | |
|---------------------------------|---------------------------------|
| 1. Stoker Body | 13. Pusher Bar K-18C |
| 2. Side Rail Left K-18C | 14. Pusher Bar Drive Shaft |
| 3. Side Rail Right K-18C | 15. Bearing K-17 |
| 4. Grate K-15-1E | 16. Feed Cook K-7 |
| 5. Grate K-15-2L | 17. Feed Assembly Connector K-6 |
| 6. Grate K-15-3L | 18. Feed Arm Nut |
| 7. Grate K-15-4L | 19. Feed Arm Adjusting Nut K-1 |
| 8. Motor | 20. Feed Latch K-12 |
| 9. Blower Motor | 21. Feed Spring |
| 10. Bearing K-19 | 22. Feed Bolt |
| 11. Throat Strap K-18 | 23. Drive Wheel K-5 |
| 12. Pusher Bar Drive Yoke K-18B | 24. Gear Bar K-14 |
| | 25. Coupling |



VENT TERMINATOR LOCATION

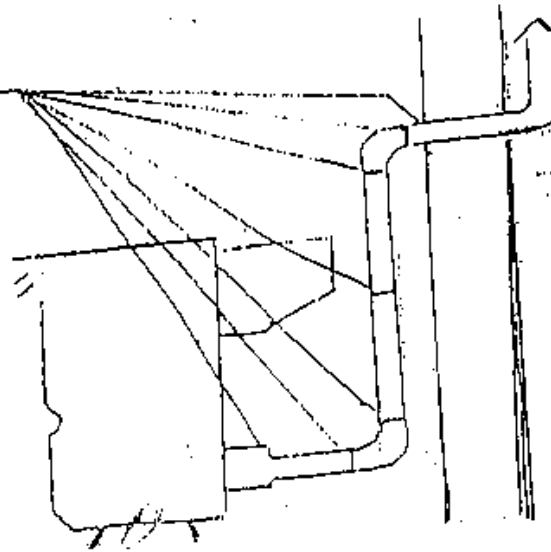
Vent Terminator may not be located:

1. Less than 1' above grade
2. Above or within 3' horizontally of oil tank or gas meter.
3. Closer than 3' to inside corner of home.
4. Closer than 1' from any opening that gases could re-enter home.
5. Less than 4' below windows.
6. Less than 1' horizontally of door or window.
7. Less than 3' above any forced air inlet located within 10'.
8. Less than 7' above grade when adjacent to public walkways.



IMPORTANT

Seal all joints



OUTSIDE GRADE

When it becomes necessary to run your exhaust pipe inside home as pictured, every joint must be sealed with a high temperature silicone or equivalent to prevent fumes from escaping into home.

All doors, hopper, and stove unit must be sealed completely on direct vent boilers.

DIRECT VENT

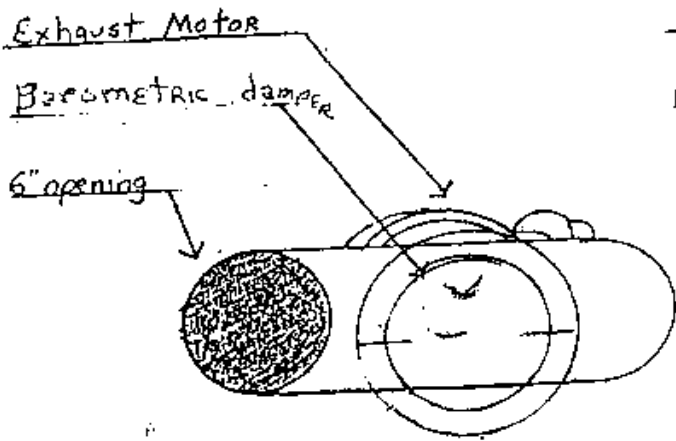
MAINTENANCE:

1. Motor: Inspect and oil motor at least once a year - motor should rotate freely.
2. Wheel: Inspect venter and exhaust wheel at least annually to thoroughly clean any soot, ash, dust, or coating which may inhibit either rotation or air flow.
3. Vent System: Inspect all vent connections annually for looseness, evidence of corrosion and for flue gas leakage. Replace seal or tighten pipe as necessary.

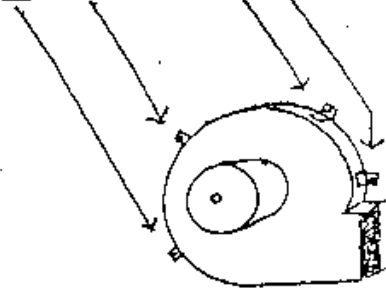
It may be necessary to clean exhaust system and stove pipe during heating season. Remove hanging baffle above 6" exhaust outlet inside stove. Brush pipe in circular motion and vacuum stove pipe. To clean exhaust motor and radial fan blade, remove 4 screws on mounting bracket of exhaust fan and clean fan and housing.

During annual maintenance, the 1/2" tube on safety fume switch must be cleaned out by vacuuming or by use of a small brush. Vacuum or brush from inside of stove.

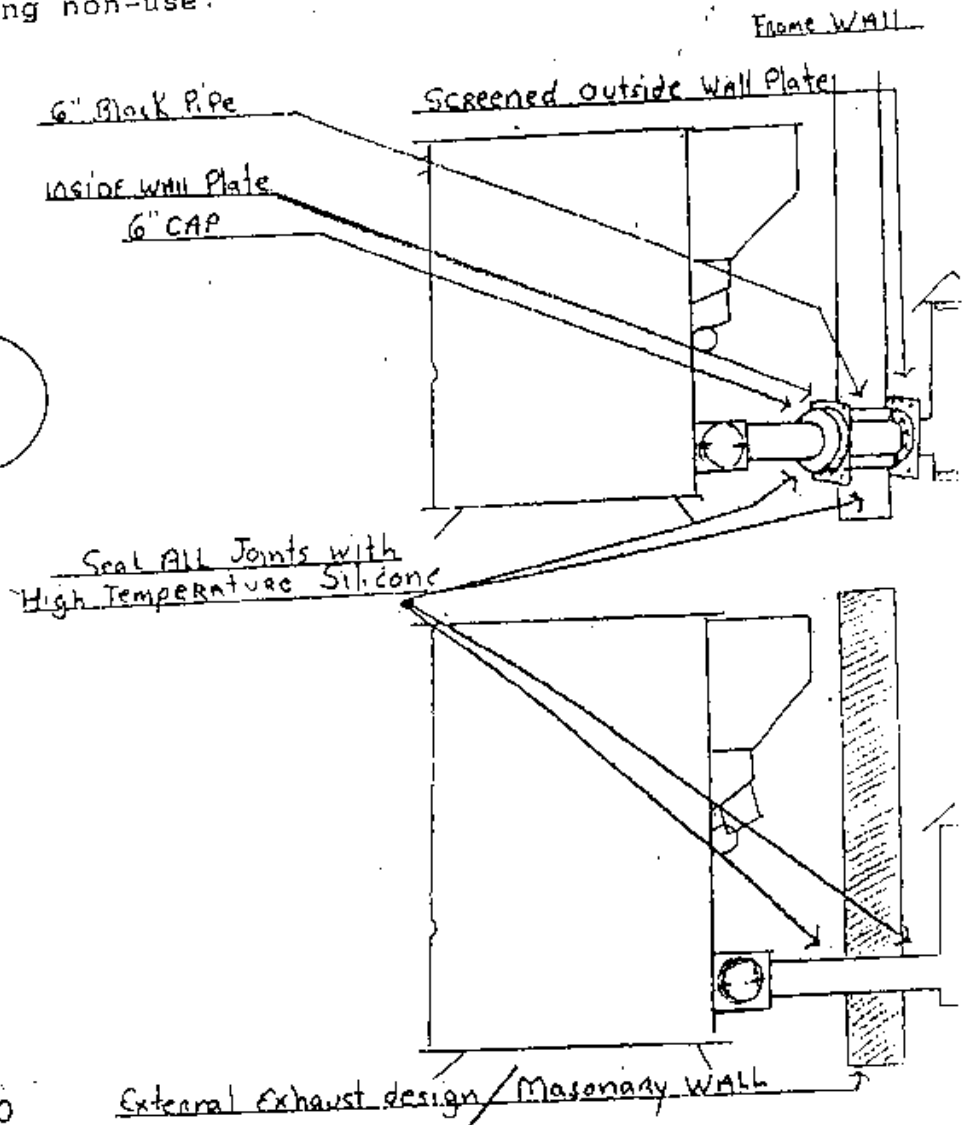
It is most important to perform the annual maintenance at the end of heating season. Residue left on fan blade and exhaust system may cause rapid deterioration during non-use.



Remove 4 screws to clean fan blades + housing



Exhaust Motor



KEYSTONE



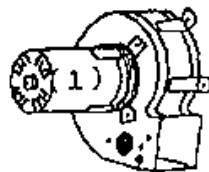
AUTOMATIC — COAL OR OIL FIRED
HOT WATER OR STEAM BOILER UNITS
FORCED WARM AIR FURNACES

MANUFACTURING CO.

PHONE: 385-3873 — R. D. 1, SCHUYLKILL HAVEN — PENNSYLVANIA 17972

DIRECT VENT COMPLETION KIT

1. Exhaust Motor
2. Exhaust System
3. 4" Stainless Steel Pipe
4. 6" Cap
5. Inside Plate
6. 6" 24 Ga. Black Pipe
7. Outside Plate
8. 4" Tee
9. 4" Chimney Cap



MODEL NO.
A082

SHADED POLE

G.F.M. 70

AMPS .95

115 V. 60 HZ.

3000 RPM 1 SPEED

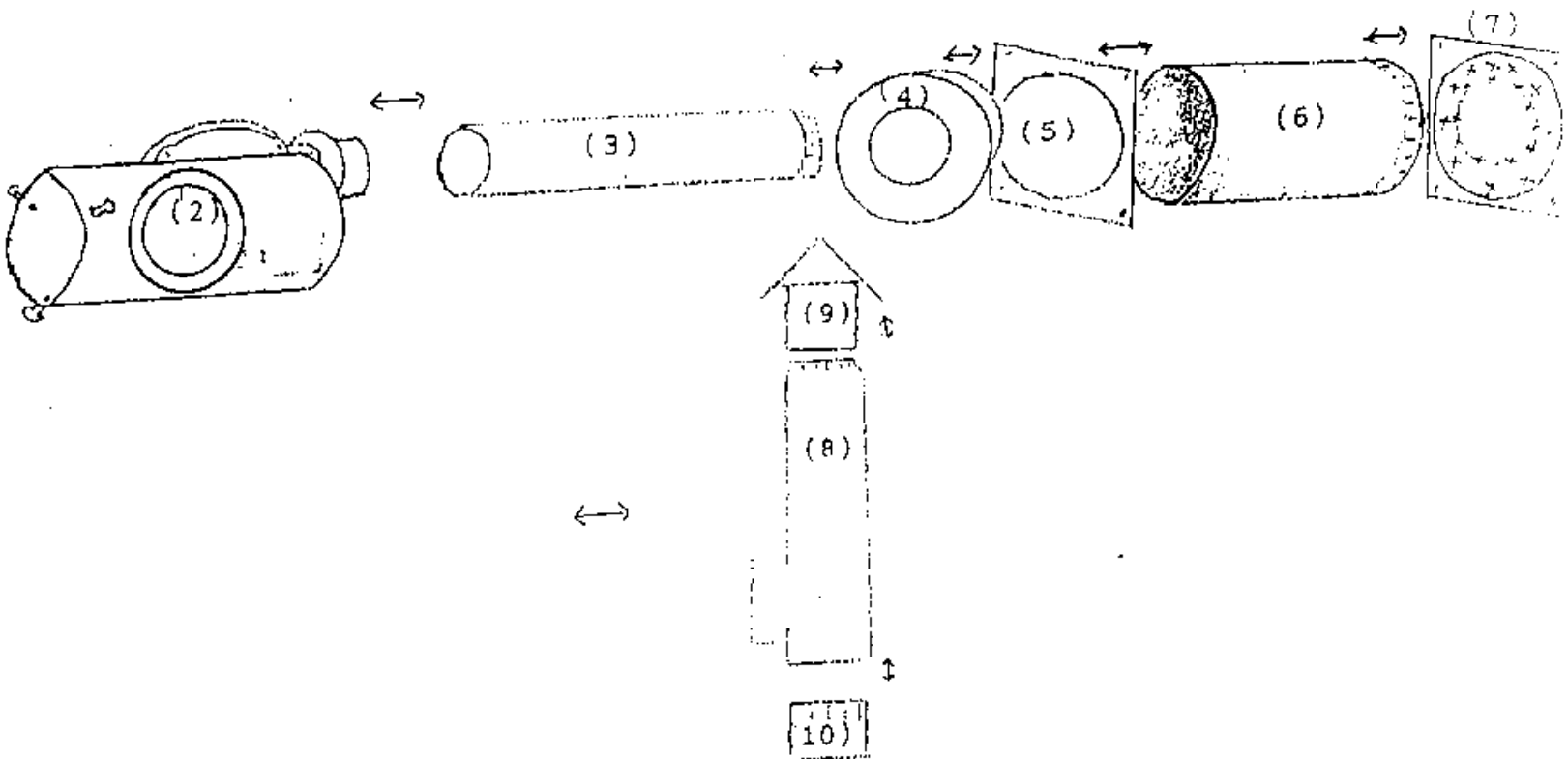
ROTATION-CWSE

THERMALLY PROTECTED

VENTILATION-OPEN

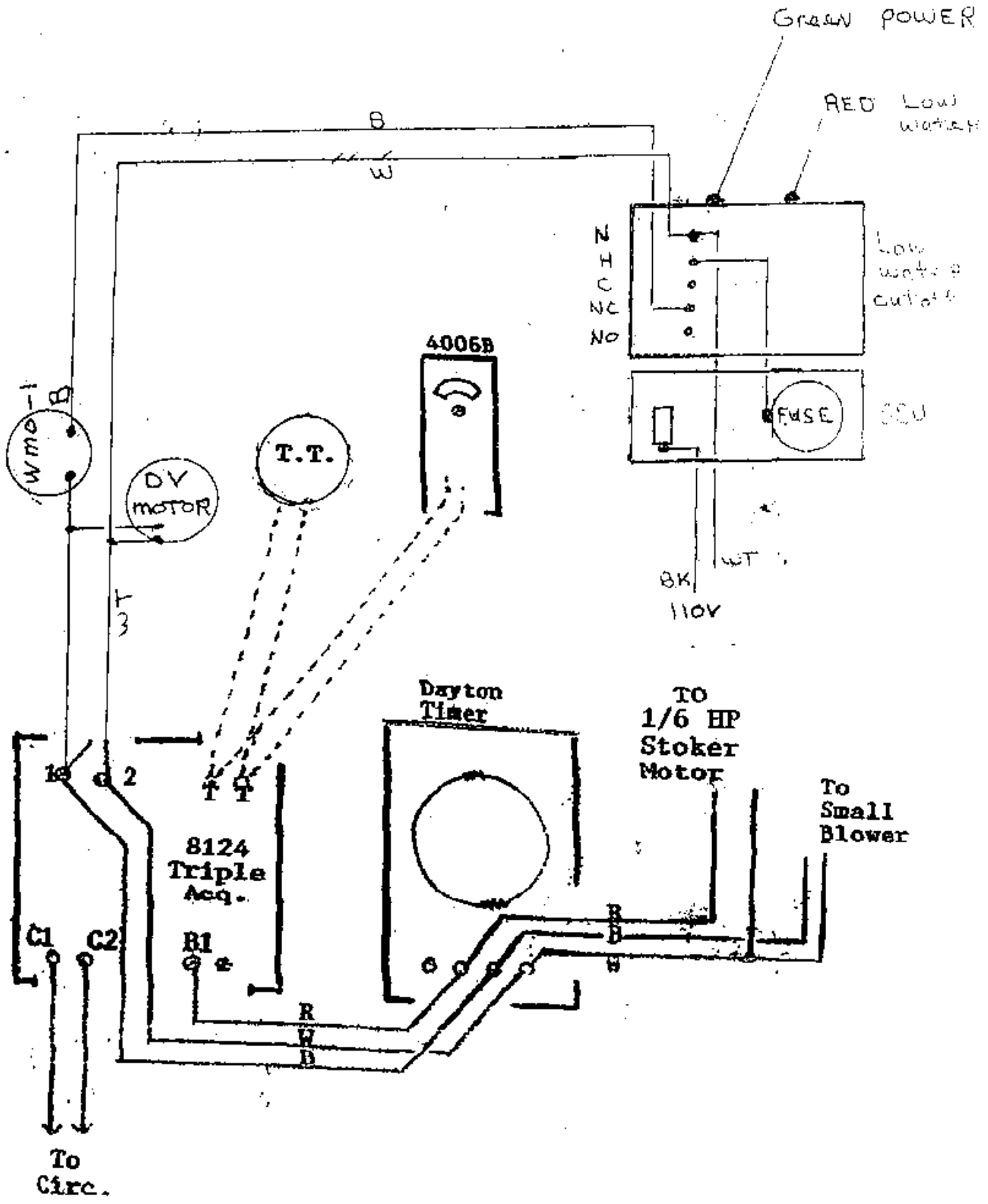
SLEEVE BEARING

WHEEL 4-3/4 X 1/2



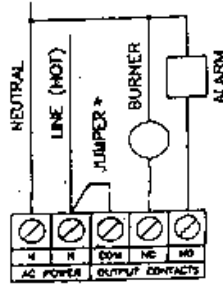
9/06

Direct vent COAL HOT WATER



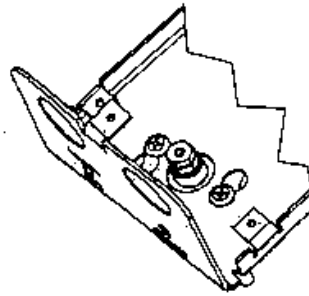
LWCO WIRING DIAGRAM USING
BURNER CIRCUIT POWER
SOURCE

FIG. 6



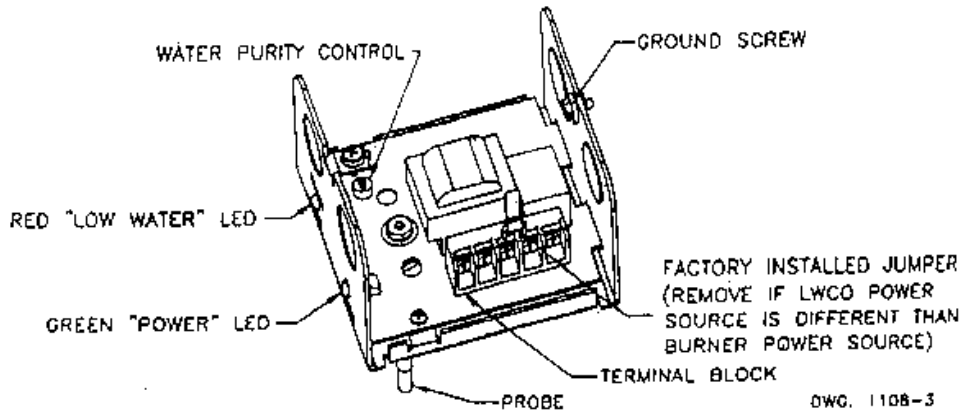
*Factory Installed

CONTROL UNIT MOUNTED ON PROBE
FIG. 2



DWG. #1108-2

LWCO
FIG. 3



INSTALLATION

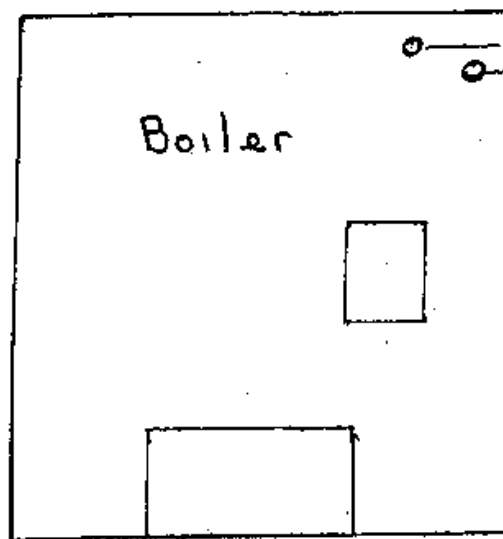
IMPORTANT NOTES FOR PROBE INSTALLATION:
Apply a small amount of pipe sealant to external threads of the probe.

CAUTION: DO NOT use teflon tape!

1. Be sure the probe is installed above the minimum safe water level, as previously determined from the boiler manufacturer's literature.
2. Be sure the probe extends into the boiler cavity so that contact with the water is made.
3. Be sure the exposed portion of the stainless steel probe is a minimum of 1/4" from any grounding surface inside the boiler to prevent the probe from shorting (see Fig. 1).

Control Unit Mounting onto Probe (See Fig. 2):

1. Tighten the probe into the tapped location of the boiler with a wrench, using the bushing flats provided.
2. Make sure the heads of the two mounting screws in the probe bushing are loosened approximately 1/8" from the bushing surface.
3. Then remove the first lock washer/nut from the probe threads.
4. Orient the slotted holes in the control unit over the heads of the mounting screws of the probe and turn control unit counter-clockwise so that the ends of the slots are fully under the mounting screw heads. Tighten mounting screws.
5. Replace the lock washer/nut onto probe and tighten.



trippla
L8124A
LNA1203
Low
WATER

SAFETY

THE BURNING OF ALL FOSSIL FUELS GENERATES CARBON MONOXIDE GASES. CARBON MONOXIDE GASES ARE TOXIC, CAN CAUSE SICKNESS, CAN BE FATAL.

To prevent toxic carbon monoxide gases from entering the home, certain precautions must be taken.

Ash tub must be emptied on a regular basis to prevent ashes from overflowing into ash pit area. Excessive ash accumulation may impede air flow to chimney, preventing gases to be drawn up chimney.

Fire door and ash door must be closed at all times during normal operation.

It is necessary to keep some coal in hopper while stove is in operation.

In most applications it is sufficient to clean stove and stove pipe twice during the heating season. However, under extreme weather conditions, or high demand on stove running periods, the stove and stove pipe may need more frequent cleaning. Clean as often as necessary.

CAUTION ASH PAN IS HOT - ALWAYS USE GLOVES TO REMOVE ASH PAN

Before removing ash pan, turn switch off, or pull power cord plug from 110V outlet. Open ash door. Use a good pair of gloves, to remove ash pan. Place ash pan on non-combustible surface. Slide an empty ash pan into stove. Close ash door. Turn switch on or plug power cord back into 110V outlet.

ON DIRECT VENT MODELS

After removing ash pan, using long brush supplied with stove. Reach brush straight back into 6" exhaust pipe and with a circular motion, sweep brush around inside of pipe. Sweep excess toward bottom of stove and remove or vacuum dust out of stove. This procedure may only be required once or twice a month during heating season. Place empty ash pan into stove and turn switch on or plug power cord into 110V outlet.

Fan blade and fan blade chamber may have to be cleaned several times during the heating season. (See cleaning instructions)

The 4" exhaust pipe going through outside wall of home should also be cleaned when fan chamber is being cleaned.

If 4" exhaust pipe is not going straight out through outside wall and 4" pipe is in a vertical position to access an area above outside grade, the 4" elbow is a likely location for dust to accumulate and restrict exhaust air flow to outside of home. A 4" tee may also be used in place of a 4" elbow. This will allow the bottom of tee to be used as a collection point (out of the flow of exhaust gases) providing an easier access for cleaning and less chance for restriction or blockage.

IT IS ESSENTIAL that every 4" pipe joint or connection be sealed with a high temperature silicone or equivalent. All adjustable joints on elbows must also be sealed with silicone. FAILURE TO SEAL ALL JOINTS could allow carbon monoxide to leak in to home.