

# TRANE XL 90

MODEL NUMBER:

BLU - 040,060,080,100 120 K-B - Upflow  
 BLD - 040,060,080,100 K-B - Downflow

BTU SIZES:

40,000 to 120,000 BTU's

## ACCESSIBILITY CLEARANCE

Clearance shall be maintained to permit cleaning of heating surfaces; replacement of filters, blowers, motors, burners, controls, and vent connectors; the lubrication of moving parts, where required, and the adjustment and cleaning of burners and pilots.

## CLEARANCE FROM COMBUSTIBLE MATERIAL

Back - 1"

Front - 6"

Top of Plenum - 1"

Side - 1"

Downflow (counterflow) models are A.G.A. design certified for installation on noncombustible floors and for closet installation. For installation on combustible floor use combustible floor frame.

## COLD AIR RETURN AIR DUCTS

Where there is no complete return duct system the return connection must be run full size from the furnace to a location outside the utility room, basement, attic, or crawl space. **Important:** Do not take return air through back of furnace cabinet.

## GARAGE

Approved. Must meet requirements in the UMC and the Good Practice Book.

## GENERAL

## HIGH ALTITUDE INSTALLATIONS

Deration

At elevations above 2,000 feet should be reduced 4% for each 1,000 feet above sea level.

Orifice

All furnaces are factory equipped with main burner orifices to provide the nameplate input rating using natural gas (having a heating value of 1100 Btu/cu. ft.). Adjust to nameplate input rating of natural gases having a different heating value.

Regulator Pressure

At elevations above 4,000 ft. gas manifold pressure should be set at 2.9 inches water column for natural gas and 8.7 inches for propane application.

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### HIGH ALTITUDE INSTALLATIONS

Pressure Switch

High altitude application (4,000 ft and above elevations) of the new XL90 Gas Furnaces necessitates a change in both the air pressure differential switch which controls the ignition, as well as the pressure switch which controls the induced draft blower speed.

### MOBILE HOME

Not approved.

### VENTING MATERIAL AND REQUIREMENTS

This furnace can be vented with stainless steel, or PVC schedule 40 pipe and fittings.

The recommended system is assembled from 3" schedule 40 PVC pipe and fittings. Where the system is routed to the outdoors through an existing masonry chimney containing flue products from another gas appliance, or where required by local codes, then 3 1/4" O.D. venting of 29-4C stainless steel must be used in place of PVC.

### VENT CLEARANCE FROM COMBUSTIBLE MATERIAL

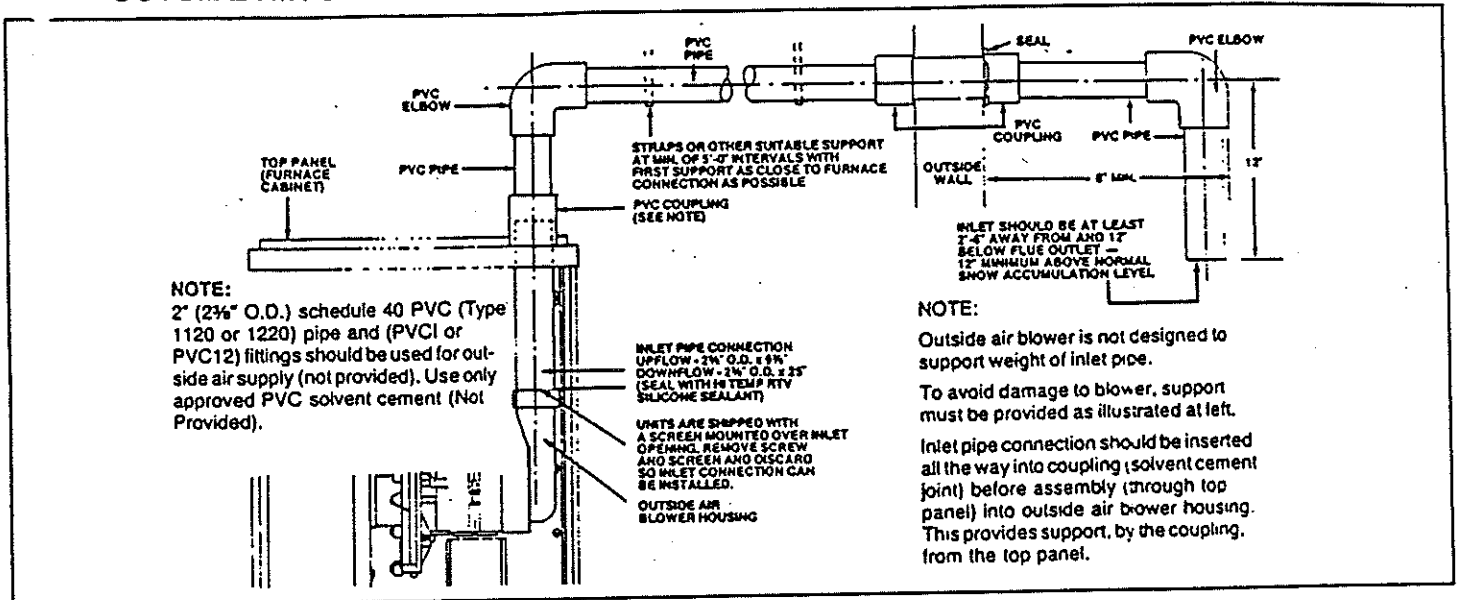
American Gas Association has certified the design of recuperative furnaces for a minimum of 0" clearance from combustible materials with a single wall vent pipe.

### VENTING PROCEDURE

Proper installation of the vent system is necessary to assure drainage of the condensate and prevent deterioration of the vent system.

### MISCELLANEOUS INFORMATION/NOTES

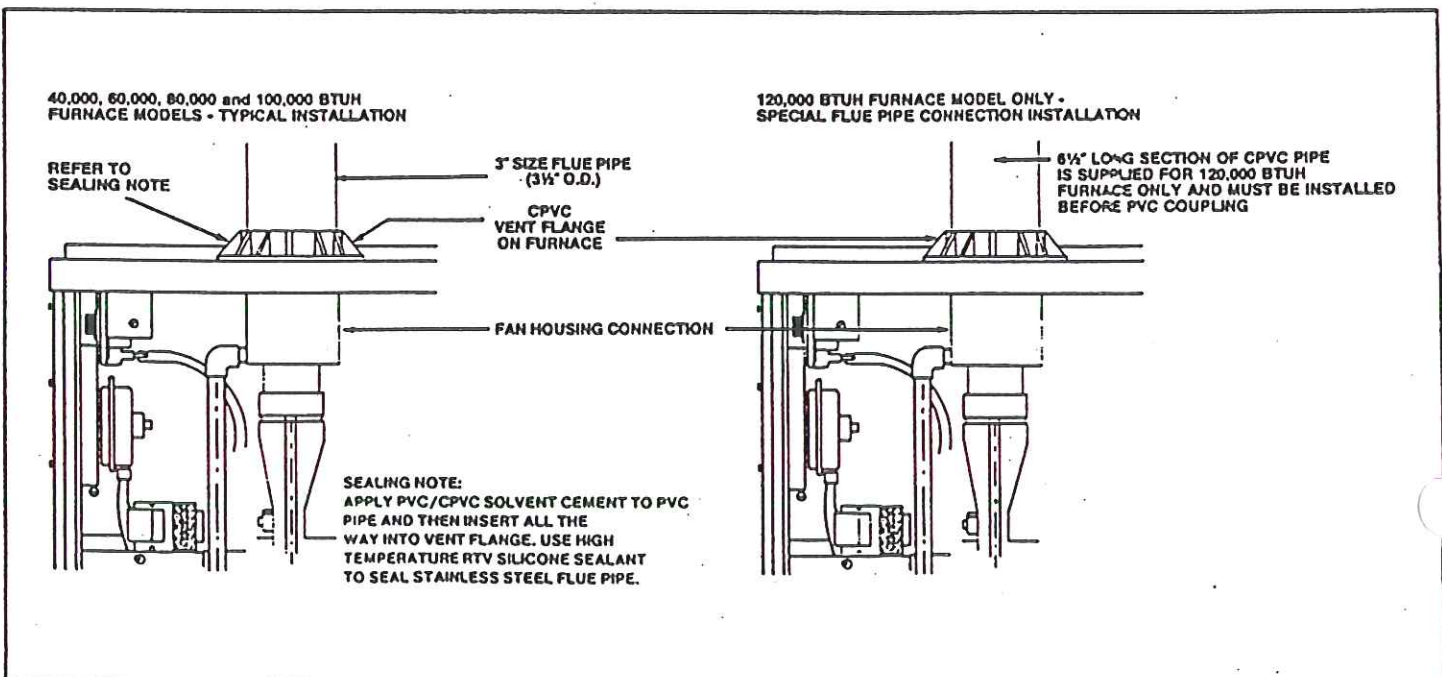
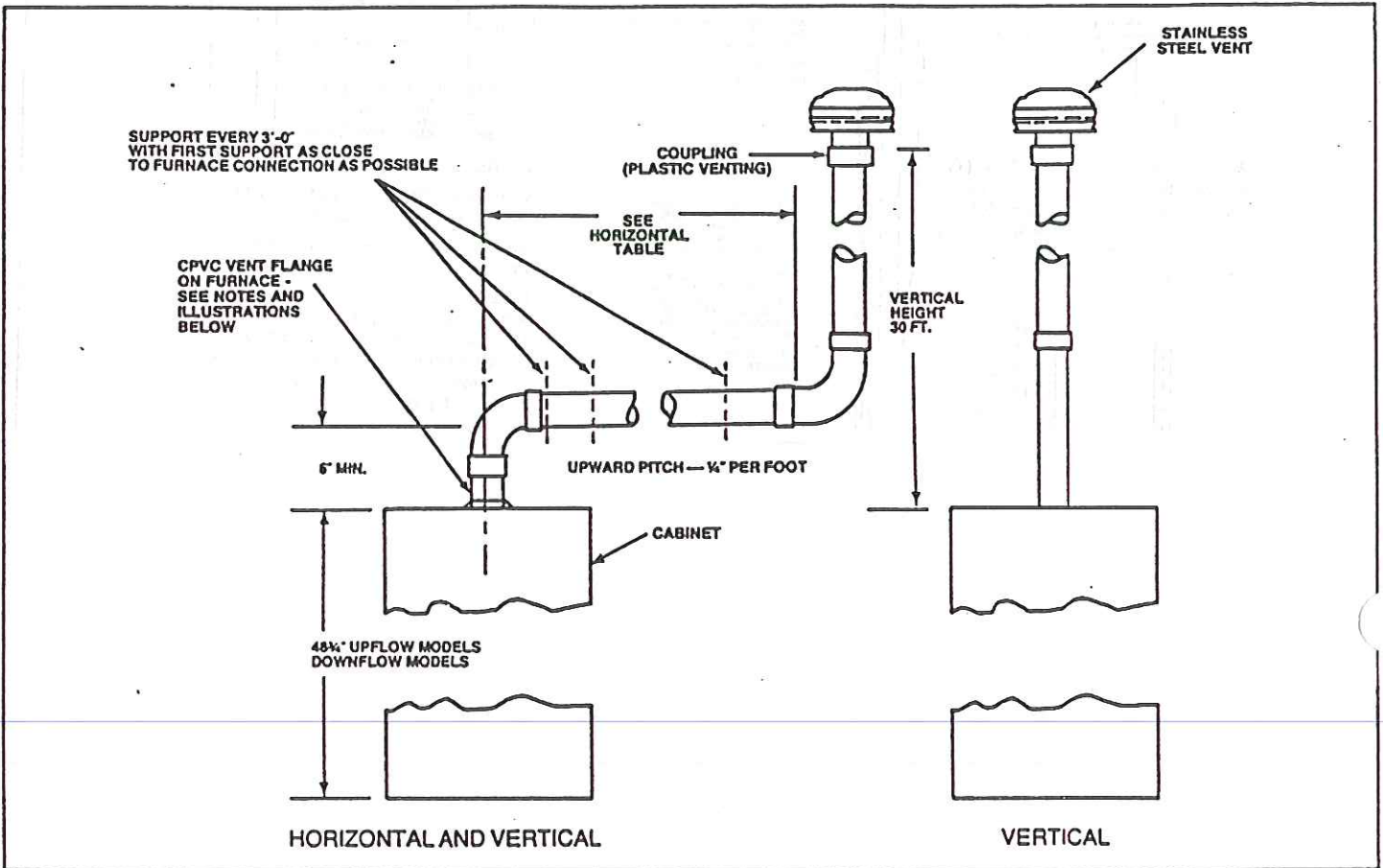
# OUTSIDE AIR SUPPLY INSTRUCTIONS FOR UPFLOW AND DOWNFLOW FURNACES



## VERTICAL VENTING HORIZONTAL AND VERTICAL VENTING

Either is the preferred method of venting.

HORIZONTAL LENGTH SCHEDULE		
VENT HOOD	ELBOWS	MAX. LENGTH
1	2	40 FT.
1	3	30 FT.
1	4	20 FT.



# INSTALLER'S GUIDE

## VENTING ROUTED THROUGH A MASONRY CHIMNEY

**PVC PLASTIC VENTING - ONLY THROUGH UNUSED CHIMNEY**

**CAUTION** — Do not run vent through chimney for wood burning or oil furnaces or incinerators or any other gas appliance.

**IMPORTANT** — The single wall flue pipe joints must be sealed.

The 90° elbow connection to vertical pipe must be sealed to prevent condensate leakage to base of masonry chimney.

**NOTE:**  
HORIZONTAL VENTING TO VERTICAL VENTING

**29-4C STAINLESS STEEL VENTING - USE THROUGH CHIMNEY THAT VENTS ANOTHER GAS APPLIANCE**

**CAUTION** — Do not run vent through chimney for wood burning or oil furnaces or incinerators. If remaining free area between single wall flue pipe and masonry chimney is to be used to vent another gas appliance, venting area must be sufficient to vent that appliance and that appliance must be connected to chimney with separate entry opening.

**IMPORTANT** — The single wall flue pipe joints must be sealed.

The 90° elbow connection to vertical pipe must be sealed to prevent condensate leakage to base of masonry chimney.

**NOTE:**  
HORIZONTAL VENTING TO VERTICAL VENTING

MAX. VERT. HT. 30 FT.

TOP OF FURNACE

# INSTALLER'S GUIDE

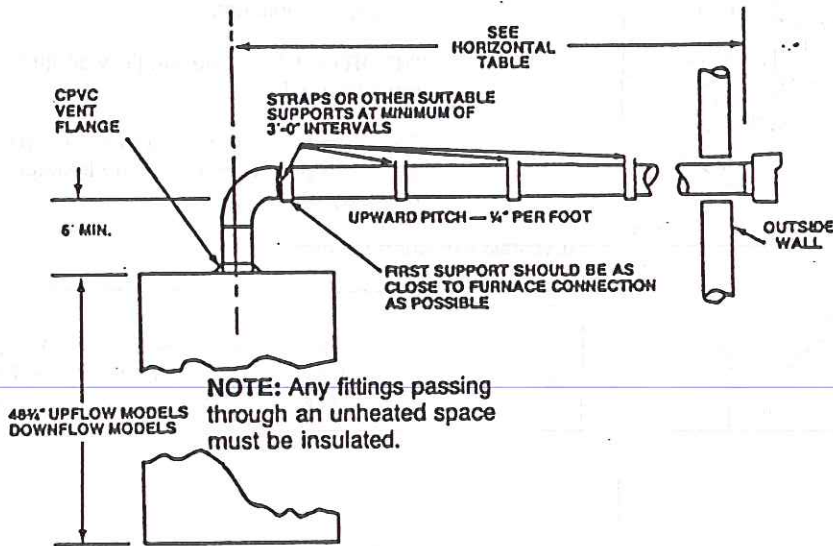
## ORIZONTAL VENTING THROUGH WALL

**AUTION:** If the furnace is to be vented through the wall, do not install through wall exposed to the prevailing winter wind.

Excessive wind can overcome the combustion blower

pressure and shut off the burners.

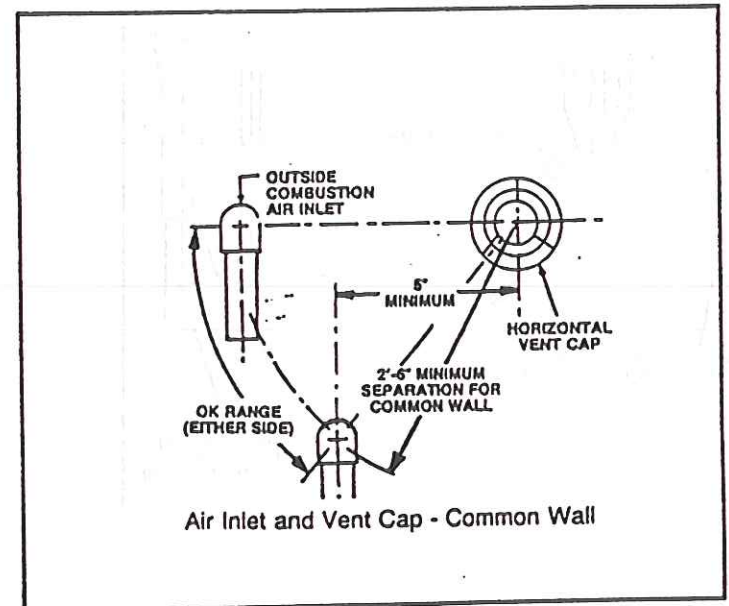
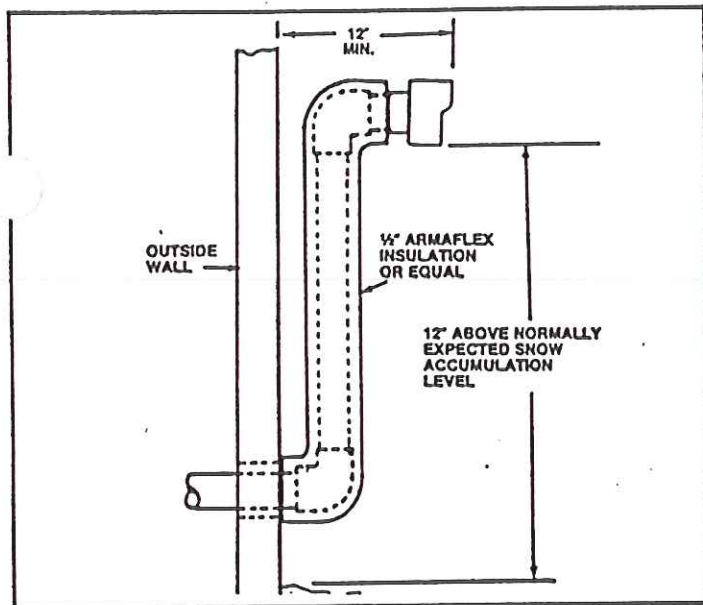
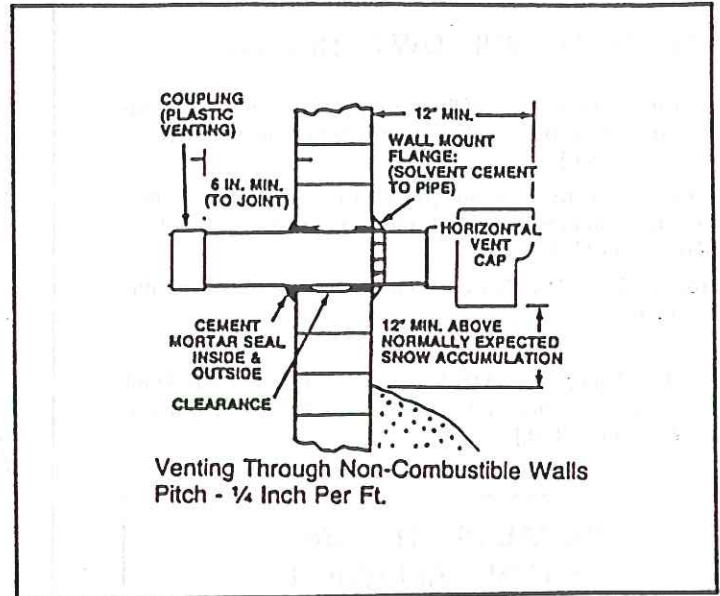
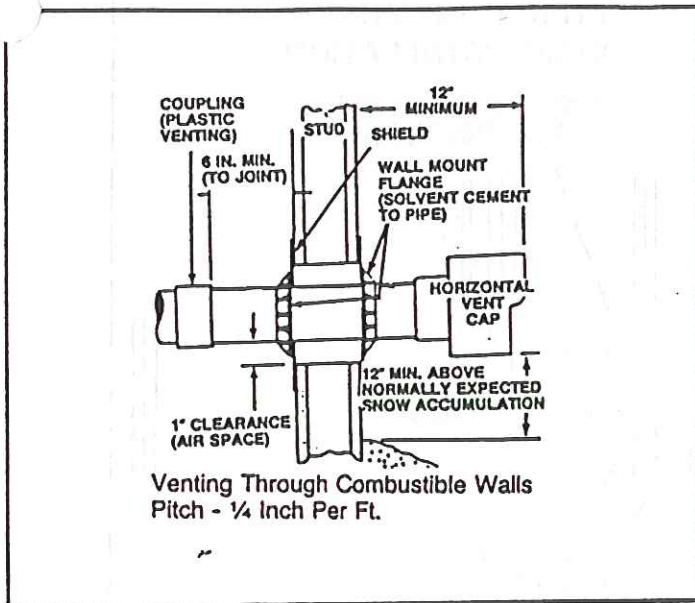
A wall most sheltered from the prevailing wind is least likely to experience excessive wind pressure.



HORIZONTAL LENGTH SCHEDULE		
VENT HOOD	ELBOWS	MAX. LENGTH
1	2	40 FT.
1	3	30 FT.
1	4	20 FT.

# INSTALLER'S GUIDE

## HORIZONTAL VENTING THROUGH WALL



The vent/wind cap must be located at least 12" minimum above normally expected snow accumulation level.

The cap must be at least 7' above grade, if it is adjacent to public walkways.

Avoid areas where staining or condensate drippage may be a problem.

The vent/wind cap must terminate at least 3' above any forced air inlet into the building that is within 10' of the cap. The cap must also terminate 4' below, 4' horizontal from or 1' above any door, window or other air inlet into building.

TCH — Venting through wall must maintain 1/4" per foot pitched upward.

### COMBUSTIBLE MATERIAL WALL

Shield material must be minimum of 24 gauge stainless or aluminum sheet metal. Minimum dimensions are 12" x

12". Shields must be fastened to both inside and outside of wall. Use screws or anchor type fasteners suited to the outside or inside wall surfaces.

A minimum clearance of 1" to combustible materials must be maintained when using single wall stainless steel venting.

### NONCOMBUSTIBLE MATERIAL WALL

The hole through wall must be large enough to maintain pitch of vent and properly seal.

Use cement mortar seal on inside and outside of wall.

### LOCATION OF OUTSIDE AIR INLET

Outside air inlet may be installed through any convenient wall. Refer to view above if common wall is to be used for air inlet and vent.

# INSTALLER'S GUIDE

## CONDENSATE DRAIN INSTRUCTIONS FOR UPFLOW AND DOWNFLOW FURNACES

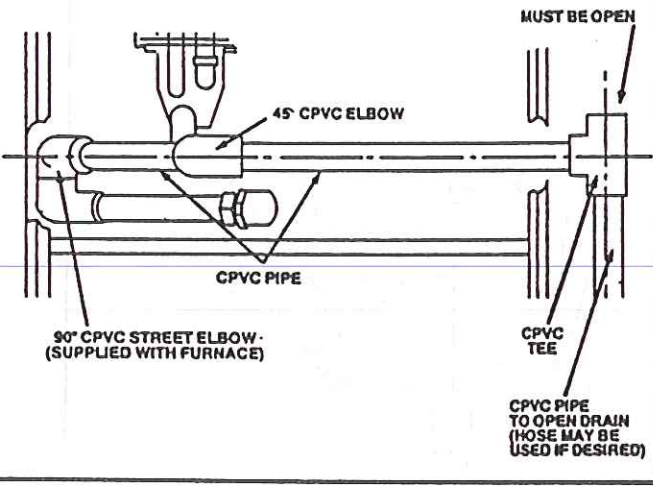
Provision is made in each side of the furnace cabinet for drain connections. Standard arrangement is for drain connection on left side (facing front of furnace).

Connections must be made to an open drain. Refer to illustrations for typical connections and select the most convenient for application — left hand or right hand.

Illustrations are for upflow furnace installations — downflow furnace installations are similar.

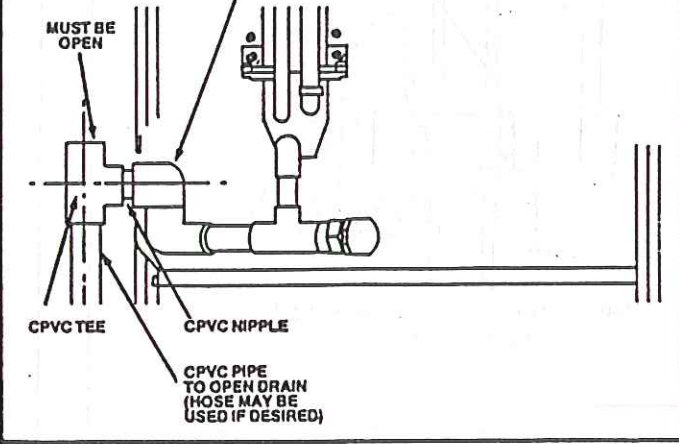
**NOTE:** Use 1/2" size (5/8" O.D.) CPVC pipe and fittings throughout for drain connections (fittings, pipe and CPVC solvent cement not provided.)

### TYPICAL RIGHT HAND DRAIN INSTALLATION



### TYPICAL LEFT HAND DRAIN INSTALLATION

90° CPVC STREET ELBOW (1/4" SIZE)  
SUPPLIED LOOSE SO IT MAY BE  
POSITIONED AS DESIRED AND  
CEMENTED IN PLACE AT INSTALLATION





# Condensing Furnaces

## SEQUENCE OF OPERATION — BLU/BLD-K, TUC120A-A MODELS

With the disconnect in the "on" position, voltage is supplied to the primary side of the control transformer (TNS) ⑨ through the blower compartment door switch ①.

The control transformer steps down line voltage to 24 volts for the low voltage control circuit. Power is supplied from the secondary of the control transformer to the "R" terminal on the thermostat ⑩ and the common side of the control circuit.

When there is a call for heat from the thermostat, power is supplied to the furnace low voltage terminal labeled "W" ⑩. From "W", 24 volts flows through a high temperature fusible link ⑬, high temperature limit switch ⑰, See Note 1, reverse flow switch ⑱ and auxiliary limit ⑮. From the auxiliary limit switch power flows to the low voltage side of the P.C. board ⑪. The P.C. board ⑪ starts the vent motor ② on the high speed. When the required combustion air is established, pressure switch #1 ⑭ closes, allowing 24 volts to flow to the ignition control ⑲. The ignition control ⑲ then supplies 115 volt power to the igniter ⑦. The igniter will heat for approximately 45 seconds, at which time the ignition control ⑲ will energize the gas valve permitting gas flow to the main burners. Multiple burner models, as in this illustration, utilize a remote flame sensor ⑳, See Note 4, to confirm ignition within a seven second trial for ignition period. Flame sensing is accomplished by flame rectification, See Note 2.

As the heat exchanger temperature increases, the thermal fan switch (FST) ⑥ closes, starting the blower on the selected heating speed.

Approximately eight seconds after a call for heat, the vent motor ② speed is switched from high to low speed by the P.C. Board ⑪. The vent motor will continue to operate at low speed with one exception. If pressure switch #2 senses a 20 to 40 mile per hour wind condition at the vent terminal, the switch will open, causing the P.C. Board to switch the vent motor ② to high speed. Eight seconds after the 20 to 40 mile per hour wind condition ceases, the vent motor will be switched back to low speed, See Note 3.

If the wind at the vent terminal exceeds 40 miles per hour, pressure switch #1 ⑭ will open closing the gas valve, shutting the burners and vent motor off.

When the thermostat is satisfied, the blower continues to run until the fan switch ⑥ reaches its cutoff temperature. It is possible, even after shutdown, for the thermal fan switch to close and recycle to dissipate residual heat.

### Notes:

1. The reverse flow limit switch is physically located on the return air side of heat exchanger in **downflow furnace models only**. Should the air temperature at the switch exceed the fixed temperature setting of the switch, the switch will open, and the gas valve will close, shutting down the burners and vent motor.
2. Furnaces produced after November 1, 1986 employ a three trial ignition control. This control will repeat the 45 seconds igniter heating and seven second trial-for-ignition sequences three times with a five second delay between each sequence. If main burner flame is not proven after three trials, the control will lockout.
3. Prior to January 1987, these furnaces employed a P.C. board which kept the combustion blower on high speed for 80 seconds before switching back to low speed.
4. BLU and BLD 040K models are single burner models and do not have a remote flame sensor. The silicone carbide igniter doubles as a flame sensor. This was changed in the first quarter of 1988. A remote sensor was installed to ensure reliable flame sensing.
5. KIT-2119 is a Fenwal to White Rodgers conversion kit. This service part is the factory recommended replacement part for the Fenwal control used in Trenton built residential gas furnaces.

# Wiring Schematic

CONDENSING FURNACES — BLU/BLD-K, TUC120A-A MODELS

Fenwal Hot Surface Ignition System

