INSTALLATION, OPERATION AND MAINTENANCE MANUAL

OIL FIRED WARM AIR FURNACES

HIGH BOY MODEL HTL

DOWNFLOW MODEL WTL

ALL INSTALLATIONS MUST MEET ALL LOCAL, PROVINCIAL AND STATE CODES WHICH MAY DIFFER FROM THIS MANUAL.

Olsen
Heating & Cooling Products

ETLM LISTED

Airco
Heating & Cooling Products

NRTL /C

ECR International Ltd.
Olsen Division

Read this complete manual before beginning installation. These instructions must be kept with the furnace for future reference.

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TABLE 1 - GENERAL SPECIFICATIONS FOR OIL WARM AIR FURNACE

TYPE OF UNIT	MODEL	INPUT U.S. G.P.H.	OUTPUT BTU/HR	NOZZLE DELAVAN	BECKETT AF OIL BURNER		AERO HF-US OIL BURNER		WAYNE HSR OIL BURNER			AIR FILTER	
					Burner Model No.	Burner Head	Burner Model No.	Burner Head	Burner Model No.	Burner Head	O.C.D.S.	Type	Size Inches
HIGH BOY (M.F.)	80 C (T)	0.65	79,000	80°A (HOL)	AF 65 XN	F3	N/A	N/A	HSR	1	1	Perm.	1-16x25x1
	90 C (T)	0.75	90,000	80°A (HOL)	AF 65 XN	F3	N/A	N/A	HSR	1	1	Perm.	1-16x25x1
	100 C (T)	0.85	101,000	80°A (HOL)	AF 65 XN	F3	N/A	N/A	HSR	1	1	Perm.	1-16x25x1
	120 C (T)	1.00	119,000	60°A (HOL)	AF 65 XN	F3	N/A	N/A	HSR	2	1	Perm.	1-16x25x1
COUNTER FLOW (M.F.)	80 A/H	0.65	78,000	80°A (HOL)	AF 65 XN	F3	HF-US-2	AFC-2	HSR	1	1	Disp.	2-15x20x1
	90 A/H	0.75	89,000	80°A (HOL)	AF 65 XN	F3	HF-US-2	AFC-2	HSR	1	1	Disp.	2-15x20x1
	100 A/H	0.85	100,000	80°A (HOL)	AF 65 XN	F3	HF-US-2	AFC-2	HSR	1	1	Disp.	2-15x20x1
	105 A/H	* 0.90	107,000	80°A (HOL)	AF 65 XN	F3	HF-US-2	AFC-2	HSR	2	1	Disp.	2-15x20x1

SUFFIX "S" DENOTES BCL MODELS ONLY AND "H" DENOTES USE IN CANADA
COMBUSTION CHAMBER # FOR ALL MODELS IS 9200-C
M.F. INDICATES THAT THE UNIT MAY BE MULTI-FIRED IN THE GIVEN MODEL RANGE
O.C.D.S - OFF CYCLE DAMPER SETTING
* FOR .90 G.P.H. INCREASE PUMP PRESSURE TO 120 P.S.I.
SUFFIX "T" INDICATES 5 TON AIR CONDITIONING CAPACITY

NOTES:
FLUE PRESSURE SHOULD BE -0.02" WC FOR ALL MODELS
AIR TUBE INSERTION LENGTH IS 6-9/16" (THIS INCLUDES THE FLAME RETENTION HEAD, AND CERAMIC HEAD OF THE BML MODELS)
STATIC PLATE DIAMETER 2-3/4" FOR AF BURNER WITH F3, F6, F12, HEAD; 3-3/8" WITH F0 HEAD; 3-3/8" FOR HF-US, 3" FOR HSR.
WHEN FIRING AT .50 GPH, USE A 7 TO 10 MICRON OIL FILTER

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

Please read these instructions completely and carefully before installing and operating the furnace.

The installation of the equipment shall be in accordance with the regulation of the authorities having jurisdiction and the latest edition C.S.A Standards B-139, "INSTALLATION CODE FOR OIL BURNING EQUIPMENT". The unit is an oil fired, multiple rated, forced air furnace which has been approved by the Canadian Standards Association and listed with The Energy Testing Laboratories of Maine for operation with No. 1 (Stove) or No. 2 (Furnace) Oil.

For recommended installation practice in the UNITED STATES, reference should be made to local codes, authorities having jurisdiction and the latest edition of The National Fire Protection Association Standard for the "INSTALLATION OF OIL BURNING EQUIPMENT". NFPA No. 31.

Regulations of these authorities take precedence over the general instructions provided on this installation manual.

CAUTION: DO NOT USE GASOLINE, CRANK CASE OIL, OR ANY OIL CONTAINING GASOLINE.

HEAT LOSS

The maximum hourly heat loss for each heated space shall be calculated in accordance with the procedure described on the manuals of the Heating, Refrigeration and Air Conditioning Institute of Canada, or by any other method which is suitable for local conditions, provided the results obtained are in substantial agreement with and not less than those obtained using the procedure described in the manual.

In the United States Manual J. titled, "Load Calculation" published by the Air Conditioning Contractors of America, describes a suitable procedure for calculating the maximum hourly heat loss.

LOCATION OF UNIT

The furnace should be located such that the flue connection to the chimney is short and direct and consists of as few elbows as possible. The unit must also be well centralised with respect to the heat distribution system. The high boy model may be installed on a combustible floor. A sub-base is available for the downflow model when installation is required on a combustible floor. Refer to the installation Figure 1. The minimum installation clearance to surrounding combustible construction is listed in Table 2.

A - Clearance from the top of the warm air plenum or top of furnace to combustible construction directly above the unit and does not include any air ducts.

P - Clearance from plenum of the unit.

F - Clearance from the furthest forward projection on the front of the unit.

R - Clearance from the rear of unit.

S1 - Clearance from the side of unit.

S2 - Clearance from control side of unit.

FP - Clearance from the flue pipe of unit.

WITH COOLING

If the furnace is used in conjunction with air conditioning, the furnace shall be installed in parallel with or on the upstream side of the evaporator coil to avoid condensation in the heating element. In a parallel installation, the dampers or air controlling means shall be such as to prevent chilled air from entering the furnace. If the dampers are manually operated, they must be provided with means to prevent operations of either unit unless

TABLE 2 - RECOMMENDED MINIMUM INSTALLATION CLEARANCE (INCHES) **

MODEL	TYPE	A	P	F	R	S1	S2	FP	ENCLOSURE
80, 90, 100, 120	High Boy	1	1	24	1	1	1	9	Alcove
80, 90, 100, 105	Counterflow	1	1	6	1	1	1	9	Closet

* For Canadian Model FP may be 9 inches

** NOTE: Recommended Minimum Clearance does not include the clearance required to replace the filter or to do maintenance.

the dampers are in full heat or cool position. The air heated by the furnace shall not pass through a refrigeration unit unless the unit is specifically approved for such service.

Ensure that the blower speed is increased, to compensate for the higher static pressure in the duct resulting from the air conditioning coil. Refer to pages 10 to 20 for recommended wiring and electrical connection of the air conditioning controls.

COMBUSTION AIR

If the furnace is installed in a closet or utility room, two openings must be provided connecting to a well ventilated space (full basement, living room or other room opening thereto, but not a bedroom or bathroom). One opening shall be located above the level of the upper vent opening and one opening below the combustion air inlet opening in the front of the furnace. Each opening shall have a minimum free area of 1-1/2 square inches per 1,000 Btu/h of total input rating of all appliances installed in the room.

For furnaces located in buildings of unusually tight construction, such as those where weather stripping and storm sashed windows are used and where basement windows are also weather stripped, a permanent opening communicating with a well ventilated attic or with outdoors shall be provided, using a duct if necessary. This opening shall have a free area of 1-1/2 square inches per 1,000 Btu/h of total input rating of all appliances to be installed. When a furnace is installed in a full basement, infiltration is normally adequate to provide air for combustion and draft operation.

VENTING

The flue pipe should be as short as possible with horizontal pipes sloping upward toward the chimney at least one quarter inch to the foot. The flue pipe should not be smaller in cross sectional area than the flue collar on the furnace. Extend the flue pipe into the chimney so that it is flush with the inside of the flue lining. Seal the joint between the pipe and the lining. The chimney should have its outlet at least two feet above the highest point of a peaked roof. All unused chimney openings should be closed. Chimneys must conform to local, provincial or state regulations or in the absence of such regulations, to the requirements of the National Building Code.

Note: The furnace has been approved for use with type L vent or equivalent.

CAUTION: The furnace must be connected to a flue having sufficient draft at all times to ensure safe and proper operation of the appliance.

Recommended flue outlet pressure is -0.02 in. w.c. (to be measured upstream of the furnace draft regulator).

The flue pipe must not pass through any floor or ceiling, but may pass through a wall where provision has been made for suitable protection against possible fire hazard. Refer to the latest edition of C.S.A. Standard B-139 for rules governing the installation of fuel burning equipment. In the United States, refer to the latest edition of NFPA31 for regulations governing the installation of oil burning equipment.

OPTIONAL SIDE WALL POWER VENTER

These furnaces are also approved for use with the Field Controls Co. SWG II-5 power venter. For installation instructions refer to the manual supplied with the venter. The power venter may be purchased at most HVAC supply houses.

BAROMETRIC DAMPER CONTROL.

This control (or draft regulator) automatically maintains a constant negative pressure in the furnace to obtain maximum efficiency. It ensures that proper pressures are not exceeded. If the chimney does not develop sufficient draft, the draft control cannot function properly. The draft regulator, when installed should be in the same room or enclosure as the furnace and should not interfere with the combustion air supplied to the burner. The control should also be located near the furnace flue outlet and installed according to the instructions supplied with the regulator. The flue outlet pressure (measured between the furnace and draft regulator) should be set to -0.02 in. w.c.

FAN AND LIMIT CONTROL

The L6064A temperature sensitive fan switch is actuated by a helical bimetal sensing element enclosed in a metal guard and controls the circulating air blower. This provides a delay between the burner ignition and blower start up to eliminate excessive flow of cold air when the blower comes on. Blower shutdown is also delayed to remove and residual heat from the heat exchanger and improve the annual efficiency of the furnace. Fan settings of 120° F to 130° F (50° C to 55° C) and fan settings of 90° F to 100° F (32° C to 37°C) will usually be satisfactory.

The L4064W temperature sensitive fan switch contains a heater-wrapped bimetal to actuate the fan switch independent of the temperature at the helical sensing element. The time from ignition, to the blower on function is approximately 30 seconds. If after 1 minute, the blower has not come on, replacement of the control may be necessary. The blower shutdown is the same as noted for the L6064A control.

The limit switch performs a safety function and operates to shut off the burner in case of overheating or excessive temperatures. The limit control is thermally

operated and automatically resets. The limit control is factory installed, pre-set and is not adjustable.

The limit control and fan control are incorporated in the same housing and are operated by the same thermal element.

The down flow furnace utilises an additional auxiliary limit control which is an automatic reset type.

ELECTRICAL CONNECTIONS

The furnace has been approved by the Canadian Standards Association and listed with the Energy Testing Laboratory of Maine. It is factory wired for minimum wiring on installation. All wiring should be done in accordance with C.S.A. Standard C22.1, Canadian Electrical Code, Part 1 or with local codes, where they prevail. In the United States, the wiring must be in accordance with the NFPA National Electrical Code (NFPA 70) and local codes and regulations.

A separate electric line should be run directly from the main house panel to the leads in the furnace junction box. A fused manual switch should be installed in the line.

For High Boy Models 80, 90, 100, 120 the electrical rating is 120V, 60Hz, 12A, 16A required for models with suffix "T".

For Counterflow Models 80, 90, 100, 105 the electrical rating for belt drive units is 120V, 60Hz, 12A.

Connect the thermostat wires to the terminal in accordance with wiring diagrams within this manual. Install the thermostat according to directions furnished with it. Select a good location which will measure true air temperature. Locate it on an inside wall away from drafts, in the room having the greatest exposure.

Refer to the wiring diagram herein, pages 10 to 20.

HUMIDIFIER

A humidifier is optional equipment. Details for installations and assembly instructions are enclosed with the humidifier. The humidifier should never be installed such that water droplets come into contact with the heat exchanger.

PIPING INSTALLATION

The entire fuel system should be installed in accordance with the requirement of C.S.A., Standard B139, and local regulations. Use only approved fuel oil tank, piping, fitting and oil filter.

In the United States the installation must be in accordance with NFPA Standard No. 31 and local codes and authorities.

Install the oil filter as close to the burner as possible. For further details of the oil supply tank and piping requirements, please refer to the illustrations in the Oil Burner Manual shipped with the furnace.

* OIL BURNER NOZZLES

The furnace has been certified for a multiple firing rate (input). By replacing the oil burner nozzle, flame retention head, static plate and adjusting the temperature rise, the furnace may be fired at different rates, refer to Table 1, and the rating plate on the furnace to determine the allowable, input range, nozzle size (head size) and type for each unit. When the furnace is fired at .50 GPH, use a 7 to 10 micron filter in the fuel supply line.

* OIL BURNER ADJUSTMENT

The burner air supply is adjusted to control the fuel-to-air ratio to obtain the correct combustion as shown by smoke tests. Too little air makes the flames "soft" and "sooty" and this clogs the furnace with soot. Too much air gives a bright roaring fire which wastes fuel by its inefficiency. This furnace operates best at No. 1 smoke spot on Bacharach Scale.

* AF AND HF-US BURNERS

Adjust air shutter by loosening lock screws and moving the air shutter and if necessary the bulk air band.

* HSR BURNERS

Adjust air supply on burner by loosening screw on indicator located near the bottom left side of the burner. Turn clockwise to increase or counterclockwise to decrease the amount of air required for combustion., then tighten the screw. After the furnace has been running for 15 minutes, test the smoke in the flue, ahead of the draft regulator. The smoke spot should not exceed No. 1 on the Bacharach Scale. After the burner adjustment is set, recheck flue pressure at the flue pipe to be sure it is set at -0.02 in. w.c.

In the United States, Becketts "Inlet Air Shut-Off" may be used to increase efficiency. (Part numbers AF/A 5861 or SR/A 5862.)

Note: In some cases nozzle dripping may occur due to use of "Inlet Air Shut-Off".

CAUTION: BEFORE OPERATING THE FURNACE CHECK BURNER ALIGNMENT WITH COMBUSTION CHAMBER. THE END CONE OF THE AIR TUBE MUST BE CENTRE TO THE ACCOMODATING RING PROVIDED IN THE DESIGN OF THE COMBUSTION CHAMBER. ADJUST AS NECESSARY.

* For units equipped with Riello Burners - see page 21.

* BURNER ELECTRODE

Correct adjustment of the electrode tips with respect to each other, to the fuel oil nozzle, and to the rest of the burners is very important.

* AF AND HF-US BURNERS

An electrode gap of 5/32 in. should be maintained with the electrode tips 7/16 in. above the centre of the nozzle and 1/16 in. ahead of the nozzle.

The distance from the front of the end cone to the face of the nozzle should be 1-1/8 in.

Burners with ceramic head, the distance from the front of the head to the face of the nozzle should be 1-3/8".

* HSR BURNER

An electrode gap of 1/8 in. with electrode tips, 1/2 in. above centre of the nozzle and 1/8 in. ahead of the nozzle.

The distance from the front of the end cone to the face of the nozzle should be 7/8 in.

BURNER PRIMARY (SAFETY) CONTROL

The furnace is equipped with a primary combustion control or burner relay which uses a light sensing device (located in the burner housing) and an appropriate thermostat to provide automatic control of the oil heating system. Dust or combustion residuals can, over a long period of time, interfere with proper operation of the light sensing device.

CAUTION: ALL CONTROLS ON THE FURNACE ARE SENSITIVE DEVICES AND SHOULD NOT BE TAMPERED WITH. CALL YOUR SERVICE PERSON.

COMBUSTION CHAMBER

This furnace is equipped with a combustion chamber made of a very high quality refractory. It is positively located in the heat exchanger by a support and stainless steel retaining band or clamp. RECHECK ALIGNMENT OF THE COMBUSTION CHAMBER AND OIL BURNER BEFORE FIRING AS IT IS POSSIBLE FOR THE COMBUSTION CHAMBER TO SHIFT IF THERE HAS BEEN ROUGH HANDLING WHILE IN TRANSIT. When your service person removes the oil burner for inspection or maintenance, he should inspect the combustion chamber for damage or carbon deposits.

CAUTION: DO NOT START THE BURNER UNLESS THE BLOWER ACCESS DOOR IS SECURED IN PLACE.

CIRCULATING AIR BLOWER

BELT DRIVE: If the blower is a belt drive type with a pulley and V-belt arrangement, air delivery and air temperature rise may be varied by adjusting the pulley on the motor see pages 8 and 9. The circulating air blower adjustment must be such as to obtain an air temperature rise specified on the rating plate.. Loosen the set screw in the pulley outer flange, close the pulley to increase speed and decrease air temperature rise; open the pulley to decrease the speed and increase the air temperature rise. Align the motor and blower pulley to minimise noise and belt wear. Check belt tension by flexing belt midway between the pulleys. Correct belt tension permits approximately 1" flexing. Too much tension will cause motor to overload and bearing wear, too little tension will permit belt slippage. The recommended minimum return air temperature is 50°F (10°C).

DIRECT DRIVE: Speed adjustments normally not required as the motor speed will automatically change to accommodate a wide range of duct static pressures. However, should the duct be excessively tight or an air conditioning coil be in the system, a higher speed may be used see pages 10 and 11. Simply change the speed by disconnecting the hot (non-white) lead from the block and reconnect it to another lead.

WARNING: Never connect power leads between windings (non-white leads).

CAUTION: OPEN THE DISCONNECTOR IN THE ELECTRICAL SUPPLY LINE BEFORE REMOVING THE BLOWER ACCESS DOOR, AND DO NOT ATTEMPT TO SERVICE THE FAN OR MOTOR UNLESS THE SWITCH IS OPEN.

MAINTENANCE AND SERVICE

The heat exchanger should be inspected periodically and cleaned if necessary.

* For units equipped with Riello Burners - see page 21.

CAUTION: COMBUSTION CHAMBER FIREPOT MAY BE BRITTLE. USE CARE WHEN INSPECTING AND CLEANING THIS AREA.

If cleaning is necessary, open the disconnect in the electrical supply line, remove the burner. Using a stiff brush with a wire handle, brush off scale and soot inside the drum and flue pipe. To clean the radiator, remove the round covers on the control compartment panel, and carefully cut away the insulation covering the opening with a sharp knife. Loosen the nuts on the radiator cleanouts found directly behind the panel, DO NOT remove the nuts. Remove the covers carefully so as not to break the gaskets. A wire brush can now be used to clean the inside surfaces of the radiator. Brush out all accumulations and use a vacuum cleaner to remove all soot and scale. When replacing the covers, use new gaskets if old gaskets are broken.

The belt drive blower motor and burner motor bearing should be oiled once each heating season, using a good grade SAE 20 oil. Do not over oil the motor. A few drops in each oil cup are sufficient. Blower bearings are permanently lubricated and require no oil. Check belt for wear and tension.

The direct drive blower motor is factory oiled. Under normal operating conditions it does not require oiling for at least the first two years after installation. Oil sparingly as required with two drops of SAE 20 motor oil thereafter. Over oiling may cause premature motor failure.

Air filters should be inspected regularly and replaced at least each heating season. Change more frequently if unusually dusty conditions are encountered. Replace with new filters of the same size as those removed. Do not reverse the old filters and reuse. Where permanent type high velocity filters are supplied, these may be washed and reused. The required filter size and type is shown in Table 1.

Clean and replace flue pipe regularly.

OPERATING INSTRUCTIONS

BEFORE LIGHTING

1. Open all supply and return air registers.
2. Open all valves in oil pipes.
3. Turn on electric power supply

TO LIGHT UNIT

1. Set the thermostat to call for heat. The burner should start.
   NOTE: It may be necessary to press the RESET button on the primary combustion control relay.
2. After a short period of time the blower should start.
3. Set the thermostat down to lowest setting. The burner should stop.
4. The air circulation blower remains in operation as long as the temperature in the furnace is higher than the "FAN OFF" setting on the fan control. If the air at the room registers is uncomfortably high upon blower start up, or shutdown, set the temperature on the fan control to a lower setting.
5. To check the operation of the limit switch, for belt drive units, shut power off to unit and remove the fan belt, for direct drive units disconnect the neutral wire from the motor and isolate it, turn power back on and set the thermostat to call for heat. After three or four minutes of burner operation, the limit control should turn the burner off. Shut power off to the unit, replace fan belt, replace neutral wire, turn power back on. The blower will run until the heat exchanger cools down.

CAUTION: DO NOT ATTEMPT TO START THE BURNER WHEN EXCESS OIL HAS ACCUMULATED, WHEN THE FURNACE IS FULL OF VAPOUR, OR WHEN THE COMBUSTION CHAMBER IS VERY HOT. NEVER BURN GARBAGE OR PAPER IN THE FURNACE, AND NEVER LEAVE PAPER OR RAGS AROUND THE UNIT.

TO SHUT DOWN UNIT

1. Set the thermostat to the lowest possible setting.
2. Set the manual switch (if installed) in the Electrical Power Supply Line to "OFF".
3. If the burner is to shut down for an extended period of time, close the oil valve tightly.

FIGURE 1 SUB BASE ASSEMBLY FOR COUNTERFLOW FURNACE ON COMBUSTIBLE FLOOR

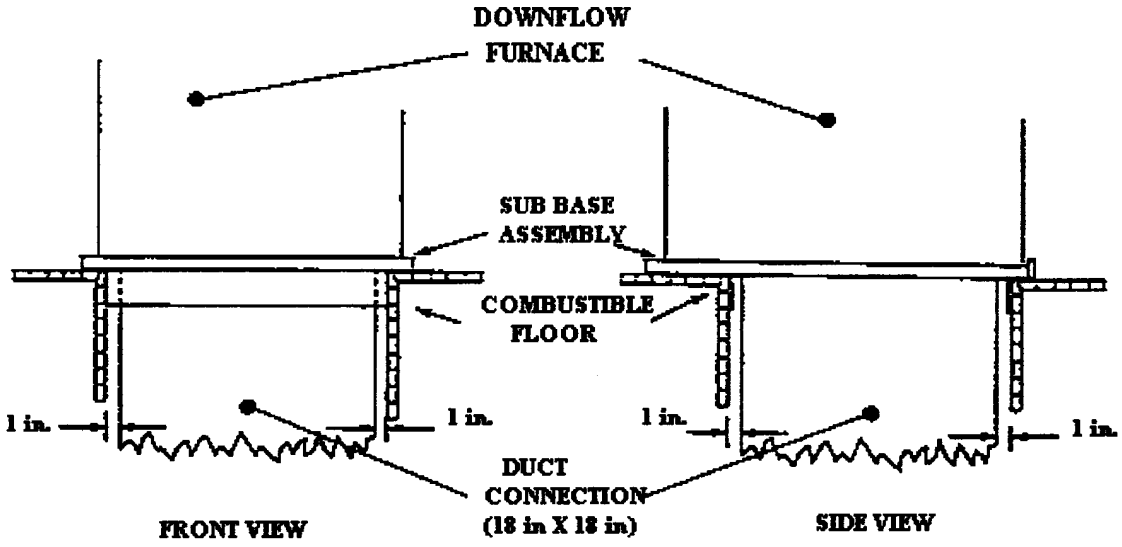
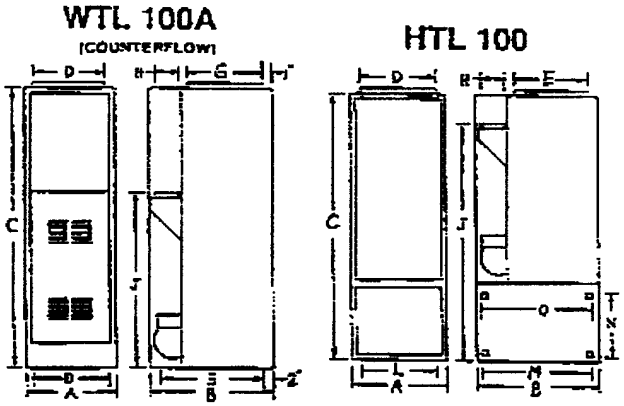


FIGURE 2



HIGHBOY & COUNTERFLOW SPECIFICATIONS

MODEL			BLOWER		EXTERNAL STATIC PRESSURE						COOLING CAPACITY		
					0.20 " W.C.			0.50"W.C.					
			BELT	DIRECT	BELT	DIRECT	MOTOR	BELT	DIRECT	MOTOR	TON	HP	CFM RANGES
HIGHBOY	HTL	80 C	10-10	10-10	3-1/4x6x36	MED-HI	1/2	3-1/4x6x36	MED-HI	1/2	3-4	1/2	1000-1600
		80 C (T)	N/A	12-11T	N/A	LOW	1	N/A	LOW	1	3-4.5	1	1200-1750
		90 C	10-10	10-10	3-1/4x6x36	MED-HI	1/2	3-1/4x6x36	HI	1/2	3-4	1/2	1000-1600
		90 C (T)	N/A	12-11T	N/A	LOW	1	N/A	LOW	1	3-4.5	1	1200-1750
		** 100 C	10-10	10-10	3-1/4x5x35	HI	1/2	3-1/4x5x35	HI	1/2	3-4	1/2	1000-1600
		** 100 C (T)	N/A	12-11T	N/A	LOW	1	N/A	MED	1	3-4.5	1	1200-1750
		120 C	10-10	10-10	3-1/4x5x35	HI	1/2	3-1/4x5x35	HI	1/2	3-4	1/2	1000-1600
		120 C (T)	N/A	12-11T	N/A	LOW	1	N/A	HI	1	3-4.5	1	1200-1750
COUNTERFLOW	WTL	80	10-8	N/A	3-1/4x6x36	N/A	1/3	3-1/2x6x36	N/A	1/3	3-4	1/2	1000-1600
		90	10-8	N/A	3-1/4x6x36	N/A	1/3	3-1/2x6x37	N/A	1/3			
		** 100	10-8	N/A	3-1/4x6x37	N/A	1/3	3-1/2x6x35	N/A	1/2			
		105	10-8	N/A	3-1/4x6x37	N/A	1/3	3-1/2x6x35	N/A	1/2			

** Factory Standard Production.

Note: Clearance (in inches). One side - 1", Other side - 1", Rear - 1", Front - 6", Flue - 9", Plenum - 1".

Note: When WTL is installed on combustible floor - order optional base (Part no. 006000070).

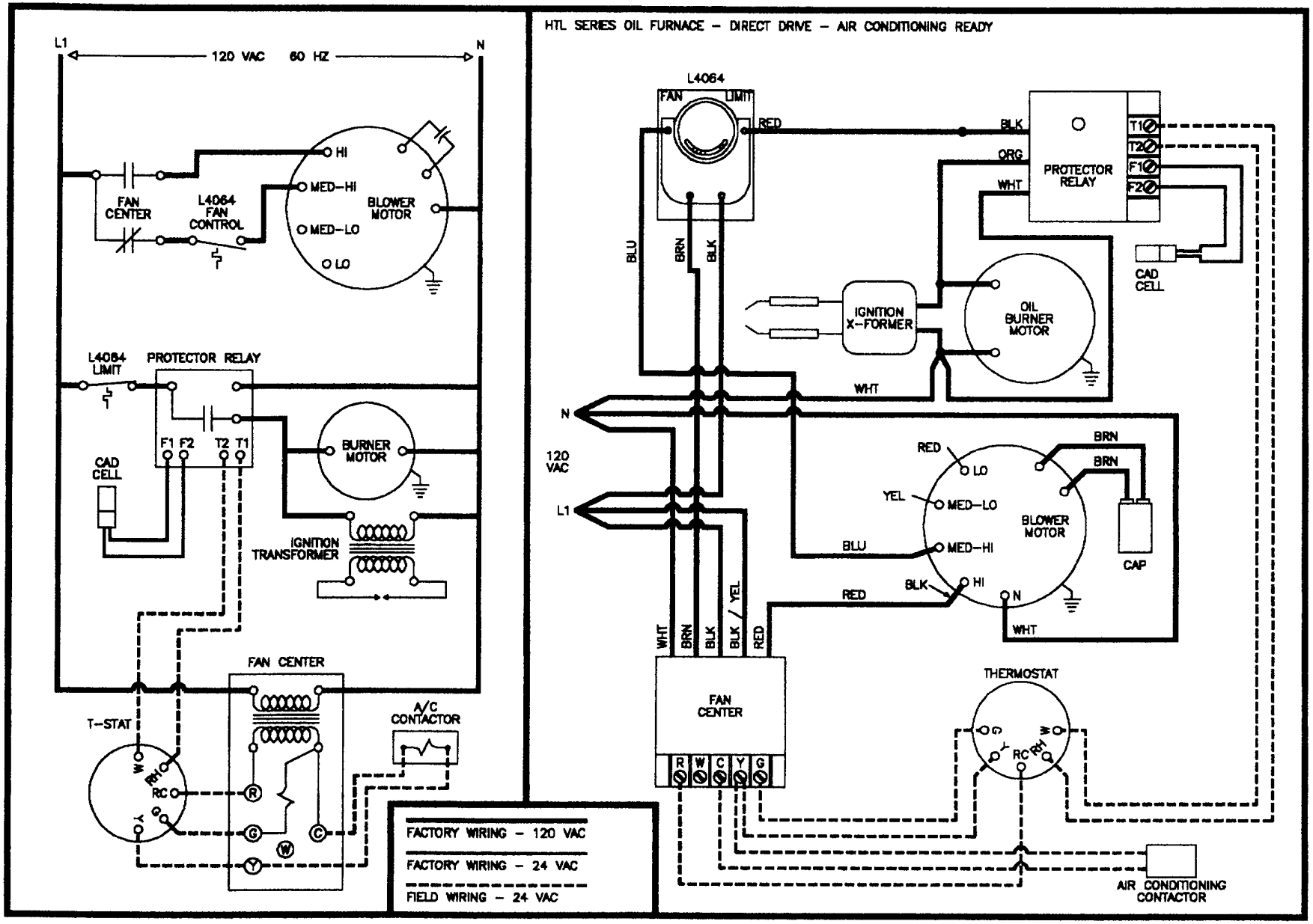
Note: (T) indicates increased air conditioning capacity.

Note: For direct drive, blower must be on HIGH speed in order to get maximum CFM.

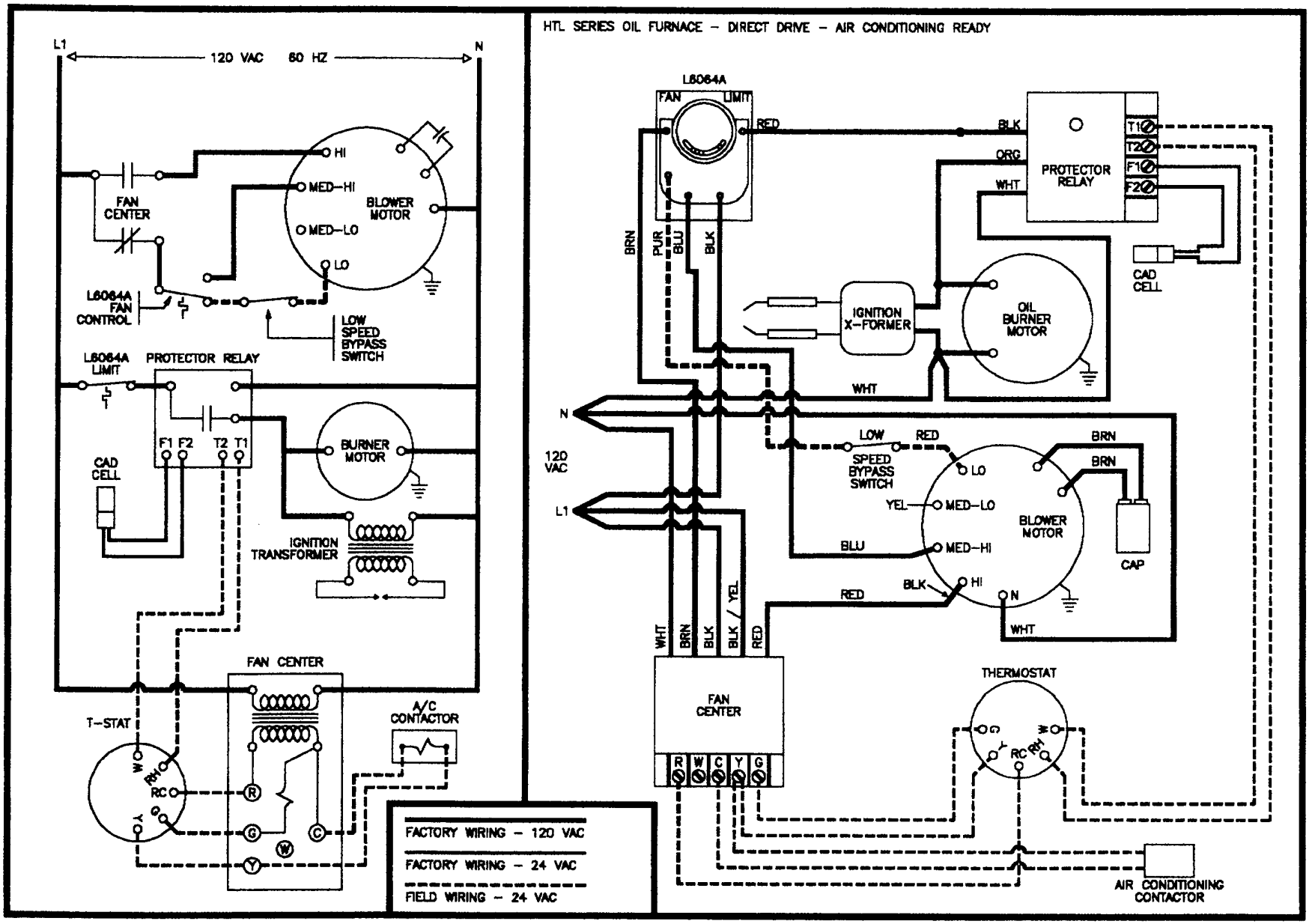
DIMENSIONS (inches) See Figure 2.

Model	Cabinet			Plenum Openings				Flue		Shipping Weight
				Warm Air DxE	Return Air			Dia.	Height	
	Width A	Depth B	Height C		Top DxG	Btm LxM	Side NxO	H	J	
HTL	22	30-3/4	58	20-1/2x20		14x22	16x25	6	55-1/2	270 lbs
WTL	22	29	68	18x18	20x20			6	38-3/4	285 lbs

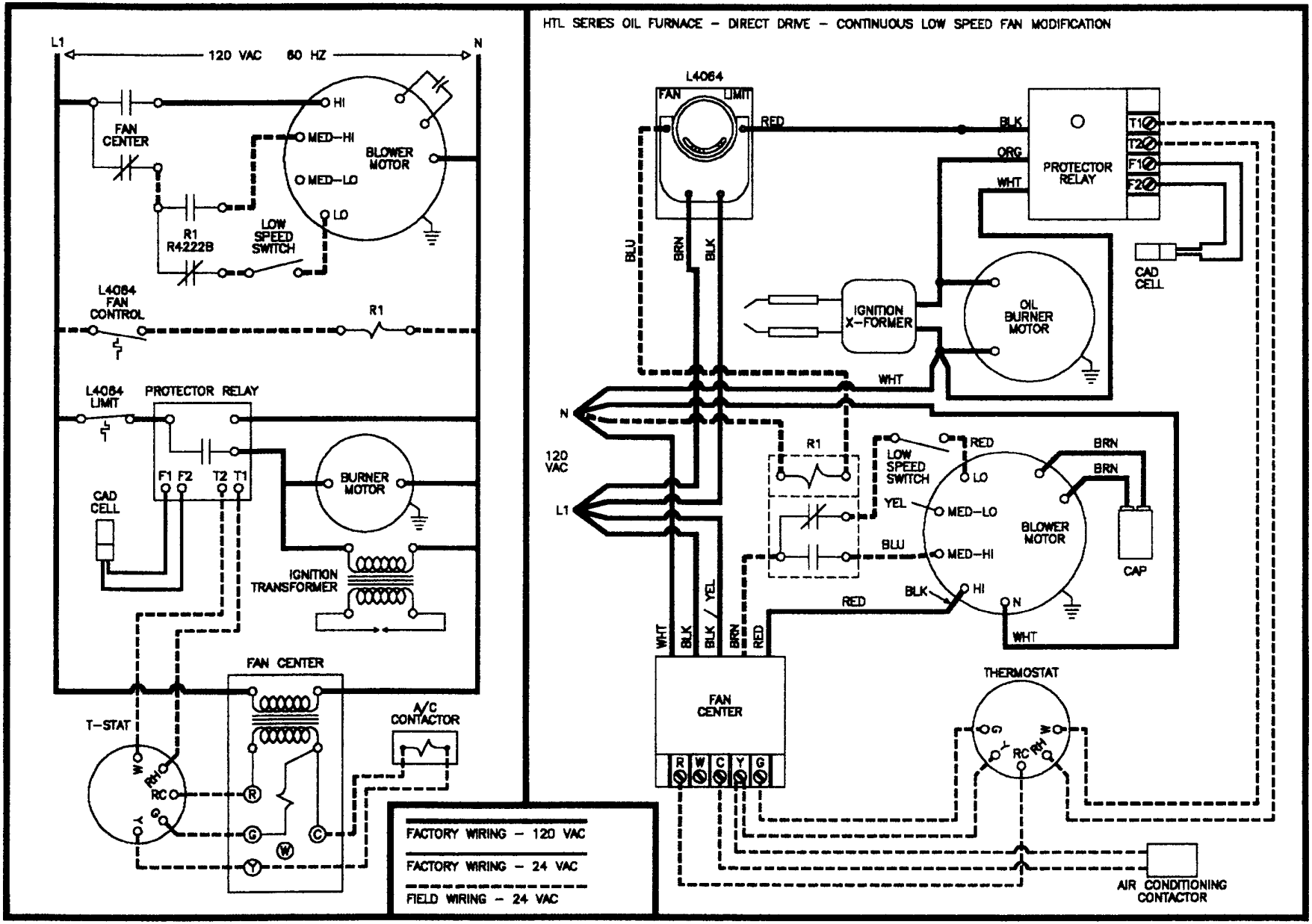
WIRING DIAGRAM - HTL OIL FIRED FURNACE - DIRECT DRIVE - AIR CONDITIONING READY



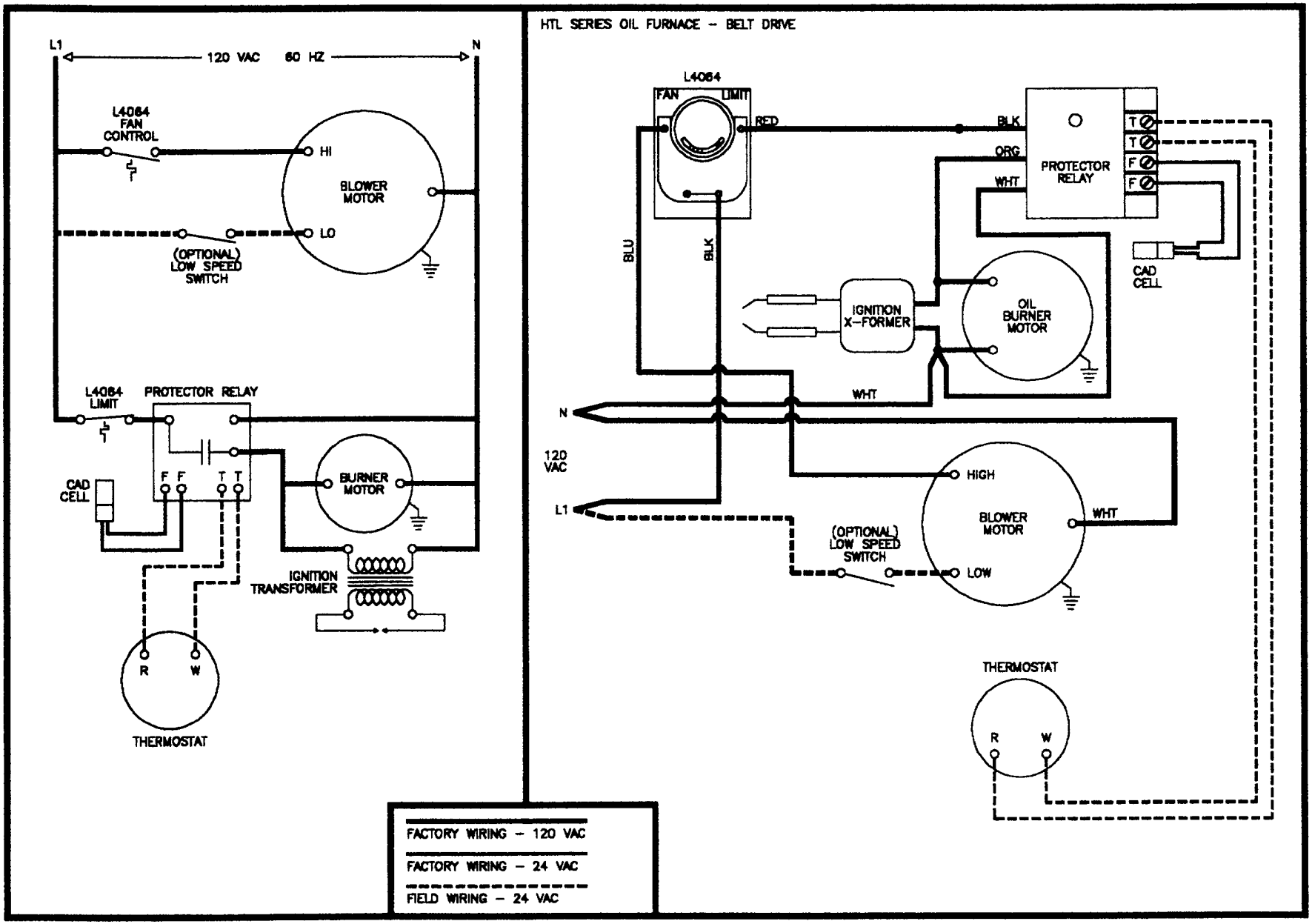
WIRING DIAGRAM - HTL OIL FIRED FURNACE - DIRECT DRIVE - WITH CONTINUOUS LOW SPEED FAN - L6064A



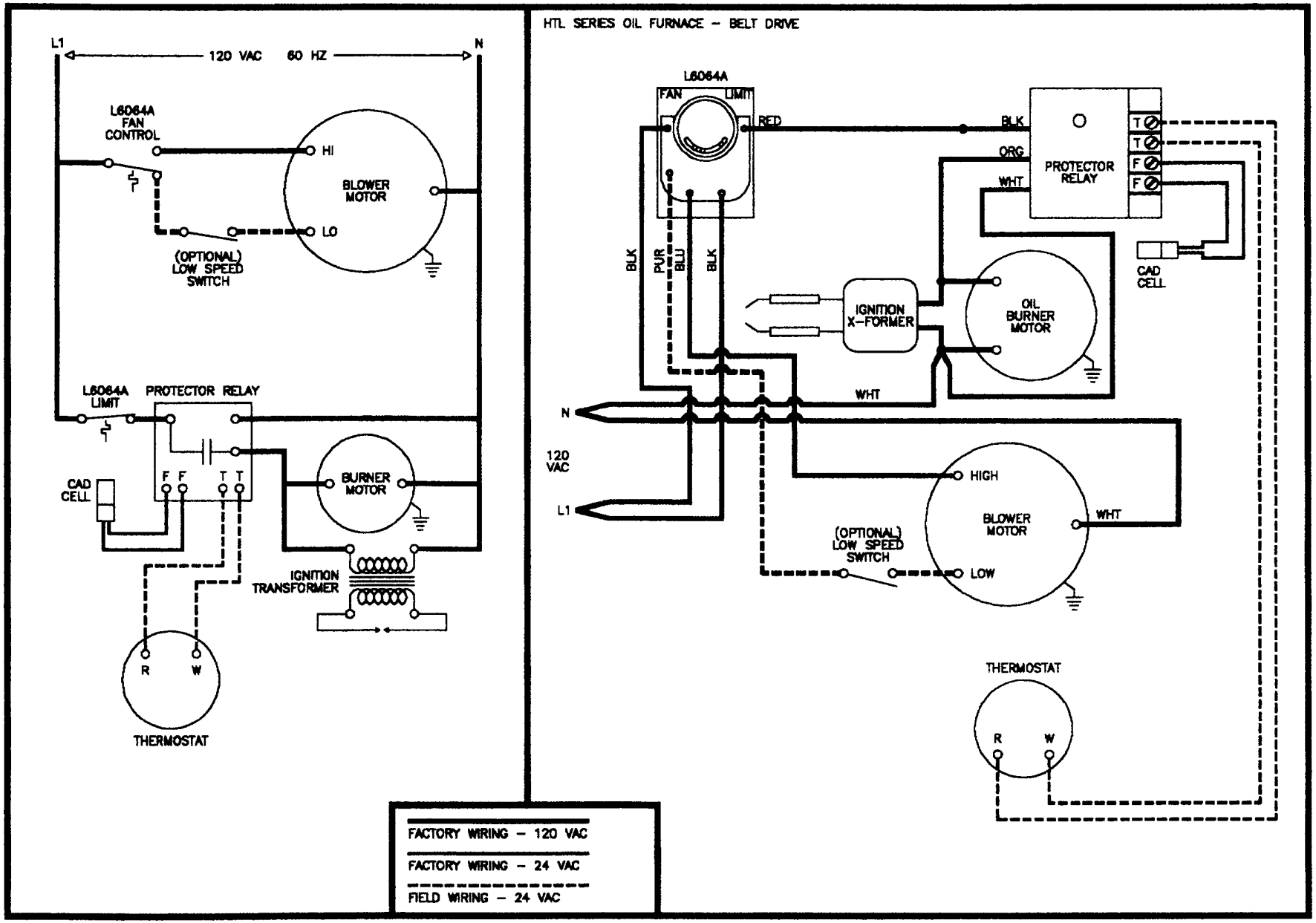
WIRING DIAGRAM - HTL OIL FIRED FURNACE - DIRECT DRIVE - WITH CONTINUOUS LOW SPEED FAN MODIFICATION (L4064)



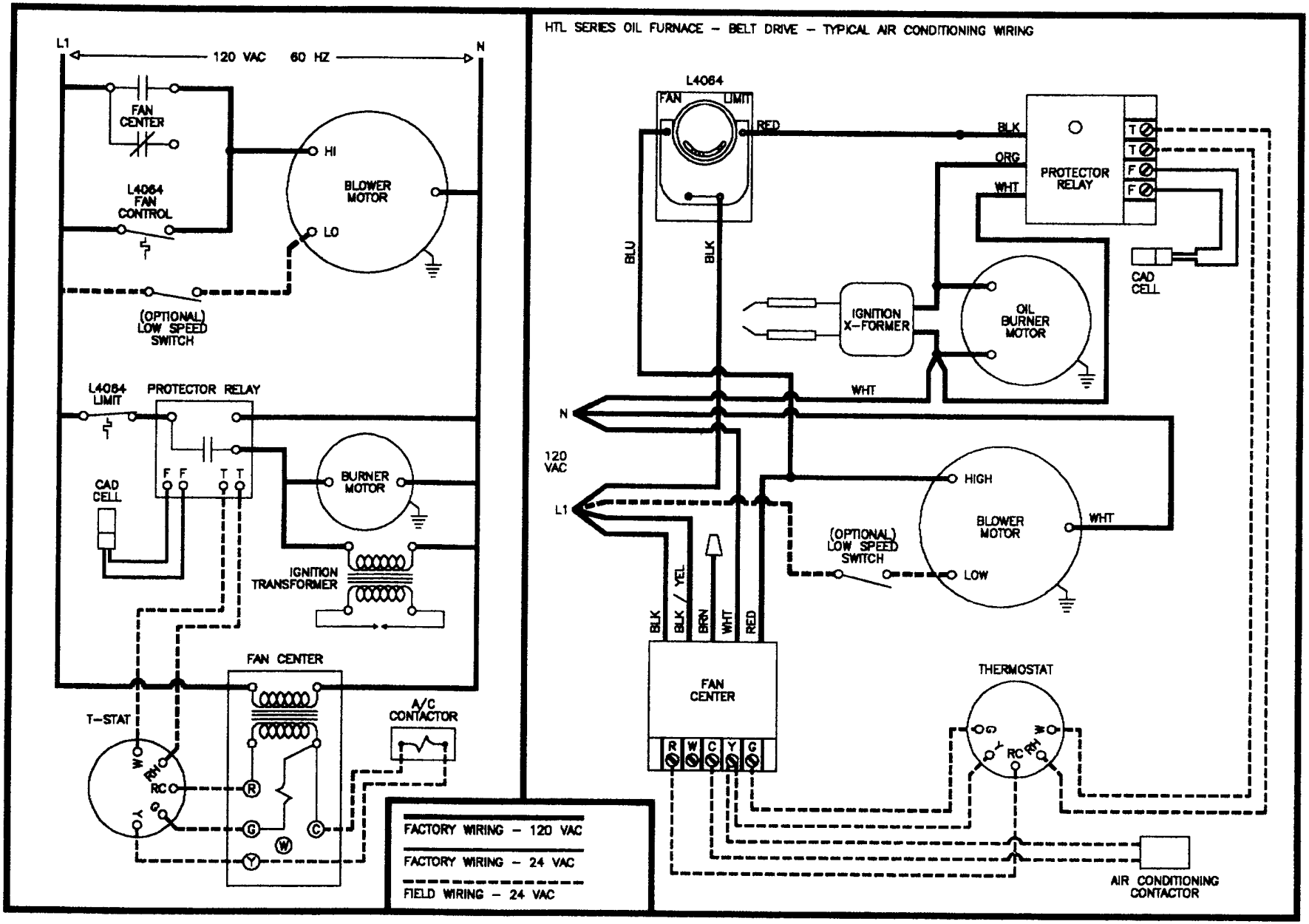
WIRING DIAGRAM - HTL OIL FIRED FURNACE - BELT DRIVE (L4064)



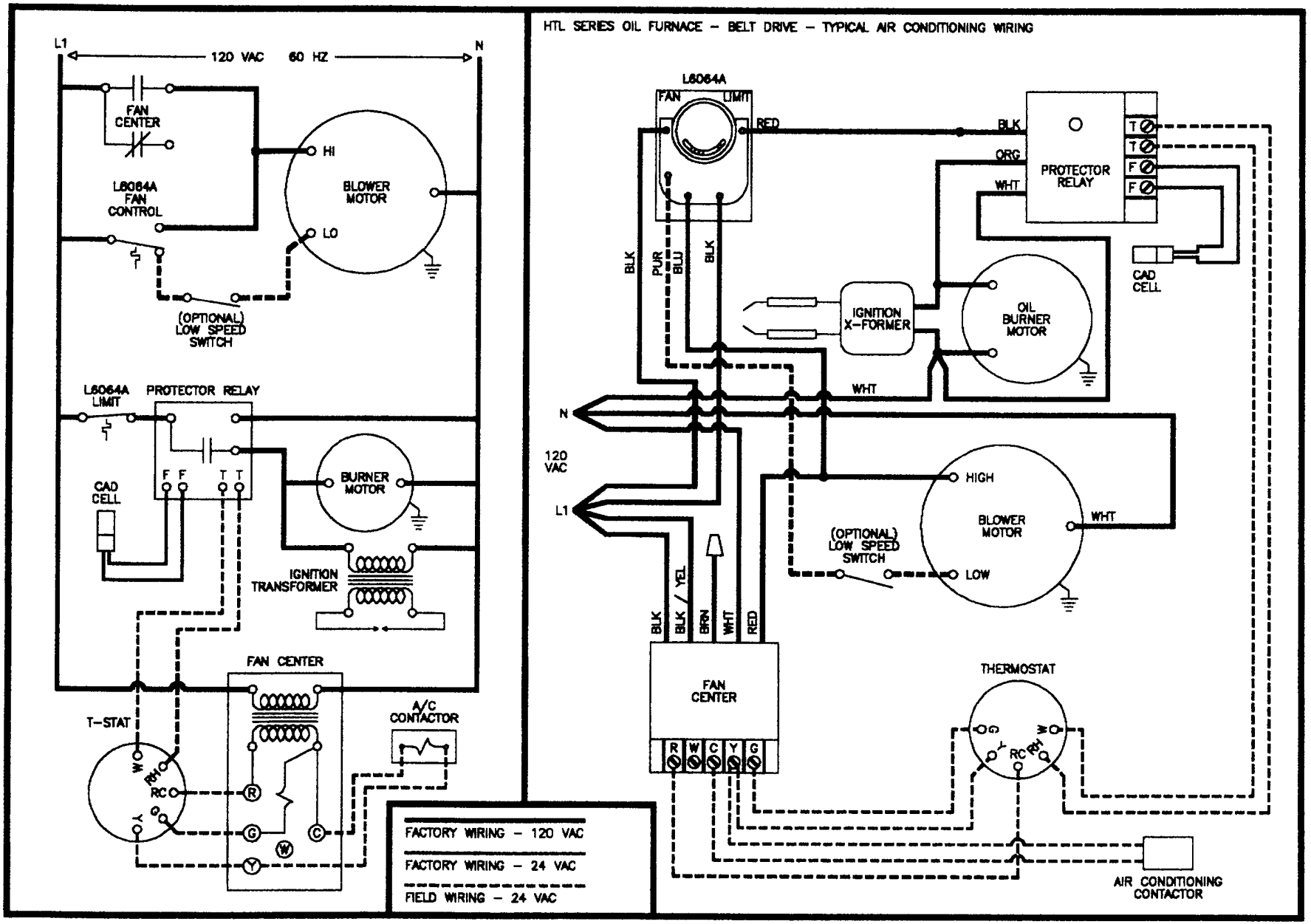
WIRING DIAGRAM - HTL OIL FIRED FURNACE - BELT DRIVE (L6064A)



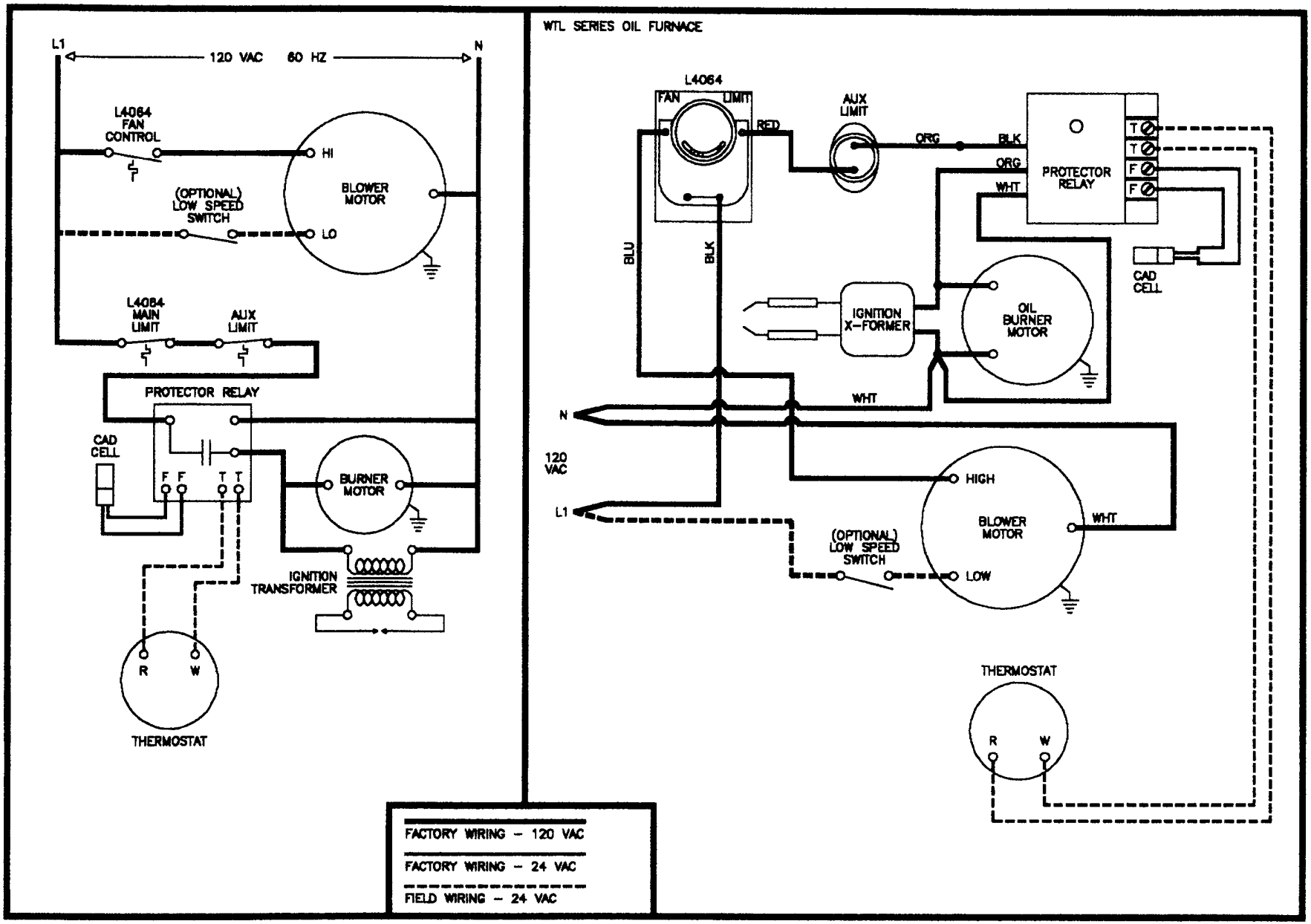
WIRING DIAGRAM - HTL OIL FIRED FURNACE - BELT DRIVE - TYPICAL AIR CONDITIONING WIRING (L4064)



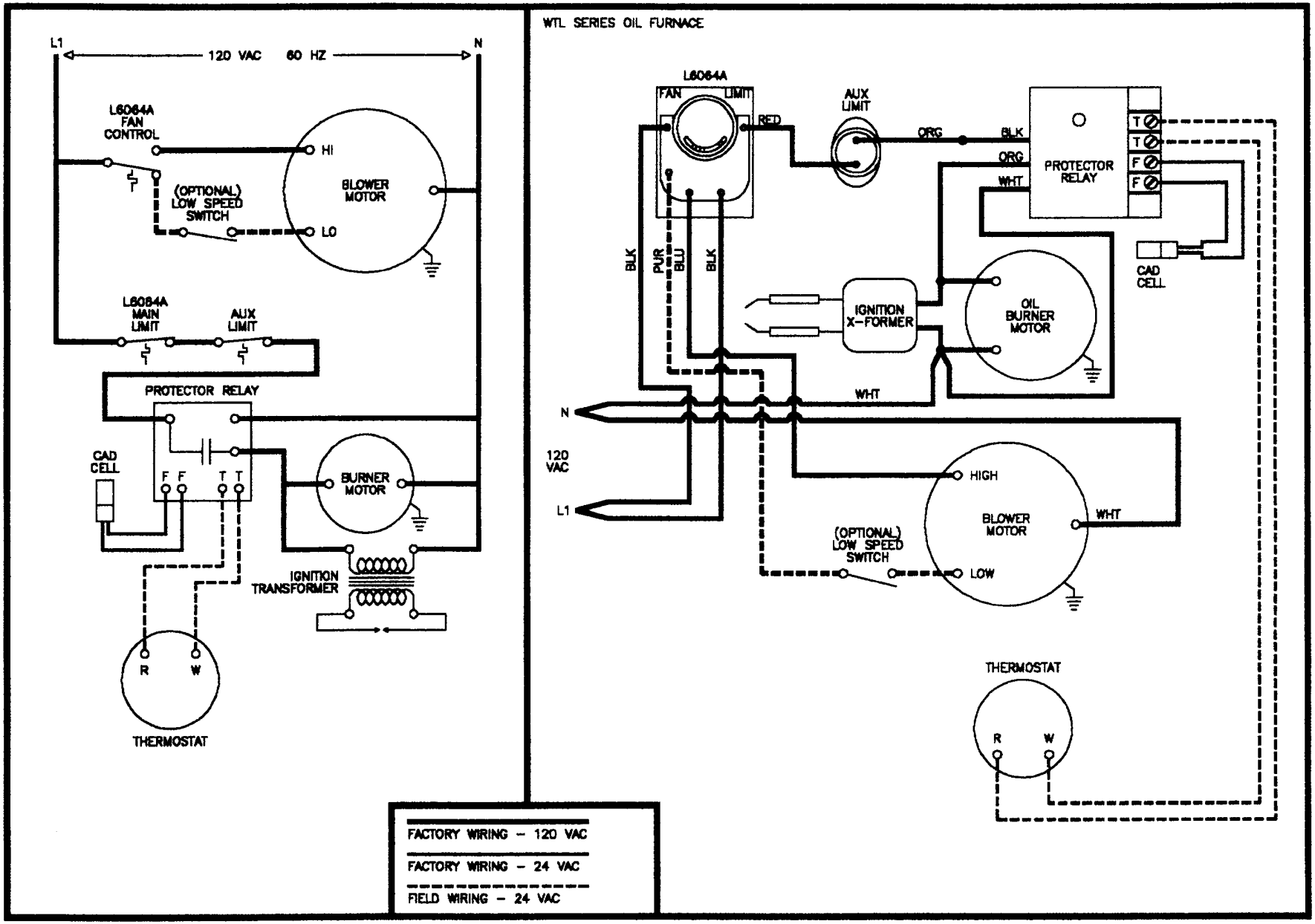
WIRING DIAGRAM - HTL OIL FIRED FURNACE - BELT DRIVE (L6064A)



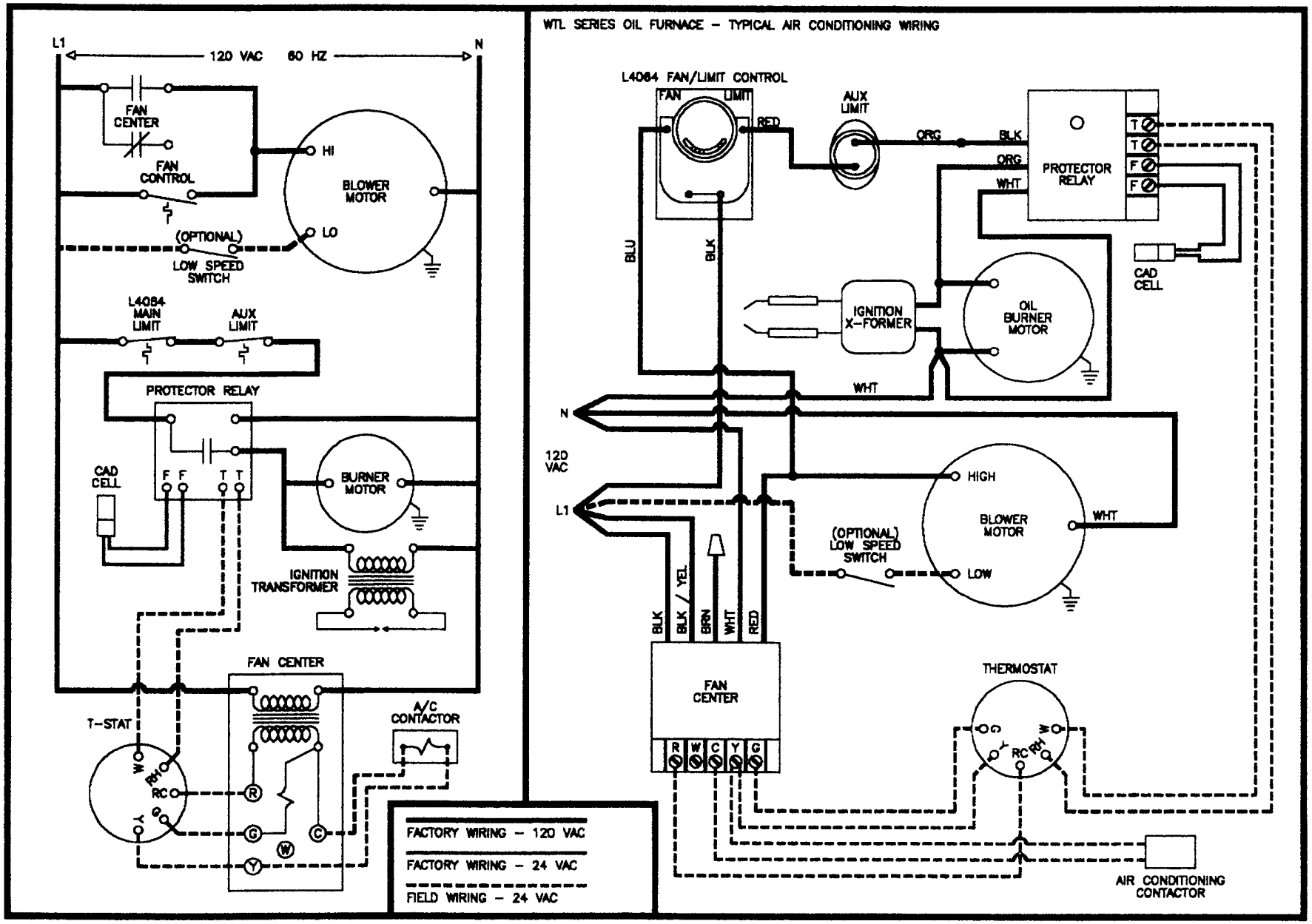
WIRING DIAGRAM - WTL OIL FIRED FURNACE (L4064)



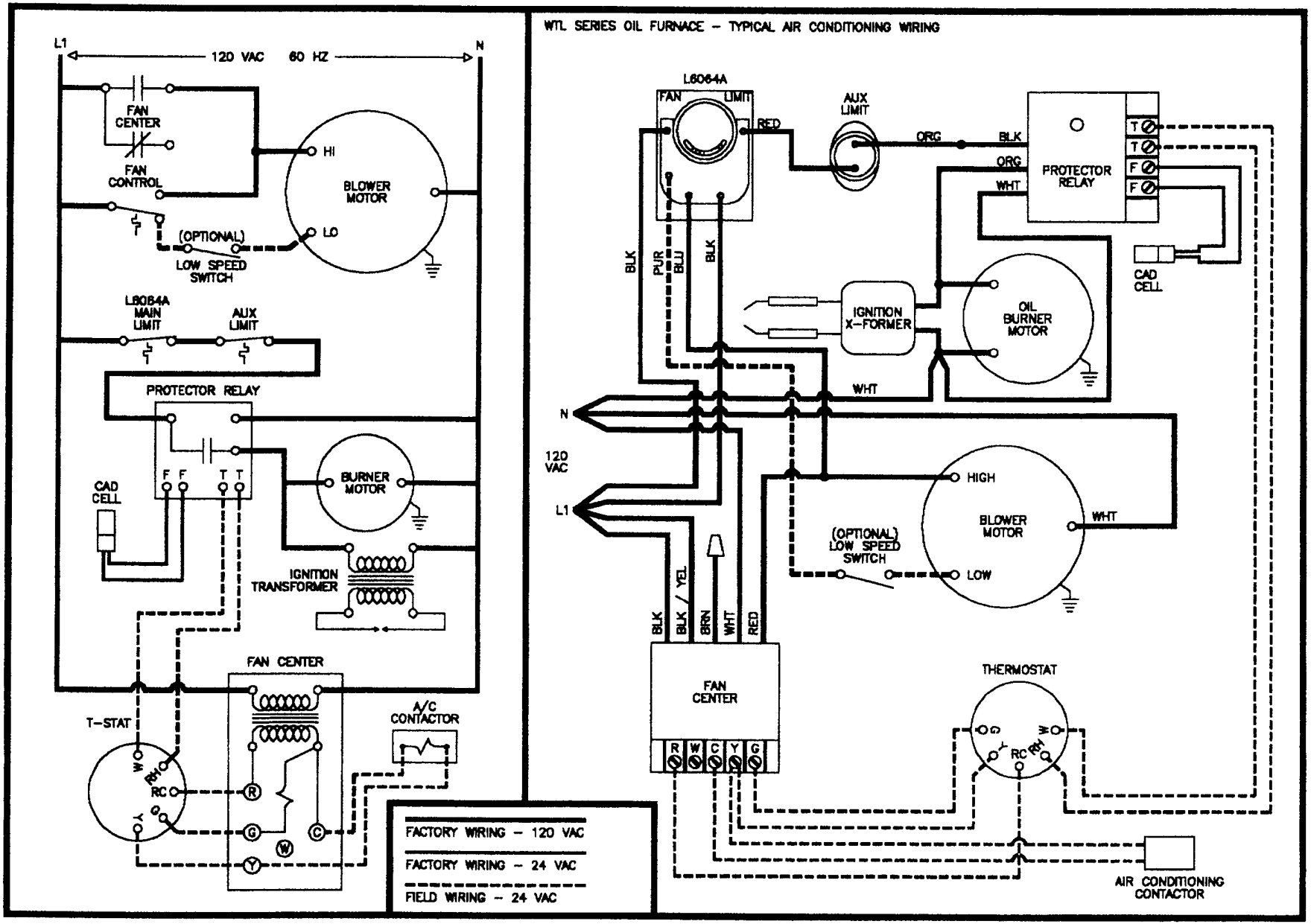
WIRING DIAGRAM - WTL OIL FIRED FURNACE - BELT DRIVE (L6064A)



WIRING DIAGRAM - WTL OIL FIRED FURNACE - BELT DRIVE - TYPICAL AIR CONDITIONING WIRING (L4064)



WIRING DIAGRAM - WTL OIL FIRED FURNACE - BELT DRIVE - TYPICAL AIR CONDITIONING WIRING (L6064A)



SPECIAL INSTRUCTIONS FOR UNITS WITH RIELLO BURNERS

Units with Riello burners have an R or F in the model number. Please see the attached chart for units CSA approved with Riello burners. The burner is factory set with the proper nozzle, pump pressure, air gate and turbulator settings for the firing rate of the furnace.

Notes:
1. This chart supersedes all settings in the Riello manual.
2. Burner and amulet insert length includes 3/16" gasket thickness.

RIELLO BURNER SETTINGS FOR OIL PRODUCTS

FURNACE MODEL	BURNER MODEL	NOZZLE SIZE	PUMP PRESS.	FLOW RATE	AIR GATE	TURB. SET.	BURNER INSERT.	AMULET INSERT.
HTL 80C (RF)	40 F 3	.50 x 60 °W	170 PSI	.65 GPH	2.2	1.5	6 1/8"	6 1/4"
HTL 90C (RF)	40 F 3	.60 x 60 °W	160 PSI	.75 GPH	2.4	1.5	6 1/8"	6 1/4"
HTL 100C (RF)	40 F 3	.75 x 60 °W	130 PSI	.85 GPH	3.0	2.0	6 1/8"	6 1/4"
HTL 120C (RF)	40 F 5	.85 x 60 °W	140 PSI	1.0 GPH	3.2	0.1	6 1/8"	6 1/4"
WTL 80H (RF)	40 F 3	.50 x 60 °W	170 PSI	.65 GPH	2.2	1.5	6 1/8"	6 1/4"
WTL 90H (RF)	40 F 3	.60 x 60 °W	160 PSI	.75 GPH	2.4	1.5	6 1/8"	6 1/4"
WTL 100H (RF)	40 F 3	.75 x 60 °W	130 PSI	.85 GPH	3.0	2.0	6 1/8"	6 1/4"
WTL 105H (RF)	40 F 3	.75 x 60 °W	145 PSI	.90 GPH	3.2	2.0	6 1/8"	6 1/4"

TROUBLESHOOTING PROCEDURE

Problem	Possible Cause	Remedy
Furnace will not start.	Thermostat not calling for heat.	Check thermostat and adjust. Also, check thermostat for accuracy; if it is a mercury switch type, it might be off level.
	No power to furnace.	Check furnace switch, main electrical panel furnace fuse or circuit breaker. Also look for any other hand operated switch, such as an old poorly located furnace switch which was not removed during furnace replacement.
	Thermostat faulty.	Check reset button on protector relay. Remove thermostat wires from protector relay terminals T T. Place a jumper across T T. If furnace starts, replace thermostat, thermostat sub-base (if equipped), or both.
	Protector relay faulty.	Check reset button on protector relay. Remove thermostat wires from protector relay terminals T T. Check for 24v across T T. If no voltage is present, check for 115v to protector relay. If 115v is present, replace protector relay.
	Photo Cell wiring shorted or room light leaking into into photo cell compartment	Check photo cell (cad cell) wiring for short circuits. Also, check for room light leaking into cad cell compartment. Repair light leak if necessary.
	Open safety switch.	Check for open limit or auxiliary limit, open door switch (if equipped). Also, check internal wiring connections; loose connectors, etc.
Furnace will not start without first pushing protector relay reset button. (Happens on frequent basis)	No fuel oil.	Check fuel oil supply. Check that all hand operated all fuel oil valves are in the open position. Fill oil storage tank if necessary.
	Clogged nozzle.	Replace nozzle with high quality replacement. Use rating plate or Tables in Appendix A as a guide.
	Clogged oil filter.	Replace oil tank filter or in-line filter if used.
	Low oil pump pressure.	Connect pressure gauge to oil pump. Adjust pump pressure, or replace oil pump if necessary. Ensure that erratic pressure readings are not caused by defective fuel oil line.
	Air getting into fuel oil lines, or fuel oil line dirty, clogged, or in some manner defective.	Check fuel oil lines. Replace any compression fittings found with high quality flared fittings. Check for any signs of oil leaks. Any oil leak is a potential source of air or contaminants.
	Defective burner motor.	Check burner motor. If burner motor is cutting out on over-load, determine why. Replace if necessary.
Furnace starts, but cuts out requiring manually resetting the oil protector reset button.	Photo Cell (Cad Cell) defective.	If cad cell is dirty, clean it. (Determine why cad cell is getting dirty). If cad cell is poorly aimed, realign it. NOTE: The photo cell should have a resistance of 100K W in absence of light; a maximum of 1500 W in the presence of light. Ensure that room light is not leaking into the cad cell compartment.

Problem	Possible Cause	Remedy
Furnace starts, but cuts out requiring manually resetting the oil protector reset button. ...continued	No fuel oil.	Check fuel oil supply. Check that all hand operated all fuel oil valves are in the open position. Fill oil storage tank if necessary.
	Clogged nozzle.	Replace nozzle with high quality replacement. Use rating plate or Tables in Appendix A as a guide.
	Clogged oil filter.	Replace oil tank filter or in-line filter if used.
	Low oil pump pressure.	Connect pressure gauge to oil pump. Adjust pump pressure, or replace oil pump if necessary. Ensure that erratic pressure readings are not caused by defective fuel oil line.
	Air getting into fuel oil lines, or fuel oil line dirty, clogged, or in some manner defective.	Check fuel oil lines. Replace any compression fittings found with high quality flared fittings. Check for any signs of oil leaks. Any oil leak is a potential source of air or contaminants.
	Defective burner motor.	Check burner motor. If burner motor is cutting out on over-load, determine why. Replace if necessary.
	Water or contaminants in oil.	Drain fuel oil storage tank, replace fuel oil. (Consult with fuel oil supplier).
	Frozen oil line.	Gently warm oil line. Insulate oil line. (Outdoor piping size may require increased diameter).
Oil burner sputtering at nozzle	Electrodes out of adjustment or defective.	Check electrode settings. check electrodes for dirt build-up or cracks in porcelain.
	Poor transformer high voltage connections or defective transformer.	Check contacts between transformer and electrodes. If OK, replace transformer.
	Fuel oil filter clogged.	Replace fuel oil storage tank filter and / or fuel oil in-line filter.
	Defective oil pump.	Check burner motor / fuel oil pump coupling. Check oil pump pressure. Replace fuel oil pump if necessary.
	Fuel oil line partially clogged or contains air.	Bleed air from oil line. If problem persists, replace oil line.
Excessive fuel oil consumption.	System temperature rise too high.	System temperature rise should not exceed 85°F. Check for clogged air filters. Check blower fan for excess dirt build-up or debris. Speed up blower fan if necessary.
	Blower fan control out of adjustment, (fan stops too soon).	Check fan control settings. The fan control is adjusted with a duct thermometer in the supply air plenum take-off or first few inches of the supply air trunk duct. The " fan off" setting should be 90° - 100°F. Once set, the "fan on" setting is normally adjusted 25° - 30°F higher than the "fan off" setting.
	Fuel oil leak.	Check fuel oil line for leaks. Repair or replace if necessary.
	Stack temperature too high.	Check stack temperature. Stack temperatures will normally range from 350° to 450°F. Check draft regulator. Draft should be set to 0.02 in. w.c.

Problem	Possible Cause	Remedy
Excessive fuel oil consumption. (Cont.)	Thermostat improperly adjusted or in poor location.	Check thermostat heat anticipator setting against measured amperage draw. Increase heat anticipator setting if necessary. If the thermostat is being influenced by drafts, sunlight, duct work, etc., relocate to more suitable location.
Too much smoke.	Insufficient combustion air adjustment at oil burner, or improper draft pressure.	Adjust the oil burner combustion air band and draft regulator to gain the highest CO_2 possible with a Bacharach No. 1 smoke.
	Heat exchanger partially clogged.	Check for soot build-up in heat exchanger flue passages, especially in the outer radiator.
Soot building up on blast tube (end coning).	Poor alignment between oil burner blast tube and fire pot.	Check alignment. blast tube should be centered with fire pot burner opening. Oil burner head should be ¼ inch back from the inside surface of the fire pot.
	Flame impingement caused by Incorrect nozzle angle.	Check nozzle size and angle. (See Appendix A). Check distance from head to inside surface of the fire pot.
	Defective fire-pot	Check fire-pot. Repair or replace.
Furnace will not warm home to desired temperature	Air flow blocked or dirty air filter.	Clean or replace air filter.
	Thermostat adjustments or location.	Check thermostat heat anticipator setting against measured amperage draw. Increase heat anticipator setting if necessary. If the thermostat is being influenced by drafts, sunlight, duct work, etc., relocate to more suitable location.
	Insufficient air flow.	Check all dampers. Open closed dampers including registers in unused rooms. Check system temperature rise. If temperature rise is too high, speed up blower fan.
	Defective high limit control.	Test high limit function of all limit switches. Use a duct thermometer to assess accuracy of limit control. Check for obstructions to air flow around limit switch bi-metal elements. Replace control if necessary.
	Under-sized nozzle.	Check nozzle. If problem is not caused by air flow problems, use larger nozzle, if permitted by rating plate.
	Blower fan motor stopping intermittently on overload.	Check blower fan motor amperage draw. Check motor ventilation ports, clean if necessary. Replace motor if necessary.
	Burner motor stopping intermittently on overload.	Check burner motor. Replace if necessary.
	Improper distribution of heat.	This is not likely to be a furnace problem. Balance duct system.
Supply air temperature too hot.	Air flow blocked or dirty air filter.	Clean or replace air filter.
	Insufficient air flow.	Check all dampers. Open closed dampers including registers in unused rooms. Check system temperature rise. If temperature rise is too high, speed up blower fan.
Supply air temperature too cool.	Excess air flow.	Check system temperature rise. Slow down blower fan if necessary.

Problem	Possible Cause	Remedy
Supply air temperature too cool. (Cont.)	Excessive duct losses.	Check supply air duct work. Seal leaky joints and seams. Insulate ductwork if necessary.
Supply air temperature too cool during first moments of furnace cycle.	Fan control "fan on" setting too low.	Increase differential between fan control "fan off" and "fan on" settings. (L4064B, L6064A fan / limit controls only, no adjustments available for L4064W fan / limit control). Register air deflectors may help.
	Excessive duct losses.	Check supply air duct work. Seal leaky joints and seams. Insulate ductwork if necessary.

NOTE: IF THE ABOVE STEPS DO NOT REMEDY THE COMPLAINT, CALL YOUR SERVICE PERSON AS LISTED. FOR ADDITIONAL TROUBLESHOOTING POINTERS, REFER TO THE MANUAL ENCLOSED WITH THE BURNER AND PAMPHLETS ENCLOSED WITH THE CONTROLS.

DO NOT TAMPER WITH THE UNIT OR CONTROLS - CALL YOUR SERVICE PERSON.

FOR SERVICE CONTACT:

Name:_____ Date:_____

Address:_____

_____ Telephone:_____

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