

COMFORTMAKER GUA

MODEL NUMBER:	GUA - UPFLOW
BTU SIZES:	40,000, 60,000, 80,000, 100,000, 120,000

ACCESSIBILITY CLEARANCE

36" horizontal clearance

CLEARANCE FROM COMBUSTIBLE MATERIAL

Refer to Recommended Clearance Guide Table. (See Page 5)

The furnace should not be installed directly on carpeting, tile, or other combustible materials other than wood flooring.

COLD AIR RETURN AIR DUCTS

DUCT CONNECTIONS:

It is recommended that a flexible duct connection of a non-flammable material be used for the return air and supply air connections to prevent transmission of vibration. Sealed to the furnace casing and terminating outside the space containing the furnace.

GARAGE

If the furnaces is installed in a residential garage, the unit must be installed so that the burners and the ignition source are located not less than 18 inches above the floor. The furnace must also be protected to avoid physical damage by vehicles.

GENERAL

HIGH ALTITUDE INSTALLATIONS

Deration	If the installation is 2,000 feet or above, ratings should be reduced at the rate of 4% for each 1,000 feet above sea level.
Orifice	Derate by peening
Regulator Pressure	3.5 ± .3

MOBILE HOME

Not approved.

VENTING MATERIAL AND REQUIREMENTS

It is possible for the Forced Draft Furnace to be common vented with another gas burning appliance.

See Tables on Page 5-6.

Type "C"
Stainless steel
Type "B"

It is recommended that all the pipe joints be caulked with a high temperature sealant (such as RTV Silicone) to assure a tight seal for the flue system from the furnace to chimney vent.

HORIZONTAL VENT

This appliance, when installed with the "Designed Certified" horizontal venting system, is a Direct Vent Furnace.

These units may be vented up to 30 feet with a maximum of (4) four ninety degree elbows. (See Maximum Length of Vent - Horizontal Application on Page 6).

WARNING: At no time should the intake and exhaust vents be terminated on opposite or adjacent sides of structure.

All vent fittings and pipe must be installed with male ends toward the furnace.

Longitudinal vent pipe seams must be on top.

The supplied condensate trap/drain connected in the horizontal pipe close to the furnace outlet will allow removal of any accumulation that may occur.

Use a high temperature silicone sealant. All joints to be sealed should be oil and dirt free.

DO NOT PUT A SCREW IN THE BOTTOM OF THE PIPE. Dab the screw with silicone sealant to prevent leakage around the threads. **Screwing the joint together is not a substitute for sealing the connection with the silicone sealant.**

Should the outlet terminal be located adjacent to a public walkway, it must be not less than seven (7) feet above grade.

Vent and intake must be on the same face of the building in order to be in the same pressure zone. The centerline of the terminals must be a minimum 16 inches apart on a horizontal line. Never install the intake terminal higher than the vent terminal.

Inspect the intake and outlet terminals to prevent the accumulation of debris at the terminal barrier screens.

Check that there is water in the tube loop. Some water should be in the trap to prevent leakage of a small amount of flue products thru the drain tube.

VENTING PROCEDURE

A horizontal flue vent system also requires a piped intake combustion air vent from the outside.

We recommend the use of B-1 type flue vent for all vertical vent applications.

CAUTION: Failure to provide for safe removal of condensate could result in water damage to the building.

MISCELLANEOUS INFORMATION/NOTES

HEAT EXCHANGER AND BURNER CLEANING PROCEDURE:

CAUTION: On units with suffix "-IN", "-IM", or "-IL" a silicon carbide ignition is used. Extreme care must be exercised in handling the assembly due to the fragile nature of the ignition assembly.

CAUTION: This furnace is equipped with a pressured combustion chamber. It is mandatory to replace all gaskets that are removed, order replacement gasket prior to starting service.

- 1) Disconnect power source to the unit.
- 2) Remove louver panel from the unit and set aside.
- 3) Turn gas supply "off" at the gas valve. Allow a few minutes for unit to cool down.
- 4) Remove the screws from the front panel of the burner enclosure and set aside.
- 5) Remove the front panel.
- 6) Remove the four screws holding the burner access shield and vertical shield in place and set aside.
- 7) On the H.S.I. System, disconnect the sensor lead from the remote sensor (far left burner) and the ignitor leads at the ignitor disconnect.
- 8) Remove the burner access shield, and vertical shield.

NOTE: At this point inspect for any loose particles or carbon deposits in the burner area. Using a flashlight and a small mirror, check the upper portions of the heat exchanger for any signs of blockage or dirt accumulation. If any of these conditions are apparent, proceed with the following steps.

- 9) Remove all burners from the unit. This is accomplished by pulling back on the burner assembly so that it compresses the springs that are located between the manifold and the burners. Tilt the burners up into the heat exchanger tube. Slide the burner assembly off the orifices and remove from the unit. Note the location of the burner assembly. The burner assembly with the ignitor is on the right hand side and the sensor burner is positioned on the left.

SEQUENCE OF OPERATION ELECTRIC IGNITION

- 1) Thermostat calls for heat, energizing the Forced Draft Blower Relay which closes contacts that power the Forced Draft Blower.
- 2) The rotation of the Forced Draft Combustion Blower will make a centrifugal switch within the motor to prove blower operation and send power from the ignition circuit to the ignition control.
- 3) The pre-purge mode will cause a (30) thirty second delay before energizing the silicone carbide ignitor.
- 4) The ignitor is energized for approximately a 10 second warm-up time before the gas valve receives the signal to open.
- 5) The ignitor provides the heat to light the main burner which lights the remaining burners via the carryovers. The control system must detect the main burner flame within 7 seconds or the gas valve and the ignitor are de-energized.
- 6) If the main burner flame is not sensed on the first attempt, the control system de-energizes the gas valve and causes a 90 second delay before attempting re-ignition.
- 7) The second attempt at lighting the burner flame will duplicate the first attempt with pre-purge, warm-up times and lock-out times identical to those in the first try. Failure to prove on the second attempt will allow yet another 90 second delay and one more complete ignition attempt before complete system lock-out.
- 8) The 24 Volt circuit or the line voltage circuit must be interrupted for 1/20th of a second or longer in order to reset the system.
- 9) The ignition sequence will repeat for a total of three cycles if the flame is extinguished within 30 seconds of ignition. The total of ignition attempts plus re-cycles must not exceed 3 or the control system will lock-out.
- 10) If flame is established for more than 30 seconds after ignition, the recycle counter will clear. If flame is lost after 30 seconds, there will be a 60 second wait and restart of the ignition sequence.
- 11) A momentary loss of power or flame to the sensing circuit will cause the valve to be de-energized and a delay of 60 seconds before restarting the ignition sequence. Re-cycles will begin and the burner will operate normally if the gas supply returns or fault condition is corrected prior to the last ignition attempt. Otherwise the control will lock-out.
- 12) Typical conditions are that the burner will light and stay lit as long as the thermostat calls for heat.
- 13) Heat from the burner flames warm the heat exchanger surface, the flue products pass through the baffles and vent outdoors through the flue pipe.
- 14) The fan and limit control senses the supply air temperature adjacent to the heat exchanger and will signal the blower to operate between the air temperature reaches on "ON" fan set point. The fan & limit control will shut the gas off if the supply air temperature reaches the "High Temperature" set point. The blower continues to operate the conditioned air is supplied to the space through the duct system.
- 15) When the thermostat set point temperature is reached, the gas valve is de-energized which stops the flow of gas to the burners. The blower continues to operate until the air temperature falls below the "OFF" blower set point.
- 16) The furnace repeats this same cycle each time the thermostat calls for heat.

RECOMMENDED CLEARANCE GUIDE (UPFLOW INSTALLATION)

(Dimensions shown in inches are the minimum clearances to combustible material for which the furnace design has been certified.)

INPUT BTU/HR	FRONT (@)	REAR	SIDES	TOP	VENT CONNECTION *	FURNACE FLUE PIPE SIZE	COMBUSTIBLE FLOOR **
40,000	6	1	1	1	6	3 Dia.	0
60,000	6	1	1	1	6	3 Dia.	0
80,000	6	1	1	1	6	3 Dia.	0
100,000	6	1	1	1	6	4 Dia.	0
120,000	6	1	1	1	6	4 Dia.	0

* May be 1 inch when listed Type B-1 vent is used. This is a Category I Furnace

** Shall not be installed directly on carpeting, tile or other combustible materials, other than wood flooring.

VENTING

FURNACE BTUH	MINIMUM HEIGHT *	FURNACE VENT SIZE	MINIMUM COMMON VENT	
			3" WATER HEATER	4" WATER HEATER
40,000	8 FT.	3"	4"	4"
60,000	8 FT.	3"	4"	4"
80,000	8 FT.	3"	4"	4"
100,000	8 FT.	4"	5"	5"
120,000	8 FT.	4"	5"	5"

* Minimum vent height measured from water heater or 9 ft. from furnace whichever is lowest.

REFER TO THE FIGURE 4 thru 7 FOR MINIMUM COMMON VENTING ARRANGEMENTS:

MINIMUM COMMON VENTING ARRANGEMENTS

FURNACE BTUH	VENTED WITH 3" WATER HEATER D.H.	VENTED WITH 4" WATER HEATER D.H.
40,000	FIGURE 4 & 5	FIGURE 4 & 5
60,000	FIGURE 4 & 5	FIGURE 4 & 5
80,000	FIGURE 4 & 5	FIGURE 4 & 5
100,000	FIGURE 6 & 7	FIGURE 6 & 7
120,000	FIGURE 6 & 7	FIGURE 6 & 7

These illustrations show the minimum pipe sizes and dimensions. Large pipe sizes and dimensions may be used to accommodate the various furnace and water heater installation.

The height of the connector above the furnace will vary from the dimensions shown. Connector height will depend on the rise of the water heater connection pipe due to the length of pipe used, height of the water heater and the height of the draft hood vent collar above the top of the water heater.

MAXIMUM LENGTH OF VENT (HORIZONTAL APPLICATION)

INPUT BTUH	VENT OR INTAKE DIA.	INSULATED VENT PIPE **			UNINSULATED VENT PIPE		
		MAX. LENGTH H	MAX. ELBOWS	CLEARANCE TO COMBUSTIBLE MATERIAL*	MAX. LENGTH	MAX. ELBOWS	CLEARANCE TO COMBUSTIBLE MATERIALS
40,000	3"	10 FT.	4	1"	-	-	6"
60,000	3"	15 FT.	4	1"	10 FT.	3	6"
80,000	3"	25 FT.	4	1"	15 FT.	3	6"
100,000	4"	25 FT.	4	1"	15 FT.	3	6"
120,000	4"	25 FT.	4	1"	15 FT.	3	6"

TYPICAL INSTALLATION FOR COMMON VENTING REQUIREMENTS
FOR FORCED DRAFT UPFLOW FURNACE 40,000 - 80,000 BTUH

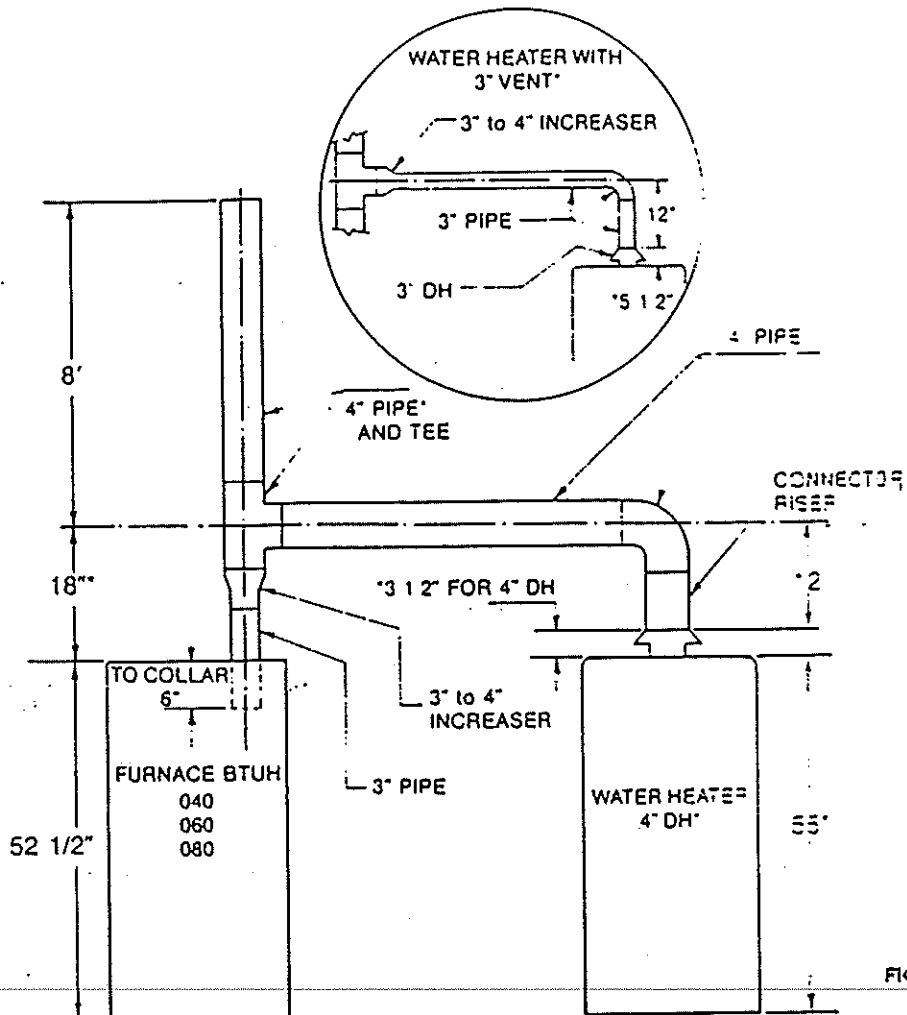


FIGURE 4

*SEE INSTRUCTION INFORMATION

TYPICAL INSTALLATION FOR COMMON VENTING REQUIREMENTS
FOR FORCED DRAFT UPFLOW FURNACE 40,000 - 80,000 BTUH

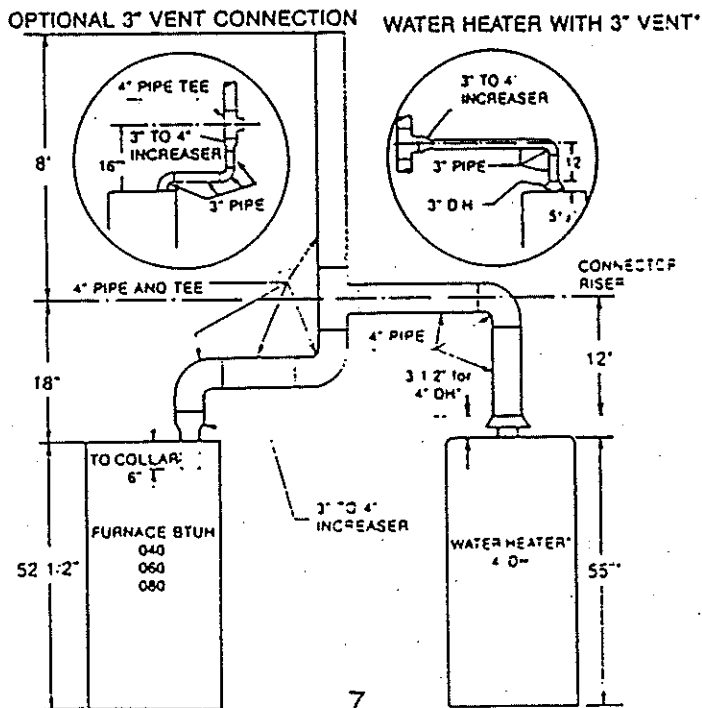


FIGURE 5

TYPICAL INSTALLATION FOR COMMON VENTING REQUIREMENTS
FOR FORCED DRAFT UPFLOW FURNACE 100,000 - 120,000 BTUH

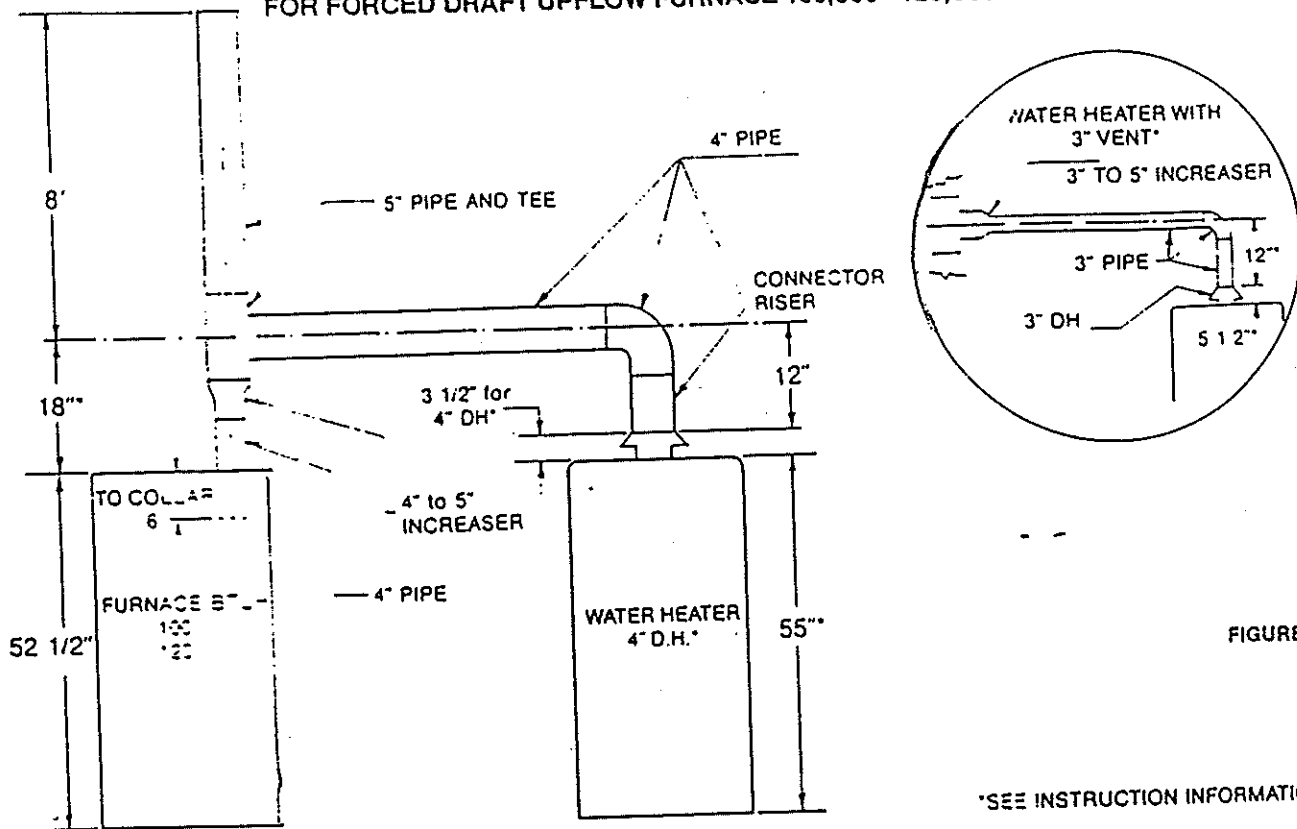
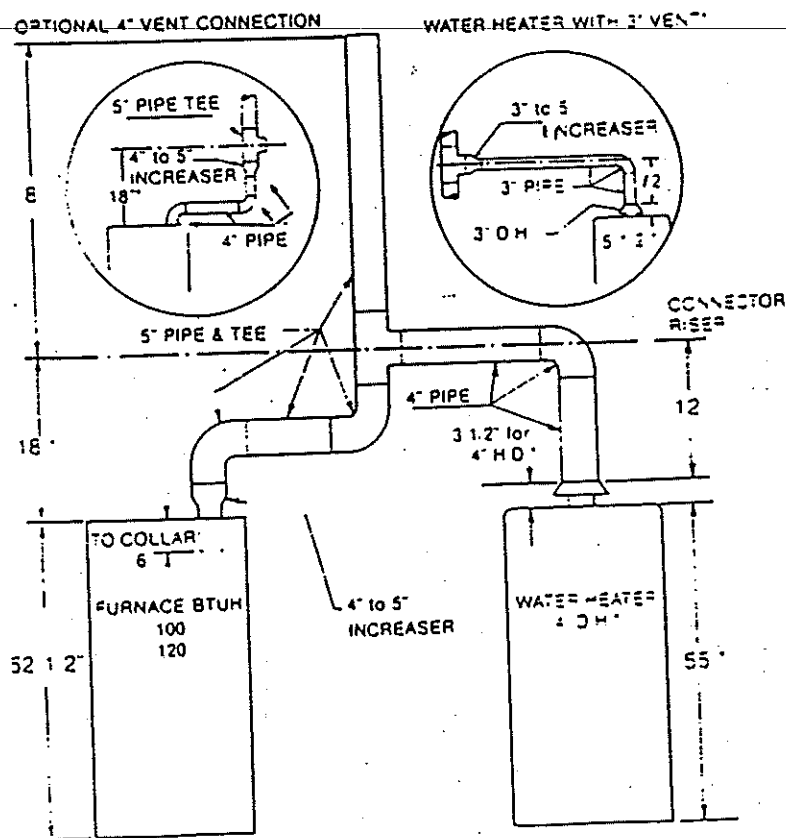


FIGURE 6

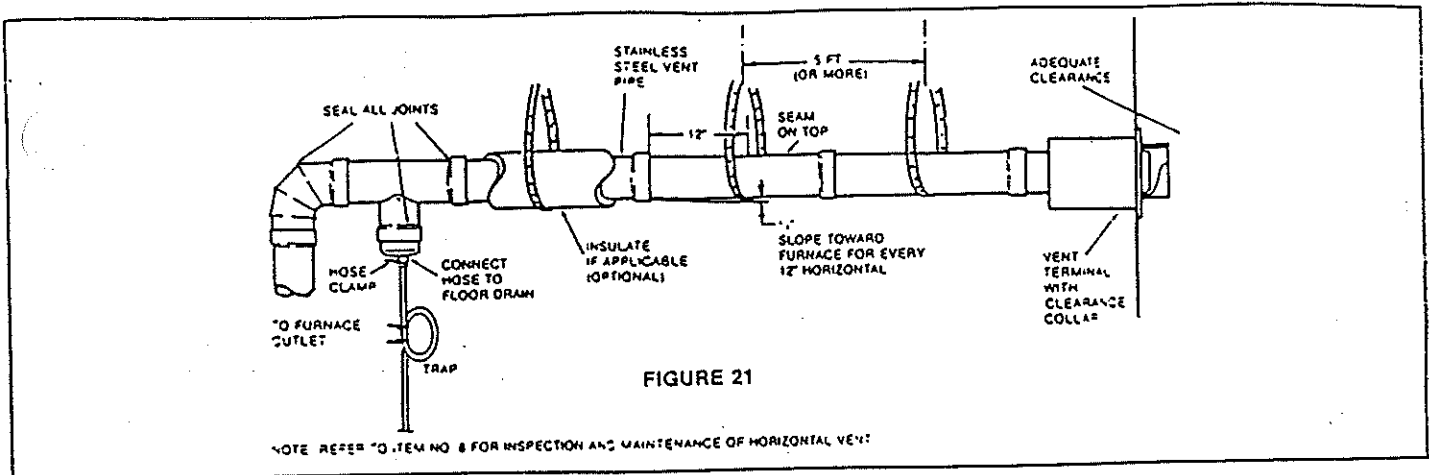
*SEE INSTRUCTION INFORMATION

TYPICAL INSTALLATION FOR COMMON VENTING REQUIREMENTS
FOR FORCED DRAFT UPFLOW FURNACE 100,000 - 120,000 BTUH

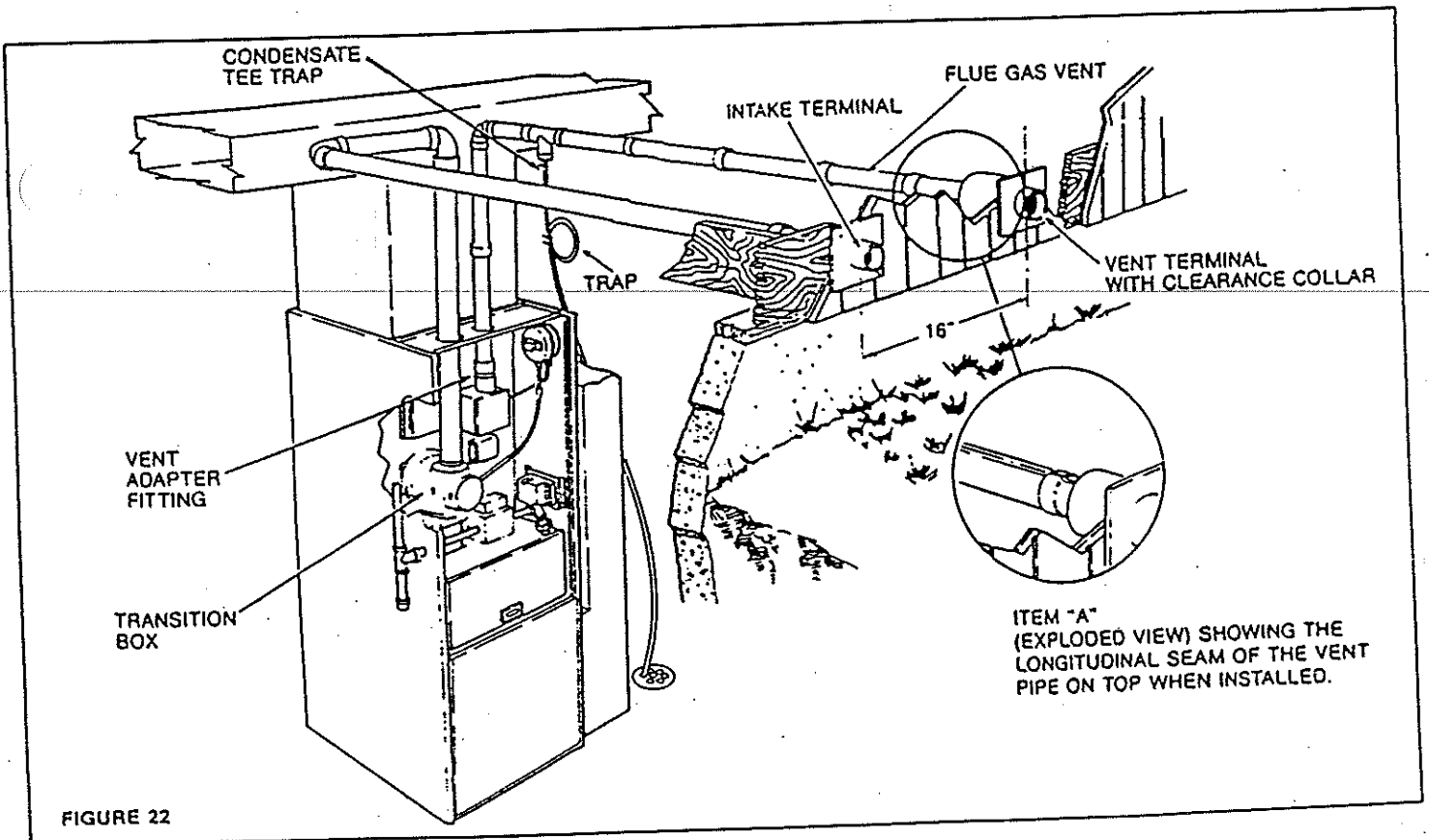


*SEE INSTRUCTION INFORMATION

FIGURE 7



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FURNACE WITH FENWAL SYSTEM, D.S.I.

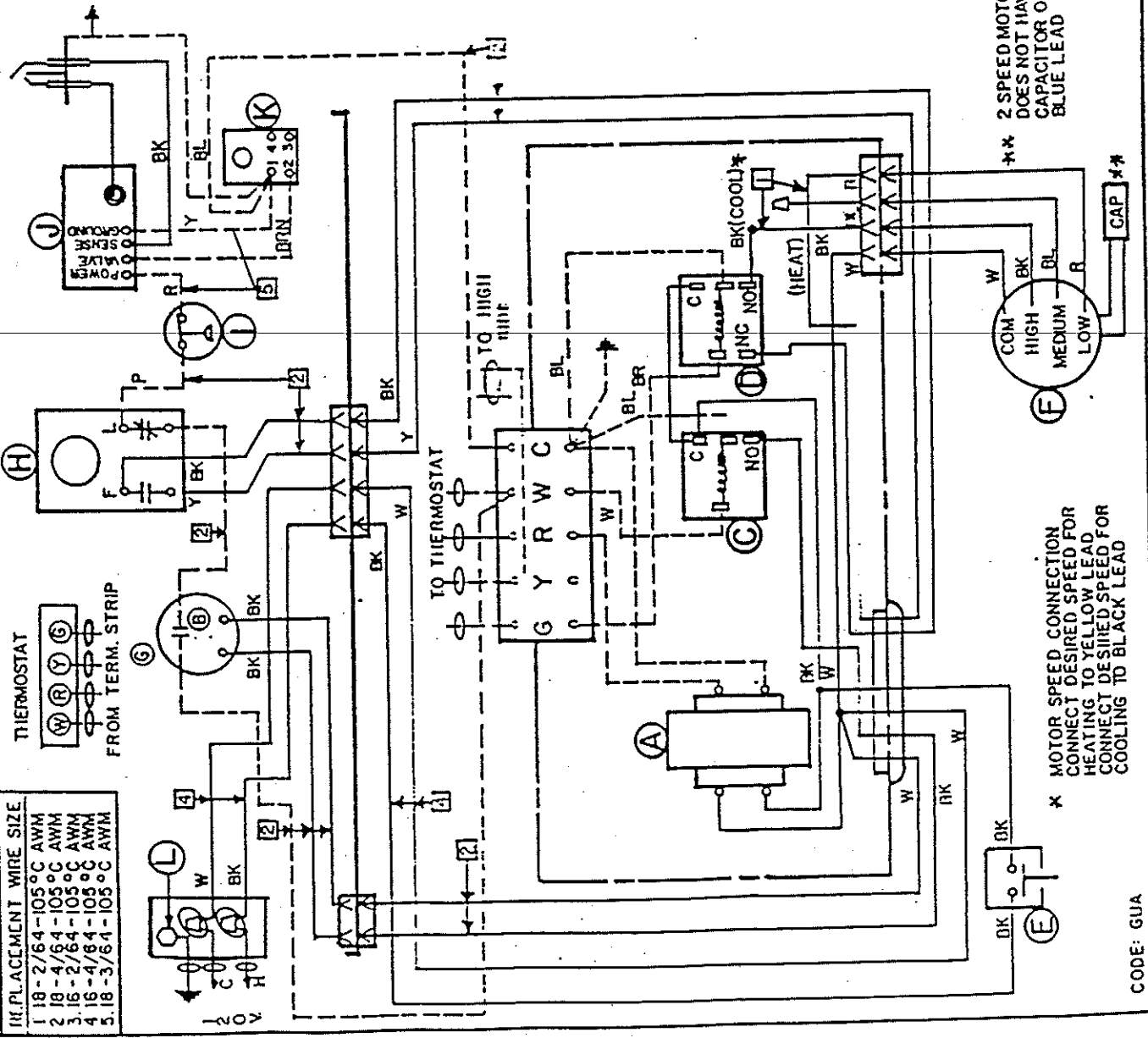
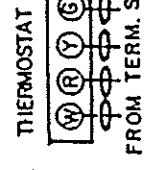
115 V.
24 V.

REVISED

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WIRE PLACEMENT WIRE SIZE

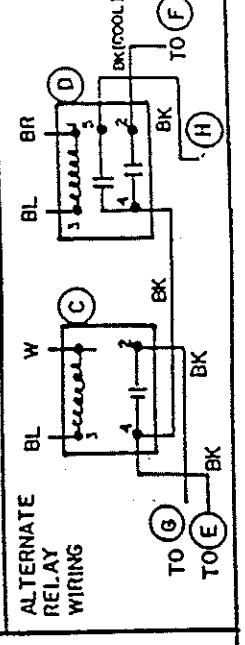
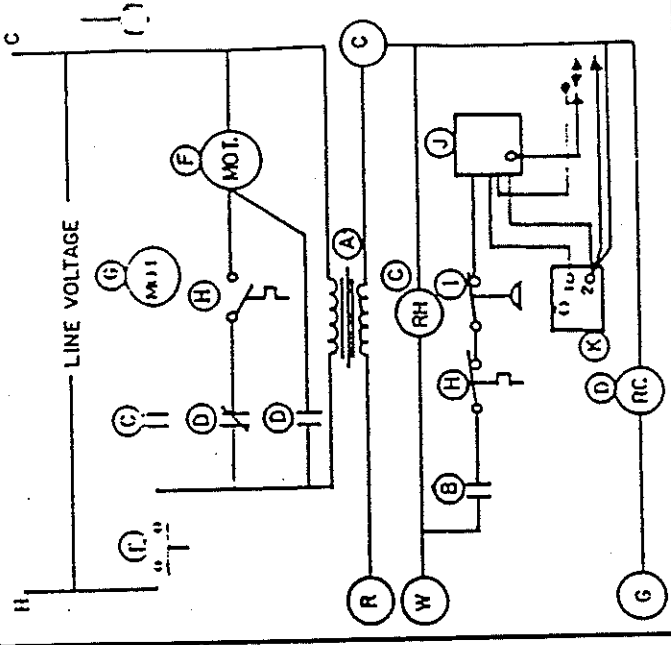
1	18	2/64	-105°C	AWM
2	18	4/64	-105°C	AWM
3	16	2/64	-105°C	AWM
4	16	4/64	-105°C	AWM
5	18	3/64	-105°C	AWM



CAUTION: HAZARD OF ELECTRIC SHOCK DISCONNECT ALL POWER SUPPLIES BEFORE SERVICING

- NOTES**
- ALL WIRING MUST BE DONE IN ACCORDANCE WITH NATIONAL AND LOCAL ELECTRIC CODES.
 - WIRING THAT IS CIRCLED MUST BE DONE BY INSTALLER.
 - IF ANY WIRE MUST BE REPLACED IT MUST BE REPLACED WITH ITS EQUIVALENT (SEE CHART).

- PARTS**
- A. TRANSFORMER
 - B. CENTRIFUGAL SWITCH
 - C. COMBUSTION BLOWER
 - D. COOLING RELAY
 - E. DOOR SWITCH
 - F. BLOWER MOTOR
 - G. COMBUSTION AIR BLOWER
 - H. FAN/LIMIT CONTROL (F/L) SWITCH
 - I. BLOCK FLUE PRESSURE SWITCH
 - J. FENWAL IGNITION PREPURGE
 - K. GAS VALVE
 - L. GROUNDING SCREW



* MOTOR SPEED CONNECTION
CONNECT DESIRED SPEED FOR HEATING TO YELLOW LEAD
CONNECT DESIRED SPEED FOR COOLING TO BLACK LEAD

** 2 SPEED MOTOR DOES NOT HAVE CAPACITOR OR BLUE LEAD

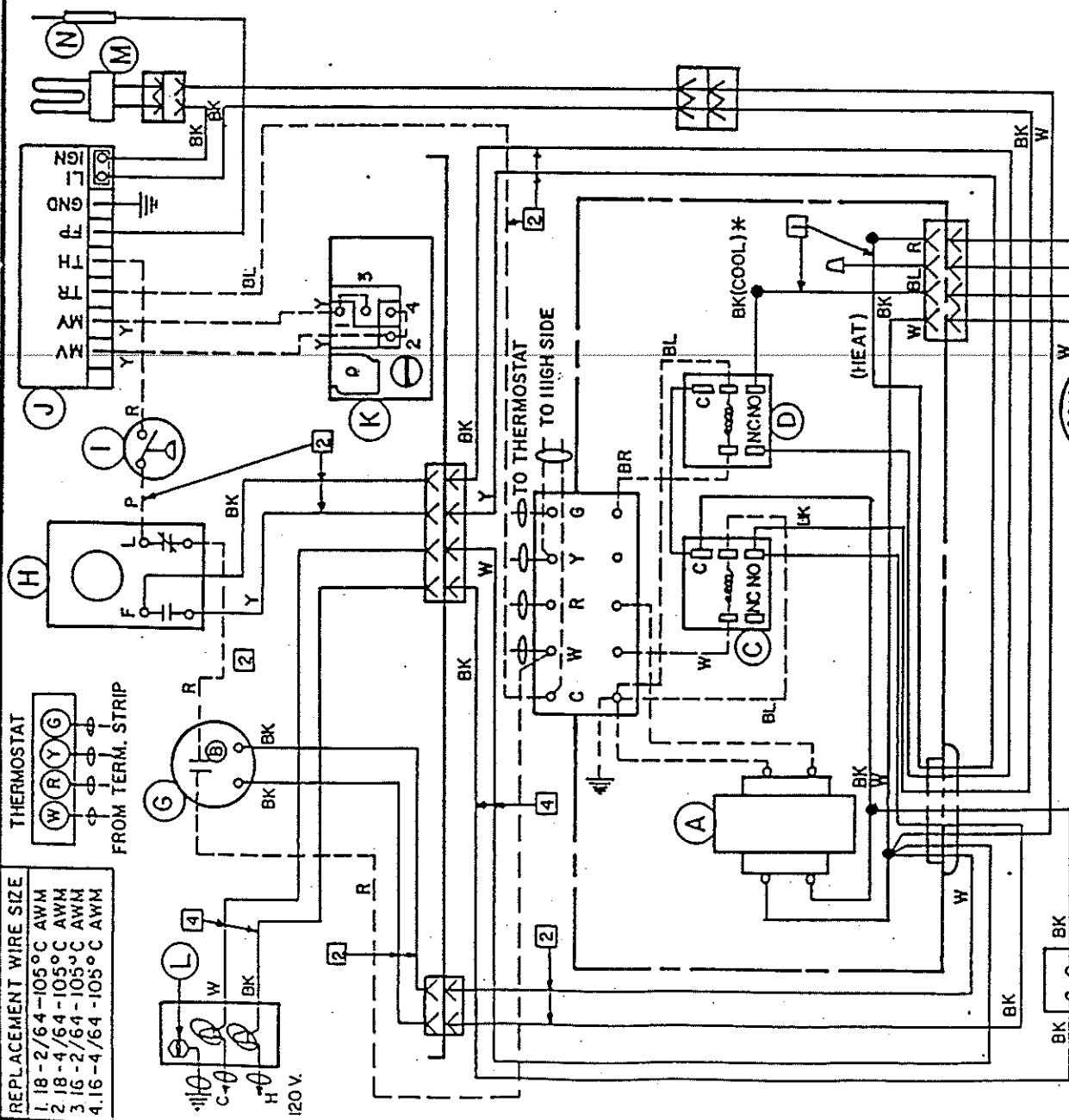
CODE: GUA

WIRING DIAGRAM FOR FORCED DR. GAS UPFLOW FURNACE WITH W-R SYSTEM, H.S.I.

CODE: 7-3-86 7-424

REPLACEMENT WIRE SIZE

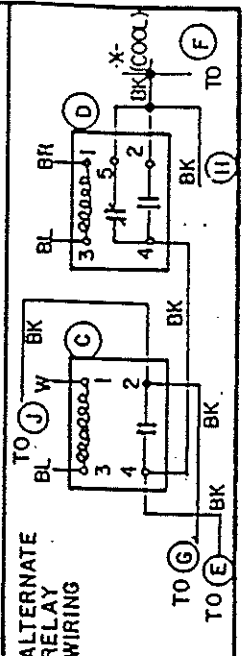
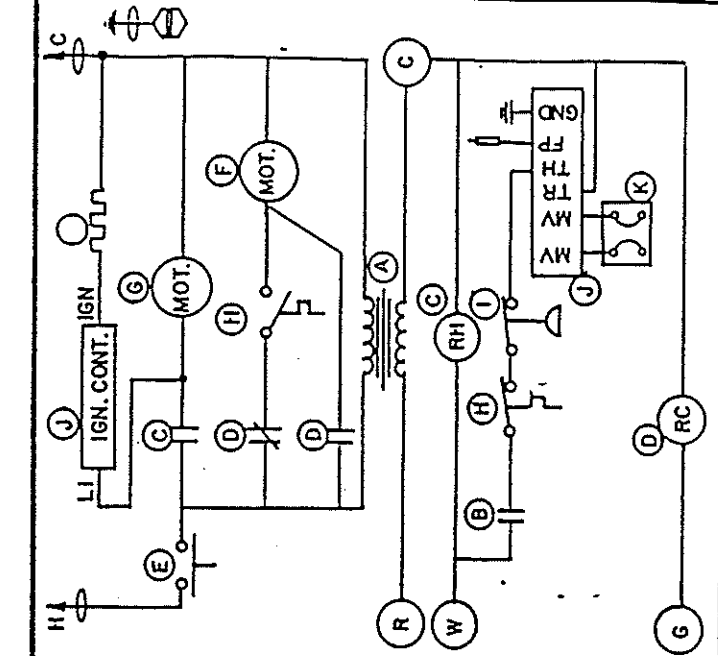
1.	18	-2/64	-105°C	AWM
2.	18	-4/64	-105°C	AWM
3.	16	-2/64	-105°C	AWM
4.	16	-4/64	-105°C	AWM



CAUTION: HAZARD OF ELECTRIC SHOCK. DISCONNECT ALL POWER SUPPLIES BEFORE SERVICING.

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 - C. COMBUSTION BLOWER RELAY
 - D. COOLING RELAY
 - E. DOOR SWITCH
 - F. BLOWER MOTOR
 - G. GAS VALVE
 - H. GROUNDING SCREW
 - I. IGNITOR
 - J. BLOCK FLUE PRESSURE SWITCH
 - K. H.S.I. IGNITION CONTROL W/PURGE
 - L. GAS VALVE
 - M. IGNITOR
 - N. SENSOR



* - MOTOR SPEED CONNECTION CONNECT DESIRED SPEED FOR HEATING TO YELLOW LEAD CONNECT DESIRED SPEED FOR COOLING TO BLACK LEAD

** - 2 SPEED MOTOR DOES NOT HAVE CAPACITOR OR BLUE LEAD

CODE: (

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