

Thermo Pride

INDUCED DRAFT HIGHBOY GAS FURNACE

INSTALLATION AND SERVICE MANUAL MODELS

FOR USE WITH NATURAL GAS
IHA-50N, IHA-75N, IHA-100N, IHA-125N

FOR USE WITH L.P. GAS (PROPANE)
IHA-50P, IHA-75P, IHA-100P, IHA-125P

WARNING: If the information in these instructions 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.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier; call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier. (Referred to in these instructions as a Qualified heating contractor).

PLEASE READ THESE INSTRUCTIONS PRIOR TO INSTALLATION, INITIAL FIRING, AND BEFORE PERFORMING ANY SERVICE OR MAINTENANCE. THESE INSTRUCTIONS MUST BE LEFT WITH THE HOMEOWNER AND SHOULD BE RETAINED FOR FUTURE REFERENCE BY QUALIFIED SERVICE PERSONNEL.

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SEE USERS INFORMATION MANUAL

This page contains reproductions of the various warning and instruction labels placed on the Thermo Pride Sectional Gas Furnaces. Please read and comply with the contents of these labels.

CAUTION

MOVING PARTS
CAN CAUSE SEVERE PERSONAL INJURY
SHUT OFF FURNACE BEFORE
REMOVING THIS PANEL.

FILTER MAINTENANCE: WHEN IT BECOMES
NECESSARY TO REPLACE OR WASH
FILTER REMOVE THE DIRTY FILTER FROM
THE RACKS PROVIDED AND WASH OR
REPLACE WITH IDENTICAL NEW FILTERS.

DO NOT REMOVE THIS LABEL

WARNING

SPECIAL HOMEOWNERS INSTRUCTIONS

- IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.
- FOR SAFE OPERATION IT IS THE RESPONSIBILITY OF THE OWNER AND/OR USER THAT THE BURNER, CHIMNEY/VENT PIPE, HEAT EXCHANGER AND CONTROLS SHOULD BE INSPECTED EVERY YEAR BY A QUALIFIED HEATING CONTRACTOR.
- THE OWNER AND/OR USER SHOULD ALSO CONDUCT PERIODIC VISUAL INSPECTIONS. REFER TO THE USER'S INFORMATION MANUAL PROVIDED WITH THIS FURNACE FOR DETAILS.
- ANY DEFICIENCIES NOTED MUST BE CORRECTED AT ONCE BY A QUALIFIED HEATING CONTRACTOR. DO NOT ATTEMPT TO MAKE REPAIRS YOURSELF!
- FOR ASSISTANCE OR ADDITIONAL INFORMATION CONSULT A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.

FOR YOUR SAFETY

WHAT TO DO IF YOU SMELL GAS:

1. DO NOT TRY TO LIGHT ANY APPLIANCE.
2. DO NOT TOUCH ANY ELECTRICAL SWITCH; DO NOT USE ANY PHONE IN YOUR BUILDING.
3. IMMEDIATELY CALL YOUR GAS SUPPLIER FROM A NEIGHBOR'S PHONE. FOLLOW THE GAS SUPPLIER'S INSTRUCTIONS.
4. IF YOU CANNOT REACH YOUR GAS SUPPLIER, CALL THE FIRE DEPARTMENT.

FOR YOUR SAFETY

DO NOT STORE GASOLINE OR OTHER
FLAMMABLE VAPORS AND LIQUIDS IN THE
VICINITY OF THIS OR ANY OTHER APPLIANCE.
THIS UNIT MUST BE INSTALLED AND SERVICED
BY A QUALIFIED CONTRACTOR ONLY.
OPERATING INSTRUCTIONS ARE LOCATED
INSIDE APPLIANCE NEAR BURNER ASSEMBLY.

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
- B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
 - Do not touch any electric switch; do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
 - D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

DESIGNED MAXIMUM OUTLET AIR TEMPERATURE **190°F**
THIS FURNACE IS CERTIFIED FOR **CLOSED** INSTALLATION
WITH MINIMUM CLEARANCES TO COMBUSTIBLE CON-
STRUCTION **1"** FROM THE TOP **6"** FROM THE
FRONT **1"** FROM THE BACK **1"** FROM THE
LEFT SIDE **1"** FROM THE RIGHT SIDE
AND **6 (+)** FROM THE FLUE PIPE

MINIMUM GAS SUPPLY PRESSURES ARE FOR PURPOSE
OF INPUT ADJUSTMENT.

NORMAL MANIFOLD PRESSURE	4	WC
MAXIMUM GAS SUPPLY LP	14"	WC
MINIMUM GAS SUPPLY LP	11"	WC
MAXIMUM GAS SUPPLY NAT	14"	WC
MINIMUM GAS SUPPLY NAT	4.5	WC

"FOR INDOOR INSTALLATION" IN BUILDING CONSTRUCTED
ON-SITE

FOR INSTALLATION ON **COMBUSTIBLE FLOORS**

(+) CLEARANCE TO FLUE MAY BE 1 IN. WHEN INSTALLED
WITH TYPE B-1 VENT

THIS FURNACE MUST BE INSTALLED IN ACCORDANCE
WITH THERMO PRODUCTS INSTRUCTIONS AND LOCAL
CODES. IN ABSENCE OF LOCAL CODES, FOLLOW THE
NATIONAL FUEL GAS CODE—ANSI Z223.1

390232

Thermo Pride

—IMPORTANT INSTRUCTIONS—
KEEP WITH UNIT

—SERVICING—
SERVICE TO THIS UNIT MUST
BE PERFORMED BY QUALIFIED
SERVICE PERSONNEL.

—FOR YOUR SAFETY—
DO NOT STORE OR USE
GASOLINE OR OTHER FLAMMABLE
VAPORS AND LIQUIDS IN THE
VICINITY OF THIS OR ANY
OTHER APPLIANCE.

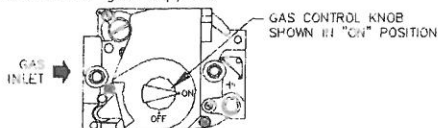
SUITABLE FOR CONNECTION
TO TYPE B-1 VENT
10-168

WARNING
THIS COMPARTMENT MUST BE
CLOSED EXCEPT WHEN SERVICING

WARNING
REMOVE THE FOAM PACKING
AROUND THE BLOWER WHEEL
BEFORE OPERATING.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
5. Push in gas control knob slightly and turn clockwise to "OFF".
NOTE: knob cannot be turned to "OFF" unless knob is pushed in slightly. Do not force.
6. Wait five (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to next step.
7. Turn gas control knob counterclockwise to "ON".
8. Turn on all electric power to unit.
9. Set thermostat to desired setting.
10. If appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.



TO TURN OFF GAS TO APPLIANCE

1. Set thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Push in gas control knob slightly and turn clockwise to "OFF". Do not force.

390286

FILTERS MUST BE INSTALLED EXTERNAL TO THE
FURNACE CASING.

390339

OUTSIDE POWER SOURCE
CONNECT 115v 60Hz TO
L1 HOT AND L2 COMMON

The following pages contain various warnings and cautions found throughout the Thermo Pride Sectional Gas Furnace Manual. Please read and comply with the statements below.

WARNING: This furnace is not to be used as a construction heater.

WARNING: Gas utilization equipment must not be connected to a chimney flue serving a separate appliance designed to burn solid fuel.

WARNING: Either drill a starter hole in the inducer or use a self-tapping screw to mount the flue pipe to the inducer. Failure to follow these instructions may damage the inducer.

WARNING: When common venting two appliances into a common vent, the smallest appliances must be vented into the top opening.

WARNING: A Category I appliance must never be connected to a chimney that is servicing a solid fuel appliance. If a fireplace chimney, lined with a metal liner is used to vent this appliance, the fireplace opening must be permanently sealed.

WARNING: The IHA Series furnaces must not be installed with a manual or thermally actuated vent damper.

WARNING: Because of the potential of odorant fade, a gas leak may not be detected by smell. If this furnace is installed below grade, contact your gas supplier for a gas detector.

WARNING: **TURN OFF THE ELECTRICAL POWER** to the furnace before attempting to change blower speed wiring.

WARNING: Heat exchanger oil will burn off on initial firing creating an unpleasant odor. To prevent this odor from occurring more than once, it is suggested that:

1. A window(s) be opened.
2. The thermostat set at highest setting.
3. The furnace remain running at conditions 1 & 2 for 30 minutes or until odor has dissipated.

WARNING: To avoid injury from moving parts, shut off the power to the furnace before removing blower compartment door.

WARNING: A rear return is not recommended on the IHA-100 and IHA-125.

WARNING: Personal injury or property damage could result from repair or service of this furnace by anyone other than a qualified heating contractor. Only the homeowner/user routine maintenance outlined in the Users Information Manual may be performed by the homeowner/user.

CAUTION: The furnace and its individual gas shutoff valve must be disconnected from the gas supply during pressure testing of the gas supply system at pressures in excess of 1/2 PSIG or 14.0" wc. The furnace must be isolated from the gas supply piping by closing the knob on its individual gas shutoff valve during pressure testing of the piping at test pressures equal to or less than 1/2 PSIG or 14" wc.

WARNING: Turn off power to furnace. Before gas piping system is placed into service, it must have been leak tested by a qualified heating contractor. (See Section H of these instructions on the installation of gas piping).

WARNING: For initial start-up of the furnace after installation, it may be necessary to purge the air out of the gas line. This should be done by a qualified heating contractor. If excessive gas escapes when purging the gas supply at the union, allow the area to ventilate for at least 15 minutes before attempting to start the furnace. LP gas is especially dangerous because the specific gravity of LP gas allows it to accumulate at floor level at a dangerous concentration. For remainder of operating instructions, reference **Users Information Manual**.

WARNING: Call a qualified heating contractor to report suspected deficiencies (do not attempt to make repairs yourself).

FURNACE SPECIFICATIONS: IHA SERIES

MODEL NO.	IHA-50	IHA-75	IHA-100	IHA-125
BTUH Input	50,000	75,000	100,000	125,000
BTUH Output	42,000	60,000	80,000	100,000
Orifice Size	NAT LP	NAT LP	NAT LP	NAT LP
	41 53	41 53	41 53	41 53
Temp. Rise (1)	55-85F	55-85F	55-85F	55-85F
Flue Dia. (Vertical)	3"	3"	4"	4"
Flue Dia. (Vented through sidewall)	3"	4"	4"	4"
Height of Casing	48"	48"	48"	48"
Width of Casing (2)	18"	18"	20"	22"
Depth of Casing (2)	27-1/2"	27-1/2"	27-1/2"	27-1/2"
Warm Air Outlet	16"x18"	16"x18"	18"x18"	20"x18"
Return Air Outlet	16"x25"	16"x25"	16"x25"	16"x25"
Number & Size of Filter	1-16x25	1-16x25	1-16x25	1-16x25

MOTOR & BLOWER SPECIFICATIONS

HP of 4 speed motor (at high speed)	1/4	1/3	1/2	3/4
High Speed RPM's	1075	1075	1075	1100
Run Capacitor	5 MFD	5 MFD	10 MFD	15 MFD
Rotation (Shaft End)	Clockwise	Clockwise	Clockwise	Clockwise
Shaft Diameter (Length)	1/2 : 6	1/2 : 6	1/2 : 6	1/2 : 6
Motor Diameter (Height)	5-5/8:5-3/8	5-5/8:5-5/16	5-5/8:5-5/16	5-5/8:5-5/16
Full Load Amps	2.8	4.4	7.5	11.8
CFM@.2" & .5"				
WC Static Pressure	.2 .5	.2 .5	.2 .5	.2 .5
@ HI-SPEED	1060 800	1680 1490	1840 1590	2350 2070
@ MH-SPEED		1240 1160	1580 1410	1970 1760
@ ML-SPEED		1030 950	1350 1230	1590 1540
@ LO-SPEED	530 380	820 750	1130 1030	1290 1240
Blower Size	9-9 DD	10-9 DD	10-10 DD	12-11 T DD
Maximum Air Conditioning (3)	2 TON	3-1/2 TON	4 TON	5 TON
Electrical Characteristics	115 Volts - 60 Hz - 1 Phase			
(All Models).				

MIN. FUSE SIZE 15 AMPS 15 AMPS 15 AMPS 20 AMPS

¹Each installation is to be adjusted by changing fan speeds to obtain a temperature rise as close as possible to the mid point of the temperature rise specified for each furnace.

²On all outlet and inlet dimensions, the first dimension is the width.

³Air Conditioning rating is based on 400 CFM air movement per 1 ton (12,000 BTU) of cooling at .5 static pressure.

I. GENERAL INSTRUCTIONS

These instructions must be read in their entirety before installing the furnace. It is the installer's responsibility to do the following:

1. Inform and demonstrate to the user, the correct operation and maintenance of the appliance as explained in the Users Information Manual.
2. Inform the user of the hazards of flammable liquids and vapors and to remove such liquids and vapors from the vicinity of the appliance.

II. GENERAL INSTALLATION

These furnaces are shipped completely assembled and wired (internally). For parts shortage or damage, see the Dealer Receiving and Freight Claim Procedure Section of the price guide. After installation, the furnace and duct system must be adjusted to obtain a temperature rise of 55°F to 85°F through the furnace. (See rating label located on side panel inside the furnace vestibule). The installation must conform with local codes or in the absence of local codes with the National Fuel Gas Codes ANSI Z223.1 LATEST EDITION and with these instructions.

WARNING: This furnace is not to be used as a construction heater.

Many of the chemicals used during construction when burned, form acid bearing condensate that can substantially reduce the life of the heat exchanger.

A. CODES AND CLEARANCES:

The following items must be considered when choosing the size and location of the furnace.

1. All local codes and/or regulations take precedence over the instructions in this manual and should be followed accordingly. In the absence of local codes, installation must conform with these instructions, regulations of the National Fire Protection Association, provisions of National Electrical Code (ANSI/NFPA70 LATEST EDITION), and the National Fuel Gas Code (ANSI Z223.1 LATEST EDITION).
2. The BTU output capacity of the furnace proposed for installation should be based on a heat loss calculation made according to the manuals provided by the Air Conditioning Contractors of America (ACCA) or ASHRAE.
3. The furnace installed is to be level in a central location with respect to outlet registers and should be located as near the chimney or vent terminal as practical to minimize the numbers of elbows and the length of any horizontal run of connecting flue pipe which may be required.
4. Definitions of "COMBUSTIBLE MATERIAL" and "NON-COMBUSTIBLE" as issued by ANSI Z223.1 are as follows:

a. COMBUSTIBLE MATERIAL:

Materials made of or surfaced with wood, compressed paper, plant fibers, plastics or other material that will ignite and burn whether flameproof or not or whether plastered or unplastered.

b. NON-COMBUSTIBLE MATERIAL:

Material which will not ignite and burn; such materials consisting entirely of steel, iron, brick, concrete, slate, glass, plaster or combination thereof.

5. - MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS -

MODEL NO.	FROM SIDES OF FURNACE & REAR	FRONT	TOP OF PLENUM	FROM THE FLUE OR VENT	SIDE OF PLENUM
IHA-50	1 IN.	6 IN.	1 IN.	*6 IN.	2 IN.
IHA-75	1 IN.	6 IN.	1 IN.	*6 IN.	2 IN.
IHA-100	1 IN.	6 IN.	1 IN.	*6 IN.	2 IN.
IHA-125	1 IN.	6 IN.	1 IN.	*6 IN.	2 IN.

TABLE 1

*6 in. clearance may be reduced to 1 in. with UL recognized type B1 vent.

The IHA50, 75, 100 and 125 furnaces may be installed on combustible flooring. The furnace shall not be installed directly on carpeting, tile or other combustible material other than wood flooring.

These furnaces may be installed in an alcove or in a closet if the minimum clearances to combustible construction (listed previously) are met.

The minimum clearances are listed for fire protection. Clearance for servicing the front of the furnaces and to all points on the furnace requiring access must be 24".

Equipment must be installed in accordance with regulations of the National Board of Fire Underwriters. Authorities having jurisdiction should be consulted before installations are made.

B FURNACE LOCATION AND COMBUSTION AIR

When installing this furnace, provisions must be made to insure the supply of adequate combustion and ventilation air in accordance with section 5.3, air for combustion and ventilation of the National Fuel Gas Code, ANSI Z223.1 or applicable provisions of the local building code.

A furnace installed in a residential garage must be installed so the burners and ignition source are located 18 inches or higher above the floor. Also, the furnace must be located or protected to avoid physical damage by vehicles. The furnace must be located on a dry surface. If the surface becomes wet or damp at times, the furnace should be supported above the floor using a concrete base, bricks, patio blocks, etc. The furnace should be located as close to the chimney as practical. The furnace shall be installed such that the electrical components are protected from water.

The area in which the furnace is located must have an adequate supply of air for combustion and draft. Open non-partitioned basements, below grade utility rooms without storm windows or rooms with loose access doors will generally permit adequate air infiltration. However, if the furnace is located in an area of the building with tight doors and windows, outside ventilation or an opening into another room is recommended. This can be accomplished with two rectangular openings located in a wall or door, one 6" from the ceiling or at the top of the door and one 6" from the floor or at the bottom of the door each having a free area of not less than 1 square inch per 1,000 BTUH input but not less than 100 square inches (see example in figure 1). These openings must be free and unobstructed. Maintain a minimum 24" clearance to ventilation openings, which provide combustion air to the furnace. (see figure 1).

EXAMPLE: 125,000 BTUH input furnaces requires "two" openings of 125 square inches each. Minimum openings of 100 square inches each are required regardless of the input.

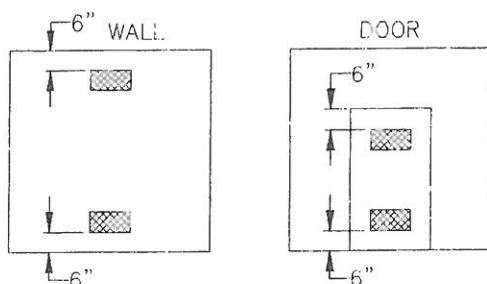


Figure 1

Measures should be taken to prevent the entry of corrosive chemicals or vapors to the combustion and ventilation air supply. Such chemicals include but are not limited to chlorinated and/or fluorinated hydrocarbons such as found in refrigerants, aerosol propellants, dry cleaning fluids, degreasers, and removers. Other harmful compounds may come from bleaches, air fresheners or mastics. Vapors from such products can form acid compounds when burned in a gas flame. Should acid compounds form in your furnace, it may reduce the life of the furnace. Please follow the instructions below to provide outside air directly to the appliance to avoid this problem.

If the building is tightly constructed and or has an exhaust fan(s) which creates a negative pressure, air for combustion and ventilation must be supplied from the outdoors or from spaces freely communicating with the outdoors. When communicating directly with the outdoors or with vertical ducts to the outdoors, two openings each having a minimum free area of 1 square inch per 4,000 BTU of the input rating of all gas appliances in the area are required. When horizontal ducts are used to communicate with the outdoors, the free area must be based on 2,000 BTUH per square inch of the total input rating of all gas appliances in the area. The minimum dimension of an air duct must be at least 4 inches in diameter.

EXAMPLE: 100,000 BTU input furnace, 40,000 BTU input water heater and 30,000 BTU gas dryer would require two openings of 42.5 square inches each if ducted vertically to the outdoors or 85 square inches each if horizontal ducts are used.

IMPORTANT: The return air duct of the furnace must be sealed air tight to prevent starvation of the combustion air, especially if the furnace is located in a closet or confined area.

C. VERTICAL VENTING:

WARNING: Gas utilization equipment must not be connected to a chimney flue serving a separate appliance designed to burn solid fuel.

The IHA (Induced Draft Gas Highboy) Series Furnace must be vented in accordance with these instructions into a nationally recognized testing agency vent or chimney. A good vent is one that is sealed and has the capability of producing a -.04 draft with the capacity of handling the amount of flue gas that is introduced to it.

The vent connector must be galvanized or stainless steel metal pipe and must be 3 in. for the IHA-50 and IHA-75 and 4 in. for the IHA-100 and IHA-125. The IHA-100 and IHA-125 are supplied with a 3 in. to 4 in. adapter as a transition from the inducer to the 4 in. vent size (see figure 2). No size reduction is permissible. The minimum length of flue pipe is two feet with one elbow. For maximum vent lengths, see Appendix Venting Tables for Category I appliances in the National Fuel Gas Code NFPA54 ANSIZ223.1 (Latest Edition). The horizontal run must slope upward 1/4" per foot from the furnace to the chimney. The piping must be supported every four feet for the entire horizontal run.

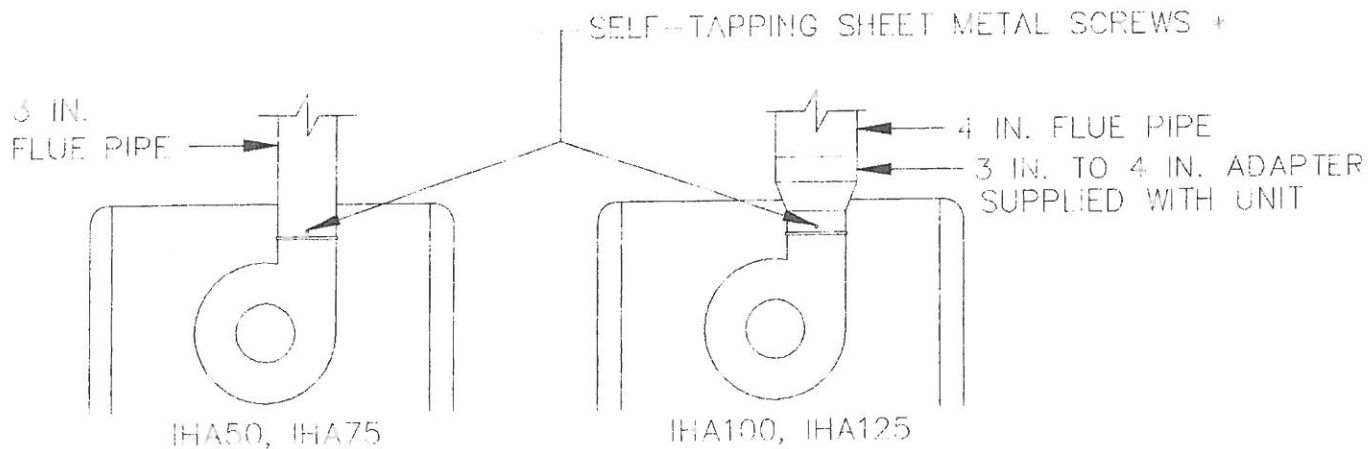


Figure 2

WARNING: *Either drill a starter hole in the inducer or use a self-tapping screw to mount the flue pipe to the inducer. Failure to follow these instructions may damage the inducer.

A self-tapping sheet metal screw and high temperature sealant such as Dow Corning RTV-732 (temperature rating 450° minimum) should be used to secure the flue pipe (IHA-50, IHA-75) or the Thermo Products supplied 4 in. adapter (IHA-100, IHA-125) to the outlet of the inducer. If using other than a self-tapping sheet metal screw to secure the flue pipe to the inducer, a starter hole **must** be drilled in the inducer before inserting the screw.

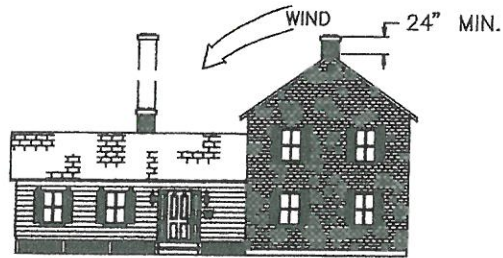
The following items are requirements:

1. Flue or vent connection materials must meet requirements of all applicable local codes and the National Fuel Gas Code (ANSI-Z223.1 LATEST EDITION).
2. Flue connection pipe must be at least 3 in. for the IHA-50 and IHA-75 furnaces and 4 in. for the IHA-100 and IHA-125 furnaces. No reduction in size is permissible.
3. A PVC pipe is not an acceptable substitute for a chimney or a flue connector. A chimney with an internal construction of stainless steel or some other material that will withstand a gross flue gas temperature of 480°F is required.
4. Type B venting as well as some masonry systems are acceptable as described in the venting tables included in the appendix of the National Fuel Gas Code NFPA54 ANSI Z223.1 (Latest Edition). These venting tables also include venting combinations which apply to common venting arrangements of two or more appliances.

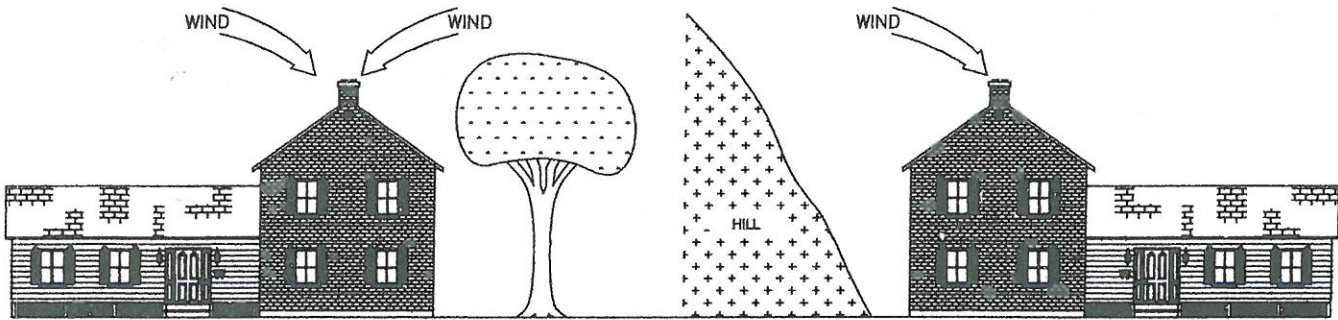
WARNING: When common venting two or more appliances into a common vent, the smallest appliances must be vented into the top opening.

WARNING: A Category 1 appliance must never be connected to a chimney that is servicing a solid fuel appliance. If a fireplace chimney, lined with a metal liner is used to vent this appliance, the fireplace opening must be permanently sealed.

5. The chimney height is determined by the height of the surrounding trees, roof, buildings and terrain. The chimney should extend 24" above any surrounding obstructions.



Trim or remove nearby trees which could interfere with chimney draft or when this is not practical use an approved chimney cap designed to reduce the effect of downdrafts.



Typical installations where a downdraft reducing vent cap might be necessary.

Figure 3

6. In cases where the chimney flue extends to the basement floor, the draft can usually be improved by filling the base of the chimney with sand to within 12" of the flue pipe after relocating the cleanout cover.

7. All joints of the vent must be tightly sealed. The inside of the vent should be free of all obstructions.

8. All vents and vent connectors must fit tightly to avoid air leaks.

9. All vent connectors connecting the furnace to the vent must be rigidly supported with hangers and straps, in order to prevent movement after installation. The vent connector must be supported every four feet for the design and weight of the material used, to maintain clearances, and to prevent physical damage. The vent pipe must slope upward 1/4" for each foot of horizontal run away from the furnace.

10. Vent connectors used in connecting the furnace to the vent cannot be channeled through floors, ceilings, and walls without the proper protective construction. This construction must be in accordance with the requirements of the National Fuel Gas Code (ANSI Z223.1 LATEST EDITION).

11. It is recommended that all single wall vent connectors connected to the IHA Series furnaces have all seams and joints sealed with high temperature pressure sensitive aluminum tape or silicone rubber sealant.

EXAMPLE:

a. High temperature aluminum tape, temperature rating of 400°F or more.

b. Dow Corning RTV-732 rubber sealant or equivalent.
Temperature rating of 450°F or more.

12. It is recommended that all vent connectors be insulated with 1.0" thick foil fiberglass or its equivalent to reduce the chance of condensation and prolong the life of the venting system. It is mandatory that vent connectors installed in or passing through an unheated space must be insulated in this manner to prevent condensate from forming in the connector or vent.

NOTE: If this furnace replaces an appliance that was installed in a common vent system serving other appliances, the vent system may now be too large to properly vent only the remaining appliances. In this case, the vent system must be modified accordingly to properly serve the remaining appliances. Refer to the National Fuel Gas Code NFPA54 ANSIZ223.1 (Latest Edition) for common venting an IHA Series furnace and one or more other fan assisted or natural draft units.

In order to common vent an IHA Series furnace with a natural draft gas fired hot water heater, refer to the National Fuel Gas Code NFPA54 ANSIZ1223.1 (Latest Edition).

The vertical vent pipe that the furnace and hot water heater connects to can be a UL recognized Type B-1 or double wall vent pipe. In all cases, the vertical vent must comply with the National Fuel Gas Code ANSI Z223.1 LATEST EDITION.

D. VENT DAMPERS

If a vent damper is installed, it must be certified by a nationally recognized testing agency. It must be an electro-mechanical type which opens completely before gas flows to the main burners and closes only after the gas valve has shut off gas flow to the main burners.

IMPORTANT: If using a vent damper with an IHA-50 or IHA-75, it will be necessary to increase the flue size to 4 in. to accommodate the vent damper (the smallest available vent size for an electric vent damper is 4 in.) The vent must be reduced back to the 3 in. vent size immediately following the vent damper. Failure to reduce the vent will cause the vent to be oversized and increase the possibility of condensation.

WARNING: The IHA Series furnaces must not be installed with a manual or thermally actuated vent damper.

E. CONDENSING IN THE CHIMNEY:

Due to the increasing efficiencies of our furnaces, more heat is being placed into the home instead of up the chimney. This means that the stack temperature will be lowered which may result in condensing within the chimney under certain conditions. The following is an explanation on why and what to do if condensing occurs.

Moisture occurs in flue gases when hydrogen is mixed with oxygen from the chemical reaction produced by combustion. This mixture of hydrogen and oxygen produces water molecules.

The flue gas vapor will do one of two things as it escapes up the chimney:

1. Remain in a vapor state if the internal chimney wall temperature is above the dew point, or
2. Condense on the chimney walls if they are chilled below dew point.

Condensing will always occur on chimney walls whose temperatures are below the dew point of the flue gas, but will evaporate once the walls are warmer than the dew point. If the chimney walls do not reach the dew point during the cycle of the furnace, the moisture may accumulate in large enough quantities to cause problems such as corrosion of the chimney or corrosion of the heat exchanger.

This condensation most likely will not occur at the bottom of the chimney, because the flue gas is heating the chimney walls as it rises and the bottom will be heated first. This heating of the walls will cause the flue gas temperature to drop, which in turn may reduce the wall temperature below the dew point causing condensation to appear on the upper part of the chimney first. This condensation may drip back as far as the flue pipe and heat exchanger, where corrosion may occur if not corrected.

To prevent condensation, it is necessary that the internal chimney wall temperature always be kept above the dew point. The chimney may have to be lined with a flue liner if the temperature loss is too great for the furnace. A liner will act as an insulator and reduce the flue gas temperature loss. Insulation may be added around the liner for further temperature stability. If the chimney is on the exterior of the home and condensing occurs, the chimney may be insulated around its exterior to help the flue hold its temperature. Also, check to see if the chimney is too large for the flue gases to heat, if so reduce to proper size by lining. Be sure to use steel liners such as stainless types 430, 304 or for the toughest against corrosion type 316.

More detailed information on condensing may be obtained from the 1988 ASHRAE Equipment Handbook Chapter 26. Refer to National Fuel Gas Code NFPA54 ANSI Z223.1 Latest Edition.

F. REPLACING AN EXISTING FURNACE FROM A COMMON VENT

When an existing furnace is removed from a common vent serving other appliances, the vent system is likely too large to safely vent the remaining attached appliances.

The following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

- a. Seal off any unused opening(s) in the common venting system.
- b. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
- c. Insofar as is practical, close all outside doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
- d. Follow the lighting instructions. Place the appliance being inspected in operation. Adjust thermostat so appliance will operate continuously.
- e. Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle or smoke from a cigarette, cigar or pipe.
- f. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-burning appliance to their previous conditions of use.
- g. If the improper venting is observed on any of the appliances during the above testing, the common vent system must be corrected. Follow the steps outlined in the National Fuel Gas Code, NFPA 54/ANSI Z223.1-LATEST EDITION to re-size the vent system to approach the minimum size using the appropriate tables of that code. The National Fuel Gas Code may be obtained by writing the American Gas Association Laboratories, 8501 East Pleasant Valley Road, Cleveland, OH 44131 or the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NOTE: Common vent sizing of two Category I appliances may be done as referenced in the National Fuel Gas Code NFPA54 ANSI Z223.1 (Latest Edition).

G. GENERAL GAS PIPING

WARNING: Because of the potential of odorant fade, a gas leak may not be detected by smell. If this furnace is installed below grade, contact your gas supplier for a gas detector.

All gas piping and testing must be performed by a qualified installer or service person. The installation must comply with local codes, these instructions and The National Fuel Gas Code NFPA54/ANSI Z223.1-LATEST EDITION.

Piping from the natural gas meter to the furnace shall be in accordance with requirements of the local utility. Piping from the LP tank to the furnace must follow the recommendations of the gas supplier.

1. A readily accessible, certified manual shut off valve with a non-displaceable rotor member shall be installed within six feet of the gas equipment it serves. A union or flanged connection shall be provided downstream from the manual valve to permit removal of controls. A 1/8" N.P.T. plugged tapping is provided at the inlet of the gas control for connection of a test gage to check gas supply pressure to the furnace. Unions must be of a ground joint type or flanged-jointed using a gasket resistant to LPG. Pipe dope or sealant certified to be resistant to the action of liquefied petroleum gases shall be used on all threaded joints.

2. Left and Right Gas Supply Piping - This furnace is set up for left side gas piping using a straight pipe. If right side gas piping is required, use two field supplied street elbows to line up with knockout hole in right side of cabinet. (see Figure 4)

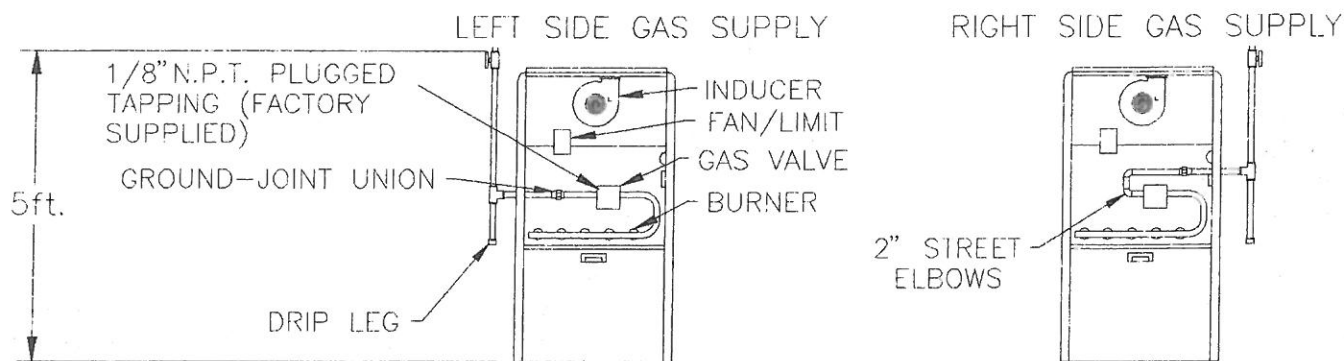


Figure 4

3. A drip leg must be used on both LP and natural gas installations prior to the furnace to trap oil, condensate and other impurities which might otherwise lodge in the gas valve or plug the burner orifice. When there is excessive condensation between the gas meter and the furnace, a drip leg shall be provided at the outlet of the gas meter. Failure to install a drip leg may void the limited warranty on the furnace.

NOTE: All gas piping must be leak tested using a soap and water solution (when the gas is turned on) following the procedure outlined in this section. A final test for gas leakage must be made after purging the gas line in Section III on operation. This test must be conducted with the unit operating and should include the furnace piping and gas valve. Never use an open flame to check for a gas leak.

IMPORTANT: Care must be taken not to wet electronic components during leak test. Wetting the primary ignition module may damage its circuitry and cause a hazardous situation. If wetting occurs, dry moisture from all leads and terminals. Wait at least 24 hours for the circuit to fully dry before energizing the burner circuit.

CAUTION: The furnace and its individual gas shutoff valve must be disconnected from the gas supply during pressure testing of the gas supply system at pressures in excess of 1/2 PSIG or 14.0" wc. The furnace must be isolated from the gas supply by closing its manual shut off valve at test pressures equal to or less than 1/2 PSIG or 14.0" w.c.

H. INSTALLATION OF NATURAL GAS PIPING

The installation of the gas piping and the following test procedures must be performed by a qualified installer or service person.

1. The following chart is to be used as a guide in sizing natural gas supply piping. The input loading of all gas appliances installed on any main or trunk line must be totaled to determine its needed carrying capacity.

EXAMPLE: A line must supply a furnace of 100,000 BTU/hr input, a hot water heater of 40,000 BTU/hr input and gas range with a 30,000 BTU/hr input capacity. The total BTU/hr input loading on the line is 170,000 BTU/hr. The 200,000 BTU/hr column on the chart must be used in sizing the pipe.

- STEEL PIPE SIZE FOR NATURAL GAS -

BURNER FIRING RATE, BTU/HR	FEET OF PIPE FROM METER TO BURNER				
	10'	20'	30'	40'	50'
50,000	1/2	1/2	3/4	3/4	3/4
100,000	3/4	3/4	3/4	3/4	1
150,000	3/4	1	1	1	1-1/4
200,000	1	1	1-1/4	1-1/4	1-1/4
250,000	1	1	1-1/4	1-1/4	1-1/4
300,000	1	1	1-1/4	1-1/4	1-1/4

TABLE 2

Use black iron steel pipe and malleable iron fittings for Natural gas service lines. Provide rigid supports for the pipe. If the pipe size must be reduced, use reducing couplings only. Avoid the use of reducing bushings. Remove all burrs and inspect the pipe for dirt or other foreign material prior to connecting.

Maximum supply pressure for natural gas is 14" wc and minimum supply for purpose of input adjustment is 4-1/2" wc.

I. INSTALLATION OF LIQUEFIED PETROLEUM GAS (LP) PIPING

1. Experience has proved that the pressure drop in the gas line running from the outside propane gas tank to the gas appliances in a home, is the most frequent cause of equipment malfunctions. A single pressure regulator, located at the tank, will not reliably regulate the high tank pressures (up to 200 lbs.) down to 11" wc. Varying pressures will occur at the appliances as outside temperatures and usage demands vary. Two stage regulation is the only effective method of controlling these variables.

(see Figure 5).

TYPICAL PIPING FOR TWO STAGE REGULATION

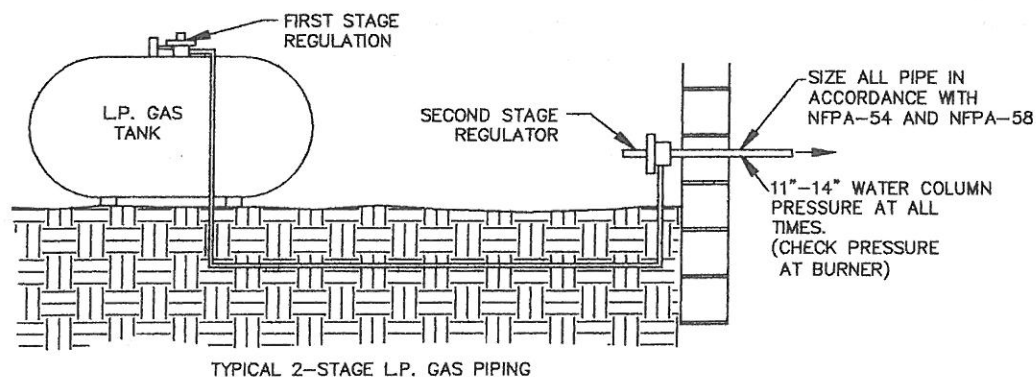


Figure 5

NOTE: Two stage regulation must be installed for liquefied petroleum gas when used with any Thermo Pride LP furnace. See illustration above of a typical two stage piping system.

- COPPER TUBING SIZE FOR LIQUEFIED PETROLEUM GASES -

TABLE I						TABLE II						
IF THE LENGTH OF LINE BETWEEN REGULATORS (TANK TO BUILDING) IS THIS LONG ----						IF LENGTH OF LINE BETWEEN SECOND STAGE REGULATOR AND FURNACE IS THIS LONG ----						
USE THIS SIZE TUBING TO KEEP PRESSURE DROP BELOW 2 LBS. FOR MAXIMUM FLOW SHOWN.	TOTAL INPUT LOAD(BTU) ON LINE	25'	50'	75'	100'	USE THIS TUBING OR PIPE TO KEEP PRESSURE DROP BELOW 1 1/2" WATER COLUMN FOR MAXIMUM FLOW SHOWN.	TOTAL INPUT LOAD(BTU) ON LINE	10' 20'	30'	40'	50'	
	125,000	3/8" O.D. COPPER					75,000	5/8" O.D. COPPER				
	250,000	3/8" O.D. COPPER			1 1/2" O.D. COPPER		125,000	5/8" O.D. COPPER	3/4" BLACK PIPE			
	375,000	1/2" O.D. COPPER					187,500	3/4" BLACK PIPE				
	500,000	1/2" O.D. COPPER					250,000	3/4" BLACK PIPE				
							375,000	3/4" BLACK PIPE	1" BLACK PIPE			
						500,000	1" BLACK PIPE					

All black pipe sizes shown are I.D.

TABLE 3

Seamless copper tubing may only be used with gases that are not corrosive to it. See note below and check with your LP gas supplier before using. Seamless copper tubing must comply with standard type K or L for seamless copper water tube, ASTM B 88; or seamless copper tube for air conditioning field service, ASTM B 280. Copper tubing sizes for indicated BTU input rates are given above in Table 3.

NOTE: Copper and brass tubing and fittings (except tin lined) shall not be used if the gas contains more than a trace (0.3 grains per 100 cubic ft.) of hydrogen sulfide gas. Check with your gas supplier.

Maximum supply pressure for liquefied petroleum (LP) gas is 14" wc and minimum supply for purpose of input adjustment is 11" wc.

J. REQUIREMENTS AND SIZING OF DUCT WORK

The duct system must be sized and installed by a qualified installer or service person, following the design standards of the Air Conditioning Contractors of America (ACCA) or ASHRAE.

1. When a return air register is located in the same room as the furnace, it must be installed a minimum of 20 feet away from the furnace.
2. If supply ducts carry circulated air to areas outside the space containing the furnace, the return air duct shall also be sealed to the furnace and also terminate outside of the furnace space.
3. The return air duct system must equal the supply air duct system in its CFM capabilities. Use a supplier's catalog for proper sizing of outlet and return air registers and grills to ensure that they meet the CFM requirements of the run to which they are connected.
4. If the furnace is used in connection with an air conditioning evaporator coil, the furnace must be installed parallel with or on the upstream side of the coil, to prevent condensation in the heat exchanger. If the evaporator coil is installed with a parallel flow arrangement, dampers or other means to control flow of air should be installed to prevent chilled air from entering the furnace. If such a device is manually operated, it must be equipped with a means to prevent operation of either the furnace or air conditioner unless it is in the full heat or cool position.
5. The duct system shall be sized for the maximum CFM requirement of the installation, whether it is for heating or cooling. Two common rules for heating and cooling follow:

A. 400 CFM (1200 BTU's) per ton of cooling is required.

B. 14 CFM of heating per 1000 BTU's of furnace output based on its steady state efficiency and a 55° to 85° temperature rise.

EXAMPLE: Heating output of furnace is 100,000 x 14 - 1000 = 1400 CFM. Air conditioning installed is 4 tons x 400 CFM = 1600 CFM or 48,000 BTU's. **NOTE:** The duct system must be sized for the larger CFM requirement for cooling. If only 3 tons 36,000 BTU's of cooling x 400 CFM = 1200 CFM was installed, the duct would have to be sized for the 1400 CFM heating requirement.

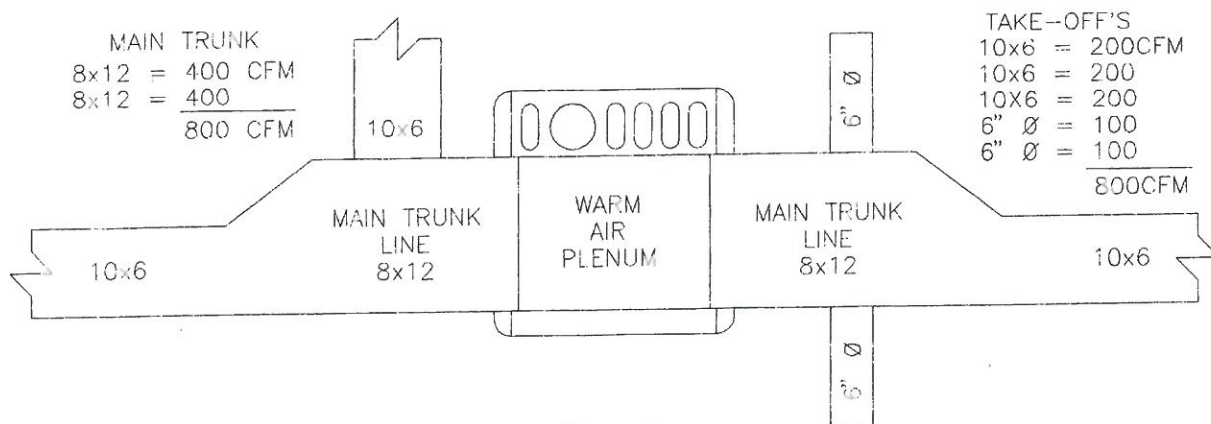


Figure 6

All trunk lines, take-offs, registers and grill-free areas must be figured when determining the air handling capacity of a duct system. By utilizing the chart below, one can obtain the necessary duct system size. (For example, see Figure 6). Use a supplier's catalog for proper sizing of outlet and return air registers to insure that the register will meet the CFM requirements of the run to which it is connected.

To achieve proper air movement, the main trunk lines, take offs, registers and grills of the supply return air duct system must have an adequate square inch area to move the desired CFM. The chart below shows the CFM air handling capability based on a 0.1" SP loss, in the supply duct system.

DUCT SIZES FOR HOMES, QUIET OFFICES OR SIMILAR INSTALLATIONS

CFM	DIA.	SQ."	RECTANGULAR DUCT DIMENSIONS ... INCHES							
45	4	12.5								
65	5	19.6								
100	6	28						6x6	9x4	
150	7	38						8x6	12x4	
200	8	50						10x6	14x4	
250	9	63					8x8	12x6	18x4	
300	9	63					9x8	14x6	20x4	
400	10	78					12x8	16x6	25x4	
500	12	113				10x10	14x8	19x6	30x4	
600	12	113				12x10	16x8	22x6	38x4	
700	12	113				14x10	18x8	26x6		
800	14	154			12x12	15x10	20x8	28x6		
900	14	154			14x12	17x10	22x8	32x6		
1000	16	201			15x12	18x10	24x8	34x6		
1100	16	201		14x14	16x12	20x10	26x8	40x6		
1200	16	201		15x14	17x12	22x10	28x8	42x6		
1300	16	201		16x14	18x12	22x10	30x8	46x6		
1400	18	255		16x14	19x12	24x10	32x8	48x6		
1500	18	255		17x14	20x12	26x10	34x8	50x6		
1600	18	255	16x16	18x14	22x12	26x10	36x8	54x6		
1700	18	255	17x16	20x14	22x12	28x10	38x8	58x6		
1800	18	255	18x16	20x14	24x12	30x10	40x8	62x6		
1900	20	314	18x16	22x14	26x12	32x10	44x8	64x6		
2000	20	314	20x16	22x14	26x12	34x10	46x8			
2200	20	314	18x18	20x16	24x16	28x12	36x10	48x8		

TABLE 4

To ensure obtaining the necessary air handling capacity of a duct system, each of the system components (trunk lines, take offs, runs and register and grill-free areas) must be properly sized and matched together. A 12" x 8" duct with a 400 CFM capacity for example will not flow 400 CFM if the register(s) to which it connects only flow a total of 200 CFM.

To obtain the proper 55°F to 85°F temperature rise for heating when an air conditioning coil is installed, the speed of the blower motor may have to be changed. This depends on the static resistance of an individual duct system and the size of the air conditioner.

K. FILTERS

It is necessary to cut the return air opening in the side, bottom or rear casing, (IHA-50 & IHA-75 only) depending upon the needs of the specific installation.

WARNING: A rear return is not recommended on the IHA-100 and IHA-125.

This IHA furnace has been factory supplied with a high quality re-usable filter rated for air velocities up to 600 ft/min. An optional Thermo Products filter rack assembly (part no. AOPS7547) is available which is sized for the filter provided.

If an optional Thermo Pride filter rack (figure 7) is used with the furnace, it will serve as a template to scribe a mark for the return air opening on the casing. Place the filter rack on the casing one inch up from the bottom of the furnace and centered from side to side. Place the securing flange against the casing for locating the return air opening.

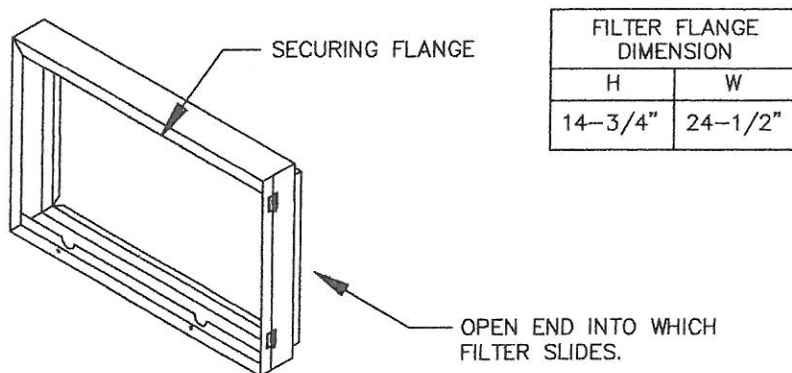


Figure 7

- **PLEASE NOTE:** While scribing the return air opening, the filter rack can be held into position by tape or similar means.

- Position the open end of the filter rack so that it is accessible for filter replacement. Once the filter rack is positioned correctly, scribe a line along the inside of the securing flange of the filter rack on three of the sides. To scribe a line on the fourth side, on the open end, use the open end support for a guide.

- Remove the filter rack and cut the return air opening in the casing. Now the filter rack can be permanently attached to the furnace with screws or pop-rivets along the securing flange.

- Connect the return plenum to the filter rack and slide the filter into place.

If a method other than a Thermo Pride filter rack is selected for retention of the filter, see Table 6 for minimum size guidelines for selecting a filter system for the IHA furnaces.

(NOTE: Failure to comply with minimum filter installation requirements may effect the performance and/or void the warranty on this furnace.)

MINIMUM FILTER AREA REQUIRED (LENGTH X WIDTH, SQ. IN.)

FILTER TYPE (MAX. AIR VELOCITY)	FURNACE MODEL			
	IHA-50	IHA-75	IHA-100	IHA-125
THERMO PRODUCTS SUPPLIED	*	*	*	*
RE-USABLE FILTER (600 FT/MIN)	120 IN ²	180 IN ²	240 IN ²	300 IN ²
STANDARD RE-USABLE FILTER (500 FT/MIN)	144 IN ²	216 IN ²	288 IN ²	350 IN ²
DISPOSABLE TYPE FILTER (300 FT/MIN)	240 IN ²	360 IN ²	NOT PERMITTED	NOT PERMITTED

Table 5

* The Thermo Products supplied filter can be cut to size to fit other filter retention systems as long as the minimum size requirement is met. **NOTE:** Any internal stiffeners used in the filter must not be removed, although they can be cut to size as needed.

L. WIRING

All wiring must conform to the provisions of local codes or in the absence of these codes with the provisions of the National Electrical Code, ANSI/NFPA NO. 70 (Latest Edition).

The following items are guidelines to complete the wiring portion of the installations.

1. All IHA Series furnaces are supplied with a fuse disconnect switch box to be mounted on the outside surface of the right or left side casing so a fuse disconnect can be mounted on the furnace. Make the 115 volt supply connection in this junction box. A green screw and a strain relief are provided in order to connect the power supply ground wire and provide strain relief for the 115 volt power leads from the furnace in the fuse disconnect box.

IMPORTANT: The furnace must be grounded in accordance with local codes and with the National Electrical Code, ANSI/NFPA NO. 70 (Latest Edition) when an external electrical source is utilized.

2. THERMOSTAT ANTICIPATOR SETTING

Proper control of the indoor temperature can only be achieved if the thermostat is calibrated to the heating and/or cooling cycle. A vital consideration of this calibration is related to the thermostat heat anticipator.

The proper thermostat heat anticipator setting is 0.8 AMPS for furnace operation only. To increase length of cycle, increase setting of heat scale; to decrease length of cycle, decrease setting of heat scale.

Anticipators for the cooling operation are generally pre-set by the thermostat manufacturer and require no adjustment.

Anticipators for the heating operation are of two types, pre-set and adjustable. Those that are pre-set will not have an adjustment scale and are generally marked accordingly.

Thermostat models having a scale as shown in Figure 8 must be adjusted to each application.

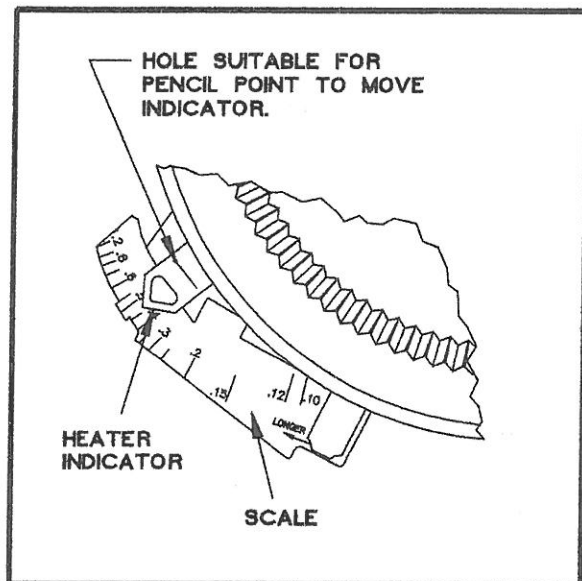


Figure 8

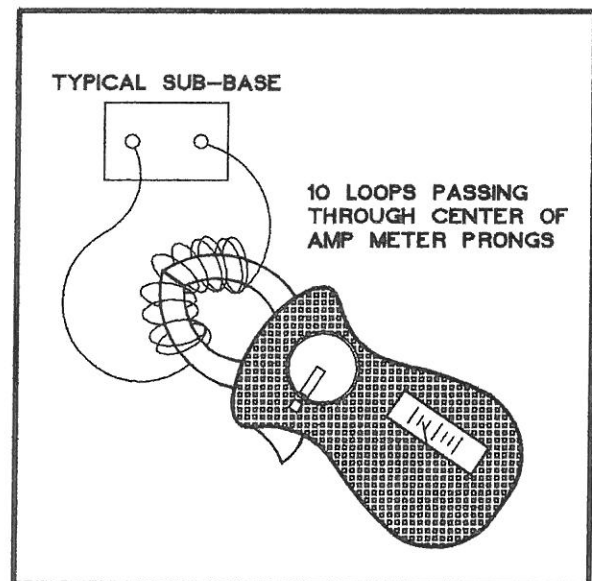


Figure 9

In many cases, this adjustment setting can be found in the thermostat installation instructions. If this information is not available, or if the correct setting is questioned, the following procedures should be followed:

PREFERRED METHOD:

Use a low scale ammeter such as an amp check. Connect the meter across terminals "R" and "W" on the sub-base ("RH" & "W" on multi-state thermostat sub-base) or

STEP 1. Wrap 10 loops of single strand insulated thermostat wire around the prongs of an amp meter. Set the scale to the 1 to 5 or 1 to 6 amp. scale.

STEP 2. Connect the uninsulated ends of this wire jumper across terminals "R" and "W" on the sub-base ("RH" and "W" on multi-stage thermostat sub-base). See Figure 9. This test must be performed without the thermostat attached to the sub-base.

STEP 3. Let the heating system operate in this position for about one minute. Read the amp meter scale. Whatever reading is indicated must be divided by 10 (for 10 loops of wire).

This is setting at which the adjustable heat anticipator should be set.

FORMULA: $\frac{\text{Amp meter reading}}{10 \text{ loops}} = \text{ANTICIPATOR SETTING}$

OR: $\frac{2.5 \text{ AMPS}}{10} = .25 \text{ AMPS SETTING}$

STEP 4. If a slightly longer cycle is desired, the pointer should be moved to a higher setting. Slightly shorter cycles can be achieved by moving to a lower setting.

STEP 5. Remove the meter jumper wire and reconnect the thermostat. Check the thermostat in the heating mode for proper operation.

NOTE: The length of the heating cycle can also be affected by the fan limit control settings (if applicable). The fan "ON" and "OFF" settings should be checked at this point.

For thermostats having 2 stage heat, Step 1 and 2 and 3 must be repeated. Second stage heat is controlled through terminals "RH" and "W2" on the sub-base.

If Digital Amp Probe is used, read amp draw direct from meter, then Step #1 is not required.

3. BLOWER MOTOR SPEED WIRING

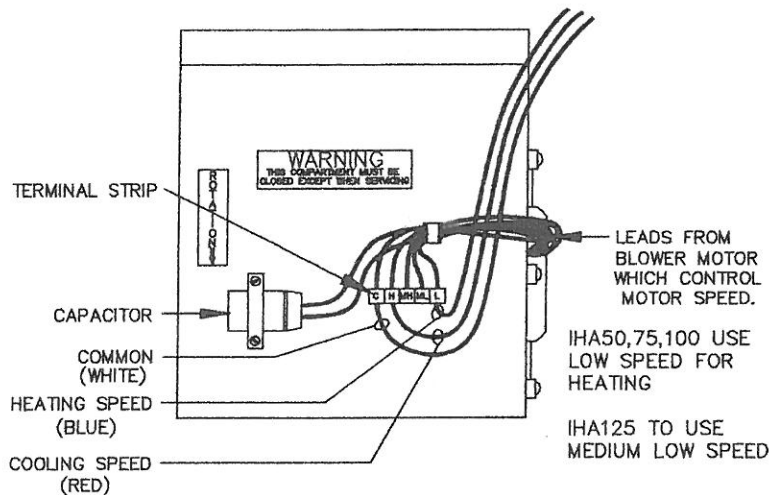


Figure 10

WARNING: TURN OFF THE ELECTRICAL POWER to the furnace before attempting to change blower speed wiring.

The two supply leads that are factory wired to the terminal strip provide the heating and cooling fan speed. The blue lead is for the lower speed on the heating mode and the red lead is for the higher speed on the cooling mode. When changing motor speed, use the proper color for the desired mode. Red for cooling, blue for heating. These two leads can be connected to different motor speed leads, shown above to achieve the desired CFM.

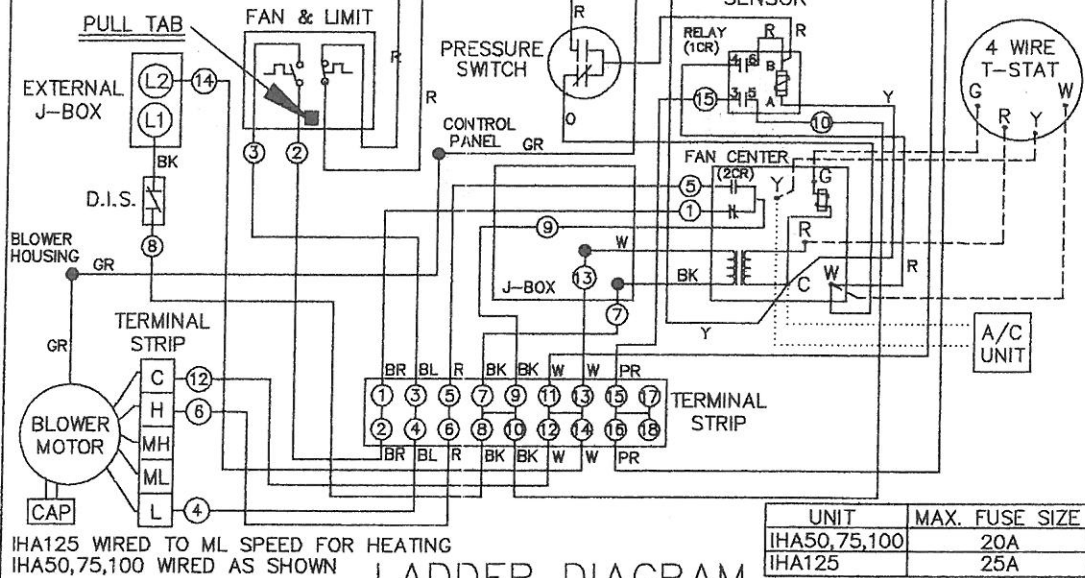
All wiring must perform to provisions of the National Electrical Code ANSI/NFPA NO. 70 (Latest Edition). Wiring between the furnace and devices, which are field installed, shall conform with temperature limitations for type T wire (35 C rise) and Local Ordinances. If any of the original wire supplied with the unit needs to be replaced, 105°C thermoplastic or its equivalent, must be used. The furnace must be supplied by its own fused, electrical circuit.

WIRING DIAGRAM IHA50,75,100,125

(HONEYWELL IGNITION MODULE)

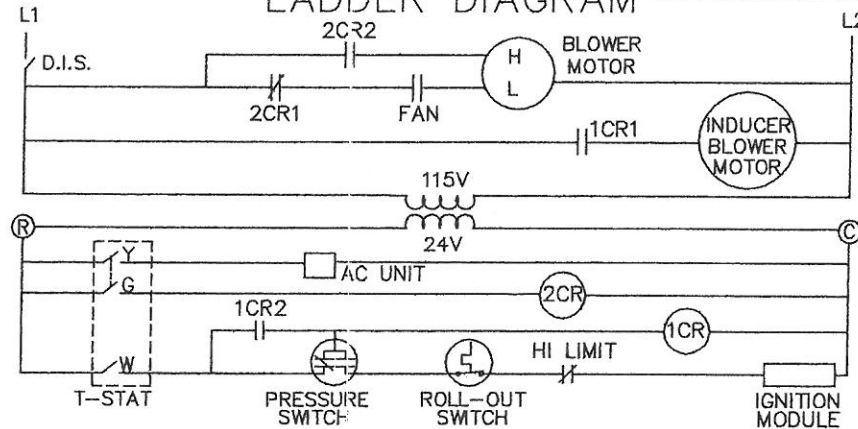
ELECTRICAL SCHEMATIC

UNIT	LIMIT SETTING
IHA50, IHA75	250°F
IHA100	220°F
IHA125	170°F



IHA125 WIRED TO ML SPEED FOR HEATING
IHA50,75,100 WIRED AS SHOWN

LADDER DIAGRAM



NOTES:

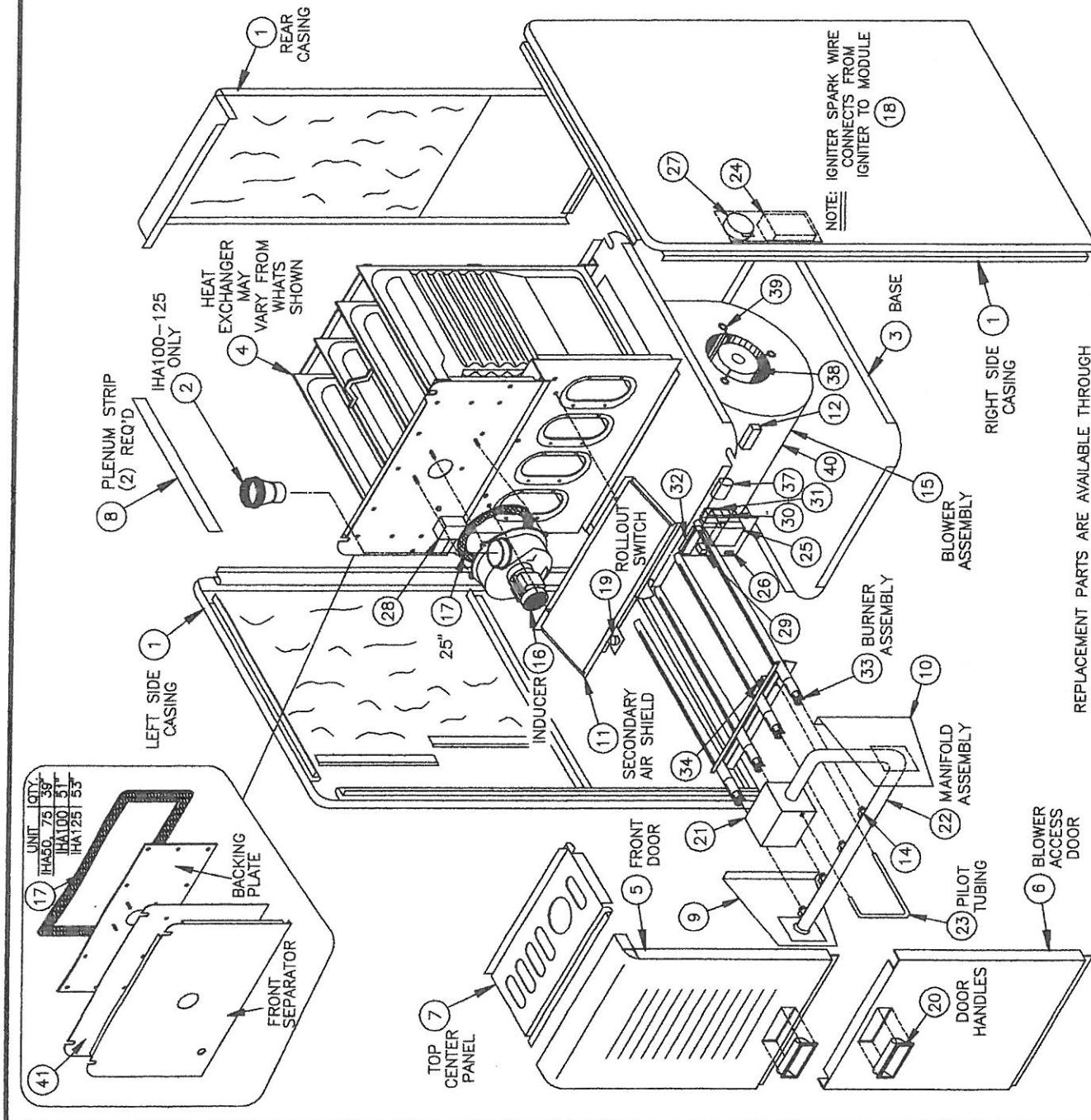
1. CONNECT HOT TO L1 AND COMMON TO L2.
2. REPLACE IGNITER/SENSOR WIRE WITH TYPE 150°C U.L. STYLE.
3. IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE FURNACE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105°C
4. SET HEAT ANTICIPATOR AT .9 AMP.

LEGEND	
---	FIELD WIRING
—	FACTORY WIRING
.....	AIR CONDITIONING WIRING
D.I.S.	DOOR INTERLOCK SWITCH
1CR	#1 CONTROL RELAY (INDUCER)
2CR	#2 CONTROL RELAY (HOUSE BLOWER)
CAP.	CAPACITOR

M. REPLACEMENT PARTS LIST FOR IHA-50, IHA-75, IHA-100 and IHA-125.

#	PART DESCRIPTION	PART #
1	SIDE & REAR CASINGS	*
2	3" - 4" TRANSITION	14310
3	BASE	*
4	HEAT EXCHANGER ASSEMBLY	*
5	FRONT DOOR	*
6	BLOWER ACCESS DOOR	*
7	TOP CENTER PANEL	*
8	PLENUM STRIPS	*
9	MANIFOLD BRACKET (LEFT)	*
10	MANIFOLD BRACKET (RIGHT)	*
11	SECONDARY AIR SHIELD	*
12	BLOWER TERMINAL STRIP	350679
14	MAIN BURNER ORIFICES	NAT. 380038 L.P. 380039
15	BLOWER ASSEMBLY	IHA50 30054062 IHA75 30054063 IHA100 30054064 IHA125 30054065
16	INDUCER	340048
17	ROPE GASKET MATERIAL	330118
18	IGNITER SPARK WIRE	350562
19	ROLLOUT SWITCH	350435
20	DOOR HANDLES	320157
21	GAS VALVE	380049
22	MANIFOLD ASSY	*
23	PILOT TUBING	320407
24	IGNITION MODULE	380026
25	FAN CENTER	350387
26	DOOR INTERLOCK SWITCH	350423
27	PRESSURE SWITCH	350564
28	FAN/LIMIT CONTROL	350434
29	K-10 RELAY	350411
30	RELAY	350386
31	BAIL (RELAY RETAINING WIRE)	350388
32	TERMINAL BLOCK	350708
33	BURNER ASSEMBLY	IHA50 380030 IHA75 380031 IHA100 380032 IHA125 380033
34	PILOT/IGNITER ASSY (INCLUDES NATURAL ORIFICE)	380041
	NATURAL GAS PILOT ORIFICE	380045
	L.P. GAS PILOT ORIFICE	380046
37	CAPACITOR	IHA50, 75, 100 350073 IHA125 350077
38	BLOWER MOTOR	IHA50 350336 IHA75 350347 IHA100 350041 IHA125 350342
39	MOTOR BRACKET	IHA50 350826 IHA75, 100, 125 350627
40	BLOWER	IHA50 340044 IHA75 340082 IHA100 340082 IHA125 340083
41	COLLECTOR BOX GASKET	IHA50, 75 330123 IHA100 330121 IHA125 330120

* ORDER ITEM BY PART DESCRIPTION FOR SPECIFIC MODEL



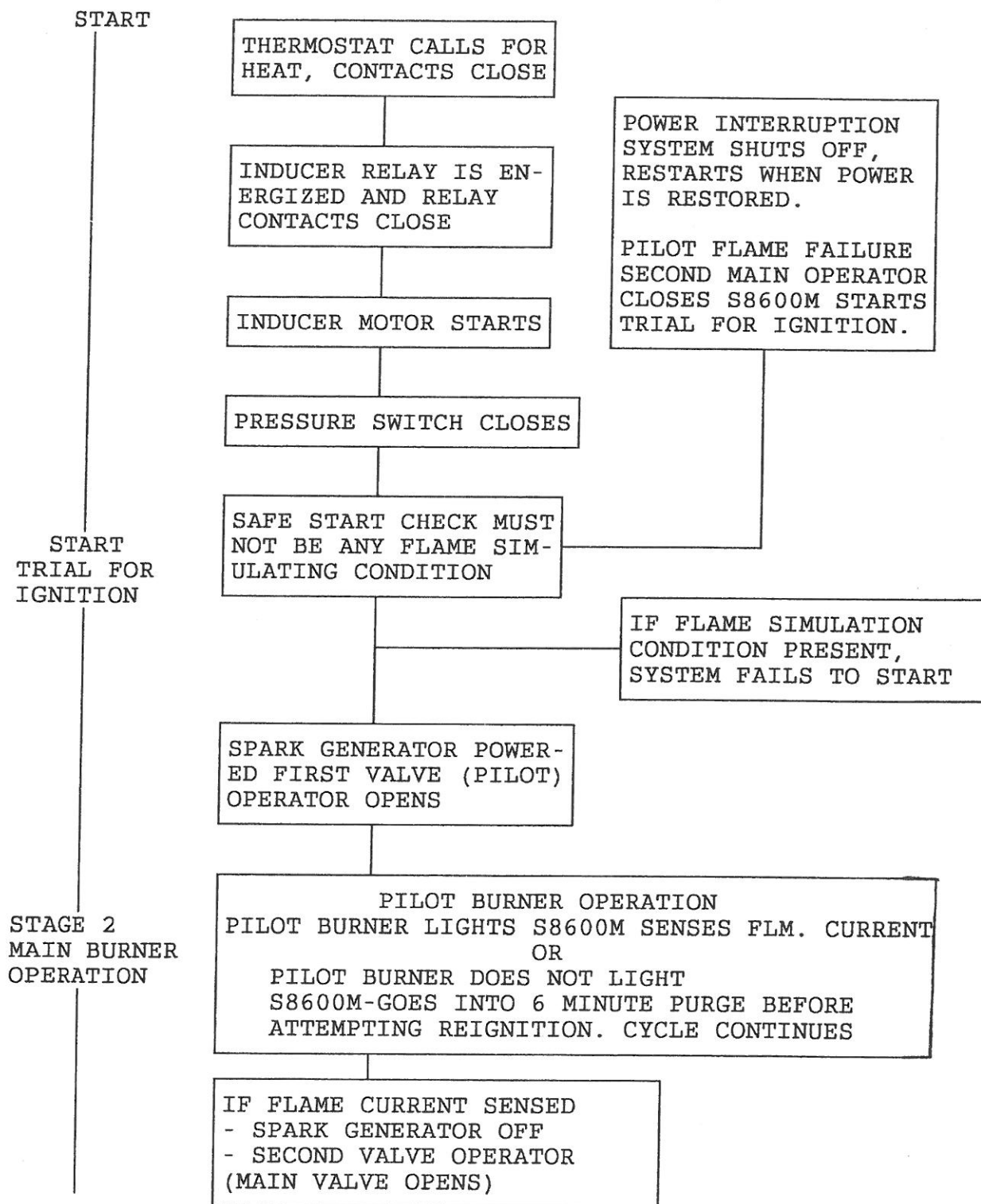
REPLACEMENT PARTS ARE AVAILABLE THROUGH
THERMO PRODUCTS, INC.
P.O. BOX 217
NORTH JUDSON, IN 46366

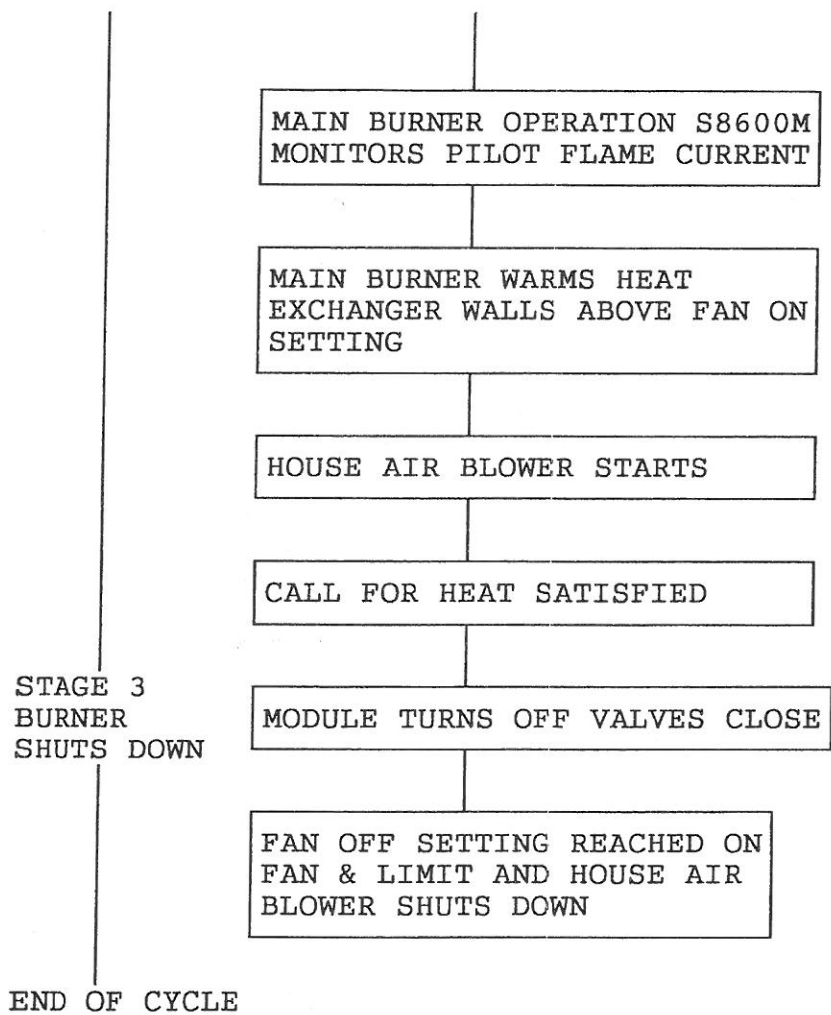
OVERALL

III. STARTING THE UNIT

A. SEQUENCE OF OPERATIONS

SPARK PILOT SYSTEM WITH HONEYWELL MODEL S86M IGNITION MODULE





B. INITIAL START UP:

This furnace is equipped with an intermittent pilot ignition system. Do not attempt to manually light the pilot. Each time the thermostat calls for heat, an electronic spark ignites the pilot. The pilot does not burn when there is no call for heat. Check the following items before the initial start-up:

1. Check all wiring for loose connections and proper hook up.
2. Leak test gas piping connections.
3. Check tubing to the pressure switch to make sure it is pushed firmly onto the pressure tap.
4. Check flue pipe, chimney, and all connections for tightness and to make sure there is no blockage.
5. Make sure air filter is in place.

OPERATING INSTRUCTIONS:

WARNING: Turn off power to furnace. Before gas piping system is placed into service, it must have been leak tested by a qualified heating contractor. (See Section G of these instructions on the installation of gas piping).

WARNING: For initial start-up of the furnace after installation, it may be necessary to purge the air out of the gas line. This should be done by a qualified heating contractor. If excessive gas escapes when purging the gas supply at the union, allow the area to ventilate for at least 15 minutes before attempting to start the furnace. LP gas is especially dangerous because the specific gravity of LP gas allows it to accumulate at floor level at a dangerous concentration. For remainder of operating instructions, reference **Users Information Manual**.

WARNING: Heat exchanger oil will burn off on initial firing creating an unpleasant odor. To prevent this odor from occurring more than once, it is suggested that:

1. A window(s) be opened.
2. The thermostat set at highest setting.
3. The furnace remain running at conditions 1 & 2 for 30 minutes or until odor has dissipated.

C. ADJUSTMENT OF BTU INPUT RATE:

The orifice for this furnace was sized: 1). For natural gas having a heating value of 1025 BTU per cubic foot and a specific gravity of .60 or 2). For liquefied propane gas with a heating value of 2500 BTU per cubic foot and a specific gravity of 1.53. The information plate inside the furnace vestibule will specify which gas your furnace is orificed for. If the furnace is installed at an altitude that is more than 2,000 feet above sea level, it is mandatory that the input to the burner be reduced 4.0% for every 1,000 feet that it is above sea level. If the furnace is installed at an elevation of 5,000 feet, its input must be reduced 20.0%. Example: a furnace rated at 100,000 BTU at sea level must be reduced to a firing rate of 80,000 ($100,000 \times .80 = 80,000$) at an elevation of 5,000 feet. If the furnace is installed at an elevation of 2,000 feet or less, no reduction in input is required. Your gas supplier will supply you with the correct orifice sizing information.

To check the input of your natural gas furnace, allow the unit to operate for 10 to 15 minutes and proceed as follows:

- a. Call your gas supplier and ask for the BTU content (heating value) of one cubic foot of the gas, supplied to the installation area. An alternate approach is to assume a value of 1025 BTU/Cu Ft which is the national average.
- b. With all other gas appliances turned off and using a stop watch, clock the time required for the (small) dial on the gas meter to make one full revolution. The meter will state how many cubic feet is flowed for one revolution usually one, two or five. The unit must have been in operation at least 10 minutes before clocking.

FORMULA: $\frac{\text{BTU/Cu Ft} \times \text{Number of Cu Ft} \times 3600 \text{ Seconds}}{\text{Seconds for one revolution}} = \text{Input BTU/hr}$

Seconds for one revolution

EXAMPLE: $\frac{1025 \text{ BTU/Cu Ft} \times 2 \text{ Cu Ft} \times 3600}{74.8 \text{ Seconds}} = 98,663 \text{ BTU Input}$

Check for the model number of this furnace, its input, the type of gas and the manifold pressure on the information plate located on the vestibule panel behind the upper front panel. If using the above example, the furnace was a IHA-100 model the 98,663 BTU input would be acceptable because it was within 2% of the listed input of 100,000.

c. Make sure that the gas supply pressure to the furnace falls within the maximum range of 4-1/2" to 14" wc pressure on natural gas and 11.0" to 14.0" wc on LP gases. The pressure to the furnace must be checked while the furnace burner and any other gas appliances on the same supply system are operating, using the 1/8" in. plugged tapping shown in Section H of this manual.

GAS PRESSURE CHART FOR ALL IHA MODEL FURNACES

	SUPPLY PRESURE	MANIFOLD PRESSURE
NAT	MAX 14" WC MIN 4.5" WC	3.5" \pm .3" WC
LP	MAX 14" WC MIN 11" WC	10.3" \pm .3" WC

TABLE 6

This gas furnace is equipped with a fixed orifice sized for the manifold pressure shown on the information plate. The input can only be increased or decreased by adjusting the manifold pressure. Remove the 1/8" threaded pipe plug located on the top right side of the gas valve. Use a U tube manometer or pressure gage to measure the pressure. To adjust the pressure, remove the cap from the regulator on the top of the gas valve and using the adjustment screw, decrease the pressure by turning the screw counterclockwise or increase it by turning the screw clockwise. ADJUSTMENTS TO THE LISTED PRESSURE MUST NOT EXCEED 0.3" wc. A 0.3" wc adjustment will increase or decrease the input approximately 4.0%.

If a gas meter is not available for natural gas, or the unit is installed on liquefied petroleum gases which are not metered, the correct input can be assumed if the furnace manifold pressure is the same as that shown on the information label.

Shut off the gas supply to the furnace. Remove the pressure gage and re-install the pipe plug using a thread compound resistant to the action of LP gases.

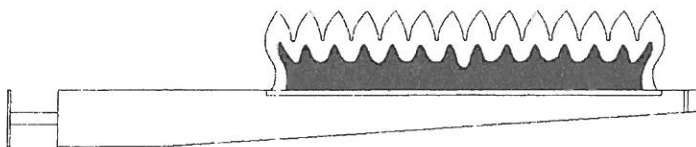
If the rated input cannot be obtained with the present orifice at the correct pressure, your local gas supplier will assist in sizing the proper orifice. Our Engineering Department will gladly assist in sizing the orifice if you provide them with the heating value in BTU per cubic foot and the specific gravity of the gas.

D. BURNER AND PILOT ADJUSTMENT

This unit is designed to maintain a soft flame. An IHA furnace should typically give a good blue flame with the air shutter completely open. Air shutters are provided on the burners to compensate for variations in the composition of the local gas supplier. If the flames are unsteady or lifting, the air shutters can be closed down to reduce primary air until the flames become steady. If flames are yellow in color, the air shutters can be opened to allow more primary air. As air is added, the yellow will gradually disappear. When sufficient air has been added, all the yellow will be gone and a soft blue flame will be present.

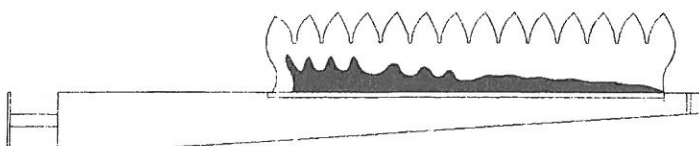
BURNER FLAMES

NATURAL GAS



Natural gas flames should have a soft blue outer cone and a brighter sharper inner cone.

L.P. GAS



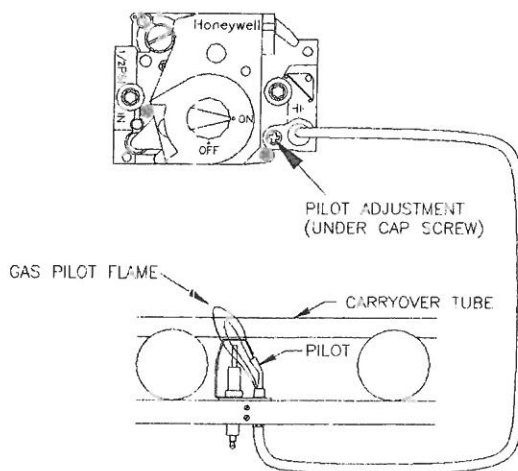
L.P. gas will have a soft blue outer cone and a very short brighter inner cone which will taper down and be almost flat at the tip of the burner.

The pilot flame stays lit only during the burner on cycle and in normal operation, will burn with a hard blue flame that just encompasses the pilot sensor and extending just over the carryover tube. If the pilot flame is incorrect, (see illustration below) remove the pilot adjustment cap and adjust screw out (counterclockwise) to enlarge flame or (clockwise) to decrease flame.

b. Burner combustion can be checked by drilling a small hole within 1 foot of inducer outlet and taking readings of the carbon dioxide and carbon monoxide. Results should be as follows:

1. Carbon Dioxide for NAT 7.5%-8.5% (CO_2) - LP 8.5%-9.5% (CO_2)
2. Carbon Monoxide of 50 PPM or less (CO).

IMPORTANT: After taking reading, seal hole in vent pipe with high temperature aluminum tape.



E. FURNACE CHECKOUT PROCEDURE

Before any system of gas piping is finally put into service, it shall be carefully tested to assure that it is gas tight as indicated in Gas Piping Section of Burner Manual.

NOTICE: All controls on the unit should be checked for proper functioning prior to the qualified service personnel leaving the job site. Specifically the following should be checked:

With furnace in normal heating operation, check to make certain blower will start and stop automatically under control of fan switch.

a. Check safety limit control as follows:

1. Shut off incoming power.
2. Block return air opening or disconnect blower motor leads.
3. Restore power to furnace.
4. Set thermostat above room temperature calling for heat.
5. When temperatures are reached in furnace at limit control setting with blower out of operation, burner should shut off.
6. Shut off electrical power. **IMPORTANT:** Remove blockage or reconnect blower motor and restore power.

b. Make certain thermostat will automatically start and stop furnace.

c. Block the flue pipe outlet gradually with a flat piece of metal, until the pressure switch functions shutting off the main burners. **IMPORTANT:** Remove flue blockage when done.

IV. INSTALLER'S INSTRUCTIONS TO HOMEOWNER:

After completing the installation, the installer shall inform and/or demonstrate to the homeowner:

1. The location of these instructions in the furnace and that these instructions and the users information manual must be kept along with instructions for any accessories in the plastic pouch on the inside of the furnace.
2. The location and use of the manual gas shut off valve and furnace electrical disconnect switch. Instruct user to always shut off gas before shutting off electric power.
3. The sequence of operation of the furnace.
4. The correct operation and maintenance of the appliance as outlined in the users information manual.
5. That failure to maintain and operate this furnace in accordance with these instructions could result in hazardous conditions, bodily injury, property damage and may void the limited warranty on the furnace.
6. Review with and encourage the user to read the label reproductions and all warnings and instructions outlined on the front cover and in sections I, II and III of this manual and in the Users Information Manual.
7. Recommend that the user have a qualified heating contractor inspect the furnace at the start of each heating season. Inform the user of the frequency of inspection required for each item in Section II of the Users Manual.

V. DEALER MAINTENANCE

The following maintenance procedures should be performed at the beginning of each heating season by a qualified heating contractor. Correct any deficiencies at once.

WARNING: Personal injury or property damage could result from repair or service of this furnace by anyone other than a qualified heating contractor. Only the homeowner/user routine maintenance described in the Users Information Manual may be performed by the user.

WARNING: To avoid injury from moving parts, shut off the power to the furnace before removing blower compartment door.

A. ELECTRICAL:

1. Check all wiring for loose connections and any signs of damage or unusual wear.
2. Check for correct voltage at the furnace when operating.
3. Check amp-draw on blower motor and inducer motor to assure they are not exceeding name plate amp rating.
4. Check for correct operation and proper settings (if manually adjustable) of all controls.

Shut off gas and disconnect power before continuing.

B. GENERAL INSPECTION

1. Chimney/vent pipe - Vertically vented units - Remove flue pipe from inducer and inspect for restriction, loose joints, carbon build-up and condensation. (Figure 11)

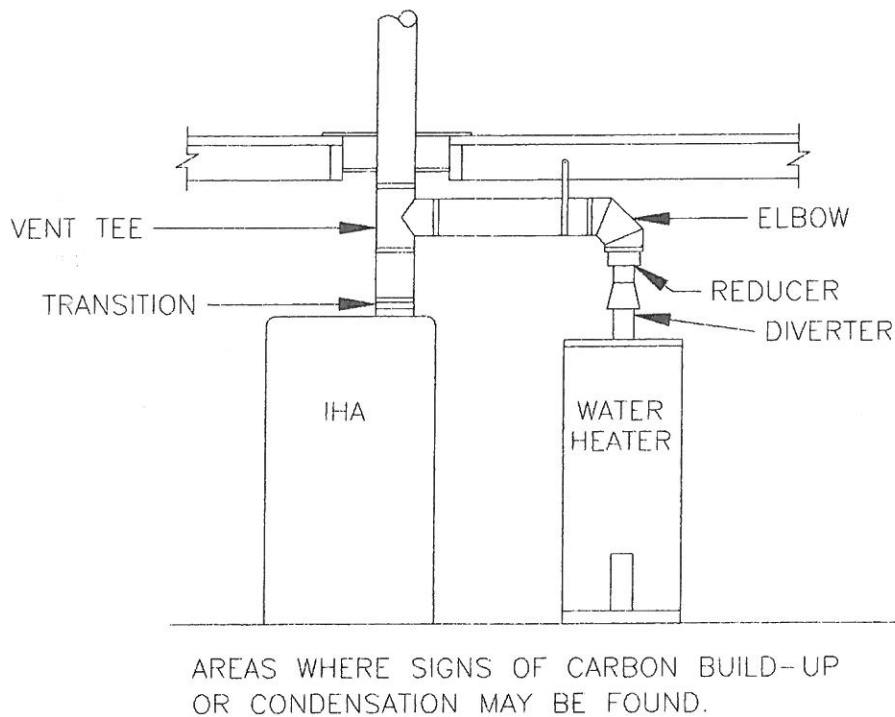


Figure 11

2. Burners - Remove burner shield and then burner. Each burner tube should be inspected and if necessary, wire brushed using compressed air to blow out the inside of each tube. (Figure 12).

3. Inducer Blower Assembly - Inspect pressure switch tubing connections and inspect inducer blower/assembly for corrosion, warpage, deterioration and carbon build-up. If necessary, clean housing and blower wheel with a damp cloth. Vacuum to remove any lint or dust from motor assembly.

C. HEAT EXCHANGER

Inspect for corrosion, pitting, warpage, deterioration, carbon build-up and loose gaskets. If inspection of flue pipe, burner orifice and accessible areas of heat exchanger indicate cleaning is necessary, follow heat exchanger cleaning instructions.

CLEANING HEAT EXCHANGER AND BURNERS:

1. Turn off gas and electrical supplies to furnace.
2. Remove front door, flue pipe, secondary air shield, burner assembly, fan limit, ignition module, pressure switch and inducer mounting plate assembly. (Refer to illustration below for parts identification for disassembly and re-assembly procedure). Please note that it is necessary to remove the flue restrictor baffles to clean the heat exchanger.

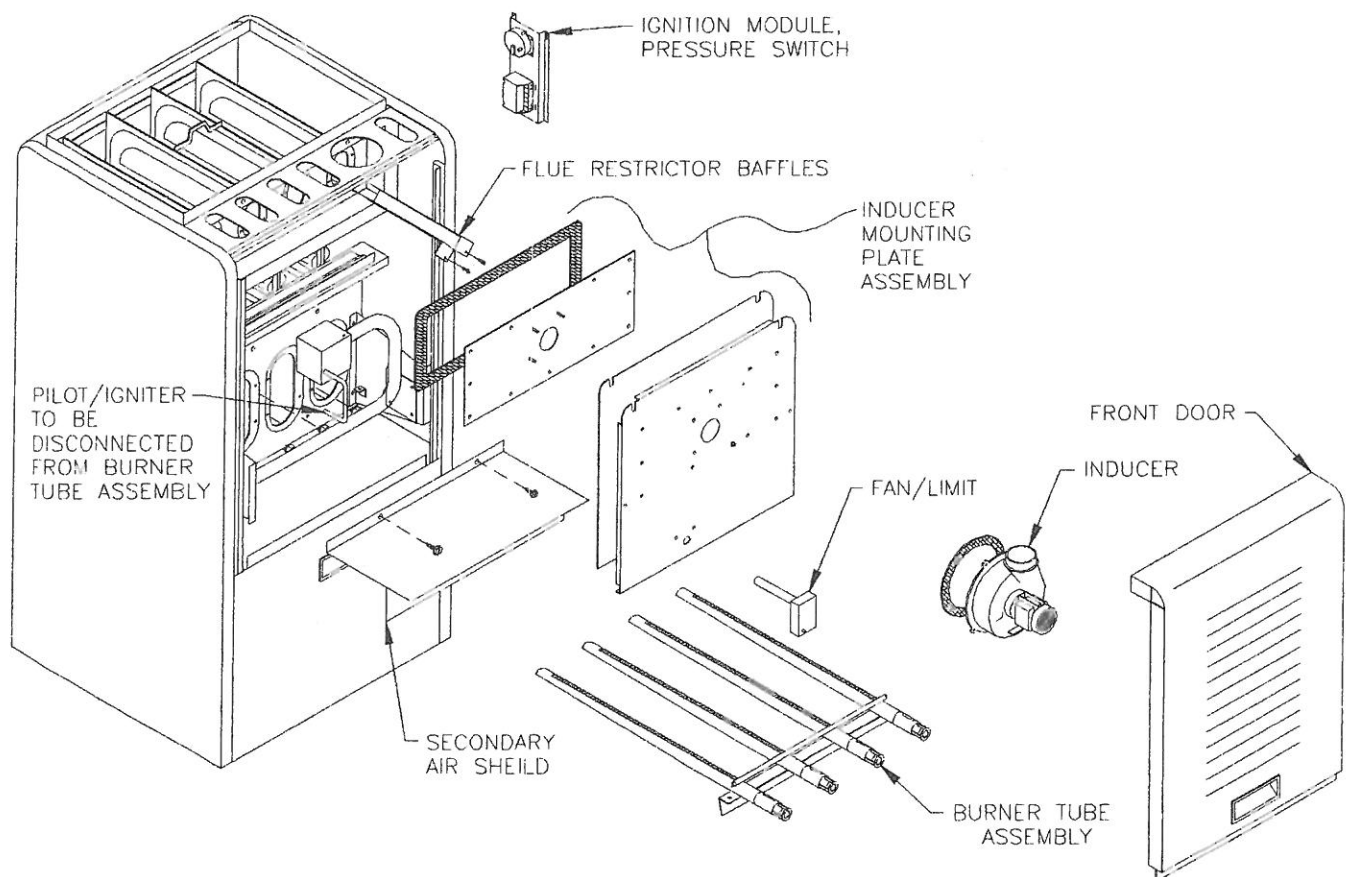


Figure 12

3. To clean the upper and lower sections of the heat exchanger, use a wire brush, which is capable of fitting into each section of the heat exchanger inlet and outlet and an industrial type vacuum.

- The inducer mounting plate assembly and flue baffles can be cleaned using a wire brush or damp cloth, depending on the degree of soiling. Care should be taken not to damage any gaskets while cleaning.
4. The serpentine section of the heat exchanger can be cleaned with two metal coat hangers, 1 foot of Thermo Pride rope gasket (part #330118) and a 3' section 3/8" in. single jack chain (available at any hardware store).
- a. Straighten the coat hangers and bend them into the configuration for the chain and guide wires in Diagram 1.

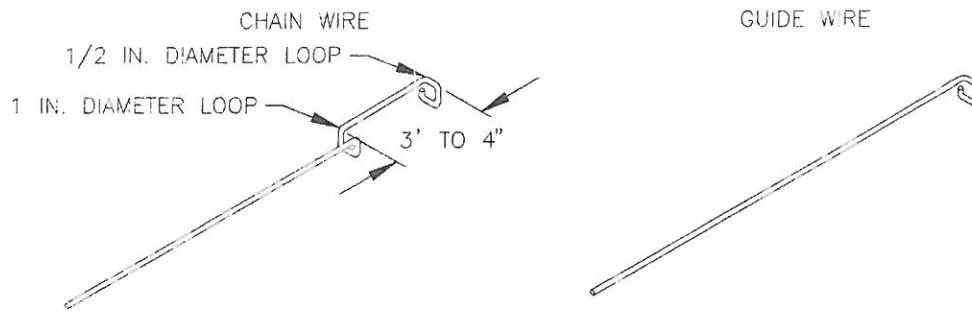


Diagram 1

- b. Break the chain in two pieces and attach it to the chain wire with the rope gasket as shown in Diagram 2.

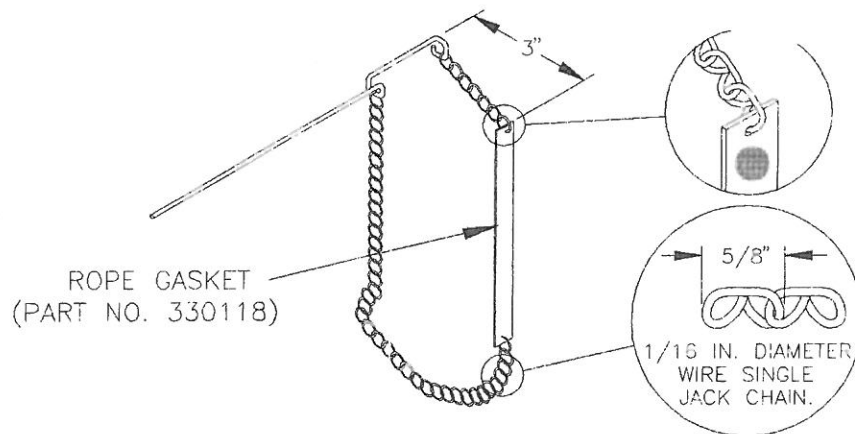


Diagram 2

- c. In order to clean the heat exchanger, insert the chain wire into the top opening and feed the chain into the heat exchanger opening until it falls through and is visible at the bottom of the heat exchanger. Grasp the chain in the lower heat exchanger and tug gently until the end of the rope material is visible at the bottom of the heat exchanger. Hook the guide wire into the chain just below the rope. now pull the wires back and forth, the chain will dislodge any larger obstructions while the rope removes the dust and light soot.

Continue to move the wires back and forth until the cell is clean and vacuum up debris through the upper and lower heat exchanger openings. Repeat for each cell of the heat exchanger. See Diagram 3.

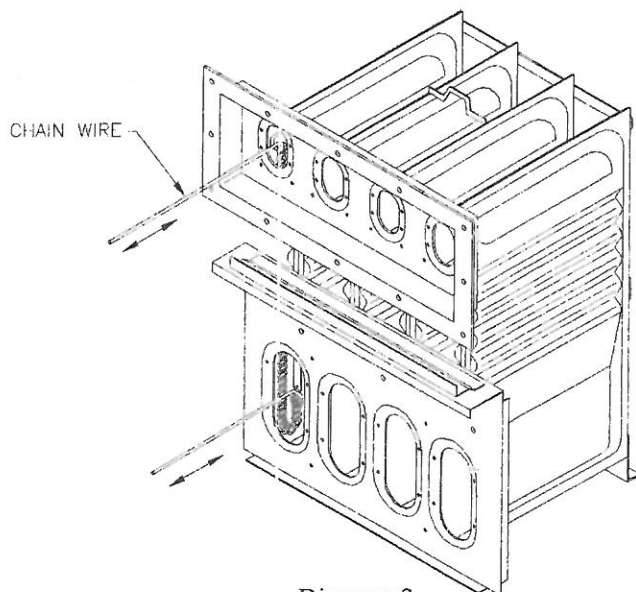


Diagram 3

D. HOUSE AIR BLOWER

Check and clean the blower wheel, housing and compartment with a vacuum. Check the motor name plate and follow motor mfrs. instructions for lubrication, if required.

NOTE: Some motors are permanently lubricated and should not be oiled. See motor name plate for specific instructions.

E. Once all components are cleaned, they must be re-installed to their factory produced state. (As shown in the previous illustration). Any seals or joints in the flue system which have been removed or loosened must be reconnected and sealed if necessary. Do this in accordance with the installation instructions. (Section IC for vertically vented units or Section ID for sidewall vented units).

NOTE: The inducer motor mounting plate gasket and the collector box gasket must be replaced if they show any sign of having been damaged.

NOTE: After cleaning the furnace, reference the burner and pilot adjustment section of this manual. Check for operation, proper combustion and no gas leakage according to the procedure outlined in Section IID Burner and Pilot Adjustment. Observe the pilot and burner flame illustrations and follow the adjustment procedures if proper flame(s) are not present.

NOTE: Before troubleshooting, familiarize yourself with the start up and check out procedure.

F. RETURN AIR FILTER

The Return Air Filter(s): Provided with this unit is a permanent type filter. This filter(s) should be inspected and when dirty, cleaned or replaced, if necessary to assure proper furnace operation. Follow the cleaning, removal and replacement procedure below.

FILTER MAINTENANCE PROCEDURE

The filter rack will be located between the return air plenum and the return air opening of the furnace. (See Figure 13). Slide dirty filter out of the filter rack. Clean the filter by vacuuming, rinsing with tap water, hosing or dipping in an ordinary detergent solution. After cleaning, replace the completely dry filter in the rack. If the filter has a mesh, the mesh side of the filter must be towards the furnace.

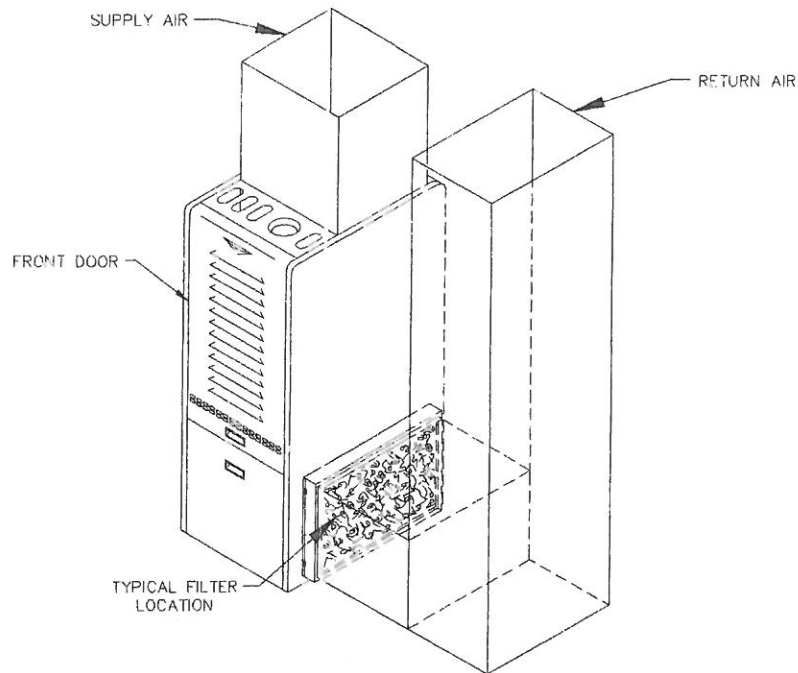


Figure 13

FILTER REPLACEMENT

Should the filter used require replacement, see Table 5 in Section K for minimum filter areas required for the different types of filters available to ensure an adequate replacement is selected.

IMPORTANT: Remind homeowner of importance of monthly filter inspections during the heating season to ensure efficient and trouble-free operation of their furnace.

VI. HOMEOWNER/USER ROUTINE MAINTENANCE

Complete instructions for the homeowner including maintenance procedures which must be performed by the homeowner/user can be found in the "Users Information Manual."

VII. TROUBLESHOOTING

NOTE: BEFORE TROUBLESHOOTING, FAMILIARIZE YOURSELF WITH THE START UP AND CHECKOUT PROCEDURE.

ALL INSTALLATION AND SERVICES MUST BE PERFORMED BY QUALIFIED HEATING CONTRACTORS.

IHA TROUBLESHOOTING GUIDE

PROBLEM	SOURCE	PROCEDURE	CAUSES	CORRECTION
UNIT WON'T START	120 VOLT	CHECK MAIN HOUSE	BLOWN FUSE	REPLACE FUSE
INDUCER NOT RUNNING	POWER SUPPLY & FURNACE DISCONNECT	SWITCHES FOR PROPER GROUND & CORRECT POLARITY	TRIPPED BREAKER	RESET BREAKER
			SWITCH OFF	TURN ON SWITCH
			FAULTY GROUND	REPLACE GROUND
			INCORRECT WIRING	HOOK L1 TO HOT LINE L2 TO GROUND LINE
	BLWR. DOOR INTERRUPT SWITCH	CHECK SWITCH LOCATED IN BLOWER COMPARTMENT FOR CONTINUITY W/THE SWITCH ENGAGED	FAULTY WIRING	REPLACE WIRING
			INCORRECT WIRING	CORRECT WIRING
			FAULTY SWITCH	REPLACE SWITCH
			POOR CONTACT	ADJUST LOCATION
	THERMOSTAT	JUMPER ACROSS R&W CONTACTS AT FAN CENTER IF INDUCER STARTS, THE FAULT IS IN THE STAT. OR THERMOSTAT CIRCUIT	STAT. IN OFF OR COOL MODE	SET FOR HEATING
			STAT. SET BELOW ROOM TEMP.	SET ABOVE OR COOL.
			VIBRATION AT STAT.	CORRECT SOURCE
			STAT. NEAR HEAT SOURCE	SHIELD OR MOVE
			THERMOSTAT NOT LEVEL	LEVEL THERMOSTAT
			FAULTY STAT. OR BASE	REPLACE STAT. OR BASE
	TRANSFORMER & FAN CENTER	CHECK FOR 24 VOLTS FROM R OR W TO CASING GROUND OR TO C TERMINAL AT THE FAN CENTER	FAULTY WIRING	REPLACE WIRING
			INCORRECT WIRING	CORRECT WIRING
			FAULTY TRANSFORMER	REPLACE FAN CENTER
			BROKEN TERMINAL STRIP	REPLACE FAN CENTER
	INDUCER RELAY	CHECK FOR 120 VOLTS AT BLACK & WHITE INDUCER MOTOR LEADS	FAULTY WIRING	REPLACE WIRING
			INCORRECT WIRING	CORRECT
			FAULTY RELAY	REPLACE RELAY
	INDUCER BLWR. ASSEMBLY	CHECK INDUCER MOTOR SHOULD BE RUNNING IF TSTAT CALLING FOR HEAT AND RELAY CLOSED	FAULTY WIRING	REPLACE WIRING
			FAULTY MOTOR	REPLACE ASSY.
			DAMAGED WHEEL	REPLACE ASSY.
			LOOSE SHAFT	REPLACE ASSY.
			DAMAGED HOUSING	REPLACE ASSY.
	PRESSURE SWITCH	CHECK SWITCH & WIRE CONNECTIONS FOR N/O & N/C TERMINALS	N/O & N/C WIRES SWITCHED	SWITCH TERMINALS
			WIRING BAD	REPLACE WIRING
			SWITCH STUCK IN N/O	REPLACE SWITCH
	PRESSURE SWITCH	CHECK FOR CONTINUITY ON N/O CONTACTS OF THE PRESSURE SWITCH WITH INDUCER RUNNING	BLOCKED FLUE VENT	UNBLOCK VENT PIPE
			FAULTY WIRING	CORRECT WIRING
			FAULTY PRESSURE SWITCH	REPLACE SWITCH
			LOOSE OR CRACKED HOSE	TIGHTEN OR REPLACE HOSE

IHA TROUBLESHOOTING GUIDE

PROBLEM	SOURCE	PROCEDURE	CAUSES	CORRECTION
UNIT WON'T START INDUCER RUNNING CONT'D.	MANUAL RESET ROLL-OUT SWITCH	CHECK CONTINUITY ON SWITCH WITH BUTTON ENGAGED	FAULTY WIRING FAULTY SWITCH PLUGGED HEAT EXCHANGER BLOCKED VENT OR FLUE	REPLACE WIRING REPLACE SWITCH CLEAN HEAT EXCHANGER UNBLOCK VENT PIPE
NO SPARK AT THE PILOT ASSEMBLY	IGN. CABLE IGN. MODULE IGN. MODULE	CHECK CABLE CONTINUITY 24 VOLTS TO MODULE PULL IGNITION LEAD & CHECK SPARK AT MODULE	FAULTY CABLE WIRE 24 CIRCUIT BROKEN SPARK NOT PRESENT FAULTY MODULE	REPLACE IGN. WIRE RETRACE CIRCUIT REPLACE IGNITION MODULE
PILOT BURNER WON'T LIGHT	GAS SUPPLY	CHECK MAIN & FURNACE GAS VALVES	MAIN GAS VALVE OFF FURNACE GAS VALVE OFF	TURN MAIN VALVE ON TURN FURNACE VALVE ON
	GAS SUPPLY PRESSURES	CHECK MIN. SUPPLY PRESSURE 4.5" NAT. 11.0" WC LP	SUPPLY PRESSURE TOO LOW ALL GAS APPLIANCES ON	INCREASE PRESSURE OR CALL GAS SUPPLIER
	IGN. MODULE & GAS VALVE	CHECK WIRING BETWEEN MODULE & GAS VALVE CHECK FOR 24 VOLTS AT PV-MV/PV AT MODULE	FAULTY WIRING INCORRECT WIRING 24 VOLTS NOT THERE 24 VOLTS IS THERE	REPLACE WIRING CORRECT WIRING REPLACE MODULE REPLACE GAS VALVE
	PILOT IGNITER	CHECK FOR 1/8" GAP FROM IGNITER TO SHIELD	INCORRECT IGNITER GAP	ADJUST TO GET 1/8" GAP FROM ROD TO SHIELD
PILOT STAYS LIT, BUT SPARK CONTINUES	PILOT IGNITER ASSEMBLY	CHECK FOR CONTINUITY OF BURNER GROUND WIRE & IGNITION CABLE CLEAN FLAME ROD CHECK FOR CRACKED CERAMIC CHECK PILOT FLAME, IT SHOULD CONTACT ROD	FAULTY BURNER GROUND FAULTY IGNITION CABLE LOOSE CONNECTIONS CORRODED ROD BROKEN CERAMIC POOR OR UNSTABLE PILOT FLAME	REPLACE GROUND WIRE REPLACE IGN. CABLE TIGHTEN CONNECTIONS CLEAN ROD OR REPLACE ASSY. REPLACE ASSY. ADJUST AT GAS VALVE CLEAN PILOT ORIFICE
MAIN BURNERS FAIL TO IGNITE AND/OR CARRY ACROSS	IGN. MODULE & GAS VALVE	CHECK WIRING FROM MODULE TO GAS VALVE CHECK FOR 24 VOLTS AT MV-MV/PV AT MODULE	FAULTY WIRING INCORRECT WIRING 24 VOLTS NOT THERE 24 VOLTS IS THERE	REPLACE WIRING CORRECT WIRING REPLACE MODULE REPLACE GAS VALVE
	BURNER ASSY.	MAKE SURE BURNERS ARE LEVEL & SEATED IF PROBLEM STILL THERE	BURNERS NOT SEATED DOWN ON ORIFICES FLAME WON'T CARRY OVER	CORRECT BURNER POSITION CALL SERVICE DEPT.

IHA TROUBLESHOOTING GUIDE

PROBLEM	SOURCE	PROCEDURE	CAUSES	CORRECTION
IGNITION SYSTEM GOES INTO LOCK-OUT	IGNITION MODULE	RESET 24 VOLTS OR 120 VOLT CIRCUIT & WAIT ONE MINUTE	IF PILOT IS NOT PROVEN MODULE LOCKS OUT ON 6 *MINUTE RETRY CYCLE	SEE PILOT TROUBLESHOOTING
HOUSE BLOWER FAILS TO COME ON	FAN SIDE OF FAN & LIMIT CONTROL	CHECK FAN ON SETTING CHECK FOR CONTINUITY AT FAN CONTACTS W/UNIT ON	FAN ON SET TOO HIGH FAULTY FAN CONTROL	CHANGE TO 130 F SETTING REPLACE FAN/LIMIT CONTROL
		CHECK WIRE CONTINUITY CHECK FOR CORRECT WIRING CHECK FOR LOOSE WIRES	FAULTY FAN WIRES INCORRECT WIRING LOOSE CONNECTIONS	REPLACE WIRING CORRECT WIRING TIGHTEN WIRE CONNECTIONS
	BLWR. MTR.	CHECK FOR 115 VOLTS AT THE BLOWER MOTOR	FAULTY BLOWER MOTOR FAULTY WIRES	REPLACE MOTOR REPLACE WIRING
FURNACE SHUTS OFF THERMOSTAT, STILL CALLING FOR HEAT	ANTICIPATOR GROUND WIRE ON IGNITION SYSTEM	CHECK ANTICIPATOR SETTING CHECK GROUND FROM MODULE TO GAS VALVE FOR CONTINUITY	SETTING TOO LOW POOR CONNECTION BROKEN WIRE FAULTY TERMINAL	SET TO .8 MINIMUM REPAIR CONNECTION REPLACE WIRE REPLACE TERMINAL
	LIMIT SIDE OF FAN & LIMIT FURNACE AIR FILTER	CHECK FOR CORRECT LIMIT CONTROL SETTING CHECK AIR FILTER	CONTROL SET TOO LOW FAULTY CONTROL DIRTY CLOGGED FILTER	RESET CONTROL REPLACE CONTROL CLEAN OR REPLACE
THERMOSTAT SATISFIED GAS VALVE STILL ON	THERMOSTAT	CHECK THERMOSTAT CIRCUIT	WIRING SHORTED FUSED CONTACTS THERMOSTAT NOT LEVEL	REPLACE WIRING REPLACE THERMOSTAT LEVEL THERMOSTAT
	GAS VALVE	REMOVE MV LEAD AT MODULE	FAULTY VALVE	REPLACE GAS VALVE
THERMOSTAT SATISFIED HOUSE BLOWER WONT SHUT OFF	FAN SIDE OF FAN & LIMIT CONTROL	CHECK FAN OFF SETTING	SET TOO LOW FAULTY FAN CONTROL CONSTANT FAN SELECTED	SET AT 110 DEGREES F REPLACE FAN & LIMIT PULL SELECT SWITCH TO SET TO AUTOMATIC

THERMOSTAT SATISFIED TROUBLESHOOTING ENDS: REPEAT PROCEDURE UNTIL TROUBLEFREE SYSTEM SHUTS OFF OPERATION IS OBTAINED OR CALL SERVICE DEPARTMENT FOR ASSISTANCE.

N/O = NORMALLY OPEN

N/C = NORMALLY CLOSED