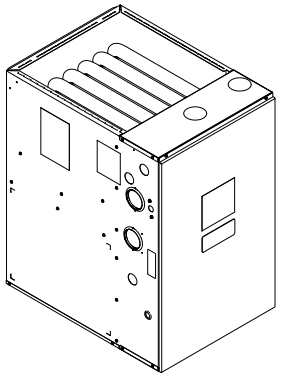
Installation, Operation, and Maintenance

Upflow/Horizontal and Dedicated Downflow Gas-Fired, Direct/Non-Direct Vent, 2-Stage Condensing Variable Speed Furnaces

Upflow, Convertible to Horizontal Right or Horizontal Left
A952V040BU3SB
A952V060BU4SB
A952V080BU4SB
A952V080CU5SB
A952V100CU5SB
A952V120DU5SB

Downflow Only
A952V040BD3SB
A952V060BD3SB
A952V080BD4SB
A952V100CD5SB
A952V120DD5SB



Note: *Graphics in this document are for representation only. Actual model may differ in appearance.*

⚠ WARNING

FIRE HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
This Warning applies to installations with a flammable refrigeration system. The furnace must be powered except for service. The furnace shall be installed and connected according to installation instructions and wiring diagrams that are provided with the evaporator coil.

⚠ CAUTION

COIL REQUIREMENT!

Failure to follow this Caution could result in property damage or personal injury. 4GXC* and 4MXC* coils installed on upflow furnaces in vertical, horizontal left, or horizontal right orientations without a factory installed metal drain pan shield must use a MAY*FERCOLKITAA kit. Coils installed on upflow furnaces must have drain pans that are suitable for 400° F (205°C) or have a metal drain pan shield. Downflow furnaces do not require a metal drain pan shield or the use of the MAY*FERCOLKITAA kit.

A952V-SVX001-1B-EN

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

September 2023 **A952V-SVX001-1B-EN**

SAFETY SECTION — FURNACES

Important: *— This document pack contains a wiring diagram and service information. This is customer property and is to remain with this unit. Please return to service information pack upon completion of work.*

⚠ WARNING

FIRE OR EXPLOSION HAZARD!

Failure to follow safety warnings exactly could result in a fire or explosion 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.

⚠ WARNING

EXPLOSION HAZARD!

Failure to follow this Warning could result in property damage, personal injury or death.

Install a gas detecting warning device in case of a gas leak. *NOTE: The manufacturer of your furnace does not test any detectors and makes no representations regarding any brand or type of detector.*

⚠ WARNING

FIRE OR EXPLOSION HAZARD!

Failure to follow the safety warnings exactly could result in serious injury, death, or property damage.

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury, or loss of life.

⚠ WARNING

ELECTRICAL SHOCK, FIRE, OR EXPLOSION HAZARD!

Failure to follow this Warning could result in dangerous operation, property damage, severe personal injury, or death.

Improper servicing could result in dangerous operation, property damage, severe personal injury, or death.

- **Before servicing, disconnect all electrical power to furnace.**
- **When servicing controls, label all wires prior to disconnection. Reconnect wires correctly.**
- **Verify proper operation after servicing.**

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

To ensure furnace is vented properly, do not replace factory supplied venting components with field fabricated parts. Fabricating parts can result in damaged vents and components allowing carbon monoxide to escape the venting system.

⚠ WARNING

CARBON MONOXIDE HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

Do not attempt to change the venting system. Follow the installation and operation instructions for the venting system.

⚠ WARNING

FIRE HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

Do not install the furnace directly on carpeting, tile or other combustible material other than wood flooring. For vertical downflow applications, subbase (BAYBASE205) must be used between the furnace and combustible flooring.When the downflow furnace is installed vertically with a cased coil, a subbase is not required.

⚠ WARNING

WARNING!

This product can expose you to chemicals including lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm.
For more information go to www.P65Warnings.ca.gov.

⚠ WARNING

EXPLOSION HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
Propane gas is heavier than air and may collect in any low areas or confined spaces. In addition, odorant fade may make the gas undetectable except with a warning device. If the gas furnace is installed in a basement, an excavated areas or a confined space, it is strongly recommended to contact a gas supplier to install a gas detecting warning device in case of leak. The manufacturer of your furnace does not test any detectors and makes no representations regarding any brand or type of detector.

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
Do not bypass the door switch or panel loop by any permanent means.

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
Do not touch any components other than the Menu and Option buttons on the IFC when setting up the system or during fault code recovery.

⚠ WARNING

FIRE OR EXPLOSION HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
Do NOT attempt to manually light the furnace.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
Follow the service and/or periodic maintenance instructions for the Furnace and venting system.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

Failure to follow this Warning could result in serious personal injury or death.
Make sure that the blower door is in place and not ajar. Dangerous fumes could escape an improperly secured door.

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
Disconnect power to the unit before removing the blower door. Allow a minimum of 10 seconds for IFC power supply to discharge to 0 volts.

⚠ WARNING

SAFETY HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
These furnaces are not approved or intended for installation in trailers or recreational vehicles. Installation in manufactured (mobile) housing is only approved with BAYMFGH Kit.

⚠ WARNING

EXPLOSION HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.
In the event that electrical, fuel, or mechanical failures occur, shut gas supply off at the manual gas valve located on the supply gas piping coming into the furnace before turning off the electrical power to the furnace. Contact the service agency designated by your dealer.

⚠ WARNING

EXPLOSION HAZARD!

Failure to follow this Warning could result in property damage, serious personal injury, or death.

Do not store combustible materials, gasoline, or other flammable vapors or liquids near the unit.

⚠ WARNING

SAFETY HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

Do not use semi-rigid metallic gas connectors (flexible gas lines) within the furnace cabinet.

⚠ WARNING

INSTALLATION WARNING – HIGH VOLTAGE MOVING PARTS!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

Bodily injury can result from high voltage electrical components, fast moving fans, and combustible gas. For protection from these inherent hazards during installation and servicing, the main gas valve must be turned off and the electrical supply must be disconnected. If operating checks must be performed with the unit operating, it is the technician's responsibility to recognize these hazards and proceed safely.

⚠ WARNING

SAFETY HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

Do not install the filter in the return duct directly above the furnace in horizontal applications. Install the filter remotely.

⚠ WARNING

SAFETY HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

Turn the power to the furnace off before servicing filters to avoid contact with moving parts.

⚠ WARNING

CARBON MONOXIDE HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

Furnace venting into an unlined masonry chimney or concrete chimney is prohibited.

⚠ WARNING

CARBON MONOXIDE HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

The chimney liner must be thoroughly inspected to insure no cracks or other potential areas for flue gas leaks are present in the liner. Liner leaks will result in early deterioration of the chimney.

⚠ WARNING

SHOCK HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

If a disconnect switch is present, it must always be locked in the open position before servicing the unit.

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

Failure to follow this Warning could result in an electrical shock, fire, injury or death.

Ensure cabinet has an uninterrupted or unbroken ground in accordance with National Electrical Code, ANSI/ NFPA 70 – 'latest edition' and Canadian Electrical Code, CSA C22.1 or local codes to minimize personal injury if an electrical fault should occur.

⚠ WARNING

OVERHEATING AND EXPLOSION HAZARD!

Failure to follow this Warning could result in property damage, personal injury or death.

Should overheating occur, or the gas supply fail to shut off, shut off the gas valve to the unit before shutting off the electrical supply.

⚠ CAUTION

IMPROPER VOLTAGE CONNECTION!

Failure to follow this Caution could result in property damage.
Do NOT connect the furnace line voltage to a GFCI protected circuit.

⚠ CAUTION

CORROSION WARNING!

Failure to follow this Caution could result in property damage or personal injury.
Do not install the furnace in a corrosive or contaminated atmosphere.

⚠ CAUTION

SAFETY HAZARD!

Failure to follow this Caution could result in property damage or personal injury.
The vent for this appliance shall not terminate; (1) Over public walkways; or (2) Near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage; or (3) Where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

⚠ CAUTION

SHARP EDGE HAZARD!

Failure to follow this Caution could result in property damage or personal injury.
Be careful of sharp edges on equipment or any cuts made on sheet metal while installing or servicing.

⚠ CAUTION

BACKUP WRENCH REQUIRED!

Failure to follow this Caution could result in property damage or personal injury.
Use a backup wrench on the gas valve when installing gas piping to prevent damage to the gas valve and manifold assembly.

⚠ CAUTION

FREEZE CAUTION!

Failure to follow this Caution could result in property damage or personal injury.
If complete furnace shutdown is done during the cold weather months, provisions must be taken to prevent freeze-up of all water pipes and water receptacles.

⚠ CAUTION

FREEZE CAUTION!

Failure to follow this Caution could result in property damage or personal injury.
When the vent pipe is exposed to temperatures below freezing, i.e., when it passes through unheated spaces, etc., the pipe must be insulated with 1/2 inch (12.7 mm) thick Armaflex-type insulation or equal. If the space is heated sufficiently to prevent freezing, then the insulation would not be required. If domestic water pipes are not protected from freezing then the space meets the condition of a heated space.

⚠ CAUTION

FREEZE CAUTION!

Failure to follow this Caution could result in property damage or personal injury.
Whenever your house is to be vacant, arrange to have someone inspect your house for proper temperature. This is very important during freezing weather. If for any reason your furnace should fail to operate damage could result, such as frozen water pipes.

⚠ CAUTION

FREEZE CAUTION!

Failure to follow this Caution could result in property damage or personal injury.
Caution should be taken to prevent drains from freezing or causing slippery conditions. Excessive draining of condensate may cause saturated ground conditions that may result in damage to plants.

⚠ CAUTION

IGNITION FUNCTION!

Failure to follow this Caution may result in poor ignition characteristics.
Maintain manifold pressure in high altitude installations.

⚠ CAUTION

WATER DAMAGE!

Failure to follow this Caution could result in property damage or personal injury.
It is recommended that an external overflow drain pan be installed in all applications over a finished ceiling to prevent property damage or personal injury from leaking condensate.

⚠ CAUTION

HOT SURFACE!

Failure to follow this Caution could result in personal injury.
Do NOT touch igniter. It is extremely hot.

⚠ CAUTION

FURNACE SERVICE CAUTION!

Failure to follow this Caution could result in property damage or personal injury.
Label all wires prior to disconnection when servicing controls. Verify proper operation after servicing. Wiring errors can cause improper and dangerous operation.

⚠ CAUTION

DO NOT USE AS CONSTRUCTION HEATER!

Failure to follow this Caution could result in property damage or personal injury.
In order to prevent shortening its service life, the Furnace should NOT be used as a "Construction Heater" during the finishing phases of construction until the requirements listed in the Furnace Installation Guidelines section have been met. Condensate in the presence of chlorides and fluorides from paint, varnish, stains, adhesives, cleaning compounds, and cement create a corrosive condition which may cause rapid deterioration of the heat exchanger.

⚠ CAUTION

WIRING INFORMATION!

Failure to follow this Caution could result in property damage or personal injury.
The integrated furnace control is polarity sensitive. The hot leg of the 120 VAC power must be connected to the BLACK field lead.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death.

The following steps shall be followed for each appliance connected to the venting system being placed into operation, while all other appliances connected to the venting system are not in operation:

- **Inspect the venting system for proper size and horizontal pitch as required in the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the CSA B149.1 *Natural Gas and Propane Installation Code* and these instructions. Determine there is no blockage or restriction, leakage, corrosion or other deficiencies which could cause an unsafe condition.**
- **Close all doors and windows between the space in which the appliance(s) connected to the venting system are located. Also close fireplace dampers.**
- **Turn on clothes dryers and any appliance not connected to the venting system. Turn on any exhaust fans such as range hoods so they are operating at maximum speed. Do not operate a summer exhaust fan.**
- **Follow the lighting instructions. Place the appliance being inspected into operation. Adjust the thermostat so appliance is operating continuously.**
- **Test for spillage from draft hood equipped appliances at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle.**
- **If improper venting is observed during any of the above tests, the venting system must be corrected in accordance with the National Fuel Gas Code, ANSI Z221.1/NFPA 54 and/or CSA B149.1 *Natural Gas and Propane Installation Code.***
- **After it has been determined that each appliance connected to the venting system properly vents when tested, return all doors, windows, exhaust fans, etc. to their previous condition of use.**

⚠ CAUTION

VENTING REQUIREMENT!

Failure to follow this Caution could result in property damage or personal injury.

For condensing furnaces, 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 for another gas appliance, venting area must be sufficient to vent that appliance and that appliance must be connected to chimney with separate entry openings.

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.

⚠ CAUTION

VENTING REQUIREMENT!

Failure to follow this Caution could result in property damage or personal injury.

Condensing furnaces may be vented through UNUSED chimneys. 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.

⚠ CAUTION

EQUIPMENT DAMAGE!

UV light exposure can cause the plastic blower material to deteriorate which could lead to Blower Housing Damage.

For units containing a plastic Blower Housing, Do NOT install third party Ultra-Violet Air Cleaners where the Blower Housing can be exposed to UV light.

For more information, visit www.trane.com and www.americanstandardair.com or contact your installing dealer.
6200 Troup Highway
Tyler, TX 75707

Coil Caution

⚠ CAUTION

COIL REQUIREMENT!!

Failure to follow this Caution could result in property damage or personal injury.

4GXC* and 4MXC* coils installed on upflow furnaces in vertical, horizontal left, or horizontal right orientations without a factory installed metal drain pan shield must use a MAY*FERCOLKITAA kit. Coils installed on upflow furnaces must have drain pans that are suitable for 400° F (205° C) or have a metal drain pan shield. Downflow furnaces do not require a metal drain pan shield or the use of the MAY*FERCOLKITAA kit.

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Accessories

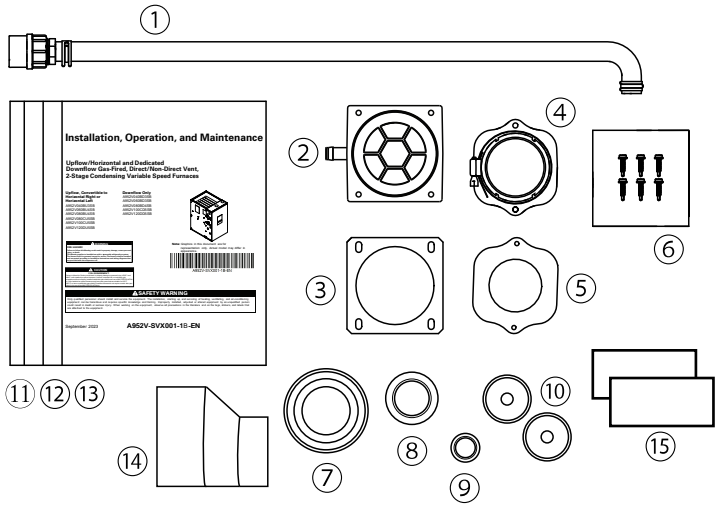
Table 1. Accessories

Model Number	Description	Use with
BAYHANG	Horizontal Hanging Kit	All Upflow Furnaces
BAYVENT200B	Sidewall Vent Termination Kit	All Furnaces
BAYVENTCN200B	Sidewall Vent Termination Kit (Canada —CPVC)	All Furnaces
BAYAIR30AVENTA	Concentric Vent Kit	All Furnaces
BAYAIR30CNVENT	Concentric Vent Kit (Canada — CPVC)	All Furnaces
BAYREDUCE	Reducing Coupling (CPVC)	All Furnaces
BAYLIFTB	Dual Return Kit (B size extension)	B Cabinet Upflow Furnaces
BAYLIFTC	Dual Return Kit (C size extension)	C Cabinet Upflow Furnaces
BAYLIFTD	Dual Return Kit (D size extension)	D Cabinet Upflow Furnaces
BAYBASE205	Downflow Subbase	All Downflow Furnaces
BAYFLTR203	Horizontal Filter Kit	B Cabinet Modular Blowers in Downflow/ Horizontal
BAYFLTR204	Horizontal Filter Kit	C Cabinet Modular Blowers in Downflow/ Horizontal
BAYFLTR205	Horizontal Filter Kit	D Cabinet Modular Blowers in Downflow/ Horizontal
BAYFLTR206	Filter Access Door Kit (Downflow only)	All Downflow Furnaces
BAYSF1165*[(a)]	1″ SlimFit Box with MERV 4 Filter	All Upflow Furnaces
BAYSF1255*	2″ SlimFit Filter Box with MERV 4 Filter	All furnaces when used in side return application. B-Cabinet Furnaces only when in bottom return application.
BAYLPSS400*	Propane Conversion Kit with Stainless Steel Burners	All Furnaces
FLRSF1255	1″ Filter replacement (Qty 12)	BAYSF1255*
BAYMFGH200B	Manufactured/Mobile Housing Kit	All Furnaces
BAYCNDTRAP2A	Inline Condensate Trap Kit used with Special Venting on 2″ Vent Pipe	All Furnaces
BAYCNDTRAP3A	Inline Condensate Trap Kit used with Special Venting on 3″ Vent Pipe	All Furnaces

[(a)] Airflow greater than 1600 CFM requires dual returns

Document Pack Contents

Item	Qty.	Description
1	1	Condensate Drain Tube Assembly
2	1	Inlet Vent (2”- ADP01586 and 3” - ADP01587)(a)
3	1	Inlet Vent Gasket
4	1	Outlet Vent Assembly
5	1	Outlet Vent Gasket
6	6	Screws
7	1	Condensate Trap Grommet
8	1	Plug - Condensate/Gas
9	1	Plug - Electrical
10	2	Grommet - Condensate/Gas
11	1	Installation, Operation, and Maintenance
12	1	Owner Guide
13	1	Limited Warranty
14	1	2” to 3” Coupling - CPL01544 (b)
15	2	Brand labels (c)



(a) 3” inlet vent supplied with A952V120DU5S and A952V120DD5S only. 2” inlet vent supplied with all other models.
(b) Supplied with A952V120DU5S and A952V120DD5S only.
(c) Place appropriate brand label below the warning label on the front panel using stencil marks as guides.

Part List

• Igniter	• Inducer Assembly	• Pressure Switch(es)
• Flame Sensor	• Blower Motor	• Main Thermal Limit
• In-shot Burner(s)	• Blower Wheel	• Roll-Out Switch(es)
• Gas Valve	• IFC (Integrated Furnace Control)	• Reverse Air Switch(es)

Product Specification

Model	A952V040BU 3SB [a], [b]	A952V060BU 4SB [a], [b]	A952V080BU 4SB [a], [b]	A952V080CU 5SB [a], [b]	A952V100CU 5SB [a], [b]	A952V120DU 5SB [a], [b]
Type	Upflow / Horizontal					
RATINGS [c]						
1st Stage Input BTUH	26,000	39,000	52,000	52,000	65,000	78,000
1st Stage Capacity BTUH (ICS)	25,300	38,100	50,500	50,600	63,400	75,500
2nd Stage Input BTUH	40,000	60,000	80,000	80,000	100,000	120,000
2nd Stage Capacity BTUH (ICS) [d]	38,950	58,400	77,700	77,750	97,650	115,700
1st Stage Temp. Rise (Min. - Max.) °F	25 - 55	25 - 55	30 - 60	30 - 60	25 - 55	35 - 65
2nd Stage Temp. Rise(Min. - Max.) °F	30 - 60	35 - 65			30 - 60	40 - 70
AFUE (%) [d]	96.0					
Return Air Temp. (Min. - Max.) °F	45°F - 80°F					
BLOWER DRIVE	DIRECT					
Diameter - Width (in.)	11 X 8			11 X 10		
No. Used	1	1	1	1	1	1
Speeds (No.)	Variable					
CFM vs. in. w.g.	See Fan Performance Table					
Motor HP	1/2	3/4	3/4	1	1	1
R.P.M.	Variable					
Volts / Ph / Hz	120 / 1 / 60					
FLA	5.7 / 6.4	8 / 9.6	8 / 9.6	10.5 / 10	10.5 / 10	10.5 / 10
COMBUSTION FAN - Type	PSC					
Drive - No. Speeds	Direct - 2					
Motor RPM	3300/2600					
Volts/Ph/Hz	120 / 1 / 60					
FLA	0.66					
Inducer Orifice	0.61	0.79	0.96	0.88	1.05	1.19
FILTER - Furnished?	No					
Type Recommended	High Velocity					
Hi Vel. (No.-Size-Thk.)	1 - 16 X 25 - 1 in.			1 - 20 X 25 - 1 in.		1 - 24 X 25 - 1 in.
VENT OUTLET DIA - MIN. (in.) [e]	2 Round					3 Round
INLET AIR DIA -MIN. (in.) [e]	2 Round					3 Round
HEAT EXCHANGER – Type						
Fired	409 Stainless Steel					
Unfired	29-4C Stainless Steel					
Gauge (Fired)	20					
ORIFICES - Main						
Nat. Gas (Qty. - Drill Size)	2 - 45	3 - 45	4 - 45	4 - 45	5 - 45	6 - 45
Propane Gas (Qty. - Drill Size)	2 - 56	3 - 56	4 - 56	4 - 56	5 - 56	6 - 56
GAS VALVE	Redundant - Two Stage					
PILOT SAFETY DEVICE – Type	120 V SiNi Igniter					
BURNERS - TYPE - QTY	Inshot - 2	Inshot - 3	Inshot - 4	Inshot - 4	Inshot - 5	Inshot - 6
POWER CONN. - V/Ph/HZ [f]	120 / 1 / 60					
Ampacity (Amps)	7.9 / 8.8	10.8 / 12.8	10.8 / 12.8	13.9 / 13.3	13.9 / 13.3	13.9 / 13.3
Max. Overcurrent Protection (Amps)	15					
PIPE CONN. SIZE (IN.)	1/2					

Model	A952V040BD 3SB [a], [b]	A952V060BD 3SB [a], [b]	A952V080BD 4SB [a], [b]	A952V100CD 5SB [a], [b]	A952V120DD 5SB [a], [b]
Type	Downflow				
RATINGS [c]					
1st Stage Input BTUH	26,000	39,000	52,000	65,000	78,000
1st Stage Capacity BTUH (ICS)	25,300	37,700	50,300	63,300	75,800
2nd Stage Input BTUH	40,000	60,000	80,000	100,000	120,000
2nd Stage Capacity BTUH (ICS) [d]	38,850	57,850	77,350	97,150	116,100
1st Stage Temp. Rise(Min. - Max.) °F	25 - 55		30 - 60		
2nd Stage Temp. Rise(Min. - Max.) °F	30 - 60	35 - 65			
AFUE (%) [d]	96.0				
Return Air Temp. (Min. - Max.) °F	45°F - 80°F				
BLOWER DRIVE	DIRECT				
Diameter - Width (in.)	11 X 8			11 X 10	
No. Used	1	1	1	1	1
Speeds (No.)	Variable				
CFM vs. in. w.g.	See Fan Performance Table				
Motor HP	1/2	1/2	3/4	1	1
R.P.M.	Variable				
Volts / Ph / Hz	120 / 1 / 60				
FLA	5.7 / 6.4	5.7 / 6.4	8 / 9.6	10.5 / 10	10.5 / 10
COMBUSTION FAN - Type	PSC				
Drive - No. Speeds	Direct - 2				
Motor RPM	3300/2600				
Volts/Ph/Hz	120 / 1 / 60				
FLA	0.66				
Inducer Orifice	0.61	0.79	0.96	1.05	1.19
FILTER - Furnished?	No				
Type Recommended	High Velocity				
Hi Vel. (No.-Size-Thk.)	1 - 16 X 25 - 1 in.			1 - 20 X 25 - 1 in.	1 - 24 X 25 - 1 in.
VENT OUTLET DIA - MIN. (in.) [e]	2 Round				3 Round
INLET AIR DIA -MIN. (in.) [e]	2 Round				3 Round
HEAT EXCHANGER – Type					
Fired	409 Stainless Steel				
Unfired	29-4C Stainless Steel				
Gauge (Fired)	20				
ORIFICES - Main					
Nat. Gas (Qty. - Drill Size)	2 - 45	3 - 45	4 - 45	5 - 45	6 - 45
Propane Gas (Qty. - Drill Size)	2 - 56	3 - 56	4 - 56	5 - 56	6 - 56
GAS VALVE	Redundant - Two Stage				
PILOT SAFETY DEVICE – Type	120 V SiNi Igniter				
BURNERS - TYPE - QTY	Inshot - 2	Inshot - 3	Inshot - 4	Inshot - 5	Inshot - 6
POWER CONN. - V/Ph/HZ [f]	120 / 1 / 60				
Ampacity (Amps)	7.9 / 8.8	7.9 / 8.8	10.8 / 12.8	13.9 / 13.3	13.9 / 13.3
Max. Overcurrent Protection (Amps)	15				
PIPE CONN. SIZE (IN.)	1/2				

[a] Meets Energy Star

[b] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 - latest edition.

[c] For U.S. Applications, above input ratings (BTUH) are up to 2,000 feet, derate 4% per 1,000 feet for elevations above 2,000 feet above sea level. For Canadian applications, above input ratings (BTUH) are up to 4,500 feet, derate 4% per 1,000 feet for elevations above 4,500 feet above sea level.

[d] Based on U.S. government standard tests.

[e] Refer to Vent Length Table in this document.

[f] The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

Furnace Installation Guidelines

The following sections give general guidelines for the installation of the gas furnaces.

Safety Practices and Precautions

The following safety practices and precautions must be followed during the installation, servicing, and operation of this furnace.

1. Use only with the type gas approved for this furnace. Refer to the furnace rating plate.
2. Install the furnace only in a location and position as specified in “Locations and Clearances” of these instructions.
3. Provide adequate combustion and ventilation air to the furnace space as specified in “Air for Combustion and Ventilation” of these instructions.
4. Combustion products must be discharged outdoors. Connect this furnace to an approved vent system only, as specified in the “Venting” section of these instructions.
5. Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections, as specified in the “Gas Piping” section of these instructions.
6. Always install the furnace to operate within the furnace’s intended temperature-rise range with a duct system which has an external static pressure within the allowable range, as specified on the unit rating plate. Airflow within temperature rise for cfm versus static is shown in this document accompanying this furnace.
7. When a furnace is installed so that the supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by a duct(s) sealed to the furnace casing and terminating outside the space containing the furnace.
8. A gas-fired furnace for installation in a residential garage must be installed as specified in "Location and Clearances" section of these instructions.
9. The furnace may be used for temporary heating of buildings or structures under construction only when the following conditions have been met:
    a. The furnace venting system must be complete and installed per manufacturer’s instructions.
    b. The furnace is controlled only by a room Comfort Control (no field jumpers).
    c. The furnace return air duct must be complete and sealed to the furnace.
    d. The furnace input rate and temperature rise must be verified to be within the nameplate marking.
    e. A minimum 4” MERV 11 air filter must be in place.
    f. 100% of the furnace combustion air requirement must come from outside the structure.
    g. The Furnace return air temperature range is between 45 and 80 Fahrenheit.

        80% models = 55°F

        90%+ models = 45°F

    h. Clean the furnace, duct work, and components upon substantial completion of the construction process, and verify furnace operating conditions including ignition, input rate, temperature rise, and venting, according to the manufacturer’s instructions.
10. **In the Commonwealth of Massachusetts, this product must be gas piped by a Licensed Plumber or Gas Fitter.**

This furnace is certified to leak 2% or less of nominal air conditioning CFM delivered when pressurized to .5” water column with all inlets, outlets, and drains sealed.

General Guidelines

The manufacturer assumes no responsibility for equipment installed in violation of any code or regulation.

It is recommended that Manual J of the Air Conditioning Contractors Association (ACCA) or A.R.I. 230 be followed in estimating heating requirements. When estimating heating requirements for installation at Altitudes above 2000 ft., remember the gas input must be reduced. See Combustion and Input Check.

Material in this shipment has been inspected at the factory and released to the transportation agency without known damage. Inspect exterior of carton for evidence of rough handling in shipment. Unpack carefully after moving equipment to approximate location. If damage to contents is found, report the damage immediately to the delivering agency.

Codes and local utility requirements governing the installation of gas fired equipment, wiring, plumbing, and flue connections must be adhered to. In the absence of local codes, the installation must conform with latest edition of the National Fuel Gas Code ANSI Z223.1 / NFPA 54 • National Installation Code, CAN/CGA B149.1. The latest code may be obtained from the American Gas Association Laboratories, 400 N. Capitol St. NW, Washington D.C. 20001.
1-800-699-9277 or www.aga.org.

These furnaces have been classified as CATEGORY IV furnaces in accordance with latest edition of ANSI Z21.47 standards • CSA 2.3. Category IV furnaces operate with positive vent static pressure and with a

flue loss less than 17 percent. These conditions require special venting systems, which must be gas tight and water tight. These Category IV Direct Vent furnaces are approved for installation in Manufactured/ Mobile housing when used with BAYMFGH200B.

A manufactured (mobile) home installation must conform with the *Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280,* or when this standard is not applicable, the *Standard for Model Manufactured Home Installation, NFPA 225,*or the *Canadian Standard for Manufactured Homes, CSA Z240 MH.*

Locations and Clearances

The location of the furnace is normally selected by the architect, the builder, or the installer. However, before the furnace is moved into place, be sure to consider the following requirements:

1. Is the location selected as near the chimney or vent and as centralized for heat distribution as practical?
2. Do all clearances between the furnace and enclosure equal or exceed the minimums stated in Clearance Table below?

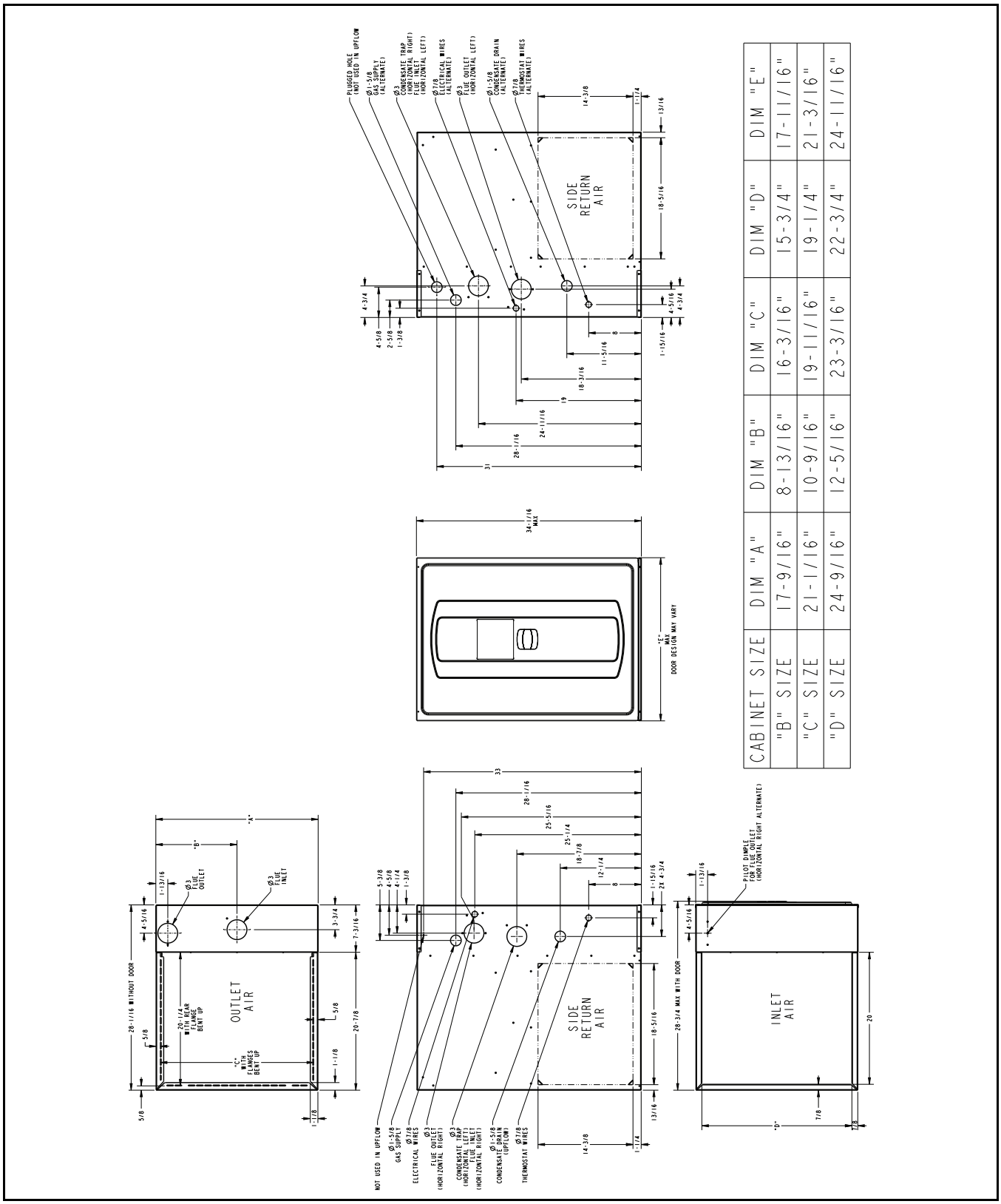
Minimum clearance to combustible materials	
Closet	
Sides	0 in.
Back	1 in.
Top	1 in.
Front	0 in.
Bottom	0 in.
Flue	0 in.
24 in. minimum front clearance recommended for service	
Horizontal Closet and Alcove	
Right Side	0 in.
Left Side	0 in.
Back	1 in.
Top	1 in.
Bottom	0 in.
Flue	0 in.
Horizontal Flue (discharge on left)	
Closet	
Right Side	0 in.
Left Side	0 in.
Rear	1 in.
Top	1 in.
Bottom	0 in.
Flue	0 in.

3. Is there sufficient space for servicing the furnace and other equipment? A minimum of 24 inches front accessibility to the furnace must be provided. Any access door or panel must permit removal of the largest component.
4. Are there at least 3 inches of clearance between the furnace combustion air openings in the front panel and any closed panel or door provided?
5. Are the ventilation and combustion air openings large enough and will they remain unobstructed? If outside air is used, are the openings set 12" above the highest snow accumulation level?
6. Allow sufficient height in supply plenum above the furnace to provide for cooling coil installation, if the cooling coil is not installed at the time of this furnace installation.
7. The furnace shall be installed so electrical components are protected from water.
8. A vertical downflow furnace without a coil, must use BAYBASE205 when installed on combustible flooring.
9. If the furnace is installed in a garage, it must be installed so that the burners, and the ignition source are located not less than 18 inches above the floor and the furnace must be located or protected to avoid physical damage from vehicles.
10. The gas furnace must not be located where excessive exposure to contaminated combustion air will result in safety and performance related problems. Avoid the following contaminants:
    a. Permanent wave solutions
    b. Chlorinated waxes and cleaners
    c. Chlorine based swimming pool chemicals
    d. Water softening chemicals
    e. De-icing salts or chemicals
    f. Carbon tetrachloride
    g. Halogen type refrigerants
    h. Cleaning solvents (such as perchloroethylene)
    i. Printing inks, paint removers, varnishes, etc.
    j. Hydrochloric acid, Cements and glues
    k. Antistatic fabric softeners for clothes dryers
    l. Masonry acid washing materials

IMPORTANT: The furnace must be installed level. The only allowable variation would be slightly to the left and/ or forward in upflow installations or slightly toward the front in horizontal installations. This is necessary for proper condensate drainage.

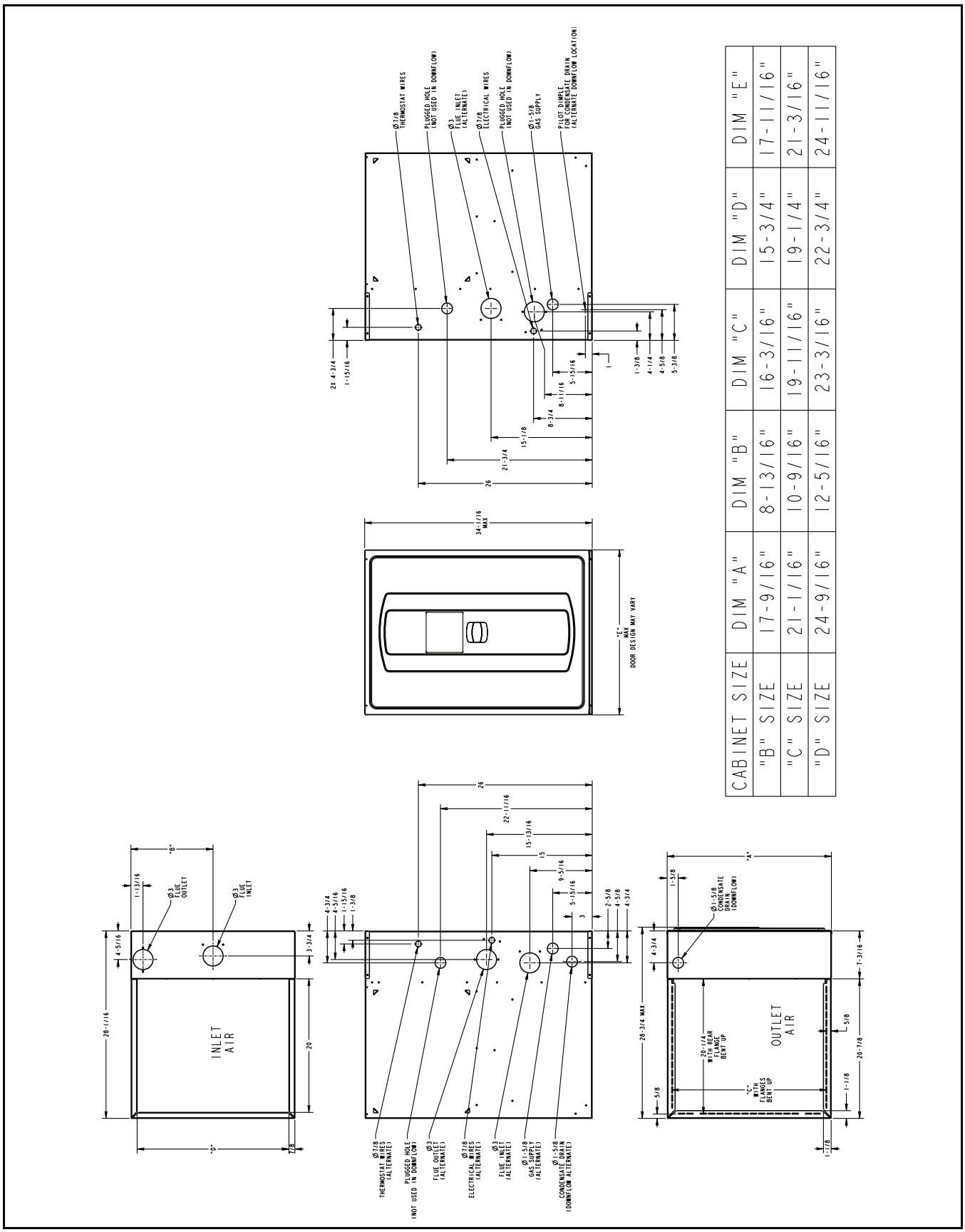
Outline Drawing

Table 2. 17.5”, 21” and 24.5” Upflow Cabinets



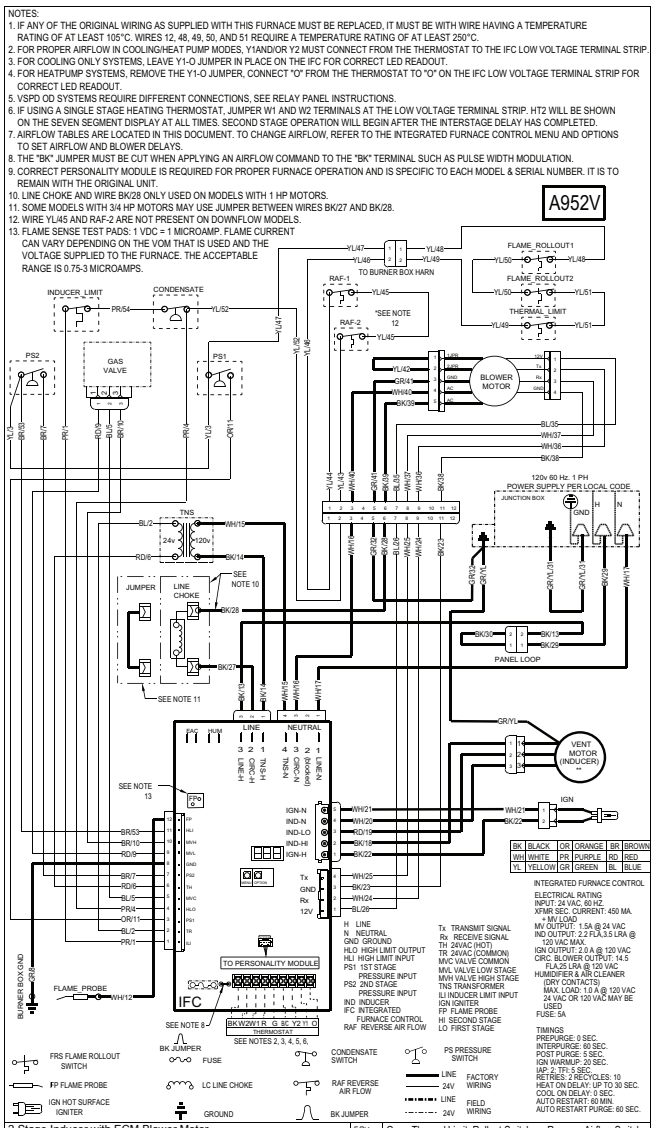
CABINET SIZE	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"
"B" SIZE	17-9/16"	8-13/16"	16-3/16"	15-3/4"	17-11/16"
"C" SIZE	21-1/16"	10-9/16"	19-11/16"	19-1/4"	21-3/16"
"D" SIZE	24-9/16"	12-5/16"	23-3/16"	22-3/4"	24-11/16"

Table 3. 17.5”, 21” and 24.5” Downflow Cabinets



CABINET SIZE	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"
"B" SIZE	17-9/16"	8-13/16"	16-3/16"	15-3/4"	17-11/16"
"C" SIZE	21-1/16"	10-9/16"	19-11/16"	19-1/4"	21-3/16"
"D" SIZE	24-9/16"	12-5/16"	23-3/16"	22-3/4"	24-11/16"

Wiring Diagrams



2 Stage Inducer with ECM Blower Motor				
	Status Codes			
Idl	Idle	CDF	Blower Constant Fan Airflow Multiplier %	
HS1	1st Stage Heating	CFC	Cooling (CFM/Ton)	
HS2	2nd Stage Heating	CFH	Heat Pump Heating (CFM/Ton)	
A-F	Airflow (followed by Airflow x 10)	Had	Heat Off Delay (sec)	
		Isd	Inter-Stage Delay (sec)	
CDF	Continuous Fan	GHC	Gas Heating CFM (Airflow x10)	
CL1	1st Stage Cooling	run	Run Test Mode	
CL2	2nd Stage Cooling		Error Codes	
HP1	1st Stage Heat Pump	E01	Loss of the IRQ/other internal failures	
HP2	2nd Stage Heat Pump	E2.1	Retry exceeded (Failed to est flame)	
dFr	Defrost Mode	E2.2	Recycles exceeded (loss of established flame) or 10X PS1 open	
	Menu Options			
Err	Active Alarm Menu	E2.3	1st Stage Gas Valve not energized when it should be exceeded after 10 times	
L&F	Last 6 Faults (To Clear, Hold Option Button 5 sec)	E3.1	Shorted Pressure Switch, 1st Stage	
Cr	Code Release Number	E3.2	Open Pressure Switch, 1st Stage	
CDd	Cooling Off Delay (sec)	E3.3	Shorted Pressure Switch, 2nd Stage	
Tons	Outdoor Tonnage	E3.4	Open Pressure Switch, 2nd Stage	

E04	Open Thermal Limit, Rollout Switch, or Reverse Airflow Switch
E05	Flame detected, should not be present
E6.1	Voltage reversed polarity
E6.2	Bad Grounding
E6.3	(1) Igniter relay fails, (2) Igniter open
E7.1	1st stage gas valve (MVL) is energized when it should be off
E08	Flame current is low, but still strong enough to allow operation.
E09	Open Inducer Limit Switch or Condensate Switch
E11	(1) 1st stage gas valve not energized when it should be (2) 1st stage gas valve relay stuck closed (3) 2nd stage gas valve relay stuck closed (4) 2nd stage gas valve energized when it should not be (5) 2nd stage gas valve not energized when it should be
E12	Open fuse
E13	Blower HP/OEM ID
E14	No PM and local copy bad
E15	Both Unit Data File in PM and local Unit Data File are Corrupt
E17	Blower motor no communication response
E18	Blower communication failure on the control

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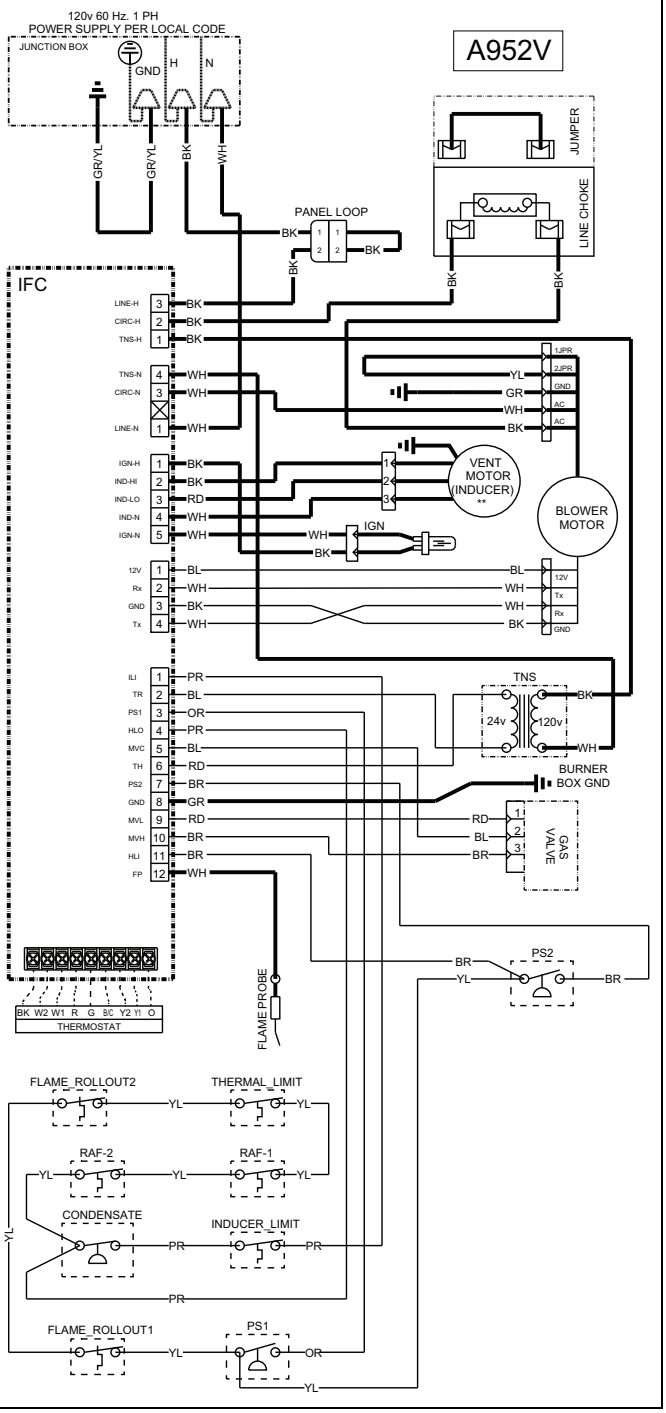


Heating and Cooling Airflow Tables

Table 4. A952V040BU3SB Heating Airflow

A952V040BU3SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 25,300 2nd Stage Capacity = 38,950				
				External Static Pressure				
Heating	**Airflow Setting**	**Target Airflow**		**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
Heating 1st Stage	Low	468	CFM	468	452	437	421	406
			Temp. Rise	49	51	54	56	58
			Watts	27	58	90	121	152
	Medium Low	598	CFM	552	600	647	694	741
			Temp. Rise	43	39	36	32	28
			Watts	41	76	112	147	183
	Medium [a]	634	CFM	583	635	687	739	791
			Temp. Rise	39	36	33	30	27
			Watts	48	83	118	153	189
	High	864	CFM	753	786	818	850	883
			Temp. Rise	30	29	28	27	26
			Watts	87	129	171	214	256
Heating 2nd Stage	Low	650	CFM	633	636	639	643	646
			Temp. Rise	57	57	57	56	56
			Watts	48	92	135	179	223
	Medium Low	830	CFM	760	786	813	840	866
			Temp. Rise	48	46	45	43	41
			Watts	82	132	182	232	282
	Medium [a]	880	CFM	792	817	842	867	892
			Temp. Rise	44	44	43	43	42
			Watts	94	142	189	237	284
	High	1200	CFM	1023	1044	1066	1088	1109
			Temp. Rise	34	34	33	33	32
			Watts	192	251	310	369	428

[a] Factory Setting.

Table 5. A952V040BD3SB Heating Airflow

A952V040BD3SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 25,300 2nd Stage Capacity = 38,850				
				External Static Pressure				
Heating	**Airflow Setting**	**Target Airflow**		**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
Heating 1st Stage	Low	468	CFM	464	453	442	431	420
			Temp. Rise	51	52	53	54	55
			Watts	26	55	84	113	142
	Medium Low [a]	634	CFM	616	607	599	591	583
			Temp. Rise	38	38	39	40	40
			Watts	40	78	115	152	190
	Medium	684	CFM	635	643	650	658	666
			Temp. Rise	37	37	36	36	35
			Watts	47	106	165	224	283
	High	900	CFM	824	843	861	880	898
			Temp. Rise	28	28	27	26	26
			Watts	82	130	178	226	274
Heating 2nd Stage	Low	650	CFM	662	655	649	642	635
			Temp. Rise	54	55	55	56	56
			Watts	37	79	120	162	203
	Medium Low [a]	880	CFM	811	818	826	834	841
			Temp. Rise	45	44	44	43	42
			Watts	67	121	176	230	284
	Medium	950	CFM	859	865	871	877	884
			Temp. Rise	42	41	41	41	41
			Watts	88	144	200	256	312
	High	1250	CFM	1082	1092	1102	1111	1121
			Temp. Rise	33	33	33	33	33
			Watts	192	253	314	375	436

[a] Factory Setting.

Table 6. A952V040BU3SB / A952V040BD3SB Cooling Airflow

A952V040BU3SB/ A952V040BD3SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	**Unit Outdoor**	**Airflow Setting (CFM/ton)**		**External Static Pressure**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
Cooling	1.5 Ton	Cooling 450 CFM/Ton	CFM	675	675	675	675	675
			Watts	47	81	121	166	215
		Cooling 420 CFM/Ton	CFM	630	630	630	630	630
			Watts	40	72	111	154	202
		Cooling 400 CFM/Ton	CFM	600	600	600	600	600
			Watts	36	67	105	147	193
		Cooling 370 CFM/Ton	CFM	555	555	555	555	555
			Watts	30	60	96	136	181
		Cooling 350 CFM/Ton	CFM	525	525	525	525	525
			Watts	27	56	90	130	174
		Cooling 330 CFM/Ton	CFM	495	495	495	495	495
			Watts	24	51	85	124	167
		Cooling 310 CFM/Ton	CFM	465	465	465	465	465
			Watts	21	48	80	118	161
		Cooling 290 CFM/Ton	CFM	435	435	435	435	435
			Watts	19	44	76	113	155
Cooling	2.0 Ton	Cooling 450 CFM/Ton	CFM	900	900	900	900	900
			Watts	94	137	186	240	298
		Cooling 420 CFM/Ton	CFM	840	840	840	840	840
			Watts	79	120	166	218	273
		Cooling 400 CFM/Ton	CFM	800	800	800	800	800
			Watts	70	109	154	204	258
		Cooling 370 CFM/Ton	CFM	740	740	740	740	740
			Watts	58	95	138	185	236
		Cooling 350 CFM/Ton	CFM	700	700	700	700	700
			Watts	51	86	127	173	223
		Cooling 330 CFM/Ton	CFM	660	660	660	660	660
			Watts	44	78	118	162	211
		Cooling 310 CFM/Ton	CFM	620	620	620	620	620
			Watts	38	71	109	152	199
		Cooling 290 CFM/Ton	CFM	580	580	580	580	580
			Watts	33	64	101	142	188
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1125	1125	1125	1125	1125
			Watts	167	219	278	341	408
		Cooling 420 CFM/Ton	CFM	1050	1050	1050	1050	1050
			Watts	139	188	244	304	368
		Cooling 400 CFM/Ton	CFM	1000	1000	1000	1000	1000
			Watts	123	170	223	281	343
		Cooling 370 CFM/Ton	CFM	925	925	925	925	925
			Watts	100	145	195	250	308
		Cooling 350 CFM/Ton	CFM	875	875	875	875	875
			Watts	87	129	178	230	287
		Cooling 330 CFM/Ton	CFM	825	825	825	825	825
			Watts	121	160	205	254	308
		Cooling 310 CFM/Ton	CFM	775	775	775	775	775
			Watts	101	139	182	229	281
		Cooling 290 CFM/Ton	CFM	725	725	725	725	725
			Watts	88	123	164	210	260
Cooling	3.0 Ton [a]	Cooling 450 CFM/Ton	CFM	1350	1350	1350	1298	1198
			Watts	272	334	402	440	450
		Cooling 420 CFM/Ton	CFM	1260	1260	1260	1260	1198
			Watts	226	284	348	417	450
		Cooling 400 CFM/Ton	CFM	1200	1200	1200	1200	1198
			Watts	198	254	315	381	450
		Cooling 370 CFM/Ton	CFM	1110	1110	1110	1110	1110
			Watts	161	213	271	333	399
		Cooling 350 CFM/Ton [a]	CFM	1050	1050	1050	1050	1050
			Watts	139	188	244	304	368
		Cooling 330 CFM/Ton	CFM	990	990	990	990	990
			Watts	119	166	219	277	338
		Cooling 310 CFM/Ton	CFM	930	930	930	930	930
			Watts	102	146	197	252	311
		Cooling 290 CFM/Ton	CFM	870	870	870	870	870
			Watts	86	128	176	229	285

[a] Factory Setting.

Table 7. A952V060BD3SB Heating Airflow

A952V060BD3SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 37,700 2nd Stage Capacity = 57,850				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	711	CFM	677	677	678	678	678
			Temp. Rise	52	52	52	52	52
			Watts	49	94	139	184	229
	Medium Low [a]	814	CFM	787	775	763	751	739
			Temp. Rise	45	46	47	48	49
			Watts	71	116	160	205	249
	Medium	893	CFM	865	856	846	837	827
			Temp. Rise	41	41	42	42	43
			Watts	86	134	182	230	278
	High	1067	CFM	1033	1013	994	974	955
			Temp. Rise	35	35	36	36	37
			Watts	141	193	245	297	349
Heating 2nd Stage	Low	900	CFM	859	856	853	850	847
			Temp. Rise	63	63	63	63	63
			Watts	90	139	188	237	287
	Medium Low [a]	1030	CFM	977	967	958	948	938
			Temp. Rise	55	56	57	57	58
			Watts	126	179	232	285	338
	Medium	1130	CFM	1067	1053	1040	1027	1013
			Temp. Rise	51	52	52	53	54
			Watts	162	219	275	332	388
	High	1350	CFM	1246	1234	1222	1209	1197
			Temp. Rise	44	44	44	45	45
			Watts	279	333	387	440	494

[a] Factory Setting.

Table 8. A952V060BD3SB Cooling Airflow

A952V060BD3SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	1.5 Ton	Cooling 450 CFM/Ton	CFM	672	674	672	666	656
			Watts	48	84	122	161	203
		Cooling 420 CFM/Ton	CFM	626	628	627	622	612
			Watts	41	76	112	150	190
		Cooling 400 CFM/Ton	CFM	595	598	597	592	583
			Watts	37	70	105	143	182
		Cooling 370 CFM/Ton	CFM	549	553	552	547	538
			Watts	32	63	97	133	171
		Cooling 350 CFM/Ton	CFM	518	522	522	518	509
			Watts	29	59	91	126	164
		Cooling 330 CFM/Ton	CFM	487	492	492	488	479
			Watts	26	55	86	121	158
		Cooling 310 CFM/Ton	CFM	456	461	462	458	449
			Watts	23	51	81	115	153
		Cooling 290 CFM/Ton	CFM	425	431	432	428	420
			Watts	21	47	77	111	148
Cooling	2.0 Ton	Cooling 450 CFM/Ton	CFM	894	891	882	871	873
			Watts	91	137	182	228	282
		Cooling 420 CFM/Ton	CFM	838	839	835	827	816
			Watts	78	122	166	212	259
		Cooling 400 CFM/Ton	CFM	798	799	795	788	778
			Watts	70	112	155	199	244
		Cooling 370 CFM/Ton	CFM	737	739	736	730	719
			Watts	58	98	138	180	223
		Cooling 350 CFM/Ton	CFM	697	699	697	690	680
			Watts	52	89	128	168	211
		Cooling 330 CFM/Ton	CFM	656	659	657	651	641
			Watts	46	81	118	157	199
		Cooling 310 CFM/Ton	CFM	616	618	617	612	602
			Watts	40	74	110	147	187
		Cooling 290 CFM/Ton	CFM	575	578	577	572	563
			Watts	35	67	101	138	177

Table 8. A952V060BD3SB Cooling Airflow (continued)

A952V060BD3SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1120	1117	1111	1102	1089
			Watts	162	218	275	332	390
		Cooling 420 CFM/Ton	CFM	1037	1035	1029	1020	1008
			Watts	132	185	238	291	346
		Cooling 400 CFM/Ton	CFM	997	996	991	982	970
			Watts	120	171	222	274	327
		Cooling 370 CFM/Ton	CFM	923	923	918	910	898
			Watts	99	146	194	243	293
		Cooling 350 CFM/Ton	CFM	873	873	869	861	850
			Watts	86	132	177	224	273
		Cooling 330 CFM/Ton	CFM	823	824	820	813	802
			Watts	75	118	162	207	253
		Cooling 310 CFM/Ton	CFM	773	774	771	764	754
			Watts	65	106	147	191	235
		Cooling 290 CFM/Ton	CFM	722	724	721	715	705
			Watts	56	94	134	175	218
Cooling	3.0 Ton [a]	Cooling 450 CFM/Ton	CFM	1336	1332	1324	1313	1299
			Watts	263	329	395	462	529
		Cooling 420 CFM/Ton	CFM	1250	1247	1239	1229	1216
			Watts	218	280	343	406	470
		Cooling 400 CFM/Ton	CFM	1193	1189	1183	1173	1159
			Watts	191	251	311	372	433
		Cooling 370 CFM/Ton	CFM	1105	1103	1097	1087	1075
			Watts	156	212	268	325	382
		Cooling 350 CFM/Ton [a]	CFM	1046	1045	1039	1030	1018
			Watts	135	189	242	296	351
		Cooling 330 CFM/Ton	CFM	987	986	981	973	961
			Watts	117	167	218	270	322
		Cooling 310 CFM/Ton	CFM	928	927	923	915	903
			Watts	100	148	196	245	295
		Cooling 290 CFM/Ton	CFM	868	868	864	857	845
			Watts	85	130	176	223	271

[a] Factory Setting.

Table 9. A952V060BU4SB Heating Airflow

A952V060BU4SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 38,100 2nd Stage Capacity = 58,400				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	782	CFM	776	769	762	756	749
			Temp. Rise	45	45	45	45	46
			Watts	70	109	149	188	227
	Medium Low	861	CFM	842	823	805	786	768
			Temp. Rise	42	43	43	44	44
			Watts	88	126	164	202	240
	Medium [a]	916	CFM	863	860	858	855	853
			Temp. Rise	41	41	41	41	41
			Watts	105	143	181	219	257
	High	1027	CFM	1105	1084	1063	1042	1021
			Temp. Rise	32	32	33	34	34
			Watts	135	173	210	248	285
Heating 2nd Stage	Low	990	CFM	1002	996	990	984	979
			Temp. Rise	55	55	55	55	55
			Watts	126	172	219	266	313
	Medium Low	1090	CFM	1130	1117	1105	1092	1079
			Temp. Rise	49	49	49	50	50
			Watts	160	206	253	300	347
	Medium [a]	1160	CFM	1139	1133	1128	1122	1116
			Temp. Rise	48	48	49	49	49
			Watts	181	231	281	331	381
	High	1300	CFM	1319	1307	1295	1283	1272
			Temp. Rise	41	42	42	42	43
			Watts	246	300	353	407	461

[a] Factory Setting.

Table 10. A952V060BU4SB Cooling Airflow

A952V060BU4SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	1.5 Ton	Cooling 450 CFM/Ton	CFM	663	673	666	641	596
			Watts	47	83	119	155	192
		Cooling 420 CFM/Ton	CFM	621	630	621	595	549
			Watts	41	75	109	144	180
		Cooling 400 CFM/Ton	CFM	582	580	566	528	507
			Watts	36	67	99	130	170
		Cooling 370 CFM/Ton	CFM	549	556	546	517	469
			Watts	32	63	95	128	162
		Cooling 350 CFM/Ton	CFM	521	527	516	486	437
			Watts	29	59	90	122	156
		Cooling 330 CFM/Ton	CFM	492	497	486	455	405
			Watts	26	55	85	117	150
		Cooling 310 CFM/Ton	CFM	463	468	455	423	372
			Watts	23	51	81	112	145
		Cooling 290 CFM/Ton	CFM	435	438	424	391	339
			Watts	21	48	77	107	141
Cooling	2.0 Ton	Cooling 450 CFM/Ton	CFM	878	893	890	869	829
			Watts	90	135	179	223	266
		Cooling 420 CFM/Ton	CFM	821	834	830	808	767
			Watts	76	119	161	202	244
		Cooling 400 CFM/Ton	CFM	770	778	770	742	725
			Watts	66	105	144	182	230
		Cooling 370 CFM/Ton	CFM	725	737	731	707	664
			Watts	57	96	134	172	211
		Cooling 350 CFM/Ton	CFM	687	698	691	666	622
			Watts	51	88	124	161	199
		Cooling 330 CFM/Ton	CFM	649	659	651	625	580
			Watts	45	80	115	151	188
		Cooling 310 CFM/Ton	CFM	611	620	611	584	538
			Watts	39	73	107	142	177
		Cooling 290 CFM/Ton	CFM	573	581	571	543	496
			Watts	34	67	99	133	168
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1097	1114	1114	1097	1061
			Watts	159	212	265	317	368
		Cooling 420 CFM/Ton	CFM	1023	1040	1039	1020	984
			Watts	133	184	233	282	331
		Cooling 400 CFM/Ton	CFM	976	989	990	970	932
			Watts	117	166	214	261	308
		Cooling 370 CFM/Ton	CFM	902	917	915	894	855
			Watts	97	142	187	232	276
		Cooling 350 CFM/Ton	CFM	854	868	865	843	803
			Watts	84	128	171	214	257
		Cooling 330 CFM/Ton	CFM	806	819	815	793	752
			Watts	73	115	157	198	239
		Cooling 310 CFM/Ton	CFM	759	771	766	742	700
			Watts	63	103	143	182	222
		Cooling 290 CFM/Ton	CFM	711	722	716	692	648
			Watts	55	93	130	168	206
Cooling	3.0 Ton	Cooling 450 CFM/Ton	CFM	1319	1340	1343	1328	1295
			Watts	260	321	382	441	501
		Cooling 420 CFM/Ton	CFM	1229	1249	1251	1235	1201
			Watts	215	274	331	387	443
		Cooling 400 CFM/Ton	CFM	1170	1189	1190	1173	1139
			Watts	189	245	300	354	408
		Cooling 370 CFM/Ton	CFM	1082	1100	1099	1081	1046
			Watts	154	206	258	309	360
		Cooling 350 CFM/Ton	CFM	1023	1040	1039	1020	984
			Watts	133	184	233	282	331
		Cooling 330 CFM/Ton	CFM	965	981	979	960	922
			Watts	114	163	210	257	304
		Cooling 310 CFM/Ton	CFM	907	922	919	899	860
			Watts	98	144	189	234	278
		Cooling 290 CFM/Ton	CFM	850	863	860	838	798
			Watts	83	127	170	212	255

Table 10. A952V060BU4SB Cooling Airflow (continued)

A952V060BU4SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	3.5 Ton	Cooling 450 CFM/Ton	CFM	1546	1570	1576	1564	1534
			Watts	399	469	537	604	671
		Cooling 420 CFM/Ton	CFM	1440	1462	1466	1453	1422
			Watts	329	395	459	523	586
		Cooling 400 CFM/Ton	CFM	1369	1391	1394	1380	1348
			Watts	287	350	413	474	535
		Cooling 370 CFM/Ton	CFM	1264	1284	1287	1271	1238
			Watts	232	291	350	408	465
		Cooling 350 CFM/Ton	CFM	1195	1214	1215	1199	1165
			Watts	199	257	313	368	423
		Cooling 330 CFM/Ton	CFM	1126	1144	1145	1127	1092
			Watts	170	225	278	331	384
		Cooling 310 CFM/Ton	CFM	1059	1075	1074	1056	1020
			Watts	145	197	248	298	348
		Cooling 290 CFM/Ton	CFM	992	1006	1004	985	948
			Watts	122	171	219	267	315
Cooling	4.0 Ton [a]	Cooling 450 CFM/Ton	CFM	1779	1806	1814	1805	1778
			Watts	585	661	737	812	886
		Cooling 420 CFM/Ton	CFM	1654	1679	1686	1676	1647
			Watts	480	552	624	695	765
		Cooling 400 CFM/Ton	CFM	1572	1596	1602	1590	1561
			Watts	418	488	557	625	693
		Cooling 370 CFM/Ton	CFM	1450	1472	1477	1464	1433
			Watts	335	401	466	530	594
		Cooling 350 CFM/Ton [a]	CFM	1369	1391	1394	1380	1348
			Watts	287	350	413	474	535
		Cooling 330 CFM/Ton	CFM	1289	1310	1312	1297	1264
			Watts	244	305	364	423	481
		Cooling 310 CFM/Ton	CFM	1210	1229	1231	1214	1180
			Watts	206	264	320	376	431
		Cooling 290 CFM/Ton	CFM	1131	1149	1150	1132	1097
			Watts	172	227	281	334	386

[a] Factory Setting.

Table 11. A952V080BU4SB Heating Airflow

A952V080BU4SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 50,500 2nd Stage Capacity = 77,700				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	864	CFM	914	882	849	816	783
			Temp. Rise	51	53	55	57	59
			Watts	90	131	172	213	255
	Medium Low [a]	907	CFM	940	912	885	858	831
			Temp. Rise	50	51	53	54	56
			Watts	104	141	178	215	253
	Medium	958	CFM	983	932	881	830	779
			Temp. Rise	47	50	53	55	58
			Watts	118	151	184	218	251
	High	1051	CFM	1029	1068	1107	1146	1185
			Temp. Rise	45	44	42	40	39
			Watts	155	195	235	275	314
Heating 2nd Stage	Low	1200	CFM	1207	1206	1205	1204	1203
			Temp. Rise	60	60	60	60	60
			Watts	206	258	309	361	412
	Medium Low [a]	1260	CFM	1260	1261	1262	1263	1264
			Temp. Rise	57	57	57	57	57
			Watts	232	287	342	397	452
	Medium	1330	CFM	1360	1347	1333	1320	1306
			Temp. Rise	53	53	54	54	55
			Watts	263	322	380	439	497
	High	1460	CFM	1420	1439	1458	1477	1496
			Temp. Rise	51	50	49	49	48
			Watts	377	433	489	546	602

[a] Factory Setting.

Table 12. A952V080BD4SB Heating Airflow

A952V080BD4SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 50,300 2nd Stage Capacity = 77,350				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	864	CFM	808	795	782	770	757
			Temp. Rise	58	59	60	61	62
			Watts	82	126	171	216	261
	Medium Low	907	CFM	836	823	810	797	784
			Temp. Rise	56	57	58	59	60
			Watts	94	137	180	223	266
	Medium [a]	958	CFM	896	881	866	851	836
			Temp. Rise	51	53	54	56	57
			Watts	110	153	196	238	281
	High	1066	CFM	977	963	949	934	920
			Temp. Rise	48	49	50	51	52
			Watts	128	179	230	281	332
Heating 2nd Stage	Low	1200	CFM	1125	1104	1082	1061	1039
			Temp. Rise	64	65	67	68	69
			Watts	191	241	292	342	392
	Medium Low	1260	CFM	1188	1162	1135	1109	1082
			Temp. Rise	61	62	64	65	66
			Watts	219	273	326	380	434
	Medium [a]	1330	CFM	1243	1220	1197	1174	1151
			Temp. Rise	58	59	60	61	62
			Watts	259	309	360	410	461
	High	1480	CFM	1342	1328	1313	1299	1284
			Temp. Rise	53	54	55	56	56
			Watts	329	389	448	508	567

[a] Factory Setting.

Table 13. A952V080BU4SB / A952V080BD4SB Cooling Airflow

A952V080BU4SB / A952V080BD4SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2.0 Ton	Cooling 450 CFM/Ton	CFM	892	899	893	872	838
			Watts	91	136	180	222	265
		Cooling 420 CFM/Ton	CFM	834	841	834	813	777
			Watts	77	120	161	202	243
		Cooling 400 CFM/Ton	CFM	785	785	781	754	737
			Watts	67	106	146	183	229
		Cooling 370 CFM/Ton	CFM	738	744	736	714	677
			Watts	58	97	134	172	210
		Cooling 350 CFM/Ton	CFM	700	705	697	675	638
			Watts	52	89	125	161	198
		Cooling 330 CFM/Ton	CFM	662	666	658	635	598
			Watts	46	81	116	151	187
		Cooling 310 CFM/Ton	CFM	624	627	619	596	558
			Watts	40	74	107	142	177
		Cooling 290 CFM/Ton	CFM	585	588	580	557	518
			Watts	35	67	100	133	168
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1108	1120	1116	1098	1065
			Watts	159	213	265	315	365
		Cooling 420 CFM/Ton	CFM	1035	1046	1041	1022	989
			Watts	133	184	233	281	328
		Cooling 400 CFM/Ton	CFM	988	997	992	972	938
			Watts	118	167	214	260	306
		Cooling 370 CFM/Ton	CFM	916	924	918	897	863
			Watts	97	143	188	231	275
		Cooling 350 CFM/Ton	CFM	868	875	868	848	813
			Watts	85	129	172	213	255
		Cooling 330 CFM/Ton	CFM	820	826	819	798	762
			Watts	74	116	157	197	237
		Cooling 310 CFM/Ton	CFM	772	778	770	749	712
			Watts	64	104	143	182	221
		Cooling 290 CFM/Ton	CFM	724	729	721	699	663
			Watts	56	94	131	168	205

Table 13. A952V080BU4SB / A952V080BD4SB Cooling Airflow (continued)

A952V080BU4SB / A952V080BD4SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter								
Cooling	**Unit Outdoor**	**Airflow Setting (CFM/ton)**		**External Static Pressure**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
Cooling	3.0 Ton	Cooling 450 CFM/Ton	CFM	1326	1341	1341	1325	1296
			Watts	257	320	380	439	497
		Cooling 420 CFM/Ton	CFM	1239	1252	1250	1234	1203
			Watts	214	273	330	385	440
		Cooling 400 CFM/Ton	CFM	1181	1193	1191	1173	1142
			Watts	188	245	299	353	405
		Cooling 370 CFM/Ton	CFM	1094	1105	1101	1083	1050
			Watts	153	207	258	308	358
		Cooling 350 CFM/Ton	CFM	1036	1046	1041	1022	989
			Watts	133	184	233	281	329
		Cooling 330 CFM/Ton	CFM	978	987	982	962	928
			Watts	115	164	210	256	302
		Cooling 310 CFM/Ton	CFM	920	929	923	902	868
			Watts	99	145	189	233	277
		Cooling 290 CFM/Ton	CFM	863	870	863	843	807
			Watts	84	128	170	212	253
Cooling	3.5 Ton	Cooling 450 CFM/Ton	CFM	1547	1565	1568	1556	1529
			Watts	392	463	531	598	664
		Cooling 420 CFM/Ton	CFM	1443	1460	1462	1448	1420
			Watts	324	391	456	519	581
		Cooling 400 CFM/Ton	CFM	1375	1391	1391	1376	1347
			Watts	284	348	410	471	530
		Cooling 370 CFM/Ton	CFM	1273	1287	1286	1269	1239
			Watts	230	290	349	405	461
		Cooling 350 CFM/Ton	CFM	1205	1218	1215	1199	1167
			Watts	198	256	312	366	420
		Cooling 330 CFM/Ton	CFM	1137	1149	1146	1128	1096
			Watts	170	225	278	330	381
		Cooling 310 CFM/Ton	CFM	1069	1080	1076	1057	1024
			Watts	145	197	248	297	345
		Cooling 290 CFM/Ton	CFM	1002	1012	1007	987	954
			Watts	122	172	220	266	313
Cooling	4.0 Ton [a]	Cooling 450 CFM/Ton	CFM	1769	1791	1797	1789	1766
			Watts	570	648	725	799	873
		Cooling 420 CFM/Ton	CFM	1650	1670	1675	1664	1639
			Watts	469	544	616	686	756
		Cooling 400 CFM/Ton	CFM	1571	1590	1593	1582	1555
			Watts	410	481	550	618	685
		Cooling 370 CFM/Ton	CFM	1453	1470	1472	1458	1430
			Watts	330	397	462	526	588
		Cooling 350 CFM/Ton [a]	CFM	1375	1391	1391	1376	1347
			Watts	284	348	410	471	530
		Cooling 330 CFM/Ton	CFM	1297	1312	1311	1295	1265
			Watts	242	303	363	420	477
		Cooling 310 CFM/Ton	CFM	1219	1233	1230	1214	1183
			Watts	205	263	319	374	428
		Cooling 290 CFM/Ton	CFM	1142	1154	1151	1133	1101
			Watts	172	227	280	332	384

[a] Factory Setting.

Table 14. A952V080CU5SB Heating Airflow

A952V080CU5SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 50,600 2nd Stage Capacity = 77,750				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	857	CFM	838	821	804	788	771
			Temp. Rise	56	57	57	58	59
			Watts	68	109	151	192	234
	Medium Low [a]	1044	CFM	967	993	1019	1045	1070
			Temp. Rise	48	47	46	45	44
			Watts	91	145	198	252	306
	Medium	1123	CFM	1060	1058	1056	1053	1051
			Temp. Rise	44	44	44	43	43
			Watts	108	165	222	279	335
	High	1224	CFM	1266	1171	1075	980	884
			Temp. Rise	36	40	43	46	50
			Watts	134	194	253	313	373
Heating 2nd Stage	Low	1190	CFM	1114	1127	1141	1154	1167
			Temp. Rise	64	63	62	62	61
			Watts	127	188	250	312	373
	Medium Low [a]	1450	CFM	1359	1378	1396	1414	1432
			Temp. Rise	52	52	51	50	49
			Watts	216	291	365	439	514
	Medium	1560	CFM	1466	1474	1482	1490	1497
			Temp. Rise	48	48	48	48	48
			Watts	263	344	426	507	588
	High	1700	CFM	1774	1731	1689	1647	1605
			Temp. Rise	40	41	42	43	44
			Watts	356	437	518	600	681

[a] Factory Setting.

Table 15. A952V080CU5SB Cooling Airflow

A952V080CU5SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	3.0 Ton	Cooling 450 CFM/Ton	CFM	1335	1347	1356	1362	1366
			Watts	182	241	303	366	431
		Cooling 420 CFM/Ton	CFM	1246	1259	1267	1273	1277
			Watts	152	208	266	326	387
		Cooling 400 CFM/Ton	CFM	1188	1200	1208	1214	1217
			Watts	134	188	243	301	360
		Cooling 370 CFM/Ton	CFM	1100	1111	1118	1123	1125
			Watts	110	160	212	266	322
		Cooling 350 CFM/Ton	CFM	1041	1052	1058	1061	1063
			Watts	96	143	193	245	299
		Cooling 330 CFM/Ton	CFM	983	993	997	999	1000
			Watts	83	128	176	225	277
		Cooling 310 CFM/Ton	CFM	925	933	936	937	936
			Watts	72	114	159	207	257
		Cooling 290 CFM/Ton	CFM	867	873	874	873	871
			Watts	61	101	144	190	239
Cooling	3.5 Ton	Cooling 450 CFM/Ton	CFM	1557	1568	1576	1581	1585
			Watts	273	342	413	486	559
		Cooling 420 CFM/Ton	CFM	1453	1465	1473	1480	1483
			Watts	228	292	359	427	496
		Cooling 400 CFM/Ton	CFM	1384	1396	1405	1411	1415
			Watts	200	262	325	391	457
		Cooling 370 CFM/Ton	CFM	1281	1293	1302	1308	1312
			Watts	163	221	280	341	404
		Cooling 350 CFM/Ton	CFM	1212	1224	1233	1239	1242
			Watts	142	196	253	311	371
		Cooling 330 CFM/Ton	CFM	1144	1155	1163	1168	1171
			Watts	122	173	227	283	341
		Cooling 310 CFM/Ton	CFM	1076	1086	1093	1097	1099
			Watts	104	153	204	257	312
		Cooling 290 CFM/Ton	CFM	1007	1017	1023	1025	1026
			Watts	88	134	183	233	286

Table 15. A952V080CU5SB Cooling Airflow (continued)

A952V080CU5SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	4.0 Ton	Cooling 450 CFM/Ton	CFM	1782	1789	1794	1797	1798
			Watts	392	471	551	632	715
		Cooling 420 CFM/Ton	CFM	1662	1671	1678	1682	1685
			Watts	325	399	474	550	628
		Cooling 400 CFM/Ton	CFM	1582	1592	1600	1606	1609
			Watts	285	355	427	500	575
		Cooling 370 CFM/Ton	CFM	1463	1474	1483	1489	1493
			Watts	232	297	364	432	502
		Cooling 350 CFM/Ton	CFM	1384	1396	1405	1411	1415
			Watts	200	262	325	391	457
		Cooling 330 CFM/Ton	CFM	1305	1317	1327	1333	1337
			Watts	172	230	290	352	416
		Cooling 310 CFM/Ton	CFM	1227	1239	1248	1254	1257
			Watts	146	201	258	317	378
		Cooling 290 CFM/Ton	CFM	1149	1160	1168	1173	1176
			Watts	123	175	229	285	343
Cooling	4.5 Ton	Cooling 450 CFM/Ton	CFM	2008	2011	2012	2011	2008
			Watts	542	630	719	811	903
		Cooling 420 CFM/Ton	CFM	1872	1878	1881	1883	1882
			Watts	448	530	614	700	786
		Cooling 400 CFM/Ton	CFM	1782	1789	1794	1797	1798
			Watts	392	471	551	632	715
		Cooling 370 CFM/Ton	CFM	1647	1656	1663	1668	1670
			Watts	318	390	465	541	618
		Cooling 350 CFM/Ton	CFM	1557	1568	1576	1581	1585
			Watts	273	342	413	486	559
		Cooling 330 CFM/Ton	CFM	1468	1479	1488	1494	1498
			Watts	234	299	366	435	505
		Cooling 310 CFM/Ton	CFM	1379	1391	1400	1407	1410
			Watts	198	260	323	388	455
		Cooling 290 CFM/Ton	CFM	1291	1303	1312	1318	1322
			Watts	167	224	284	346	409
Cooling	5.0 Ton [a]	Cooling 450 CFM/Ton	CFM	2235	2233	2230	2224	2216
			Watts	726	824	923	1023	1125
		Cooling 420 CFM/Ton	CFM	2084	2085	2084	2082	2078
			Watts	599	690	783	877	973
		Cooling 400 CFM/Ton	CFM	1983	1986	1988	1988	1985
			Watts	524	611	699	789	880
		Cooling 370 CFM/Ton	CFM	1832	1838	1843	1845	1845
			Watts	423	503	586	669	754
		Cooling 350 CFM/Ton [a]	CFM	1732	1740	1746	1749	1751
			Watts	363	440	518	597	678
		Cooling 330 CFM/Ton	CFM	1632	1641	1649	1654	1656
			Watts	310	382	456	531	608
		Cooling 310 CFM/Ton	CFM	1533	1543	1551	1557	1561
			Watts	262	330	400	471	544
		Cooling 290 CFM/Ton	CFM	1434	1445	1454	1460	1464
			Watts	219	283	349	416	485

[a] Factory Setting.

Table 16. A952V100CU5SB Heating Airflow

A952V100CU5SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 63,400 2nd Stage Capacity = 97,650				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	1145	CFM	1111	1097	1083	1068	1054
			Temp. Rise	52	52	52	52	53
			Watts	135	184	234	283	333
	Medium Low	1426	CFM	1393	1383	1372	1362	1352
			Temp. Rise	41	41	42	42	42
			Watts	232	286	340	394	447
	Medium [a]	1483	CFM	1451	1447	1443	1438	1434
			Temp. Rise	39	40	40	40	40
			Watts	260	310	360	410	460
	High	1548	CFM	1495	1477	1458	1439	1421
			Temp. Rise	38	39	39	40	40
			Watts	285	352	419	486	553
Heating 2nd Stage	Low	1590	CFM	1564	1550	1536	1522	1508
			Temp. Rise	58	58	58	58	59
			Watts	323	397	470	544	618
	Medium Low	1980	CFM	1959	1936	1913	1891	1868
			Temp. Rise	46	46	47	47	47
			Watts	597	681	764	847	930
	Medium [a]	2060	CFM	2047	2034	2021	2008	1995
			Temp. Rise	44	44	44	45	45
			Watts	655	737	818	900	982
	High	2150	CFM	2102	2087	2073	2058	2044
			Temp. Rise	43	43	43	44	44
			Watts	745	801	857	913	969

[a] Factory Setting.

Table 17. A952V100CD5SB Heating Airflow

A952V100CD5SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 63,300 2nd Stage Capacity = 97,150				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	1094	CFM	1093	1092	1090	1089	1088
			Temp. Rise	53	53	53	52	52
			Watts	126	183	240	296	353
	Medium Low	1296	CFM	1234	1238	1242	1247	1251
			Temp. Rise	47	47	47	47	47
			Watts	186	243	299	356	413
	Medium [a]	1346	CFM	1279	1268	1256	1245	1234
			Temp. Rise	45	45	46	46	47
			Watts	214	268	321	375	428
	High	1512	CFM	1453	1429	1405	1381	1358
			Temp. Rise	40	40	41	41	42
			Watts	277	344	411	478	545
Heating 2nd Stage	Low	1520	CFM	1484	1477	1469	1461	1453
			Temp. Rise	60	60	61	61	61
			Watts	296	370	444	518	592
	Medium Low	1800	CFM	1693	1688	1684	1679	1674
			Temp. Rise	53	53	53	53	53
			Watts	449	533	618	702	786
	Medium [a]	1870	CFM	1768	1772	1775	1778	1781
			Temp. Rise	51	50	50	50	50
			Watts	505	591	678	765	852
	High	2100	CFM	1969	1956	1944	1931	1918
			Temp. Rise	45	45	46	46	46
			Watts	723	789	854	920	986

[a] Factory Setting.

Table 18. A952V100CU5SB / A952V100CD5SB Cooling Airflow

A952V100CU5SB / A952V100CD5SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1153	1149	1147	1145	1141
			Watts	111	159	208	260	314
		Cooling 420 CFM/Ton	CFM	1077	1073	1071	1068	1064
			Watts	94	138	185	235	287
		Cooling 400 CFM/Ton	CFM	1061	1057	1054	1044	1021
			Watts	90	134	180	227	273
		Cooling 370 CFM/Ton	CFM	950	945	942	939	935
			Watts	69	109	151	197	246
		Cooling 350 CFM/Ton	CFM	899	893	890	887	882
			Watts	60	98	140	184	232
		Cooling 330 CFM/Ton	CFM	848	841	838	835	830
			Watts	53	89	129	172	219
		Cooling 310 CFM/Ton	CFM	796	789	786	782	777
			Watts	46	80	119	161	208
		Cooling 290 CFM/Ton	CFM	745	737	733	729	724
			Watts	39	72	110	151	198
Cooling	3.0 Ton	Cooling 450 CFM/Ton	CFM	1378	1376	1374	1372	1368
			Watts	178	234	292	352	413
		Cooling 420 CFM/Ton	CFM	1289	1286	1284	1282	1277
			Watts	149	201	256	312	371
		Cooling 400 CFM/Ton	CFM	1228	1225	1223	1221	1217
			Watts	131	181	234	288	345
		Cooling 370 CFM/Ton	CFM	1138	1134	1132	1130	1125
			Watts	108	154	203	255	309
		Cooling 350 CFM/Ton	CFM	1077	1073	1071	1068	1064
			Watts	94	138	185	235	287
		Cooling 330 CFM/Ton	CFM	1016	1011	1009	1006	1002
			Watts	81	123	168	216	266
		Cooling 310 CFM/Ton	CFM	955	950	947	944	940
			Watts	70	110	153	199	248
		Cooling 290 CFM/Ton	CFM	894	888	885	882	877
			Watts	59	97	138	183	231
Cooling	3.5 Ton	Cooling 450 CFM/Ton	CFM	1601	1599	1597	1594	1590
			Watts	269	334	401	469	539
		Cooling 420 CFM/Ton	CFM	1498	1496	1494	1491	1487
			Watts	224	284	347	411	477
		Cooling 400 CFM/Ton	CFM	1428	1426	1424	1422	1417
			Watts	196	254	314	376	439
		Cooling 370 CFM/Ton	CFM	1324	1321	1319	1317	1313
			Watts	160	214	270	327	387
		Cooling 350 CFM/Ton	CFM	1253	1251	1249	1246	1242
			Watts	138	190	243	298	355
		Cooling 330 CFM/Ton	CFM	1183	1180	1178	1175	1171
			Watts	119	167	218	271	326
		Cooling 310 CFM/Ton	CFM	1112	1109	1107	1104	1100
			Watts	102	147	196	246	299
		Cooling 290 CFM/Ton	CFM	1041	1037	1035	1032	1028
			Watts	86	129	175	223	275
Cooling	4.0 Ton	Cooling 450 CFM/Ton	CFM	1820	1819	1816	1812	1807
			Watts	388	462	538	615	693
		Cooling 420 CFM/Ton	CFM	1704	1702	1700	1697	1692
			Watts	321	390	461	533	607
		Cooling 400 CFM/Ton	CFM	1626	1624	1622	1619	1614
			Watts	281	347	415	484	554
		Cooling 370 CFM/Ton	CFM	1507	1505	1504	1501	1497
			Watts	228	289	352	417	482
		Cooling 350 CFM/Ton	CFM	1428	1426	1424	1422	1417
			Watts	196	254	314	376	439
		Cooling 330 CFM/Ton	CFM	1348	1346	1344	1342	1338
			Watts	168	223	280	338	399
		Cooling 310 CFM/Ton	CFM	1268	1266	1264	1261	1257
			Watts	143	195	248	304	362
		Cooling 290 CFM/Ton	CFM	1188	1185	1183	1180	1176
			Watts	120	169	220	273	328

Table 18. A952V100CU5SB / A952V100CD5SB Cooling Airflow (continued)

A952V100CU5SB / A952V100CD5SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	4.5 Ton	Cooling 450 CFM/Ton	CFM	2037	2034	2031	2026	2020
			Watts	537	621	706	792	879
		Cooling 420 CFM/Ton	CFM	1907	1905	1902	1898	1893
			Watts	444	522	601	682	763
		Cooling 400 CFM/Ton	CFM	1820	1819	1816	1812	1807
			Watts	388	462	538	615	693
		Cooling 370 CFM/Ton	CFM	1689	1687	1685	1682	1677
			Watts	313	382	452	524	597
		Cooling 350 CFM/Ton	CFM	1601	1599	1597	1594	1590
			Watts	269	334	401	469	539
		Cooling 330 CFM/Ton	CFM	1512	1510	1509	1506	1501
			Watts	230	291	354	419	485
		Cooling 310 CFM/Ton	CFM	1423	1421	1419	1417	1412
			Watts	195	252	312	373	436
		Cooling 290 CFM/Ton	CFM	1334	1331	1329	1327	1323
			Watts	163	217	274	332	392
Cooling	5.0 Ton [a]	Cooling 450 CFM/Ton	CFM	2249	2246	2241	2236	2228
			Watts	722	815	909	1004	1101
		Cooling 420 CFM/Ton	CFM	2108	2105	2101	2096	2090
			Watts	595	681	770	859	949
		Cooling 400 CFM/Ton	CFM	2013	2010	2007	2003	1997
			Watts	519	602	685	771	857
		Cooling 370 CFM/Ton	CFM	1869	1867	1864	1860	1855
			Watts	418	494	572	651	731
		Cooling 350 CFM/Ton [a]	CFM	1772	1770	1768	1764	1759
			Watts	359	431	505	580	656
		Cooling 330 CFM/Ton	CFM	1675	1673	1671	1667	1663
			Watts	305	374	443	514	587
		Cooling 310 CFM/Ton	CFM	1576	1575	1573	1570	1565
			Watts	258	322	388	455	523
		Cooling 290 CFM/Ton	CFM	1478	1476	1474	1471	1467
			Watts	216	276	337	401	466

[a] Factory Setting.

Table 19. A952V120DU5SB Heating Airflow

A952V120DU5SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 75,500 2nd Stage Capacity = 115,700				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	1123	CFM	1138	1158	1178	1198	1218
			Temp. Rise	61	60	59	58	57
			Watts	115	176	236	297	358
	Medium Low	1332	CFM	1371	1383	1394	1406	1417
			Temp. Rise	51	50	50	49	49
			Watts	182	251	320	389	457
	Medium [a]	1404	CFM	1440	1450	1461	1471	1482
			Temp. Rise	48	48	48	47	47
			Watts	208	283	357	431	505
	High	1620	CFM	1669	1674	1680	1685	1691
			Temp. Rise	42	42	41	41	41
			Watts	315	388	460	533	605
Heating 2nd Stage	Low	1560	CFM	1654	1637	1621	1604	1587
			Temp. Rise	65	66	67	67	68
			Watts	291	360	430	499	568
	Medium Low	1850	CFM	1980	1951	1922	1893	1864
			Temp. Rise	55	56	57	58	58
			Watts	456	539	621	704	787
	Medium [a]	1950	CFM	2075	2037	1999	1961	1923
			Temp. Rise	52	53	54	55	56
			Watts	527	611	696	781	865
	High	2250	CFM	2280	2197	2114	2032	1949
			Temp. Rise	48	50	52	54	56
			Watts	795	819	842	865	888

[a] Factory Setting.

Table 20. A952V120DD5SB Heating Airflow

A952V120DD5SB Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 75,800 2nd Stage Capacity = 116,100				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	1160	CFM	1234	1240	1246	1252	1258
			Temp. Rise	56	56	56	55	55
			Watts	137	198	258	319	380
	Medium Low	1332	CFM	1305	1311	1318	1325	1332
			Temp. Rise	53	53	53	52	52
			Watts	158	221	284	347	410
	Medium	1404	CFM	1324	1510	1697	1884	2070
			Temp. Rise	53	46	39	32	25
			Watts	179	246	313	380	447
	High [a]	1620	CFM	1598	1484	1371	1257	1144
			Temp. Rise	44	47	49	52	54
			Watts	266	316	366	416	466
Heating 2nd Stage	Low	1750	CFM	1687	1673	1659	1645	1631
			Temp. Rise	63	64	64	65	65
			Watts	327	407	487	568	648
	Medium Low	1850	CFM	1788	1771	1754	1738	1721
			Temp. Rise	60	60	61	61	62
			Watts	380	464	549	633	718
	Medium	1950	CFM	1891	1862	1833	1803	1774
			Temp. Rise	56	57	58	60	61
			Watts	424	524	624	724	824
	High [a]	2250	CFM	2080	2100	2120	2140	2160
			Temp. Rise	51	51	51	51	51
			Watts	708	768	828	888	948

[a] Factory Setting.

Table 21. A952V120DU5SB / A952V120DD5SB Cooling Airflow

A952V120DU5SB / A952V120DD5SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	3.0 Ton	Cooling 450 CFM/Ton	CFM	1336	1346	1354	1360	1363
			Watts	163	221	281	341	402
		Cooling 420 CFM/Ton	CFM	1248	1258	1265	1271	1274
			Watts	137	191	247	304	361
		Cooling 400 CFM/Ton	CFM	1189	1199	1206	1211	1214
			Watts	121	173	227	281	336
		Cooling 370 CFM/Ton	CFM	1102	1110	1116	1121	1123
			Watts	100	148	198	249	301
		Cooling 350 CFM/Ton	CFM	1043	1051	1057	1060	1062
			Watts	87	133	181	230	279
		Cooling 330 CFM/Ton	CFM	985	991	996	999	1000
			Watts	76	119	165	211	259
		Cooling 310 CFM/Ton	CFM	927	932	936	937	938
			Watts	65	107	150	195	241
		Cooling 290 CFM/Ton	CFM	869	872	874	875	875
			Watts	56	95	136	179	223
Cooling	3.5 Ton	Cooling 450 CFM/Ton	CFM	1559	1567	1574	1579	1583
			Watts	244	312	381	450	519
		Cooling 420 CFM/Ton	CFM	1455	1464	1472	1477	1481
			Watts	204	267	331	396	462
		Cooling 400 CFM/Ton	CFM	1386	1395	1403	1409	1413
			Watts	179	240	301	363	426
		Cooling 370 CFM/Ton	CFM	1282	1292	1300	1305	1309
			Watts	147	203	260	318	376
		Cooling 350 CFM/Ton	CFM	1214	1223	1231	1236	1239
			Watts	127	181	235	290	346
		Cooling 330 CFM/Ton	CFM	1145	1154	1161	1166	1169
			Watts	110	160	212	265	318
		Cooling 310 CFM/Ton	CFM	1077	1085	1092	1096	1098
			Watts	94	142	191	241	292
		Cooling 290 CFM/Ton	CFM	1009	1016	1021	1025	1026
			Watts	80	125	171	219	267

Table 21. A952V120DU5SB / A952V120DD5SB Cooling Airflow (continued)

A952V120DU5SB / A952V120DD5SB Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	4.0 Ton	Cooling 450 CFM/Ton	CFM	1783	1789	1793	1796	1798
			Watts	350	427	505	584	663
		Cooling 420 CFM/Ton	CFM	1663	1671	1677	1681	1683
			Watts	290	362	436	509	583
		Cooling 400 CFM/Ton	CFM	1584	1592	1599	1603	1607
			Watts	255	324	393	464	534
		Cooling 370 CFM/Ton	CFM	1465	1474	1481	1487	1491
			Watts	207	271	336	401	467
		Cooling 350 CFM/Ton	CFM	1386	1395	1403	1409	1413
			Watts	179	240	301	363	426
		Cooling 330 CFM/Ton	CFM	1307	1317	1324	1330	1334
			Watts	154	211	269	328	388
		Cooling 310 CFM/Ton	CFM	1228	1238	1246	1251	1254
			Watts	131	185	240	296	352
		Cooling 290 CFM/Ton	CFM	1150	1159	1166	1171	1174
			Watts	111	162	214	266	320
Cooling	4.5 Ton	Cooling 450 CFM/Ton	CFM	2010	2011	2012	2011	2010
			Watts	482	569	657	745	834
		Cooling 420 CFM/Ton	CFM	1874	1878	1881	1882	1883
			Watts	399	480	562	645	727
		Cooling 400 CFM/Ton	CFM	1783	1789	1793	1796	1798
			Watts	350	427	505	584	663
		Cooling 370 CFM/Ton	CFM	1648	1656	1662	1666	1669
			Watts	283	355	427	500	574
		Cooling 350 CFM/Ton	CFM	1559	1567	1574	1579	1583
			Watts	244	312	381	450	519
		Cooling 330 CFM/Ton	CFM	1470	1479	1486	1492	1495
			Watts	209	273	338	404	469
		Cooling 310 CFM/Ton	CFM	1381	1390	1398	1404	1408
			Watts	178	238	299	361	423
		Cooling 290 CFM/Ton	CFM	1292	1302	1310	1315	1319
			Watts	149	206	264	322	381
Cooling	5.0 Ton [a]	Cooling 450 CFM/Ton	CFM	2238	2235	2230	2226	2220
			Watts	646	742	840	938	1036
		Cooling 420 CFM/Ton	CFM	2086	2086	2085	2083	2080
			Watts	533	623	714	806	897
		Cooling 400 CFM/Ton	CFM	1985	1987	1988	1988	1986
			Watts	466	552	639	726	813
		Cooling 370 CFM/Ton	CFM	1834	1838	1842	1844	1845
			Watts	377	456	536	617	698
		Cooling 350 CFM/Ton [a]	CFM	1733	1740	1745	1748	1750
			Watts	324	399	475	552	628
		Cooling 330 CFM/Ton	CFM	1633	1641	1647	1652	1655
			Watts	277	347	419	492	564
		Cooling 310 CFM/Ton	CFM	1534	1543	1550	1555	1558
			Watts	234	301	369	437	505
		Cooling 290 CFM/Ton	CFM	1435	1444	1452	1458	1461
			Watts	196	259	322	387	451

[a] Factory Setting.

Furnace General Installation

The following sections give general instructions for the installation of the gas furnaces.

Furnace Panel Removal

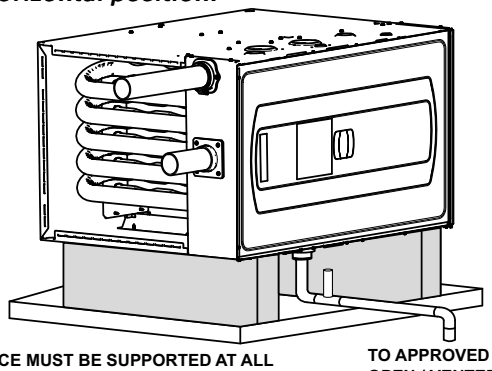
Note: *Use a 1/4" nut driver to remove the two screws on the front panel.*

Horizontal Installation in an Attic or Crawlspace

The S-Series upflow condensing furnace may be installed in an attic or crawl space in the horizontal let or right position for needed airflow direction. The horizontal furnace installation in an attic should be on a service platform large enough to allow for proper clearances on all sides and service access to the front of the furnace. See "the Locations and Clearance section," p. 14. Line contact is only permissible between lines formed by intersections of the top and two sides of the furnace casing and building joists, studs, or framing.

The furnace may be placed horizontally in a crawl space on a pad or other noncombustible material which will raise the unit for sufficient protection from moisture.

The Furnace must be supported at both ends and the middle when installed horizontally. The Furnace must also be elevated approximately 6 inches to allow clearance for the condensate drain to exit the cabinet in the ***horizontal position.***



FURNACE MUST BE SUPPORTED AT ALL FOUR CORNERS. BAYHANG - OPTIONAL HORIZONTAL HANGING BRACKET KIT

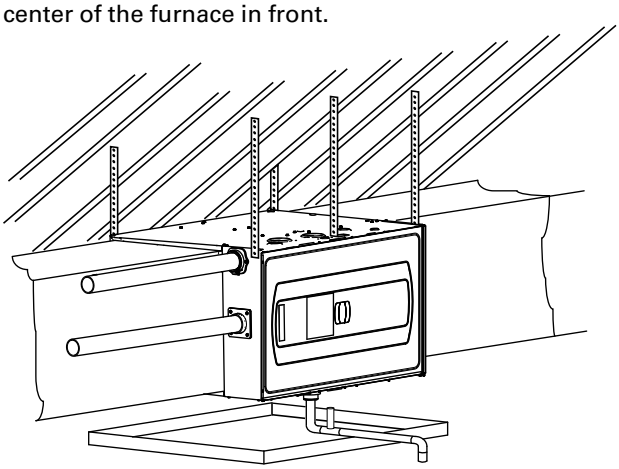
TO APPROVED OPEN / VENTED DRAIN

Note: The overflow stand pipe termination must be even with or slightly below the bottom of the condensate trap.

Note: Water from the overflow pipe must drain into the emergency drain pan.

Horizontal Installation Hanging Using Straps

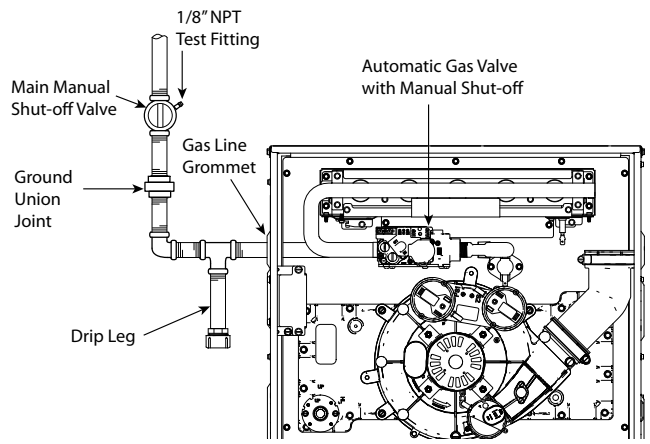
The furnace may be installed hanging in a hanging position using straps. The furnace should be supported at both ends and have an additional support in the center of the furnace in front.



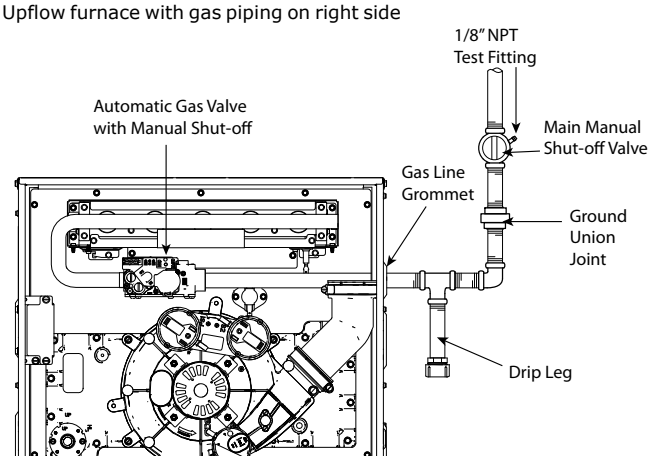
Gas Piping

Important: *When converting the gas piping from the factory default, the plug must be removed from the new gas piping location and swapped with the grommet from the default location. The upflow furnace default is left side gas piping. The downflow furnace default is right side gas piping.*

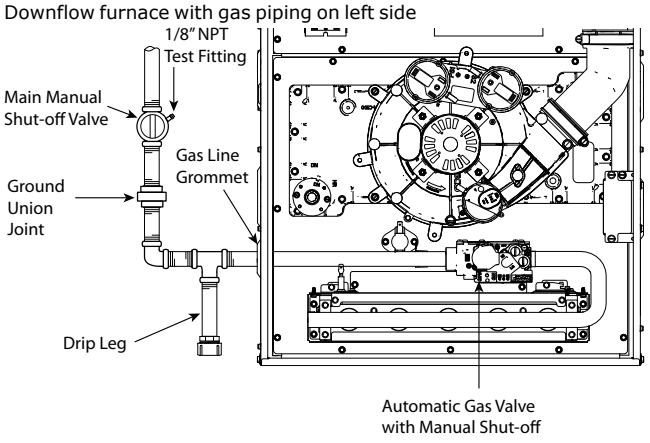
Upflow furnace with gas piping on left side



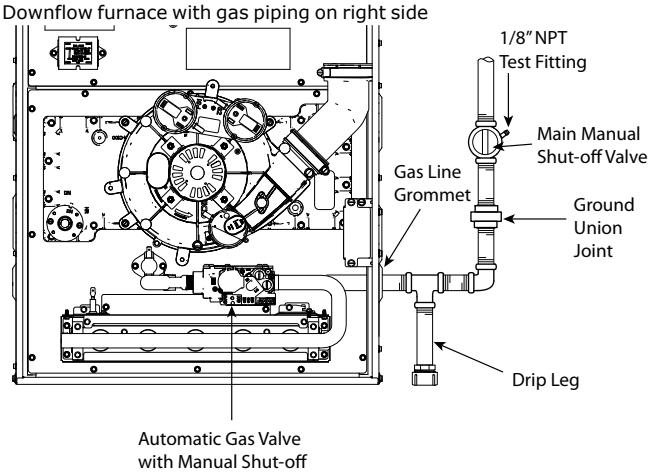
Upflow furnace with gas piping on right side



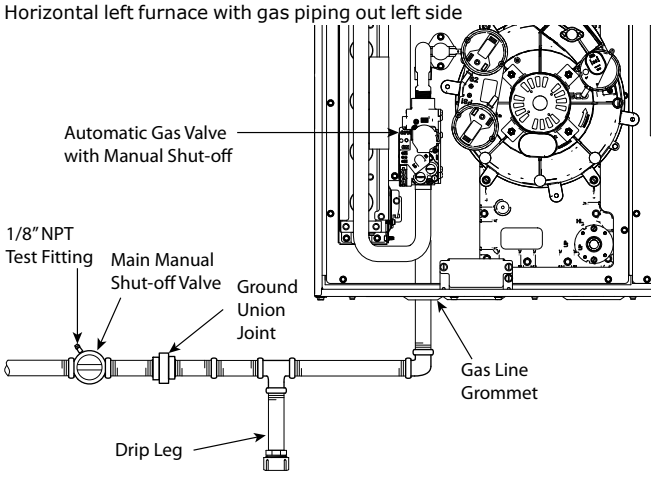
Downflow furnace with gas piping on left side



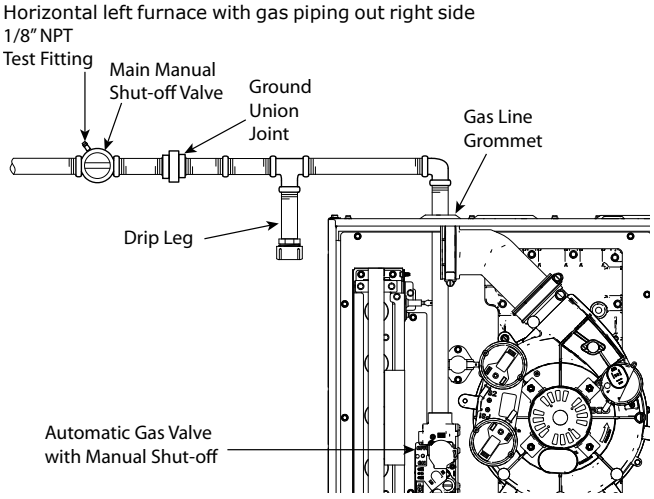
Downflow furnace with gas piping on right side



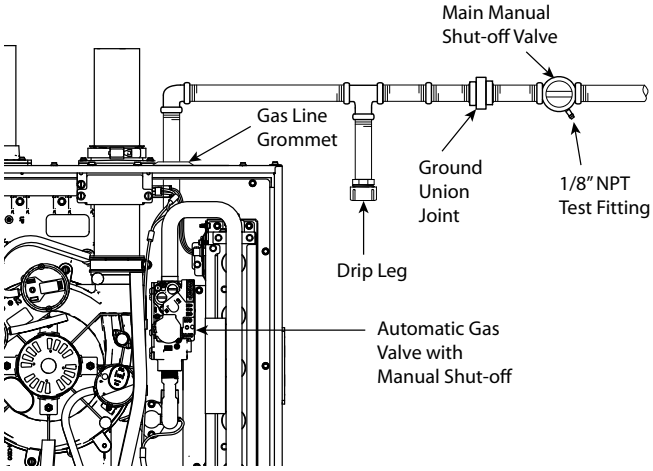
Horizontal left furnace with gas piping out left side



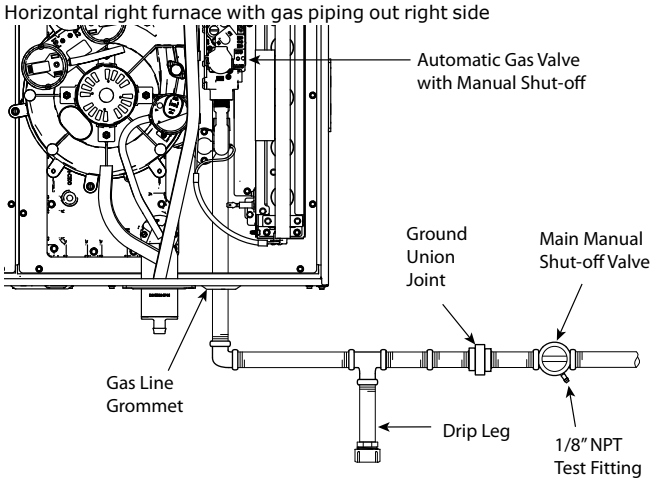
Horizontal left furnace with gas piping out right side



Horizontal right furnace with gas piping out left side



Horizontal right furnace with gas piping out right side



The upflow/horizontal furnace is shipped standard for left side installation of gas piping. An opening with plug is provided on the right side for an alternate gas piping arrangement.

The installation of piping shall be in accordance with piping codes and the regulations of the local gas company. Pipe joint compound must be resistant to the chemical reaction with liquefied petroleum gases.

Important: *If local codes allow the use of flexible gas appliance connector, always use a new listed connector. Do not use a connector which has previously serviced another gas appliance.*

Refer to the piping table for delivery sizes. Connect gas supply to the unit, using a ground joint union and a manual shut-off valve. National codes require a condensation drip leg to be installed ahead of the gas valve.

The furnace and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa).

The furnace must be isolated from the gas supply piping by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3.5 kPa).

Note: *Maximum pressure to the gas valve for natural gas is 13.8" W.C. Minimum pressure is 5.0" W.C. Maximum pressure to the gas valve for propane is 13.8" W.C. Minimum pressure is 10.0" W.C.*

NATURAL GAS ONLY

TABLE OF CUBIC FEET PER HOUR OF GAS FOR VARIOUS PIPE SIZES AND LENGTHS

PIPE SIZE	LENGTH OF PIPE						
	10	20	30	40	50	60	70
1/2	131	90	72	62	55	50	46
3/4	273	188	151	129	114	104	95
1	514	353	284	243	215	195	179
1–1/4	1060	726	583	499	442	400	368

This table is based on Pressure Drop of 0.3 inch W.C. and 0.6 SP. GR. Gas

All gas fittings must be checked for leaks using a soapy solution before lighting the furnace. ***DO NOT CHECK WITH AN OPEN FLAME!***

For propane conversions on all S-Series Furnaces, use BAYLPSS400* conversion kit with stainless steel burners.

When installing our furnaces in a manufactured house, use Manufactured Housing Accessory Kit, BAYMFGH200B.

ORIFICE SIZES

INPUT RATING BTUH	NUMBER OF BURNERS	MAIN BURNER ORIFICE DRILL SIZE	
		NAT. GAS	PROPANE GAS
40,000	2	45	56
60,000	3	45	56
80,000	4	45	56
100,000	5	45	56
120,000	6	45	56

Combustion and Input Check

1. Make sure all gas appliances are off except the furnace.
2. Clock the gas meter with the furnace operating (determine the dial rating of the meter) for one revolution.
3. Match the "Sec" column in the gas flow table with the time clocked.
4. Read the "Flow" column opposite the number of seconds clocked.
5. Use the following factors if necessary:
   a. For 1 Cu. Ft. Dial Gas Flow CFH = Chart Flow Reading ÷ 2
   b. For 1/2 Cu Ft. Dial Gas Flow CFH = Chart Flow Reading ÷ 4
   c. For 5 Cu. Ft. Dial Gas Flow CFH = 10X Chart Flow Reading ÷ 4
6. Multiply the final figure by the heating value of the gas obtained from the utility company and compare to the nameplate rating. This must not exceed the nameplate rating.

Gas Flow in Cubic Feet Per Hour							
2 Cubic Foot Dial							
Sec.	Flow	Sec.	Flow	Sec.	Flow	Sec.	Flow
10	732	31	236	52	141	86	85
11	666	32	229	53	138	88	83
12	610	33	222	54	136	90	81
13	563	34	215	55	133	94	78
14	523	35	209	56	131	98	75
15	488	36	203	57	128	100	73
16	458	37	198	58	126	104	70
17	431	38	193	59	124	108	68
18	407	39	188	60	122	112	65
19	385	40	183	62	118	116	63
20	366	41	179	64	114	120	61
21	349	42	174	66	111	130	56
22	333	43	170	68	108	140	52
23	318	44	166	70	105	150	49
24	305	45	163	72	102	160	46
25	293	46	159	74	99	170	43
26	282	47	156	76	96	180	41
27	271	48	153	78	94	190	39
28	262	49	149	80	92	200	37
29	253	50	146	82	89		
30	244	51	144	84	87		

Gas Valve Adjustment

Changes can be made by adjusting the manifold pressure, or changing orifices (orifice change may not always be required). To adjust the manifold pressure:

1. Turn off all electrical power to the system.
2. Loosen (Do Not remove) the pressure tap test set screw one turn with 3/32" hex wrench.
   a. The pressure tap adjustment kit (KIT07611) contains a 3/32" hex wrench, a 5/16" hose and a connector and can be ordered through Global Parts.
3. Attach a manifold pressure gauge with flexible tubing to the outlet pressure boss marked "OUT P" on White- Rodgers gas valve model 36J.
4. Turn on system power and energize valve.

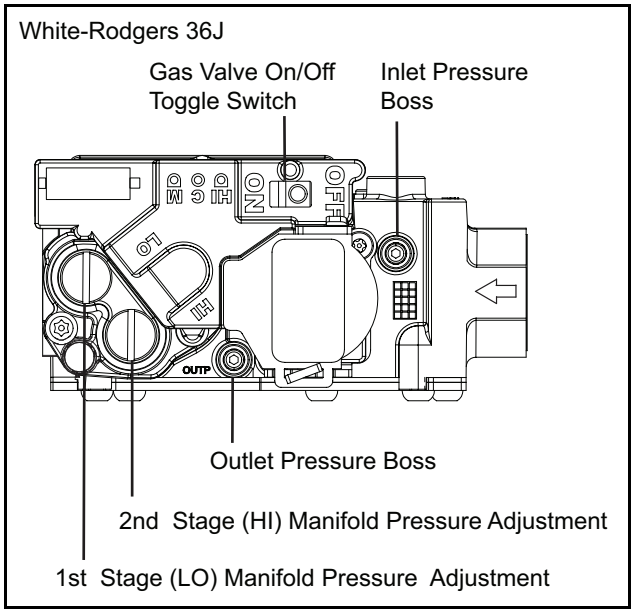
Important: *Adjust 2nd stage on the gas valve before attempting to adjust 1st stage.*

5. Adjust 2nd stage gas heat by removing the high (HI) adjustment regulator cover screw.
   a. To increase outlet pressure, turn the regulator adjust screw clockwise.
   b. To decrease outlet pressure, turn the regulator adjust screw counterclockwise.
   c. Adjust regulator until pressure shown on manometer matches the pressure specified in the table.

      The input of no more than nameplate rating and no less than 93% of the nameplate rating, unless the unit is derated for high altitude.
   d. Replace and tighten the regulator cover screw securely.
6. Adjust 1st stage gas heat by removing the low (LO) adjustment regulator cover screw.
   a. To increase outlet pressure, turn the regulator adjust screw clockwise.
   b. To decrease outlet pressure, turn the regulator adjust screw counterclockwise.
   c. Adjust regulator until pressure shown on manometer matches the pressure specified in the table.

      The input of no more than nameplate rating and no less than 93% of the nameplate rating, unless the unit is derated for high altitude.
   d. Replace and tighten the regulator cover screw securely.
7. Cycle the valve several times to verify regulator setting.
   a. Repeat steps 5-7 if needed.
8. Turn off all electrical power to the system.
9. Remove the manometer and flexible tubing and tighten the pressure tap screw.

10. Using a leak detection solution or soap suds, check for leaks at the pressure outlet boss and pressure tap test screw.
11. Turn on system power and check operation of the unit.



Fuel Manifold Pressure Settings (inches w.c.)		
Fuel	2nd Stage Max.	1st Stage Max.
Natural Gas	3.5″ W.C.	1.7″ W.C.
Propane Gas	10.0″ W.C.	6.0″ W.C.

High Altitude Derate

Input ratings (BTUH) of these Furnaces are based on sea level operation and should not be changed at elevations up to 2,000 ft. (610 m).

If the installation is 2,000 ft. (610 m) or above, the Furnace input rate (BTUH) shall be reduced 4% for each 1,000 ft. above sea level.

Installations of this furnace at altitudes above 2,000 ft. (610 m) shall be made utilizing the Vent Length table and/or Part Numbers for Replacement Orifices table in these installation instructions.

The Furnace input rate shall be checked by clocking the gas flow rate (CFH) and multiplying by the heating value obtained from the local utility supplier for the gas being delivered at the installed altitude. Input rate changes can be made by adjusting the Manifold Pressure (min 3.0 - max 3.7 in. W.C. - Natural Gas) or changing orifices (orifice change may not always be required).

If the desired input rate can not be achieved with a change in Manifold Pressure, then the orifices must be changed. Propane installations will require an orifice change.

Important: *Reinstall the replacement orifices to the same depth as the orifices supplied with the equipment.*

See the table for help in selecting orifices if orifice change is required. Furnace input rate and temperature rise should be checked again after changing orifices to confirm the proper rate for the altitude.

The vent length table shows the required vent lengths for installations at various altitudes. Installations above 12,000 feet are not allowed.

PART NUMBERS FOR REPLACEMENT ORIFICES			
DRILL SIZE	**PART NUMBER**	**DRILL SIZE**	**PART NUMBER**
44	ORF00501	54	ORF00555
45	ORF00644	55	ORF00693
46	ORF00909	56	ORF00907
47	ORF00910	57	ORF00908
48	ORF01099	58	ORF01338
49	ORF00503	59	ORF01339
50	ORF00493		

Turn the main Gas Valve toggle switch within the unit to the "**OFF**" position. Turn the external gas valve to "ON". Purge the air from the gas lines. After purging, check all gas connections for leaks with a soapy solution – **DO NOT CHECK WITH AN OPEN FLAME.** Allow 5 minutes for any gas that might have escaped to dissipate.

Propane Gas being heavier than air may require forced ventilation. Turn the toggle switch on the Gas Valve in the unit to the "ON" position.

The table in next page lists the main burner orifices used with the furnace. If a change of orifices is required to correct the furnace input rating refer to the part number for replacement orifices table.

Installation of this furnace at altitudes above 2000 ft (610m) shall be in accordance with local codes, or in the absence of local codes, the *National Fuel Gas Code, ANSI Z223.1/NFPA 54* or *National Standard of Canada, Natural Gas and Propane Installation Code, CSA B149.1.*

Orifice Twist Drill Size If Installed at Sea Level	Altitude Above Sea Level and Orifice Required at Other Elevations								
	2000	3000	4000	5000	6000	7000	8000	9000	10000
42	42	43	43	43	44	44	45	46	47
43	44	44	44	45	45	46	47	47	48
44	45	45	45	46	47	47	48	48	50
45	46	47	47	47	48	48	49	49	50
46	47	47	47	48	48	49	49	50	51
47	48	48	49	49	49	50	50	51	52
54	54	55	55	55	55	55	56	56	56
55	55	55	55	56	56	56	56	56	57
56	56	56	57	57	57	58	59	59	60
57	58	59	59	60	60	61	62	63	63
58	59	60	60	61	62	62	63	63	64
From National Fuel Gas Code — Table E.1.1(d)									

General Venting

FURNACE EXHAUST MUST BE VENTED TO THE OUTDOORS. THESE FURNACES ARE INDUCED DRAFT VENTED AND MUST **NOT** BE CONNECTED TO ANY VENT SERVING ANOTHER APPLIANCE. PLEASE NOTE THAT THESE FURNACES USE **POSITIVE-PRESSURE** VENT SYSTEMS.

Proper venting is essential to obtain maximum efficiency from a condensing Furnace. Proper installation of the vent system is necessary to assure drainage of the condensate and prevent deterioration of the vent system.

ETL has certified the design of condensing Furnaces for a minimum of 0" clearance from combustible materials to single wall plastic vent pipe.

The recommended system is assembled from 2" or 3" plastic pipe and fittings found in the Approved Vent Pipe Materials Table. 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" venting of Type 29- 4C stainless steel must be used in place of PVC material.

These Furnaces have been classified as CATEGORY IV Furnaces in accordance with ANSI Z21.47 “latest edition” standards. Category IV - a central furnace that operates with a positive vent static pressure and with a flue loss less than 17 percent. These conditions require special venting systems, which must be gas tight and water tight.

Note: *When an existing Furnace is removed from a venting system serving other gas appliances, the venting system is likely to be too large to properly vent the remaining attached appliances.*

Important: *These Furnaces may be installed as Direct Vent (sealed combustion) or as Nondirect Vent (single pipe). The Furnaces are shipped DIRECT VENT with sealed combustion.*

Important: *Products installed in Canada must use vent systems that are certified to the Standard for Type BH Gas Venting Systems (ULC S636) for Class II-A venting systems (up to 65°C). Components of the vent system must not be interchanged with other vent systems or unlisted pipe or fittings. Plastic components, specified primers, and glues must be from a single system manufacturer and not intermixed with other system manufacturer's vent system parts. In addition, the first three feet of the vent pipe must be visible for inspection.*

When the vent pipe is exposed to temperatures below freezing, e.g., when it passes through unheated spaces, etc., the pipe must be insulated with 1/2 inch (12.7 mm) thick Armaflex-type insulation or equal.

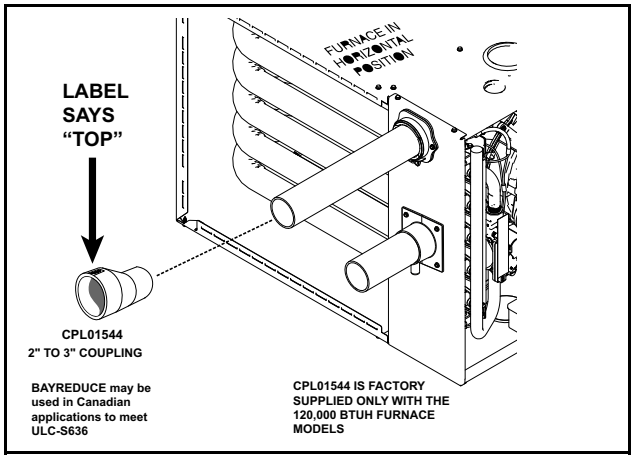
If the space is heated sufficiently to prevent freezing, then the insulation will not be required. If domestic water pipes are not protected from freezing then the space meets the condition of a heated space.

3″ Venting requirements

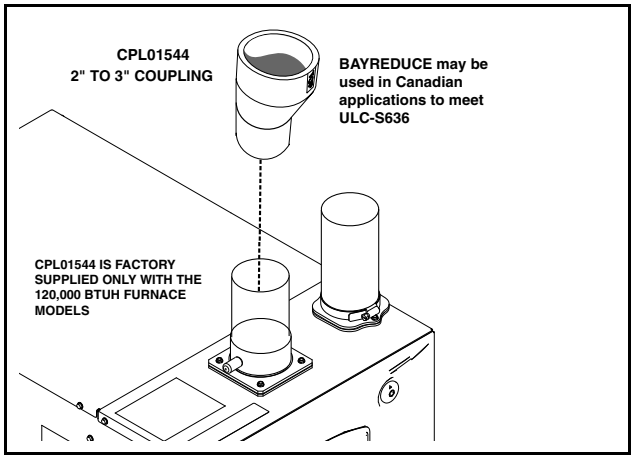
Important: *To determine if your application requires 3″ venting, see the Maximum Vent Length Table.*

Important: *Horizontal venting application must use the 2″ x 3″ offset reducing coupling. Vertical venting applications do not require the reducing coupling to be offset.*

Note: *If your furnace comes with a factory supplied 2" X 3" offset reducing coupling it is used for 3" vent pipe installation. Make sure the marking "TOP" is located on the top side of the pipe in horizontal venting applications. The straight side of the coupling must be on bottom for proper drainage of condensate.*



Note: *For Canadian applications, BAYREDUCE 2″ x 3″ offset reducing coupling meets ULC-S636 requirements. Make sure the marking "TOP" is located on the top side of the pipe. The straight side of the coupling must be on bottom for proper drainage of condensate in horizontal venting.*



Typical Venting

This combustion air intake has a built-in condensate collection system. Condensate that may collect is drained by field supplied 1/2" ID tubing. The tubing must be routed to form a trap and water seal (see Figure 1, p. 39, Figure 2, p. 39, and Figure 3, p. 40.

A field supplied hose clamp is recommended but not be required. The tubing is not under pressure.

Combustion air piping must be square cut and de-burred for proper drainage. For side entry combustion inlet applications, ensure the drain is pointed downwards.

Figure 1. Upflow Top Entry

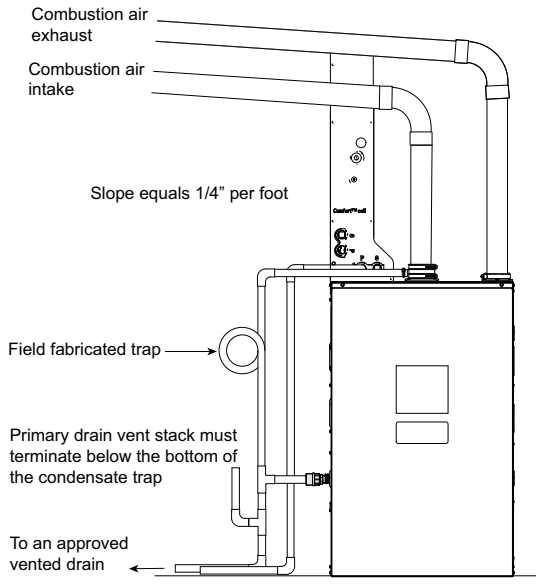
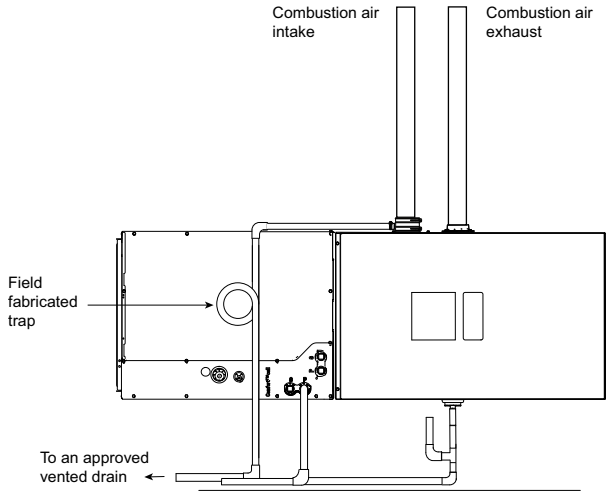
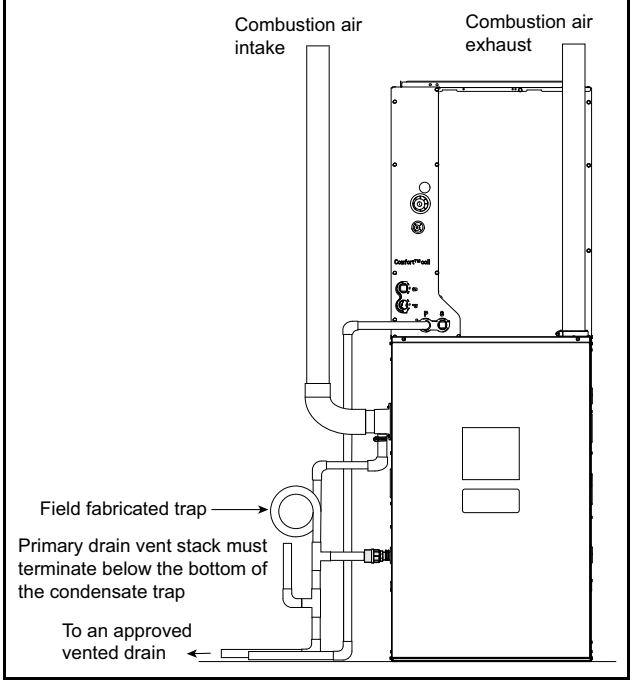


Figure 2. Horizontal Top Entry



Note: *Primary drain vent stack must terminate below the bottom of the condensate trap.*

Figure 3. Upflow Side Entry



Special Case Venting

Special instructions for direct vent furnace air intake.

In certain applications, particularly when the furnace is located in a basement, there are certain conditions that can be met where warm humid air from the outside is drawn into combustion air piping. If the area where the piping is located is conditioned below 70° F, condensation could occur inside the piping and ultimately drain into the furnace compartment, which could lead to premature component failure.

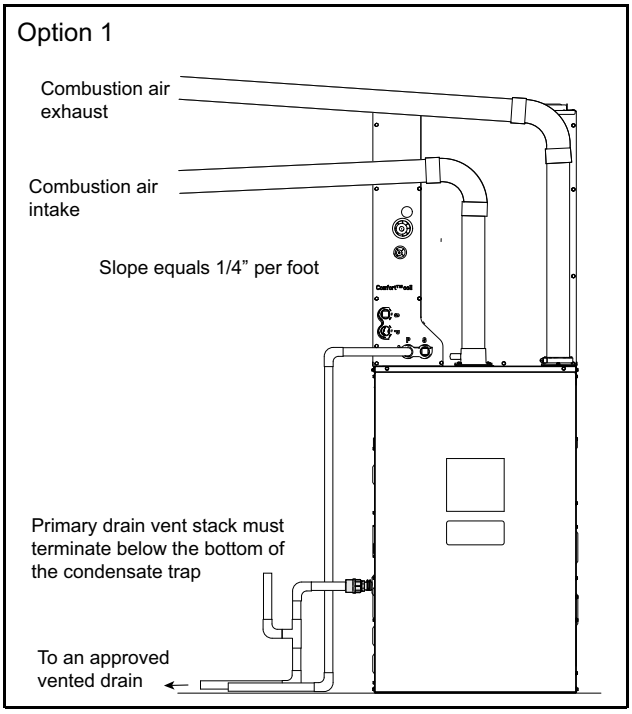
We recommend following one of the options to prevent this condition from occurring and possibly damaging components within the furnace:

Note: *Inlet air piping is not considered to be part of the venting system. The inlet air piping may be made from PVC.*

Option 1

If possible, slope the inlet combustion air piping away from the furnace. Condensation that may occur will now drain outside of the home. The combustion air outlet piping must remain sloped back to the furnace.

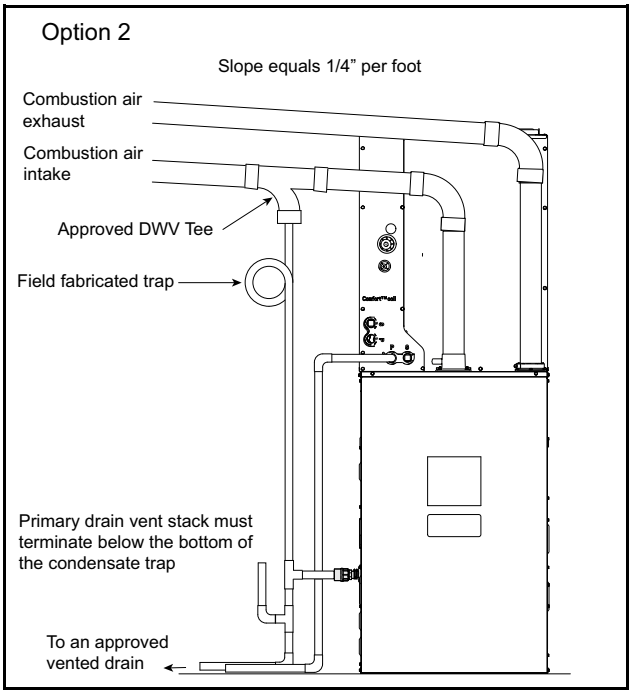
Note: *Combustion air drain fitting must remain capped if not using the drain function. See "Condensate Drain Instructions," p. 66 section.*



Option 2 – Top combustion air intake

If sloping the combustion air intake pipe is not possible, install a DWV Tee as close to the furnace as possible with drain and trap to prevent condensation from occurring in the furnace cabinet. Do not tee AC condensate and combustion air condensate trap together.

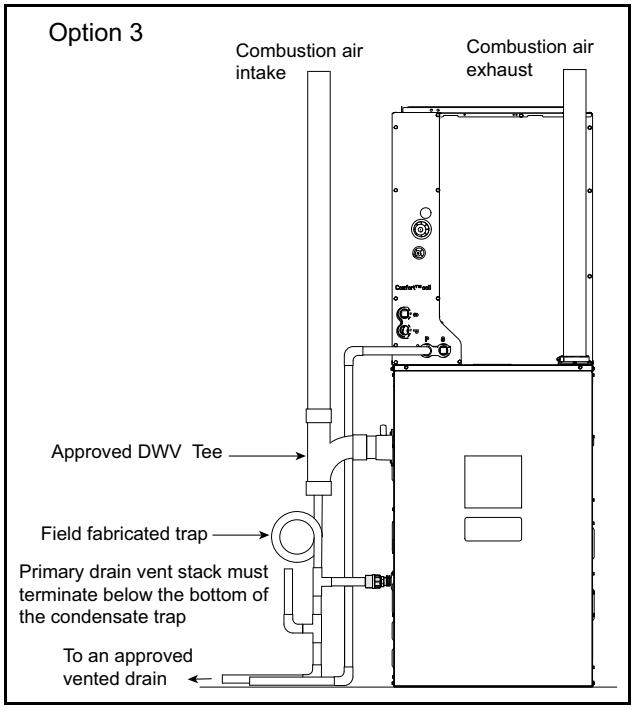
Note: *Combustion air drain fitting must remain capped if not using the drain function. See "Condensate Drain Instructions," p. 66 section.*



Option 3 – Side combustion air intake

If sloping the combustion air intake pipe is not possible, install an approved DWV Tee as close to the furnace as possible with drain and trap.

Note: *Combustion air drain fitting must remain capped if not using the drain function. See "Condensate Drain Instructions," p. 66 section.*



Vent Terminations

For **DIRECT VENT APPLICATION:** The Furnaces must be vented to the exterior of the house and combustion air MUST come through the inlet air pipe from OUTSIDE AIR.

Note: *BAYVENT* accessories can be used for inlet and outlet terminals when the pipes do not exit the structure together. For Canadian applications, venting systems must meet ULC-S636 requirements.*

For **NONDIRECT VENT APPLICATION:** The Furnace shall be vented to the exterior of the house, but combustion air may enter from the surrounding area as long as combustion air requirements are met. (See AIR FOR COMBUSTION AND VENTILATION)

Vent terminations

- BAYVENT200B
- BAYAIR30AVENTA

Vent terminations — Canadian applications. Meets ULC-S636 requirements.

- BAYVENTCN200B
- BAYAIR30CNVENT

FURNACE VENT / INLET PIPE INSTALLATION IN TWO PRESSURE ZONE CONFIGURATIONS ARE NOT ALLOWED

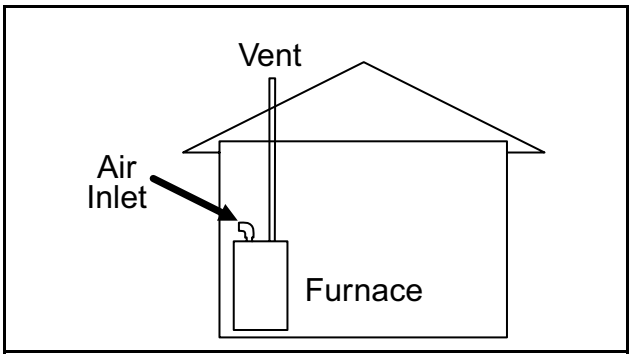
Note: *For single pressure zone applications, see the Horizontal Venting section.*

The following are **EXAMPLES ONLY.**

EX. 1 -

Example 1 shows the vent pipe exhausting through the roof and the inlet air coming from the interior of the house. The inlet air coming from the interior of the house must meet combustion requirements for area, etc., as shown in the section AIR FOR COMBUSTION AND VENTILATION in this document.

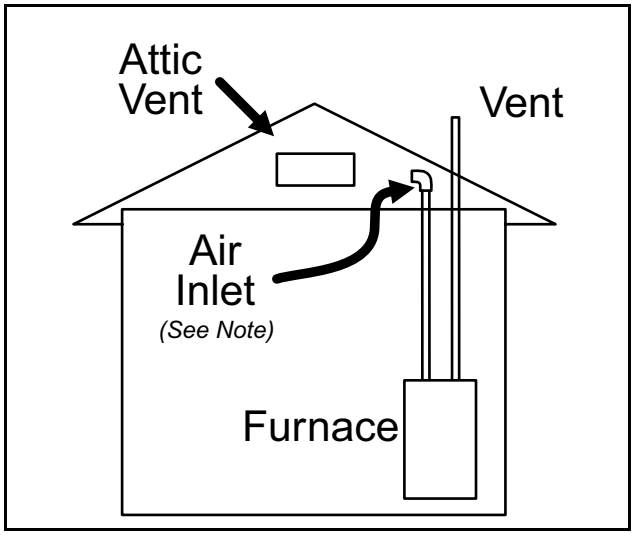
Note: *If only the flue gas pipe is to the outside of the structure, a straight section of pipe (long enough to exit the Furnace cabinet) must be attached to the inlet air side with an elbow (which is 5 to 10 equiv. ft.) installed on the end to prevent dust and debris from falling directly into the Furnace.*



EX. 2 -

The inlet air does not have to come from outside the structure. Example 2 shows the inlet air, may come from the attic if the requirements for combustion air are met as shown in the section AIR FOR COMBUSTION AND VENTILATION.

Note: *If only the flue gas pipe is to the outside of the structure, a straight section of pipe (long enough to exit the Furnace cabinet) must be attached to the inlet air side with an elbow (which is 5 to 10 equiv. ft.) installed on the end to prevent dust and debris from falling directly into the Furnace.*



Attaching Vent Piping

VENT FITTING MATERIAL – PLASTIC

Gas and liquid tight single wall vent fittings, designed for resistance to corrosive flue condensate, MUST be used throughout.

Listed in the Approved Vent Pipe Materials table are designations for different types of 2" and 3" size pipe and fittings that meet these requirements. The materials listed are various grades of PVC, CPVC, ABS, PolyPro® by DuraVent , Z-Dens by Novaflex Group, Innoflue® by Centrotherm, ECCO™ polypropylene venting system, and PolyFlue™ polypropylene venting systems.

Important: *Products installed in Canada must use vent systems that are certified to the Standard for Type BH Gas Venting Systems (ULC S636) for Class II-A venting systems (up to 65°C). Components of the vent system must not be interchanged with other vent systems or unlisted pipe or fittings. Plastic components, specified primers, and glues must be from a single system manufacturer and not intermixed with other system manufacturer's vent system parts. In addition, the first three feet of the vent pipe must be visible for inspection.*

PIPE JOINTS: All joints must be fastened and sealed per manufacturer instructions and local and national codes to prevent escape of combustion products into the building.

MANUFACTURED MODULAR VENTING SYSTEMS

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

Failure to follow this Warning may result in property damage, severe personal injury, or death.

See the Approved Vent Pipe Materials table for manufactured modular venting systems that are approved for use with this product. Follow the manufacturer's installation instructions when installing the venting system.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

Failure to follow this Warning may result in property damage, severe personal injury, or death.

Do not use cement on polypropylene venting systems. Follow the manufacturer's installation instructions when installing the venting system.

For manufactured modular venting systems that are approved with this product see PVC vent fitting material table. Do not drill into polypropelene venting pipes

BONDING OF PVC

Note: *It is recommended that the first joints from the Furnace be connected and sealed with high temperature RTV. This will enable the pipes to be removed later without cutting.*

Be sure to properly support these joints.

Commercially available solvent cement for PVC must be used to join PVC pipe fittings. Follow instructions on container carefully.

Pipe and Fitting – ASTM D1785, D2466, D2661, & D2665

PVC Primer and Solvent Cement – ASTM D2564

Procedure for Cementing Joints – Ref ASTM D2855

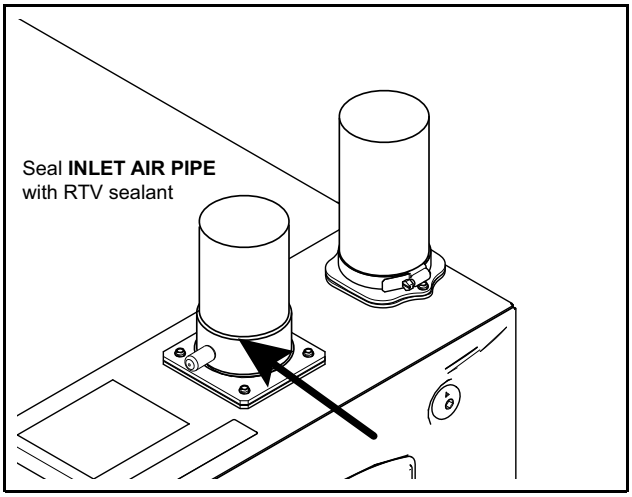
1. Cut pipe square, remove ragged edges and burrs. Chamfer end of pipe, then clean fitting socket and pipe joint area of all dirt, grease, moisture or chips.
2. After checking pipe and socket for proper fit, wipe socket and pipe with cleaner-primer. Apply a liberal coat of primer to inside surface of socket and outside of pipe.
   DO NOT ALLOW PRIMER TO DRY BEFORE APPLYING CEMENT.
3. Apply a thin coat of cement evenly in the socket. Quickly apply a heavy coat of cement to the pipe end and insert pipe into fitting with a slight twisting movement until it bottoms out.

4. Hold the pipe in the fitting for 30 seconds to prevent tapered socket from pushing the pipe out of the fitting.
5. Wipe all excess cement from the joint with a rag. Allow 15 minutes before handling. Cure time varies according to fit, temperature and humidity.

Connection of the pipe and collar of the combustion air inlet should just be a friction fit. It is recommended that the inlet air joint be sealed with RTV type sealant to allow the joint to be separated for possible future service. The inlet and vent pipes must be properly supported throughout the entire length.

Note: *Follow venting instructions carefully when using PVC cement.*

Important: *All joints must be water tight. Flue condensate is somewhat acidic, and leaks can cause equipment damage.*



Approved Vent Pipe Materials			
PVC Vent Fitting Material These fittings are available from your Gas Furnace Distributors.			
ANSI/UL 1738 APPROVED VENT PIPE MATERIAL			
ASTM STANDARD	PIPE TYPE	ALLOWABLE TEMPERATURE °F	MARKING
N/A	N/A	158	UL 1738
PVC			
ASTM STANDARD	PIPE TYPE	ALLOWABLE TEMPERATURE °F	MARKING
F891	CELLULAR CORE[a]	158	ASTM F891
D2665	DWV PIPE	158	ASTM D2665
D1785	SCH 40, 80, 120	158	ASTM 1785
D2241	SDR SERIES	158	ASTM D2241
CPVC			
ASTM STANDARD	PIPE TYPE	ALLOWABLE TEMPERATURE °F	MARKING
D2846	CPVC 41	212	ASTM D2846
F441	SCH 40, 80	212	ASTM F441
F442	SDR SERIES	212	ASTM F442
ABS			
ASTM STANDARD	PIPE TYPE	ALLOWABLE TEMPERATURE °F	MARKING
D2661	SCH 40 DWV	180	ASTM D2661
F628	SCH 40 DWV CELLULAR CORE[a]	180	ASTM F628
PolyPro® by DuraVent , Z-Dens by Novaflex Group, Innoflue® by Centrotherm, System 1738 by IPEX, ECCO™ polypropylene venting system, and PolyFlue™ polypropylene venting systems.			
ASTM STANDARD	PIPE TYPE	ALLOWABLE TEMPERATURE °F	MARKING
N/A	N/A	230	ULC-S636

[a] Beginning March 1, 2024, PVC Cellular Core and ABS Cellular Core vent materials are not approved.

Maximum Vent Length Table

Model	Maximum Total Equivalent Length in Feet for Vent and Inlet Air (See Notes)	
	2 inch or 2.5 inch Pipe	3 inch or 4 inch Pipe
Altitude 0–2,000 Feet		
A952V040BU3S, A952V040BD3S, A952V060BD3S, A952V060BU4S	200	200
A952V080BU4S, A952V080BD4S, A952V080CU5S	100	200
A952V100CU5S, A952V100CD5S	50	200
A952V120DU5S, A952V120DD5S	Note 1	200
Altitude 2,001–5,400 Feet		
A952V040BU3S, A952V040BD3S, A952V060BD3S, A952V060BU4S	200	200
A952V080BU4S, A952V080BD4S, A952V080CU5S	80	120
A952V100CU5S, A952V100CD5S	50	150
A952V120DU5S, A952V120DD5S	Note 1	200
Altitude 5,401–7,800 Feet		
A952V040BU3S, A952V040BD3S, A952V060BD3S, A952V060BU4S	100	150
A952V080BU4S, A952V080BD4S, A952V080CU5S	50	70
A952V100CU5S, A952V100CD5S	Note 1	100
A952V120DU5S, A952V120DD5S	Note 1	100
Altitude 7,801–10,100 Feet		
A952V040BU3S, A952V040BD3S, A952V060BD3S, A952V060BU4S	50	90
A952V080BU4S, A952V080BD4S, A952V080CU5S	Note 1	50
A952V100CU5S, A952V100CD5S	Note 1	50
A952V120DU5S, A952V120DD5S	Note 1	50

Notes:

1. Not allowed
2. For PolyPro® by Duravent, Z-DENS by Novaflex Group, InnoFlue® by Centrotherm, ECCO™ polypropylene venting system, and Polyflue™ manufactured modular venting systems that are in the approved vent pipe material table, fitting equivalent vent lengths may be different from what is shown in Note 6. Refer to the venting system manufacturer's installation instruction for appropriate venting diameters and equivalent lengths.
3. Minimum vent length for all models: 15' equivalent.
4. DO NOT MIX PIPE DIAMETERS IN THE SAME LENGTH OF PIPE OUTSIDE THE FURNACE CABINET (Except adapters at the top of the furnace). If different inlet and vent pipe sizes are used, the vent pipe must adhere to the maximum length limit shown in the table above (See note 7 below for exception). The inlet pipe can be of a larger diameter, but never smaller than the vent pipe.
5. MAXIMUM PIPE LENGTHS MUST NOT BE EXCEEDED! THE LENGTH SHOWN IS NOT A COMBINED TOTAL, IT IS THE MAXIMUM LENGTH OF EACH (Vent or Inlet air pipes).
6. One SHORT radius 90° elbow is equivalent to 10' of 4" pipe, 10' of 3" pipe, or 8' of 2" pipe. One LONG radius elbow is equivalent to 6' of 4" pipe, 7' of 3" pipe, or 5' of 2" pipe. Two 45° elbows equal one 90° LONG elbow. One MITERED elbow is equivalent to 12' of 3" pipe or 12' of 2" pipe.
7. The termination tee or bend must be included in the total number of elbows. If the BAYAIR30AVENTA or BAYAIR30CNVENT termination kit is used, the equivalent length of pipe is 5 feet. For BAYVENT200B and BAYVENTCN200B the equivalent length is 0 feet.
8. For Canadian applications, venting systems must meet ULC-S636 requirements.
9. The INLET AIR of one pipe systems require the installation of a minimum of one 90° elbow (to prevent dust and debris from falling straight into the furnace).

Horizontal Venting

Note: *Ensure that vent piping is sloped 1/4" per foot and that piping is supported properly to prevent sags and condensate pooling.*

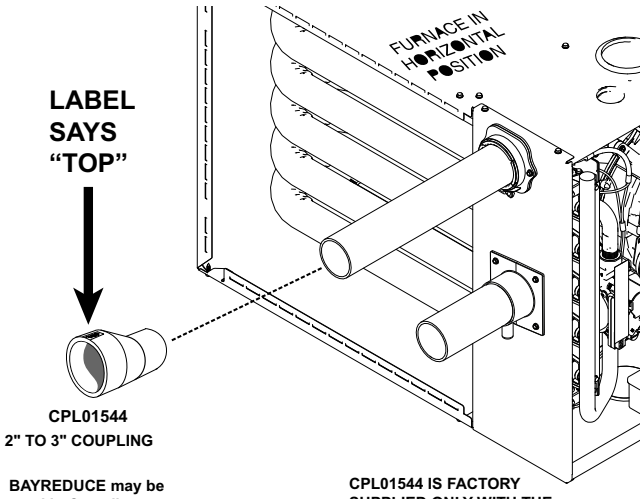
3" Venting requirements

Important: *To determine if your application requires 3" venting, see the Maximum Vent Length Table.*

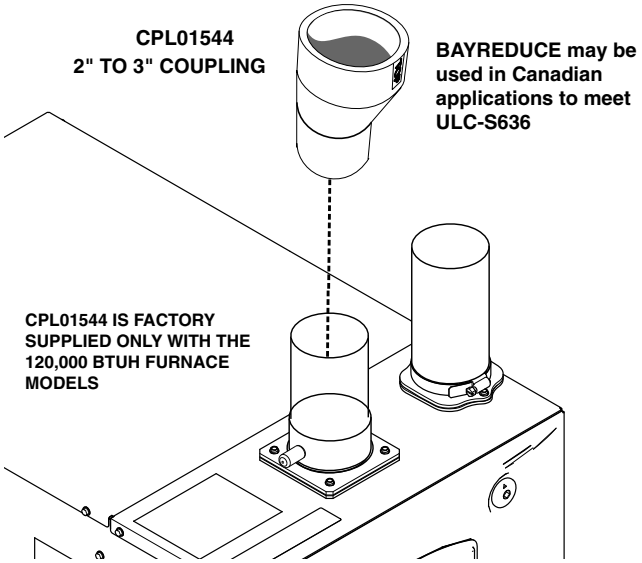
Important: *Horizontal venting application must use the 2" x 3" offset reducing coupling. Vertical venting applications do not require the reducing coupling to be offset.*

When the vent pipe is exposed to temperatures below freezing, e.g., when it passes through unheated spaces, etc., the pipe must be insulated with 1/2 inch (12.7 mm) thick Armaflex-type insulation or equal.
If the space is heated sufficiently to prevent freezing, then the insulation will not be required. If domestic water pipes are not protected from freezing then the space meets the condition of a heated space.

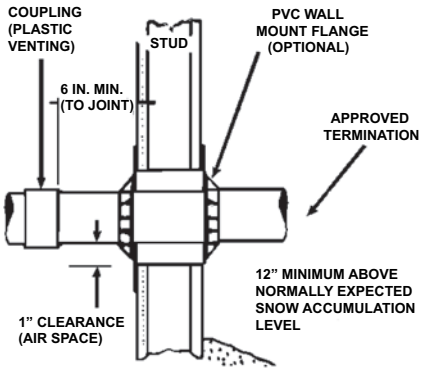
Note: *If your furnace comes with a factory supplied 2" X 3" offset reducing coupling it is used for 3" vent pipe installation. Make sure the marking "TOP" is located on the top side of the pipe in horizontal venting applications. The straight side of the coupling must be on bottom for proper drainage of condensate.*



Note: *For Canadian applications, BAYREDUCE 2" x 3" offset reducing coupling meets ULC-S636 requirements. Make sure the marking "TOP" is located on the top side of the pipe. The straight side of the coupling must be on bottom for proper drainage of condensate in horizontal venting.*

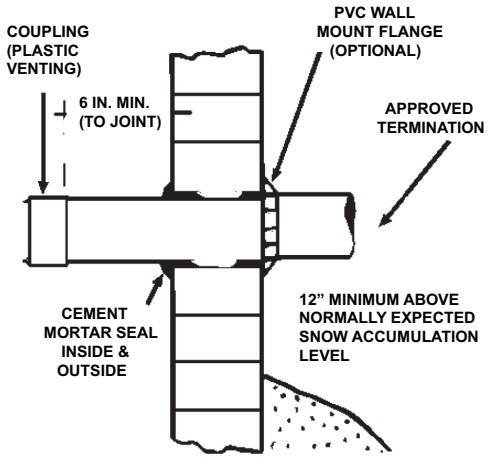


COMBUSTIBLE MATERIAL WALL
A minimum clearance of 1" to combustible materials must be maintained when using single wall stainless steel venting.
Shield material to be a minimum of 24 gauge stainless or aluminized sheet metal. Minimum dimensions are 12"x12". Shield must be fastened to both inside and outside of wall. Use screws or anchor type fasteners suited to the outside or inside wall surfaces.



VENTING THROUGH COMBUSTIBLE WALLS
Pitch - 1/4 Inch Per Foot
CLEARANCE (0" ACCEPTABLE FOR PVC VENT PIPE)
(1" ACCEPTABLE FOR TYPE 29-4C STAINLESS STEEL VENT PIPE)

NONCOMBUSTIBLE MATERIAL WALL
The hole through the wall must be large enough to maintain pitch of vent and properly seal.
Use cement mortar seal on inside and outside of wall.



VENTING THROUGH NON-COMBUSTIBLE WALLS
Pitch - 1/4 Inch Per Foot

Table 22. Horizontal Venting Through Wall

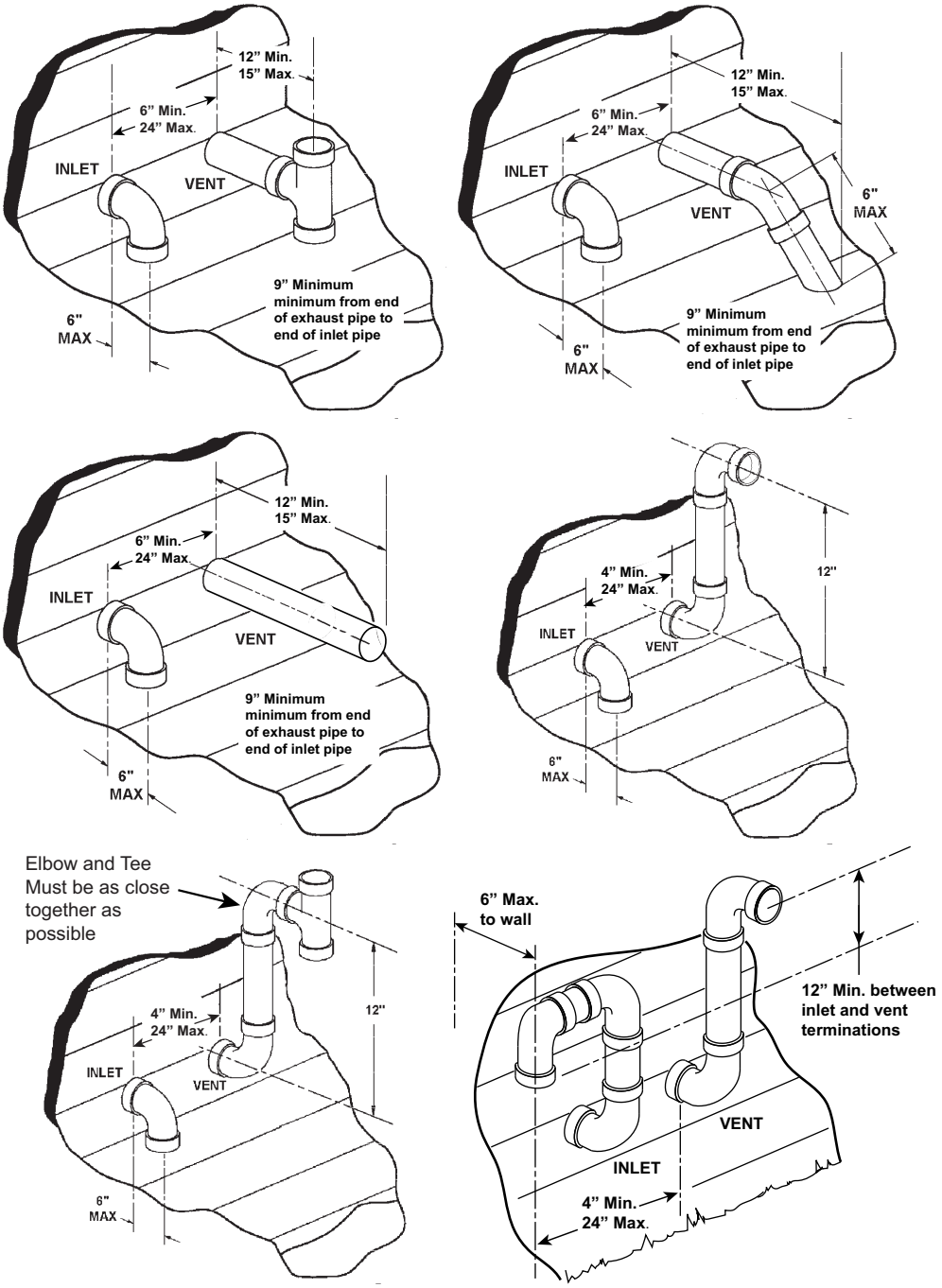
The vent for this appliance shall not terminate

1. *Over public walkways; or*
2. *Near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage; or*
3. *Where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves. or other equipment.*

Possible configurations for two pipe venting systems located in the same pressure zone.

Important: *Maintain 12" minimum clearance above highest anticipated snow level or grade, whichever is greater.*

Note: *All distances are centerline to centerline.*



Horizontal Venting Through Wall with Concentric Vent Kit

These Furnaces may be installed as direct vent (as shipped) or as nondirect vent. Installation must conform to national, state, and local codes.

The BAYVENT200B, BAYVENTCN200B, BAYAIR30AVENTA, and BAYAIR30CNVENT vent & inlet terminals kits must be located at least 12" minimum above normally expected snow accumulation level.

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

Location of the vent/wind terminal should be chosen to meet the requirements for either direct or non-direct vent applications.

PITCH — Venting through the wall must maintain 1/4" per foot pitched upward to insure that condensate drains back to the Furnace.

FLUE GAS DEGRADATION — The moisture content of the flue gas may have a detrimental effect on some building materials. This can be avoided by using the roof or chimney venting option. When wall venting is used on any surface that can be affected by moisture, it is recommended that a corrosion resistant shield (24 inches square) be used behind the vent terminal. This shield can be wood, plastic, sheet metal, etc. Also, silicone caulk all cracks, seams and joints within 3 feet of the vent terminal.

The vent for this appliance shall not terminate

1. *Over public walkways; or*
2. *Near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage; or*
3. *Where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves. or other equipment.*

For Canadian installations, if you used a ULC-S636 approved manufactured modular venting system, a copy of the manufacturer's instructions should remain with the system. The installation instruction can be obtained from the vent termination manufacturer. BAYVENTCN200B and BAYAIR30CNVENT meet ULC-S636 requirements.

Figure 4. BAYVENT200B / BAYVENTCN200B

Note: *For Canadian applications, horizontal vent termination kits must meet ULC-S636.*

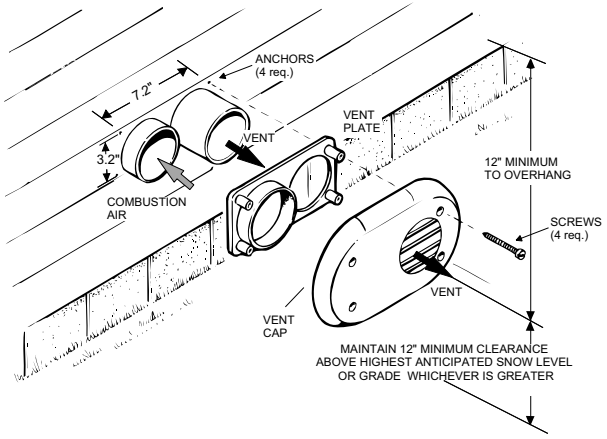
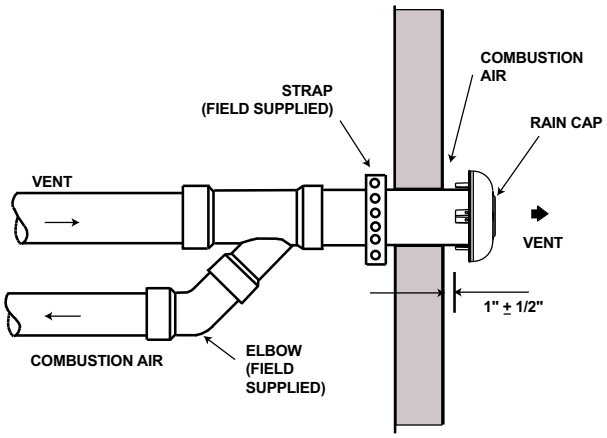
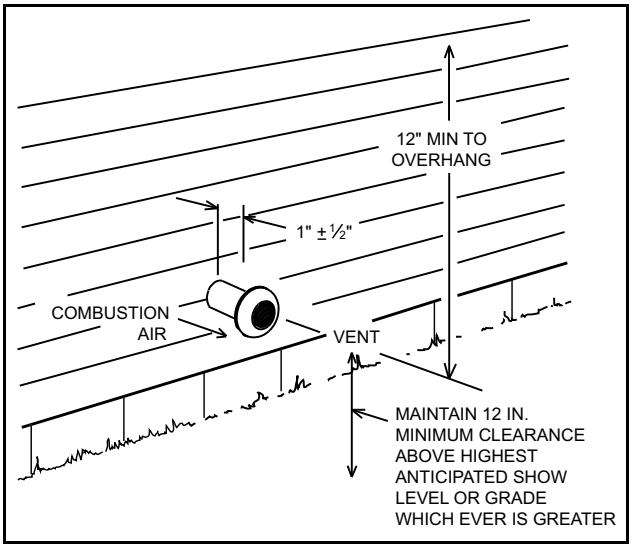


Figure 5. BAYAIR30AVENTA / BAYAIR30CNVENT(Sidewall)





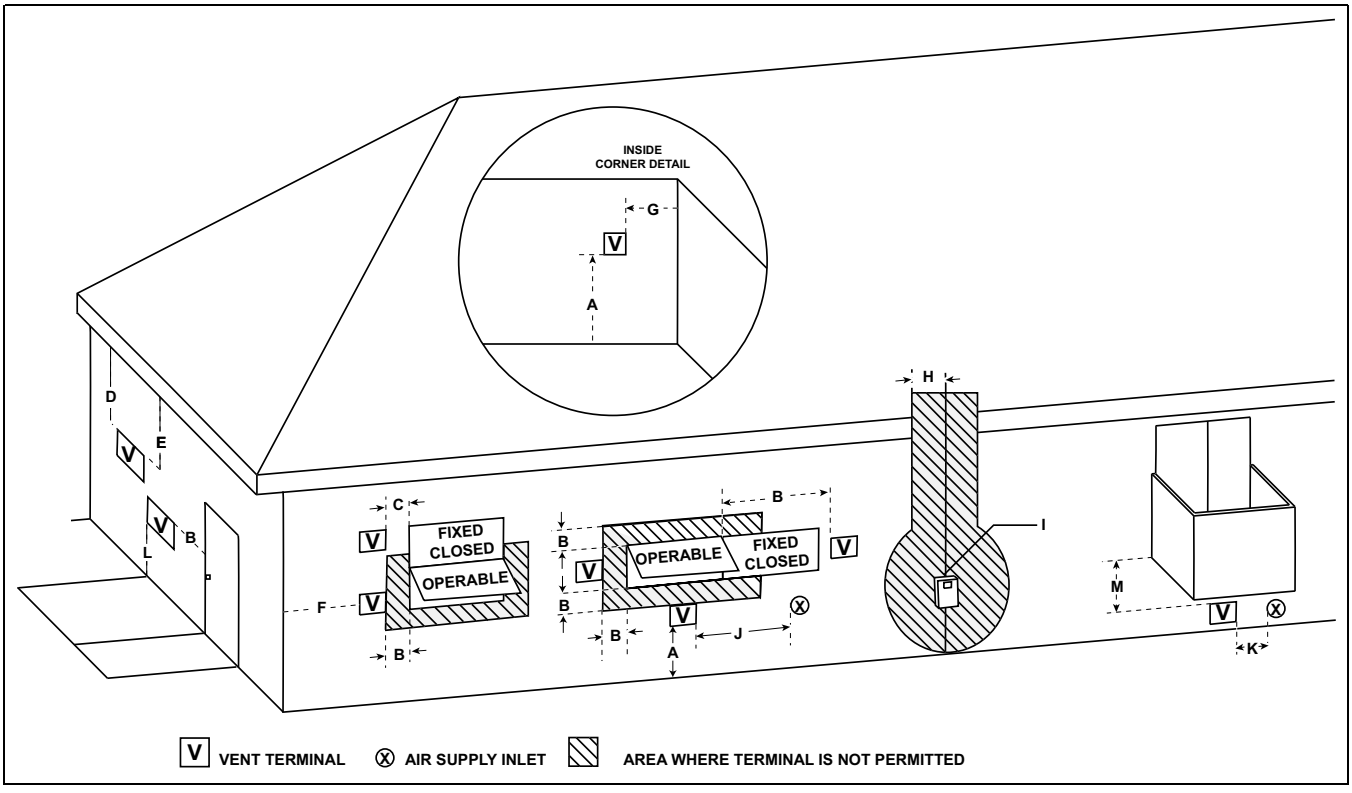
Important: *The Commonwealth of Massachusetts requires compliance with regulation 248 CMR 4.00 and 5.00 for installation of through – the – wall vented gas appliances as follows:*

For all side wall horizontally vented gas fueled equipment installed in every dwelling, building or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the side wall exhaust vent termination is less than seven (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied:

1. INSTALLATION OF CARBON MONOXIDE DETECTORS. At the time of installation of the side wall horizontal vented gas fueled equipment, the installing plumber or gasfitter shall observe that a hard wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter shall observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building or structure served by the side wall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard wired carbon monoxide detectors.
   a. In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.
   b. In the event that the requirements of this subdivision can not be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.
2. APPROVED CARBON MONOXIDE DETECTORS. Each carbon monoxide detector as required in accordance with the above provisions shall comply with NFPA 720 and be ANSI/UL 2034 listed and IAS certified.
3. SIGNAGE. A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) inch in size, "GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS".
4. INSPECTION. The state or local gas inspector of the side wall horizontally vented gas fueled equipment shall not approve the installation unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08(2) (a)1 through 4.

This appliance requires a special venting system. If BAYAIR30AVENTA or BAYVENT200B are used, a copy of the installation instructions for the kit shall remain with the appliance or equipment at the completion of installation. The venting system installation instructions can be obtained from the manufacturer by writing to the following address:
Trane and American Standard
6200 Troup Highway
Tyler, TX 75707
Attention: Manager of Field Operations Excellence

Horizontal Vent Clearances



Non-Direct Vent Termination Clearances			
		Canadian Installations	US Installations
A=	Clearance above grade, veranda, porch, deck, or balcony	12 inches (30 cm)	12 inches (30 cm)
B=	Clearance to window or door that may be opened	12 inches (30 cm) for appliances > 10,000 BTUH (3 kw) and ≤ 100,000 BTUH (30 kw), 36 inches (91 cm) for appliances > 100,000 BTUH (30 kw)	4 feet (1.2m) below or to the side of opening; 1 foot (0.3m) above opening
C=	Clearance to permanently closed window	*	*
D=	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	*	*
E=	Clearance to unventilated soffit	*	*
F=	Clearance to outside corner	*	*
G=	Clearance to inside corner	*	*
H=	Clearance to each side of center line extended above meter/regulator assembly	3 feet (91 cm) with a height 15 feet (4.5 m) above the meter/regulator assembly	*
I=	Clearance to service regulator vent outlet	3 feet (91 cm)	*
J=	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	12 inches (30 cm) for appliances > 10,000 BTUH (3 kw) and ≤ 100,000 BTUH (30 kw), 36 inches (91 cm) for appliances > 100,000 BTUH (30 kw)	4 feet (1.2 m) below or to side of opening; 1 foot (300 m) above opening
K=	Clearance to a mechanical air supply inlet	6 feet (1.83m)	3 feet (91 cm) above if within 10 feet (3m) horizontally
L=	Clearance above a paved sidewalk or paved driveway located on public property	7 feet (2.13 m) and not located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard	7 feet (2.13 m) and not located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard
M=	Clearance under veranda, porch, deck, or balcony	12 inches (30 cm) if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor	12 inches (30 cm) where the area beneath the veranda, porch, deck, or balcony is open on not less than two sides. The vent terminal is prohibited in this location where only one side is open

Notes:

1. The Canadian venting installations must be in accordance with local codes or in the absence of local codes with the current CSA B149.1 Natural Gas and Propane Installation Code.
2. The US venting installations must be in accordance with local codes or in the absence of local codes with the current ANSI Z223.1/NFPA 54 National Fuel Gas Code.

* Clearance in accordance with local installation codes and the requirements of the gas supplier.

Direct Vent Termination Clearances			
		Canadian Installations	US Installations
A=	Clearance above grade, veranda, porch, deck, or balcony	12 inches (30 cm)	12 inches (30 cm)
B=	Clearance to window or door that may be opened	12 inches (30 cm) for appliances > 10,000 BTUH (3 kw) and ≤ 100,000 BTUH (30 kw), 36 inches (91 cm) for appliances > 100,000 BTUH (30 kw)	9 inches (23 cm) for appliances > 10,000 BTUH (3 kw) and =/< 50,000 BTUH (15 kw), 12 inches (30 cm) for appliances > 50,000 BTUH (15 kw)
C=	Clearance to permanently closed window	*	*
D=	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	*	*
E=	Clearance to unventilated soffit	*	*
F=	Clearance to outside corner	*	*
G=	Clearance to inside corner	*	*
H=	Clearance to each side of center line extended above meter/regulator assembly	3 feet (91 cm) with a height 15 feet (4.5 m) above the meter/regulator assembly	*
I=	Clearance to service regulator vent outlet	3 feet (91 cm)	*
J=	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	12 inches (30 cm) for appliances > 10,000 BTUH (3 kw) and =/< 100,000 BTUH (30 kw), 36 inches (91 cm) for appliances > 100,000 BTUH (30 kw)	9 inches (23 cm) for appliances > 10,000 BTUH (3 kw) and ≤ 50,000 BTUH (15 kw); 12 inches (30 cm) for appliances > 50,000 BTUH (15 kw)
K=	Clearance to a mechanical air supply inlet	6 feet (1.83m)	3 feet (91 cm) above if within 10 feet (3m) horizontally
L=	Clearance above a paved sidewalk or paved driveway located on public property	7 feet (2.13 m) and not located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard	7 feet (2.13 m) and not located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard
M=	Clearance under veranda, porch, deck, or balcony	12 inches (30 cm) if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor	12 inches (30 cm) where the area beneath the veranda, porch, deck, or balcony is open on not less than two sides. The vent terminal is prohibited in this location where only one side is open

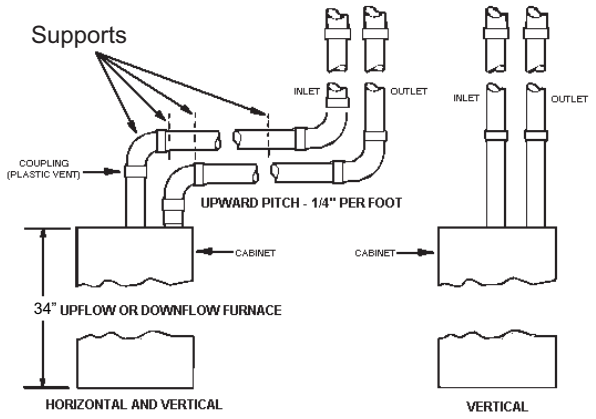
Notes:

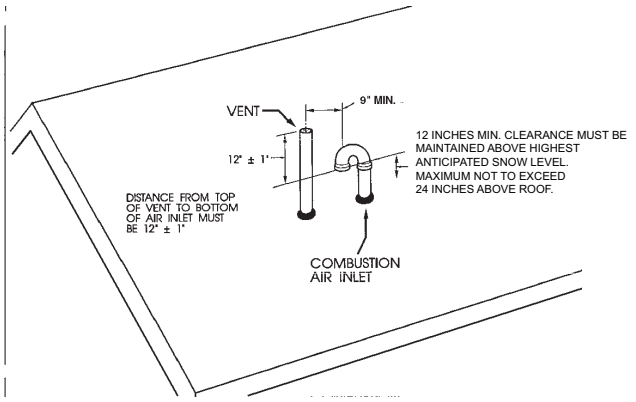
1. The Canadian venting installations must be in accordance with local codes or in the absence of local codes with the current CSA B149.1 Natural Gas and Propane Installation Code.
2. The US venting installations must be in accordance with local codes or in the absence of local codes with the current ANSI Z223.1/NFPA 54 National Fuel Gas Code.

* Clearance in accordance with local installation codes and the requirements of the gas supplier.

Venting Through The Roof

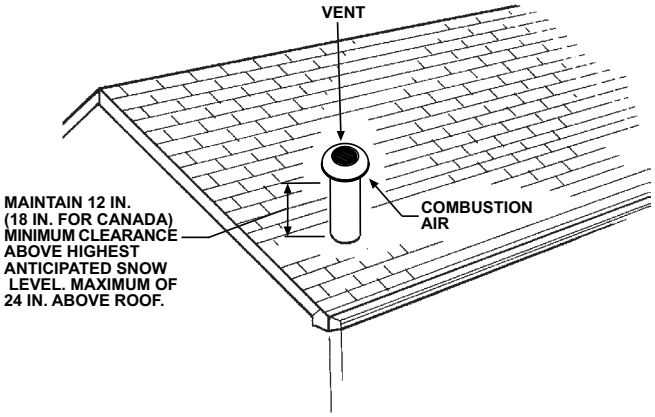
Support Horizontal pipe every 3’0” with the first support as close to the furnace as possible. Induced draft blower, housing, and furnace must not support the weight of the flue pipe.



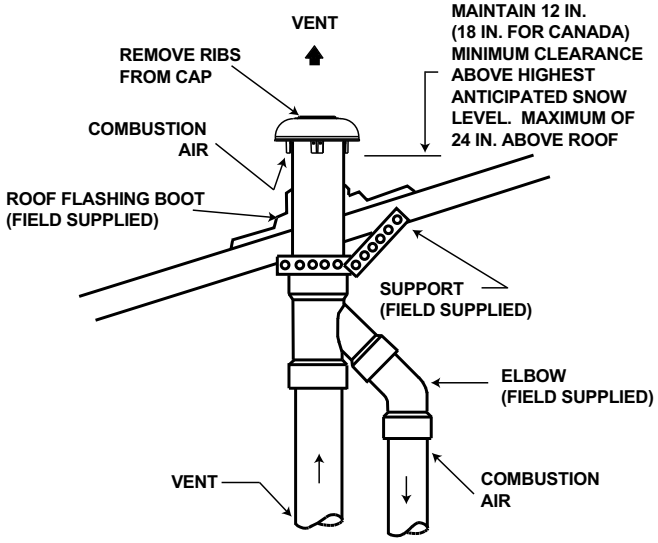


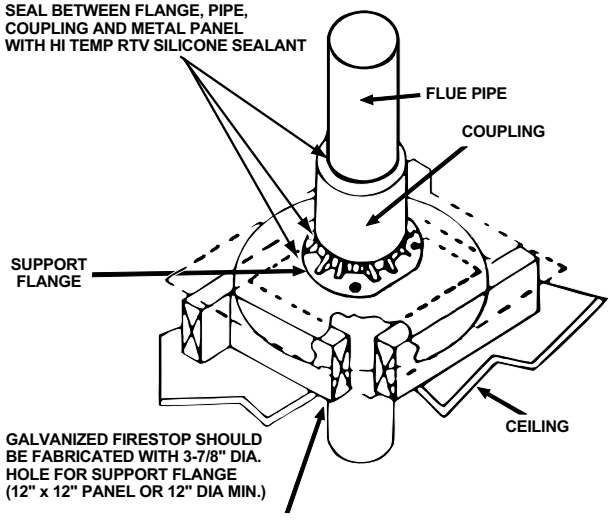
Note: *All measurements are from centerline to centerline.*

BAYAIR30AVENTA / BAYAIR30CNVENT



BAYAIR30AVENTA / BAYAIR30CNVENT





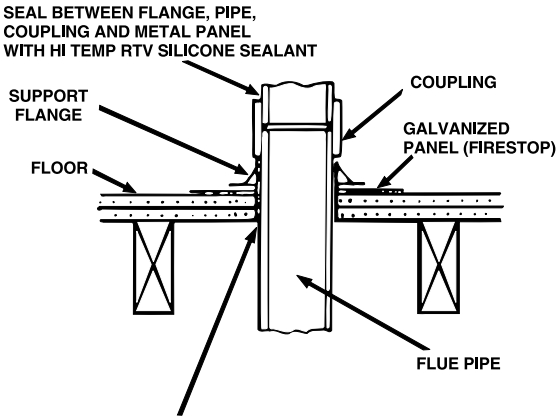
CLEARANCE - 0" ACCEPTABLE FOR PVC VENT PIPE
1" ACCEPTABLE FOR TYPE 29-4C STAINLESS STEEL VENT PIPE

VENTING THROUGH CEILING

When penetrating roof with PVC vent pipe, a flexible flashing may be used for a weather tight seal. Lubricate flexible seal on flashing before PVC pipe is pushed through the seal. (Field Supplied)

Note: *No vent cap is the preferred method for vertical vent termination in extremely cold climates.*

Note: *In extreme climate conditions, insulate the exposed pipe above the roof line with Armaflex type insulation.*



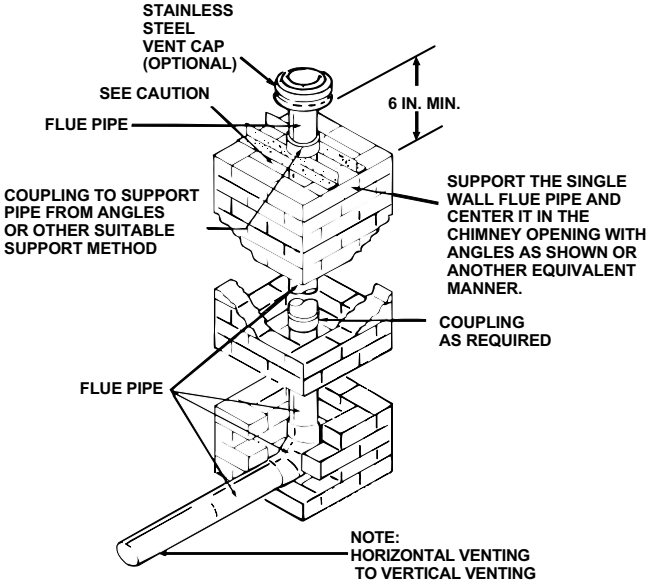
VENTING THROUGH FLOOR

Venting Through an UNUSED Chimney
Venting Routed Through a Masonry Chimney

Important: *Refer to Section 12.6.8 of NFPA 54 / ANSI 223.1 2012 when routing vent piping through a chimney.*

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.*

PVC PLASTIC VENTING THROUGH UNUSED CHIMNEY



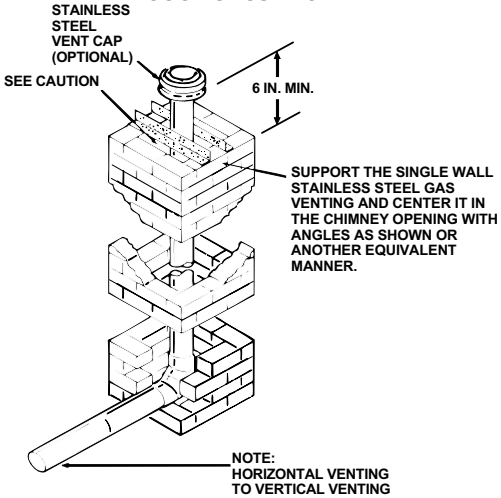
Venting Through an UNUSED Chimney

Important: *Refer to Section 12.6.8 of NFPA 54 / ANSI 223.1 2012 when routing vent piping through a chimney.*

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.*

VENT FITTING MATERIAL – STAINLESS STEEL
Gas and liquid tight single wall metal vent fitting, designed for resistance to corrosive flue condensate such as Type 29-4C MUST be used throughout.
These fittings and fitting accessories are to be field supplied.
DIRECTION OF STAINLESS STEEL FITTING
All stainless steel fitting must be installed with male end towards the Furnace.
All horizontal stainless steel sections must be positioned with the seam on top.
All long horizontal sections must be supported to prevent sagging.
All pipe joints must be fastened and sealed to prevent escape of combustion products into the building.

TYPE 29-4C STAINLESS STEEL VENTING THROUGH UNUSED CHIMNEY

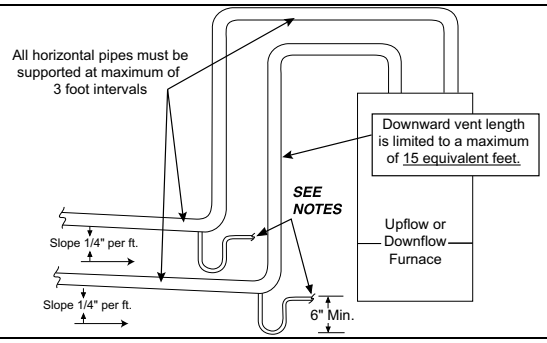


Downward Venting

Furnace may be in vertical or horizontal configuration.

Notes:

1. *Condensate trap for vent pipe must be a minimum of 6 inches in height.*
2. *Condensate trap for vent and inlet pipe must be connected into a condensate drain pump; an open or vented drain; or it can be connected to the outlet hose of the Furnace condensate trap. Outdoor draining of the Furnace and coil condensate is permissible if allowed by local codes.*
3. *The condensate trap should be primed at initial start up prior to heating season operation.*



Caution should be taken to prevent drains from freezing or causing slippery conditions that could lead to personal injury. Excessive draining of condensate may cause saturated ground conditions that may result in damage to plants.

Air for Combustion and Ventilation

Adequate flow of combustion and ventilating air must not be obstructed from reaching the Furnace. Air openings provided in the Furnace casing must be kept free of obstructions which restrict the flow of air. Airflow restrictions affect the efficiency and safe operation of the Furnace. Keep this in mind should you choose to remodel or change the area which contains your Furnace. Furnaces must have a free flow of air for proper performance.

Provisions for combustion and ventilation air shall be made in accordance with "latest edition" of Section 9.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1 / NFPA 54, or Sections 8.2, 8.3 or 8.4 of CSA B149.1 Installation Codes, and applicable provisions of the local building codes. Special conditions created by mechanical exhausting of air and fireplaces must be considered to avoid unsatisfactory Furnace operation.

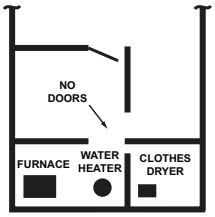
Furnace location may be in an **unconfined** space or a **confined** space.

Unconfined space are installations with 50 cu. ft. or more per 1000 BTU/hr input from all equipment installed. Unconfined spaces are defined in the table and illustration for various furnace sizes. These spaces may have adequate air by infiltration to provide air for combustion, ventilation, and dilution of flue gases. Buildings with tight construction (for example, weather stripping, heavily insulated, caulked, vapor barrier, etc.), may need additional air provided as described for confined space.

Minimum Area in Square Feet for Unconfined Space Installations	
Furnace Maximum BTUH Input Rating	With 8 Ft. Ceiling, Minimum Area in Square Feet of Unconfined Space
40,000	250
60,000	375
80,000	500
100,000	625
120,000	750

UNCONFINED

50 CU. FT. OR MORE PER 1000 BTU/HR INPUT ALL EQUIP. INSTALLED



Confined spaces are installations with less than 50 cu. ft. of space per 1000 BTU/ hr input from all equipment installed. Confined spaces are defined in the table and illustration for various furnace sizes. Air for combustion and ventilation requirements can be supplied from inside the building.

The following types of installations will **require** use of OUTDOOR AIR for combustion, due to chemical exposures:

- Commercial buildings
- Buildings with indoor pools
- Furnaces installed in commercial laundry rooms
- Furnaces installed in hobby or craft rooms
- Furnaces installed near chemical storage areas

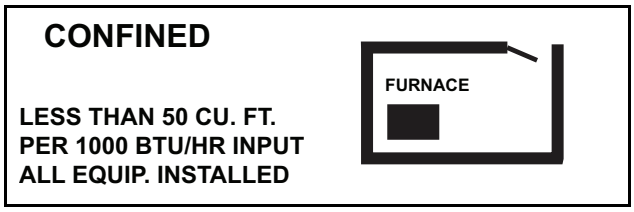
Exposure to the following substances in the combustion air supply will also require OUTDOOR AIR for combustion:

- Permanent wave solutions
- Chlorinated waxes and cleaners
- Chlorine based swimming pool chemicals
- Water softening chemicals
- Deicing salts or chemicals
- Carbon Tetrachloride
- Halogen type refrigerants
- Cleaning solvents (such as perchloroethylene)
- Printing inks, paint removers, varnish, etc.
- Hydrochloric acid
- Cements and glues

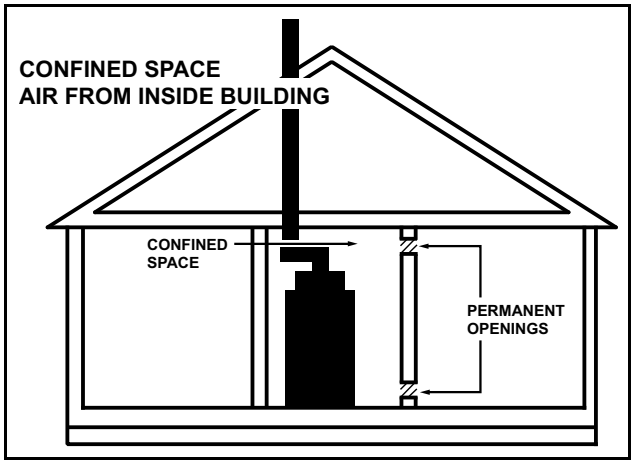
- Antistatic fabric softeners for clothes dryers
- Masonry acid washing material

Note: *Extended warranties are not available in some instances. Extended warranty does not cover repairs to equipment installed in establishments with corrosive atmospheres, including but not limited to, dry cleaners, beauty shops, and printing facilities.*

Minimum Free Area in Square Inches Each Opening (Furnace Only) in a Confined Space			
Furnace Max BTUH.Input Rtg.	Air From Inside	Air From Outside	
		Vertical Duct (a)	Horizontal Duct (b)
40,000	100	10	20
60,000	100	15	30
80,000	100	20	40
100,000	100	25	50
120,000	120	30	60
140,000	140	35	70
(a) 1 Square inch per 4000 BTU/hr Vertical Duct. (b) 1 Square inch per 2000 BTU/hr Horizontal Duct.			

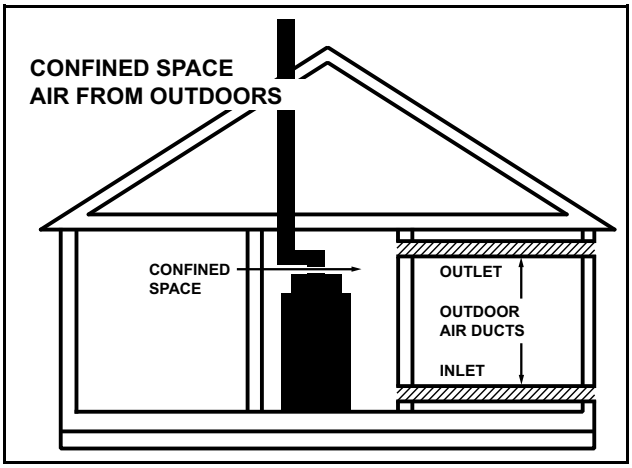


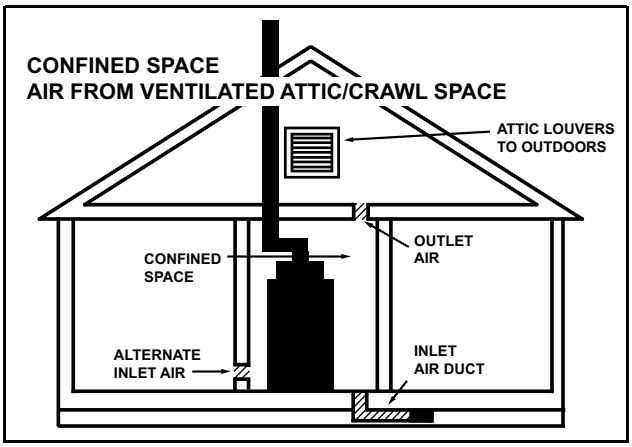
All air from inside the building The confined space shall be provided with two permanent openings communicating directly with an additional room(s) of sufficient volume so that the combined volume of all spaces meets the criteria for an unconfined space. The total input of all gas utilization equipment installed in the combined space shall be considered in making this determination. Refer to the Minimum Free Area in square inches for confined spaces table, for minimum open areas required.

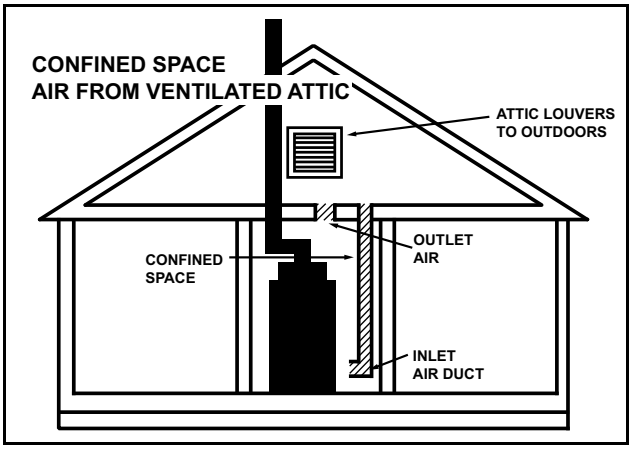


All air from outdoors The confined space shall be provided with two permanent openings, one commencing within 12 inches of the top and one commencing within 12 inches of the bottom of the enclosure.

The openings shall communicate directly, or by ducts, with the outdoors or spaces (crawl or attic) that freely communicate with the outdoors. Refer to the Minimum Free Area in square inches for confined spaces table, for minimum open areas required.







Duct Connections

Air duct systems should be installed in accordance with standards for air conditioning systems, National Fire Protection Association Pamphlet No. 90. They should be sized in accordance with ACCA Manual D or whichever is applicable. Check on controls to make certain they are correct for the electrical supply.

Central furnaces, when used in connection with cooling units, shall be installed in parallel or on the upstream side of the cooling units to avoid condensation in the heating element, unless the furnace has been specifically approved for downstream installation. With a parallel flow arrangement, the dampers or other means used to control flow of air shall be adequate to prevent chilled air from entering the furnace, and if manually operated, must be equipped with means to prevent operation of either unit unless the damper is in full heat or cool position.

Flexible connections of nonflammable material may be used for return air and discharge connections to reduce the transmission of vibration. Though these units have been specifically designed for quiet, vibration free operation, air ducts can act as sounding boards and could, if poorly installed, amplify the slightest vibration to the annoyance level.

When the furnace is located in a utility room adjacent to the living area, the system should be carefully designed with returns which minimize noise transmission through the return air grille. Although these winter air conditioners are designed with large blowers operating at moderate speeds, any blower moving a high volume of air will produce audible noise which could be objectionable when the unit is located very close to a living area. It is often advisable to route the return air ducts under the floor or through the attic. Such design permits the installation of air return remote from the living area (i.e. central hall).

When the furnace is installed so that the supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall also be handled by a duct(s) sealed to the furnace and terminating outside the space containing the furnace.

For furnaces not equipped with a cooling coil, it is recommended that the outlet duct be provided with a removable access panel. The opening shall be accessible when the furnace is installed and shall be of such a size that the heat exchanger can be viewed for possible openings using light assistance or a probe can be inserted for sampling the air stream. The removable cover must be sealed to prevent air leaks.

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.

Do Not install return air through the back of the Furnace cabinet.

Do Not install return air through the side of the furnace cabinet on horizontal applications without following the guidelines in the .

Carbon monoxide, fire or smoke can cause serious bodily injury, death, and/or property damage.

A variety of potential sources of carbon monoxide can be found in a building or dwelling such as gas-fired clothes dryers, gas cooking stoves, water heaters, furnaces and fireplaces. The U.S. Consumer Product Safety Commission recommends that users of gas-burning appliances install carbon monoxide detectors as well as fire and smoke detectors per the manufactures installation instructions to help alert dwelling occupants of the presence of fire, smoke or unsafe levels of carbon monoxide. These devices should be listed by Underwriters Laboratories, Inc. *Standards for Single and Multiple Station Carbon Monoxide Alarms, UL 2034* or CSA International Standard, *Residential Carbon Monoxide Alarming Devices*, CSA 6.19.

Note: *The manufacturer of your Furnace DOES NOT test any detectors and makes no representations regarding any brand or type of detector.*

Note: *Seal per local codes*

Supply Duct Connections

⚠ CAUTION

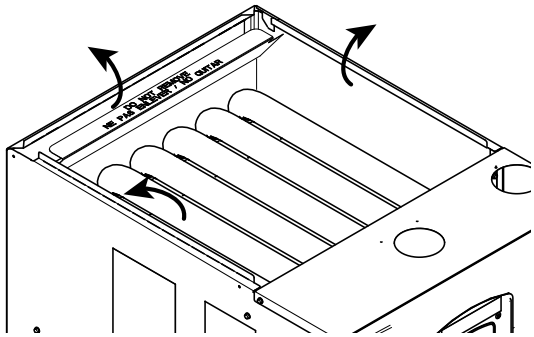
COIL REQUIREMENT!!

Failure to follow this Caution could result in property damage or personal injury.

4GXC* and 4MXC* coils installed on upflow furnaces in vertical, horizontal left, or horizontal right orientations without a factory installed metal drain pan shield must use a MAY*FERCOLKITAA kit. Coils installed on upflow furnaces must have drain pans that are suitable for 400° F (205° C) or have a metal drain pan shield. Downflow furnaces do not require a metal drain pan shield or the use of the MAY*FERCOLKITAA kit.

Note: *The "Coil Requirement" caution is applicable to:*
Upflow furnace with coil,
Furnace in horizontal left with coil and
Furnace in horizontal right with "A" coil

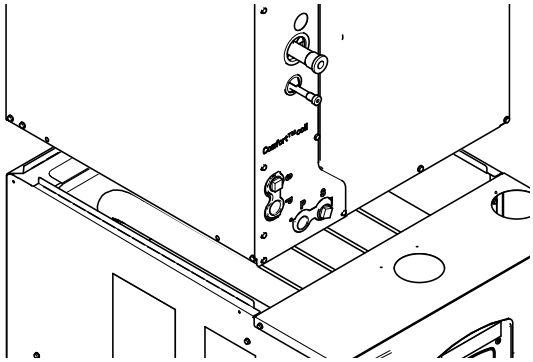
Upflow Furnace with Coil



Refer to Step 1

Upflow Furnace with Coil

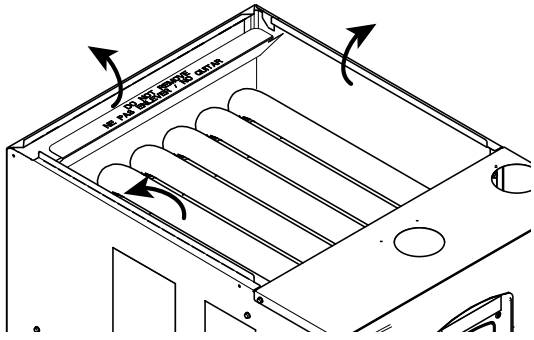
Note: *There are no longer guide holes located on the furnace flange.*



Refer to Step 2, Step 3, Step 4

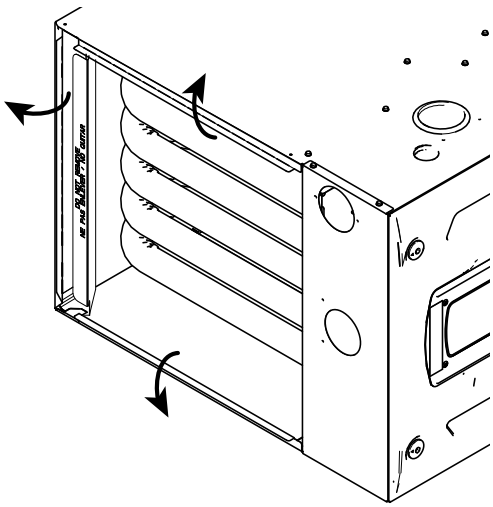
Upflow Furnace without Coil

Caution: The first 6–12 inches of the supply duct must be insulated to protect from high temperatures.



Refer to Step 1, Step 4, Step 5

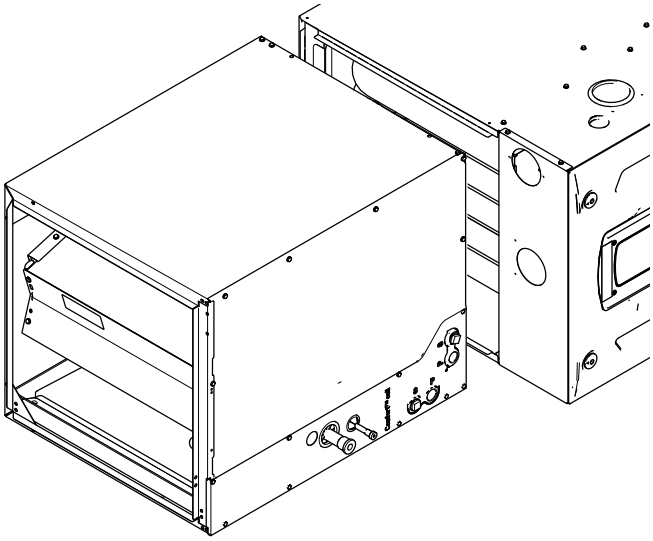
Furnace in Horizontal Left with Coil



Refer to Step 1

Furnace in Horizontal Left with Coil

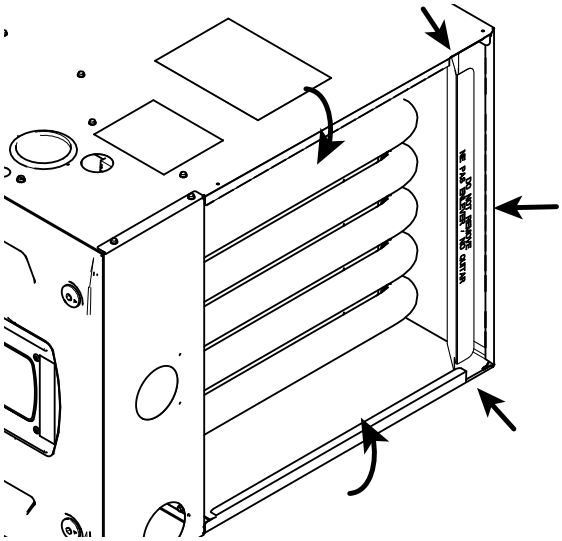
Note: *There are no longer guide holes located on the furnace flange.*



Refer to Step 6, Step 3, Step 4

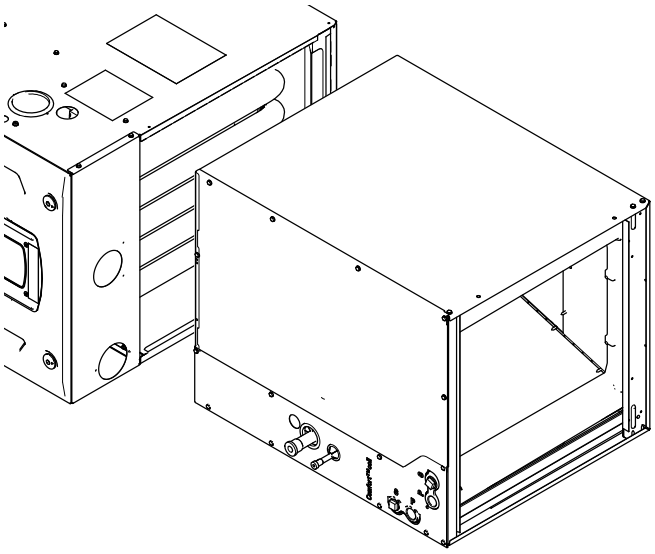
Furnace in Horizontal Right with "A" Coil

Note: *Flat or dedicated horizontal coils may require flanges to be bent upward.*



Refer to Step 7, Step 8, Step 9, Step 6

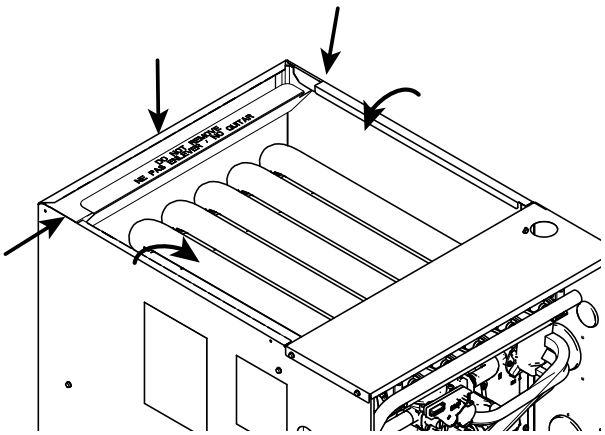
Furnace in Horizontal Right with "A" Coil



Refer to Step 10, Step 4

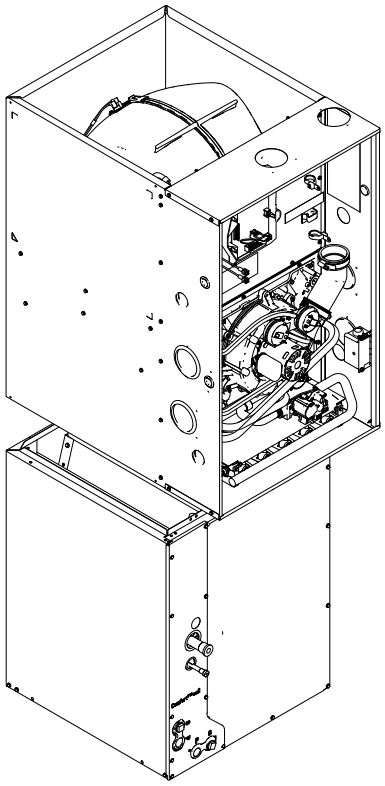
Downflow Furnace with Coil

Note: *4GXC* or 4MXC* coils installed on a downflow furnace do not require a metal drain pan shield or the use of the MAY*FERCOLKITAA kit.*



Refer to Step 7, Step 8, Step 9, Step 6

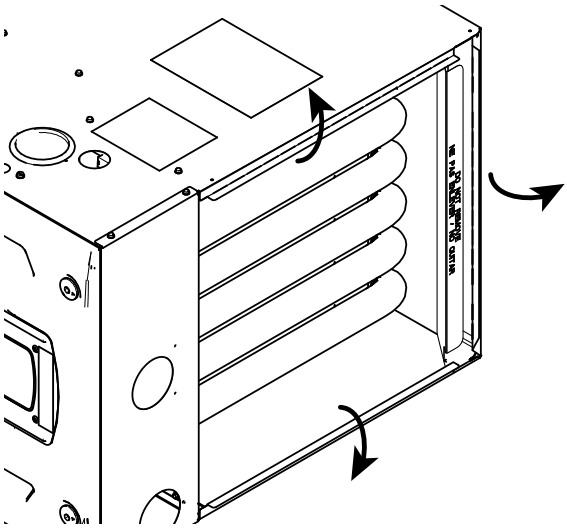
Downflow Furnace with Coil

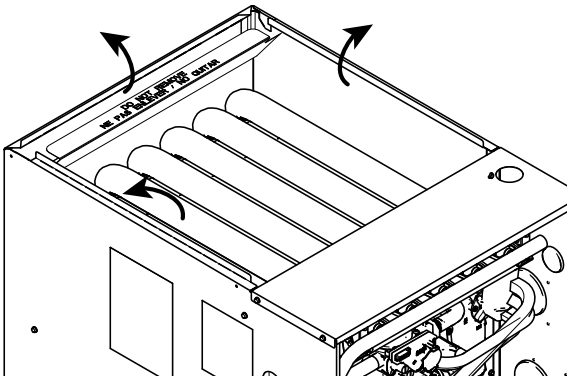


Refer to Step 11, Step 4

Horizontal Right and Downflow Furnace — no Coil

Important: *A BAYBASE is required when installing the furnace on a combustible floor.*





Refer to Step 1, Step 12, Step 4

Installation Instructions

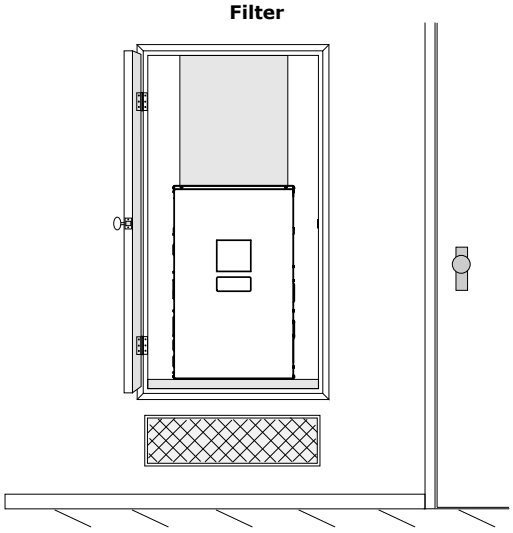
1. Bend furnace flanges up.
2. Set the coil on top of the furnace.
3. Screw through the coil cabinet into the furnace flange. Guide holes are located on the coil.
4. Seal per local codes and requirements.
5. Insulate the first 6–12 inches of the supply duct.
6. Support the furnace and coil independently.
7. Cut the back flange along perforation.
8. Starting at the back of the furnace, cut the side flanges along perforations until past the end of the heat shield to avoid interference when bending.
9. Bend furnace side flanges down.
10. Match the coil up flush to the back of the furnace.
11. Set the furnace on top of the coil so that it is flush with the back of the furnace.
12. Attach ducting.

Return Duct Connections

Return Ducting General Guidelines

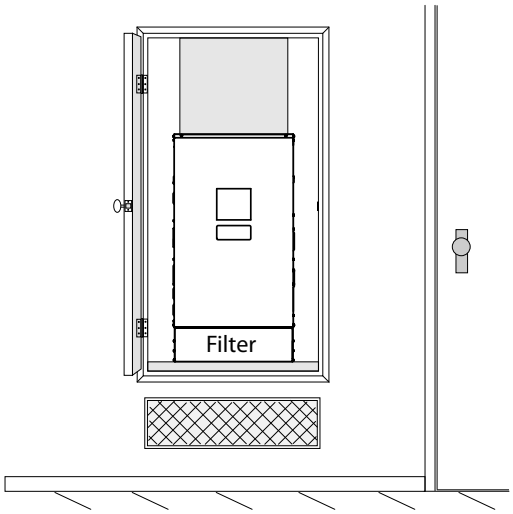
- Back returns are not allowed on any S-Series Furnaces
- Side returns are not allowed on downflow S-Series Furnaces
- Mounting flanges must be located on ducting
- Shoot screws through the mount flanges into the furnace cabinet
- Always seal per local codes and requirements
- Furnace, coil, and ducting must be supported separately
- An external overflow drain pan must be installed in all applications over a finished ceiling to prevent property damage

Upflow Furnace with Bottom Return in Closet with Remote Filter



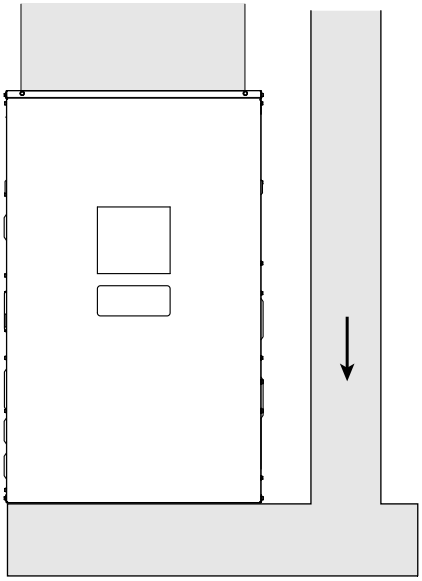
Refer to Step 1, Step 2, Step3 , Step 4

Upflow Furnace with Bottom Return in Closet with Filter Box



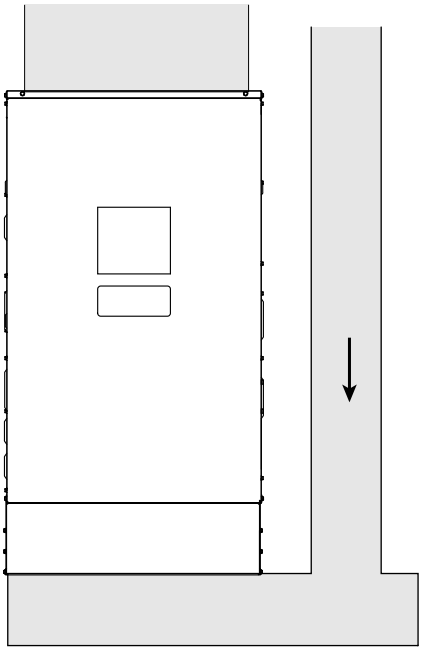
Refer to Step 1, Step 5, Step 6, Step 4

Upflow Furnace with Bottom Return Mounted on a Ducted Pedestal



Refer to Step 1, Step 7, Step 8, Step 4

Upflow Furnace with Bottom Return Mounted on a Ducted Pedestal with Filter Box



Refer to Step 1, Step 9, Step 4

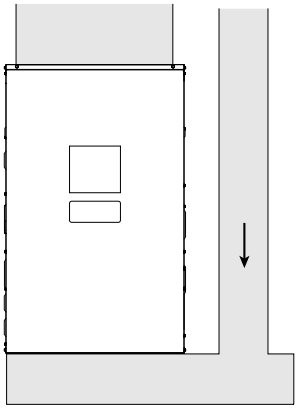
Upflow Furnace with Bottom and Side Returns Mounted on a Ducted Pedestal with Side Return and Filter Box

Important: *Make sure the condensate and thermostat wiring holes are sealed on the cabinet side with the side return. The plugs and grommets may need to be changed with those on the opposite side of the cabinet.*

Important: *Make sure not to cut the cabinet in the "No Cut" area.*

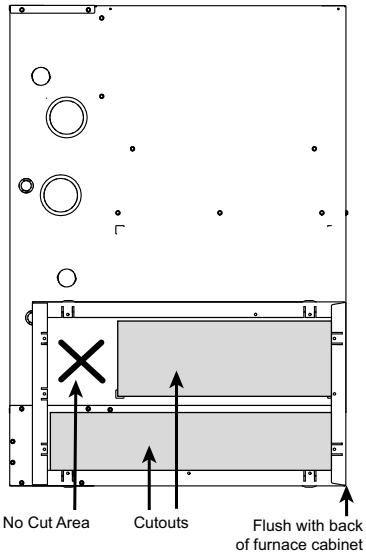
Note: *Use Optional BAYLIFT kit to lift furnace. Follow kit instructions.*

Note: *The furnace bottom pedestal must be a minimum of 6" in height.*

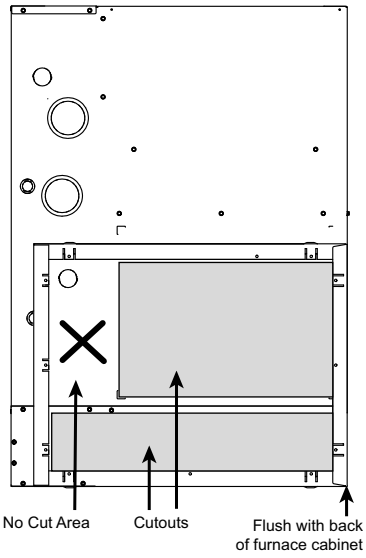


Refer to Step 1, Step 10, Step 11, Step 12, Step 13, Step 14, Step 15, Step 4

17.5" Filter Cabinet with BAYLIFT Kit



21" Filter Cabinet with BAYLIFT Kit



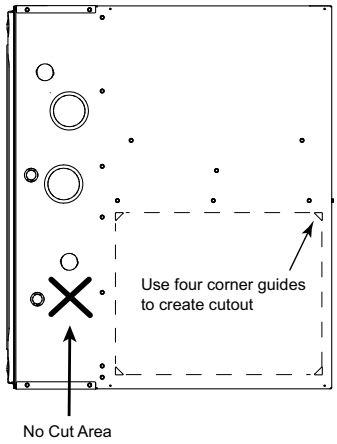
Upflow Furnace with Side Return

Important: *Make sure the condensate and thermostat wiring holes are sealed on the cabinet side with the side return. The plugs and grommets may need to be changes with those on the opposite side of the cabinet.*

Important: *Make sure not to cut the cabinet in the "No Cut" area.*

Note: *Return air on right side with the condensate on the left or return air on left with the condensate on the right do not require a transition.*

Note: *If using a filter box, use a transition, if possible, to attach the filter box to the furnace cabinet.*



Refer to Step 16, Step 17, Step 18, Step 19

Upflow Furnace with Two Side Returns

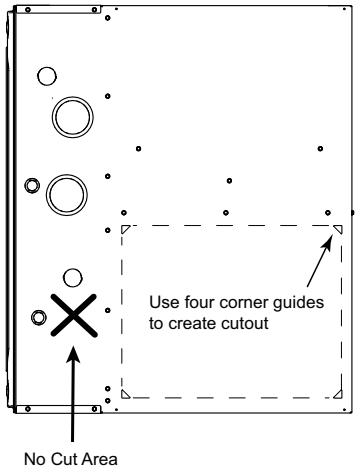
Important: *One of the sides must have a transition to allow the condensate and thermostat wiring to exit the cabinet.*

Important: *If a transition is not a viable option, a hole may be drilled in the bottom of the cabinet to allow the condensate to exit. Also, a hole will need to be drilled in the side of the cabinet for the thermostat wiring to exit.*

Important: *Make sure not to cut the cabinet in the "No Cut" area.*

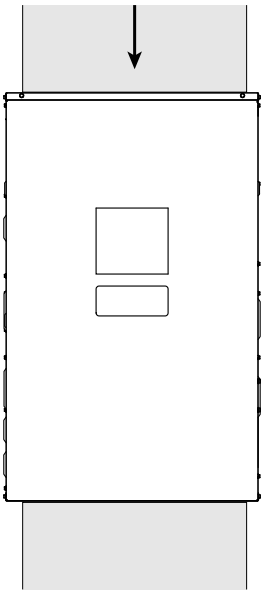
Note: *If using one transition, the condensate and thermostat wiring will exit on the transition side.*

Note: *If using a filter boxes, use transitions, if possible, to attach the filter boxes to the furnace cabinet. If transitions are not used, condensate may exit through the bottom of the furnace.*



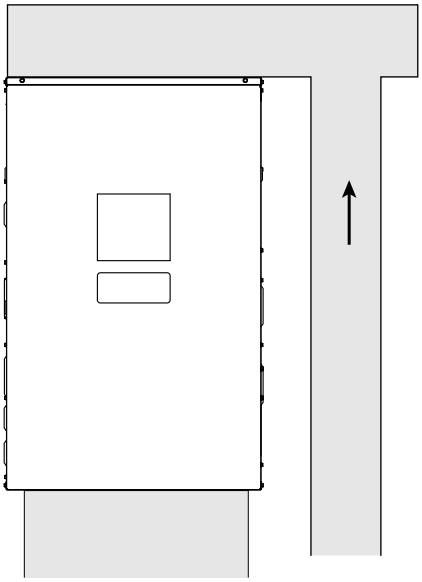
Refer to Step 16, Step 17, Step 18, Step 19

Downflow Furnace with Top Return



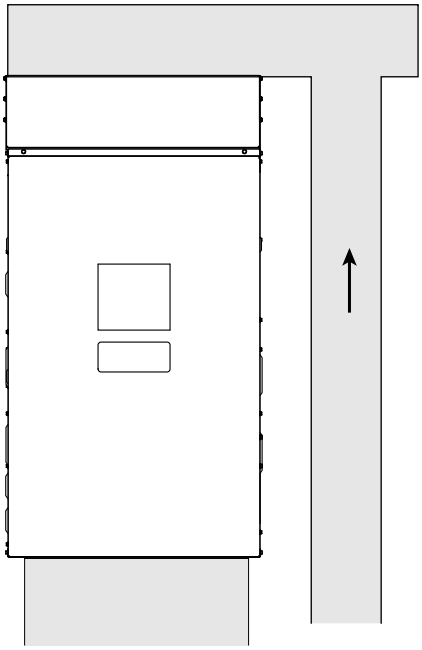
Refer to Step 20, Step 21, Step 3, Step 4

Downflow Furnace with Top Return and Plenum



Refer to Step 20, Step 22, Step 3, Step 4

Downflow Furnace with Top Return and Plenum with Filter Box



Refer to Step 20, Step 23, Step 24, Step 4

Installation Instructions

1. Remove the bottom plate.
2. Set the furnace on the base inside closet.
3. Install remote filter.
4. Seal per local codes and requirements.
5. Set the furnace on the filter box inside closet.
6. Must have grill present for air.
7. Set the furnace on the ducted pedestal. The ducted pedestal will use ducted air from a remote location.
8. Install filter at a remote location.
9. Set the furnace on the filter box. The ducted pedestal will use ducted air from a remote location.
10. Create ducting and set the furnace in place.
11. Match the filter cabinet flush to the back and bottom sides of the furnace cabinet and secure in place with screws.
12. Mark the two areas to be cut out for the return air.
13. Cut out the two sections of the cabinet and BAYLIFT kit to be removed.
14. Attach ducting to the filter box.
15. The ducted pedestal will use ducted air from a remote location.
16. Using guides, remove the cutout for the side return.
17. Create ducting and set the furnace in place. Use screws to attach ducting to the furnace cabinet.
18. Seal bottom panel per local codes and requirements.
19. Seal all other panels per local codes and requirements.
20. Remove the top plate.
21. Attach the ducting to the top of the furnace.
22. Attach the plenum ducting to the top of the furnace.
23. Attach the filter box to the top of the furnace.
24. Attach ducting.

Return Air Filters

TYPICAL UPFLOW RETURN AIR FILTER INSTALLATIONS

Filters are not factory supplied for upflow furnaces. Filter size needed will be dependent on type of filter and CFM requirement. Filters must be installed externally to the unit.

Important: *It is recommended to transition return ducting to the same size as the opening. It is acceptable for return duct or filter frame to extend forward of the opening but plastic plugs MUST be installed in any opening that the duct or filter frame may cover.*

Table 23. Upflow Return Air Filters

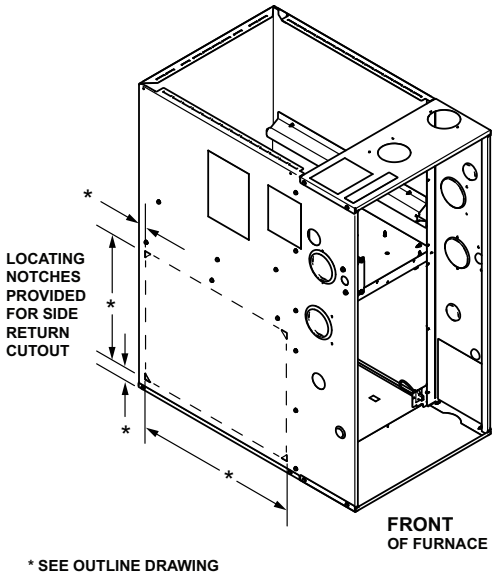
Furnace Width	Filter Qty and Size
17 – 1/2″	1 – 16″ x 25″ x 1″
21″	1 – 20″ x 25″ x 1″
24 – 1/2″	1 – 24″ x 25″ x 1″
Note: *For upflow furnace models in any configuration, where the airflow requirement exceeds 1600 CFM - Furnaces will require return air openings and filters on: (1) both sides, or (2) one side and the bottom, or (3) just on the bottom.*	

Preparation for Upflow Bottom and Side Return Air Filter Installations

All return air duct systems should provide for installation of return air filters.

1. Determine the appropriate position to set the furnace in order to connect to existing supply and return ductwork.
2. For upflow side return installations, remove the insulation around the opening in the blower compartment
3. The side panels of the upflow furnace include locating notches that are used as guides for cutting an opening for return air, refer to the figure and the upflow furnace outline drawing for duct connection dimensions for various furnaces.
4. If a 3/4" flange is to be used for attaching the air inlet duct, add to cut where indicated by dotted lines. Cut corners diagonally and bend outward to form flange.
5. If flanges are not required, and a filter frame is installed, cut between locating notches as in illustration.
6. The bottom panel of the upflow furnace must be removed for bottom return air.

UPFLOW FURNACES ONLY



RETURN AIR FILTERS FOR FURNACE IN HORIZONTAL CONFIGURATION

When the furnace is installed in the horizontal configuration, the return air filters must be installed exterior to the furnace cabinet. Remote filter grilles may be used for homeowner convenience, refer to Figure 6, p. 63 or the filters may be installed in the duct work upstream of the furnace, refer to Figure 7, p. 64.

Filter kits are available for horizontal applications.

Direct coupled side returns are not allowed to the blower cabinet.

Figure 6. Remote Filter Installation

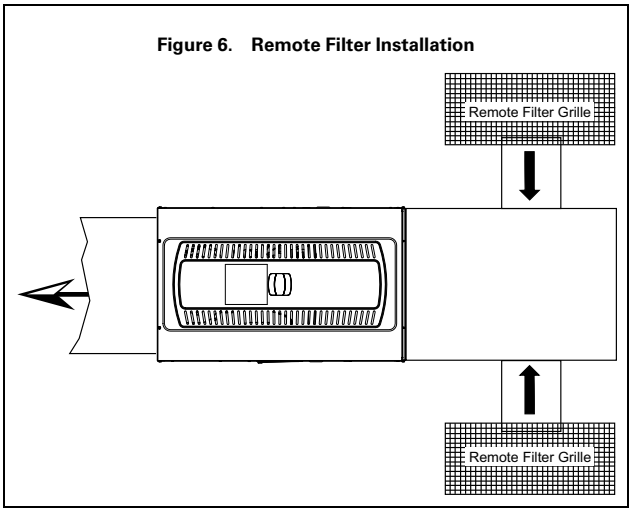
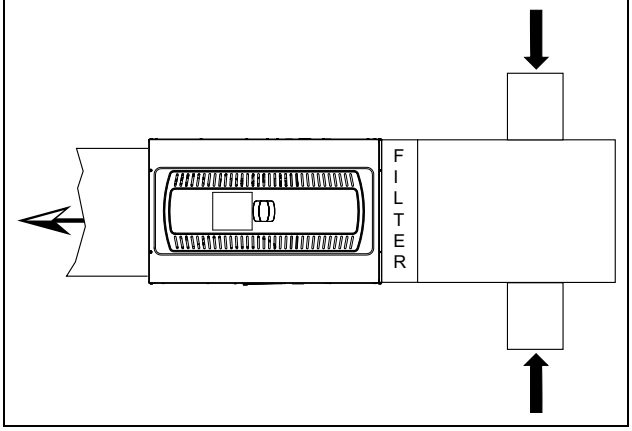


Figure 7. Duct Filter Installation



TYPICAL DOWNFLOW FURNACE RETURN AIR FILTER INSTALLATIONS

Filters are not factory supplied for downflow furnaces. Filter size needed will be dependent on type of filter and CFM requirement. Filters must be installed externally to the unit.

Table 24. Downflow Return Air Filters

Furnace Width	Filter Qty and Size
17 – 1/2″	2 – 14″ x 20″ x 1″
21″	2 – 16″ x 20″ x 1″
24 – 1/2″	2 – 16″ x 20″ x 1″

Electrical Connections

Make wiring connections to the unit as indicated on enclosed wiring diagram. As with all gas appliances using electrical power, this furnace shall be connected into a permanently live electric circuit. It is recommended that furnace be provided with a separate "circuit protection device" electric circuit. The furnace must be electrically grounded in accordance with local codes or in the absence of local codes with the National Electrical Code, ANSI/NFPA 70 or CSA C22.1 Electrical Code, if an external electrical source is utilized. ***The integrated furnace control is polarity sensitive.*** The hot leg of the 120V power supply must be connected to the black power lead as indicated on the wiring diagram. Refer to the Wiring Diagram section in this document and Unit Wiring Diagram attached to the furnace.

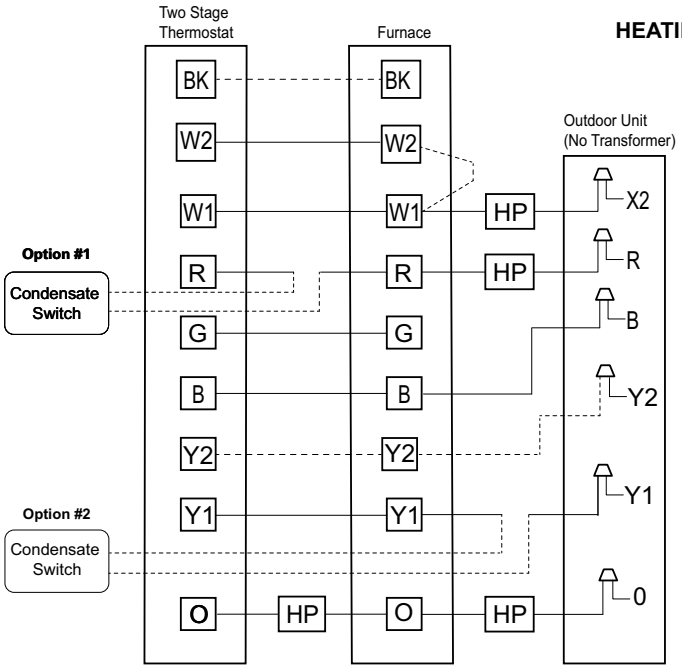
⚠ WARNING

FIRE HAZARD!

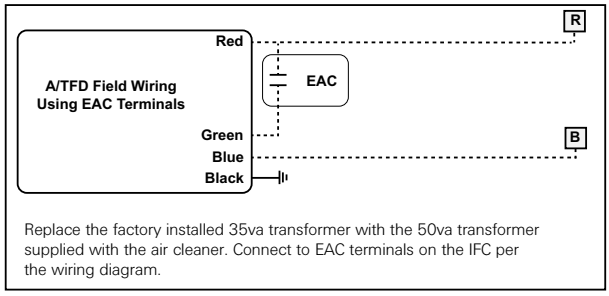
Failure to follow this Warning could result in property damage, severe personal injury, or death.
This Warning applies to installations with a flammable refrigeration system. The furnace must be powered except for service. The furnace shall be installed and connected according to installation instructions and wiring diagrams that are provided with the evaporator coil.

Field Wiring

FIELD WIRING DIAGRAM FOR A952V TWO STAGE HEATING THERMOSTAT, ONE / TWO STAGE AC OR HEAT PUMP



NOTES:
1) HP = Wiring used for Heat Pump systems.
2) Y1 and/or Y2 must connect from the thermostat to the IFC for proper airflow.
3) Remove Y1-O jumper for Hp systems. O terminal must be connected as shown for gas heating operation during defrost.
4) If the thermostat does not have W2, or there are not enough conductors jumper W1 to W2 at the IFc
5) A/TCONT824 thermostats do not require the use of X2.
6) For PWM (BK) enabled thermostats, cut the BK jumper on the IFC and connect wiring.



Replace the factory installed 35va transformer with the 50va transformer supplied with the air cleaner. Connect to EAC terminals on the IFC per the wiring diagram.

Condensate Drain Instructions

The following sections give general instructions for the installation of the gas furnace condensate drains. Repositioning of the condensate trap is covered in the exhaust air options section.

Cutouts with plugs and grommets are provided on the left and right hand side of the furnace cabinets for drain connections *IN VERTICAL APPLICATIONS*. The standard arrangement is for the drain connection on the left side. The tubing may have to be trimmed in this application to avoid kinking.

The **upflow (vertical application)** also has provisions for right side drain connections. Exchange the grommet and plugs from the left and right side. Trim all excess tubing to avoid kinking.

It is always recommended that an auxiliary drain pan be installed under a horizontally installed evaporator or 90% Gas Furnace. Connect the auxiliary drain line to a separate drain line (no trap is needed in this line).

Horizontal applications require repositioning the condensate canister trap. Additionally the drain tubing connected to the inducer housing may need to be repositioned for removing the plug and reconnecting the tubing to the lower connection on the inducer housing.

Connections must be made to an ***OPEN/ VENTED DRAIN***.

Note: *All condensate drain piping supplies included with the furnace are intended for internal piping only and should not be applied external to the furnace. All external piping must use 1/2" minimum size PVC pipe and fittings throughout for drain connections (fittings, pipe and PVC solvent cement not provided with furnace, must be field supplied). A 3/4" coupling is supplied to connect to systems that are using 3/4" piping with an air conditioner coil.*

Note: *A corrosion resistant condensate pump must be used if a pump is required for a specific drain system.*

⚠ CAUTION

Water Damage/Property Damage!

It is recommended that a drain pan be installed under the furnace to prevent property damage or personal injury from leaking condensate.

Important: *The condensate drain should be installed with provisions to prevent winter freeze-up of the condensate drain line. Frozen condensate will block drains, resulting in furnace shutdown. If the drain line cannot be installed in a conditioned space and/ or its surrounding ambient temperature is expected to fall below freezing, then heat tape should be applied as required to prevent freezing (per manufacturer's instructions). The heat tape should be rated at 5 or 6 watts per foot at 120 volts. Self-regulating (preferred) or thermostatically controlled heat tape is required.*

Typical sources of UL listed heat tapes are W.W. Granger, Inc. (Wintergard PlusTM Series), McMaster Carr Supply Co. (3554 Series), or your equipment supplier.

The condensate drain may be cleaned or inspected by removal of the drain tube at the header.

Evaporator and Furnace condensate drain piping may be manifolded together. A primary drain vent stack must be installed and terminated below the outlet of the secondary heat exchanger drain connection to prevent water from damaging Furnace controls if the primary drain outlet plugs up.

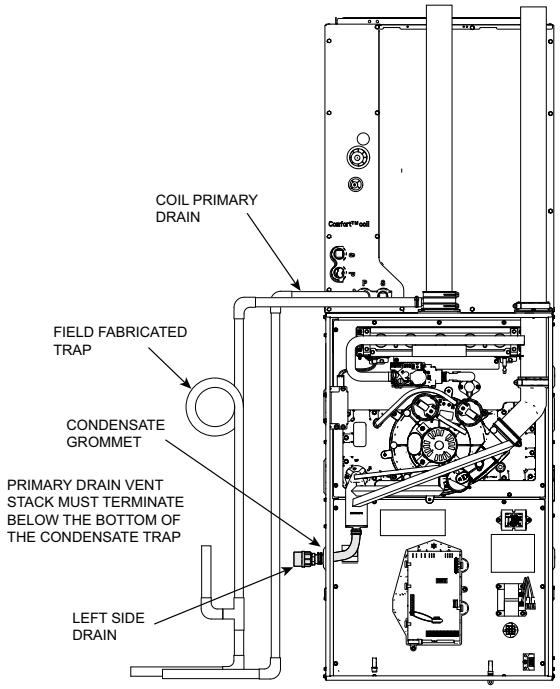
Where the Furnace is installed above a finished ceiling, the primary drain vent stack must be installed such that overflow from the vent stack opening will flow into an auxiliary drain pan in order to prevent water damage to the finished ceiling below.

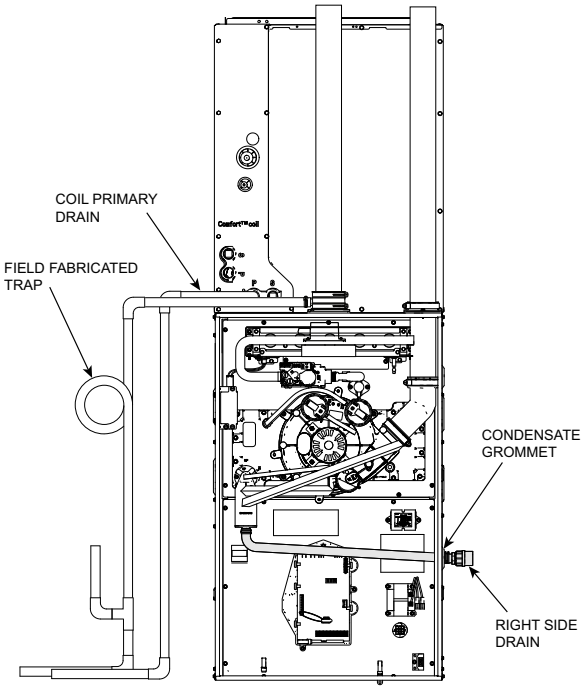
Vertical Applications

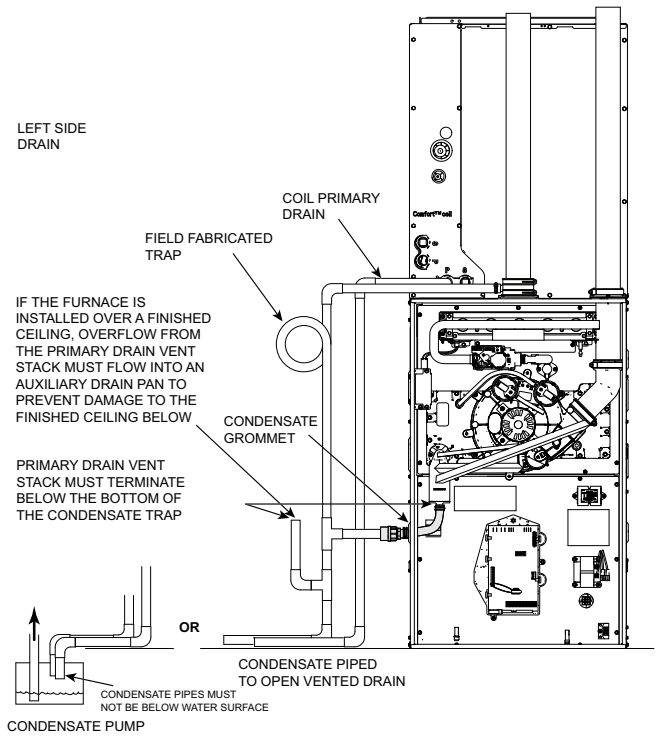
VERTICAL APPLICATIONS
Upflow furnace -
Remove the plug from the side panel where the condensate will exit.
Install the condensate grommet into the side panel.
Install the connection tubing from the trap to the side of the unit and trim all excess tubing to avoid kinks.

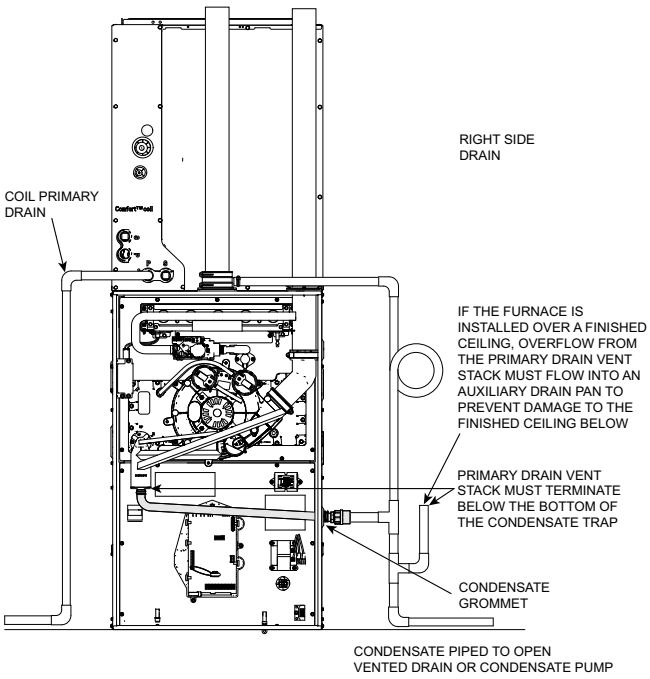
Note: *For easiest installation, remove the spring clip from the end of the condensate line and feed through the grommet.*

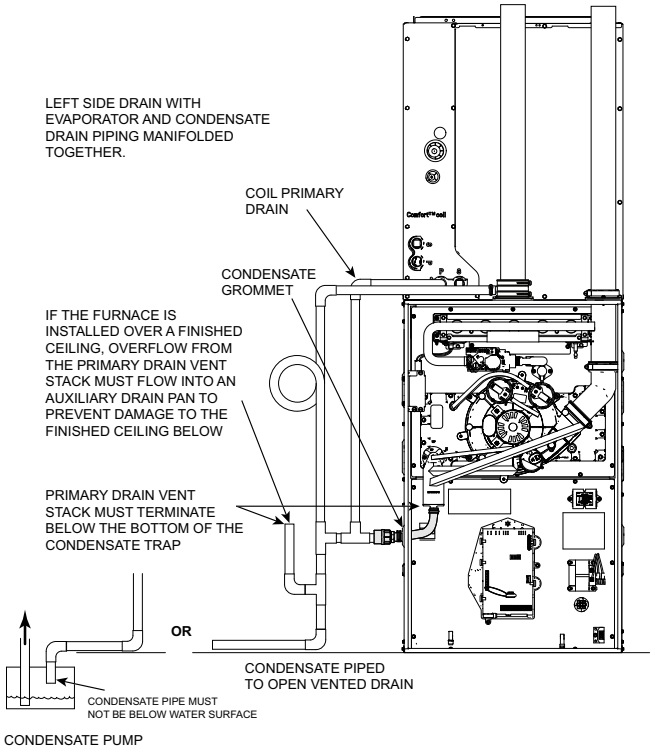
Important: *Condensate grommet must be installed for proper operation.*



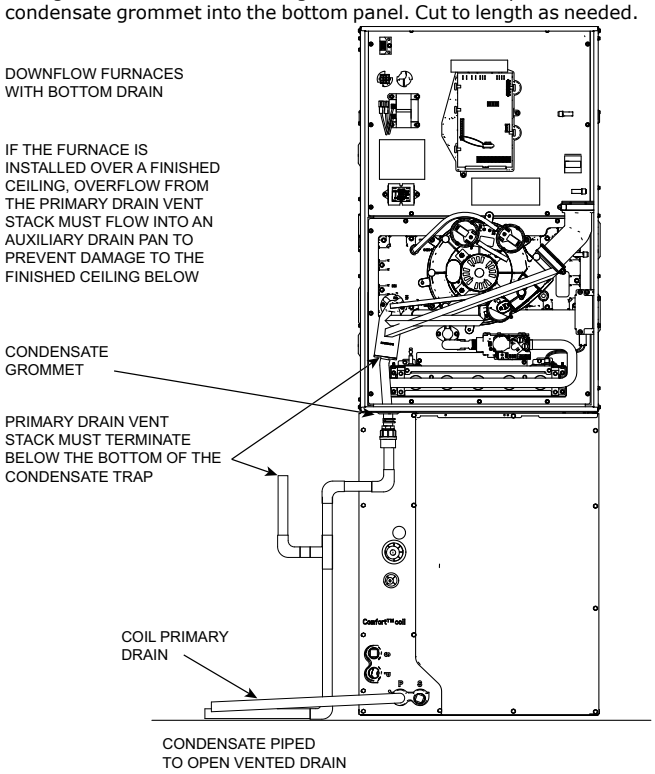






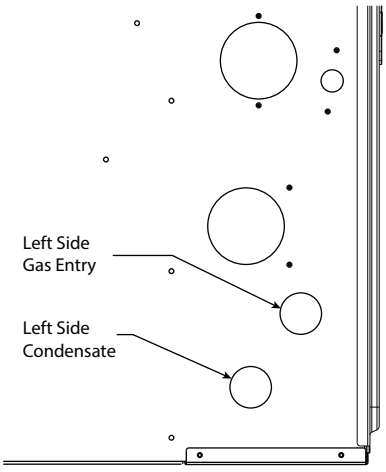


Downflow furnace - Cut the 90 degree section of the condensate tubing off and connect the tubing to the condensate trap. Install the condensate grommet into the bottom panel. Cut to length as needed.

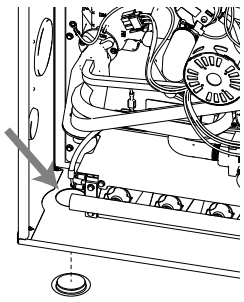


Downflow furnace with Left Side Condensate

1. Remove left hand condensate plug.
2. Install into bottom cross member.



Plug the bottom hole with plug provided in document pack.



Attaching the condensate drain line.

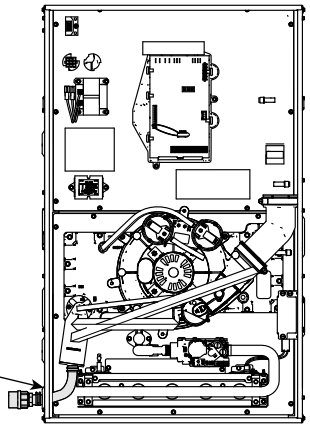
1. Locate the condensate grommet and the condensate drain line assembly in the doc pack.
2. Insert the condensate grommet in the 1–5/8″ hole in the side of the cabinet.
3. Remove the fitting at the end of the drain line assembly and insert it through the cabinet from the inside out. Attach the 90 degree section of the hose to the condensate drain trap.
4. Cut off the excess tube and reinstall the end fitting to the drain hose.

DOWNFLOW FURNACES
LEFT SIDE DRAIN

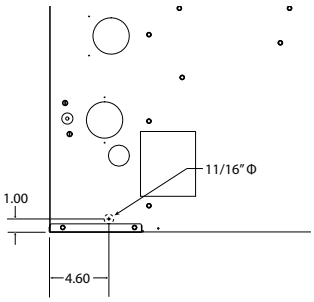
BOTTOM HOLE MUST BE PLUGGED.

IF THE FURNACE IS INSTALLED OVER A FINISHED CEILING, OVERFLOW FROM THE PRIMARY DRAIN VENT STACK MUST FLOW INTO AN AUXILIARY DRAIN PAN TO PREVENT DAMAGE TO THE FINISHED CEILING BELOW

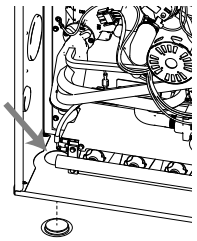
CONDENSATE GROMMET



Downflow furnace with Right Side Condensate - Drill an 11/16 inch diameter hole in the right side of the case at the dimensions shown.



Plug the bottom hole with plug provided in document pack.



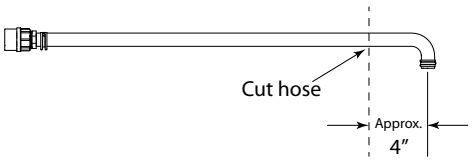
Attaching the condensate drain line.

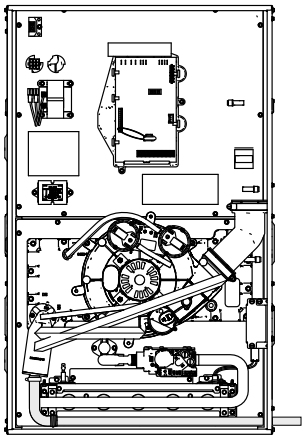
1. Locate the condensate drain line assembly in the doc pack.

Important: *It is best to cut the condensate drain hose assembly longer than 4 inches and then fit in place. It can then be trimmed to needed length. The 4 inch measurement is an approximation.*

2. Cut the condensate drain line assembly as shown.
3. Use a field supplied hose clamp to secure the condensate drain line to the condensate trap.
4. Insert a field supplied piece of 1/2″ CPVC pipe though the 11/16″ hole drilled through the cabinet and insert into drain line hose. Secure with the spring clip.

Note: *Seal around the condensate drain tubing where it exits the cabinet.*





DOWNFLOW FURNACES
RIGHT SIDE DRAIN

11/16" DIAMETER HOLE MUST BE CUT IN RIGHT SIDE OF CASE. BOTTOM HOLE MUST BE PLUGGED. CUT FACTORY SUPPLIED CONDENSATE ASSEMBLY HOSE AND ATTACH TO FIELD SUPPLIED CPVC TUBE. SECURE WITH SPRING CLIP AND FIELD SUPPLIED HOSE CLAMP.

IF THE FURNACE IS INSTALLED OVER A FINISHED CEILING, OVERFLOW FROM THE PRIMARY DRAIN VENT STACK MUST FLOW INTO AN AUXILIARY DRAIN PAN TO PREVENT DAMAGE TO THE FINISHED CEILING BELOW

Horizontal Applications

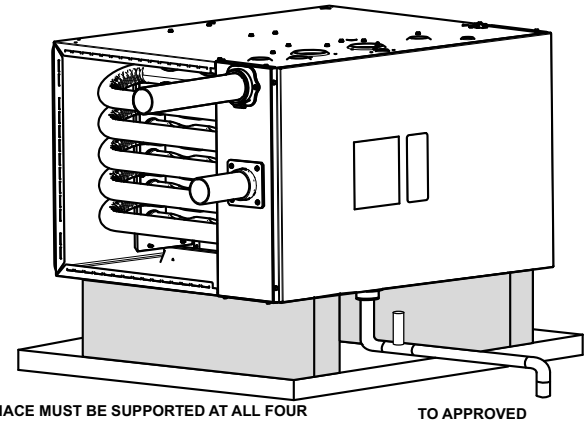
HORIZONTAL APPLICATIONS

Upflow models in horizontal - It is always recommended that the auxiliary drain pan be installed under a horizontally installed evaporator and/or 90% gas furnace. Connect the auxiliary drain pan to a separate drain line (no trap is needed in this line). Connections must be made to an ***OPEN/VENTED DRAIN***. Outdoor draining of the furnace and coil condensate is permissible if allowed by local codes. Caution should be taken to prevent drains from freezing or causing slippery conditions that could lead to personal injury. Excessive draining of condensate may cause saturated ground conditions that may result in damage to plants.

Note: *Use 1/2" or larger PVC or CPVC pipe and fittings as required for drain connections (fittings, pipe and solvent cement not provided).*

Note: *A corrosion resistant condensate pump must be used if a pump is required for a specific drain system.*

Important: *The condensate drain should be installed with provisions to prevent winter freeze-up of the condensate drain line. Frozen condensate will block drains, resulting in furnace shutdown. If the drain line cannot be installed in a conditioned space, then UL listed heat tape should be applied as required to prevent freezing (per manufacturer's instructions). The heat tape should be rated at 5 or 6 watts per foot at 120 volts. Self-regulating (preferred) or thermostatically controlled heat tape is required.*



FURNACE MUST BE SUPPORTED AT ALL FOUR CORNERS. BAYHANG - OPTIONAL HORIZONTAL HANGING BRACKET KIT

TO APPROVED OPEN / VENTED DRAIN

Note: The overflow stand pipe termination must be even with or slightly below the bottom of the condensate trap.
Note: Water from the overflow pipe must drain into the emergency drain pan.

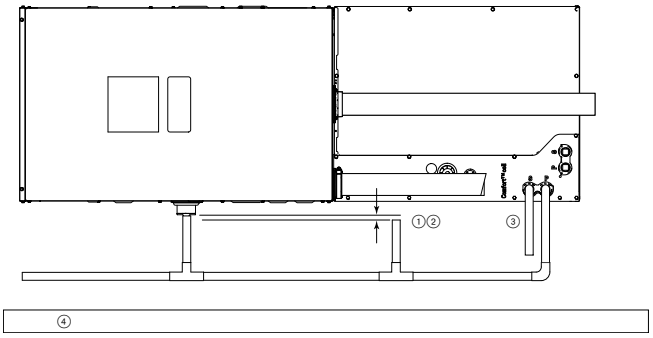
To prevent AC condensate from backing up into the furnaces, follow these instructions for condensate drainage.

Note: *1. The overflow stand pipe termination must be even with or slightly below than the bottom of the condensate trap.*

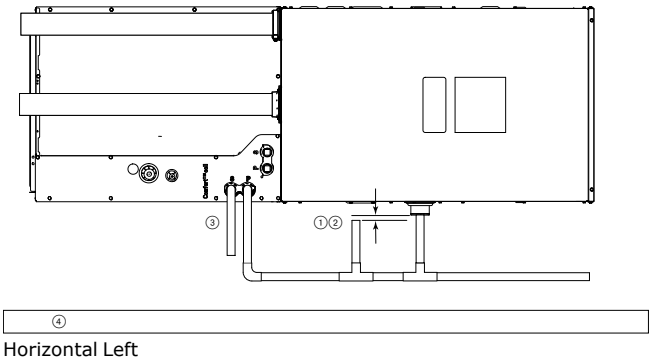
Note: *2. Water from the overflow pipe must drain into the emergency drain pan.*

Note: *3. It is recommended to use the secondary drain. The secondary drain pipe must terminate over the emergency drain pan.*

Note: *4. Emergency drain pan.*



Horizontal Right



Horizontal Left

General Start-up and Adjustment

The following sections give instructions for the general start-up and adjustment of the gas furnaces.

Preliminary Inspections

With gas and electrical power "OFF", ensure:

1. Duct connections are properly sealed.
2. Filters are in place.
3. Venting is properly assembled.
4. Blower vestibule panel is in place and all screws in place.

Turn knob on main gas valve within the unit to the "**OFF**" position. Turn the external gas valve to "ON". Purge the air from the gas lines. After purging, check all gas connections for leaks with a soapy solution.

— **DO NOT CHECK WITH AN OPEN FLAME.** Allow 5 minutes for any gas that might have escaped to dissipate. Turn the gas valve in the unit to the "ON" position.

Propane Gas being heavier than air may require forced ventilation. Turn the toggle switch on the Gas Valve in the unit to the “ON” position.

Lighting Instructions

Lighting instructions appear on each unit. Each installation must be checked out at the time of initial start up to ensure proper operation of all components. Check out should include putting the unit through one complete cycle as outlined below.

Turn on the main electrical supply and set the comfort control above the indicated temperature. The igniter will automatically heat, then the gas valve is energized to permit the flow of gas to the burners. After ignition and flame is established, the flame control module monitors the flame and supplies power to the gas valve until the comfort control is satisfied.

⚠ WARNING

FIRE OR EXPLOSION HAZARD!

Failure to follow this Warning could result in property damage, severe personal injury, or death.

Do NOT attempt to manually light the furnace.

To shut off

For complete shutdown: Turn the toggle or control switch located on the main gas valve inside the unit to the "OFF" position and the external main gas shutoff valve to the "OFF" position. Disconnect the electrical supply to the unit.

Whenever your house is to be vacant, arrange to have someone inspect your house for proper temperature. This is very important during freezing weather. If for any reason your furnace should fail to operate damage could result, such as frozen water pipes.

⚠ CAUTION

FREEZE CAUTION!

Failure to follow this Caution could result in property damage or personal injury.

If complete furnace shutdown is done during the cold weather months, provisions must be taken to prevent freeze-up of all water pipes and water receptacles.

Control and Safety Switch Adjustment

Limit Switch Check Out

The limit switch is a safety device designed to close the gas valve should the furnace become overheated. Since proper operation of this switch is important to the safety of the unit, it **must be checked out on initial start up by the installer**.

To check for proper operation of the limit switches, set the thermostat to a temperature higher than the indicated temperature to bring on the gas valve. Restrict the airflow by blocking the return air to the blower. When the furnace reaches the maximum outlet temperature as shown on the rating plate, the burners must shut off. If they do not shut off after a reasonable time and overheating is evident, a faulty limit switch is probable and the limit switch must be replaced. After checking the operation of the limit control, be sure to remove the paper or cardboard from the return air inlet, or reconnect the blower.

Furnace Combustion Air Exhaust Options

Important: *All plugs must be in place for sealed combustion.* ***Note:*** *Default is left side for electric and natural gas connections. Default for the combustion air inlet and exhaust is top of the furnace.* ***Important:*** *If the locations are changed from the defaults, the default holes not being used must be plugged.*	***Note:*** *If the electrical and natural gas connections are moved to the right side, remove the plugs and move them to the left side. The grommets will move from the left side to the right side.* ***Note:*** *The grommets are different for the natural gas and condensate connections.*

The following sections give instructions for the different furnace orientations and the options for venting the inlet and exhaust combustion air.

Important: *When looking at the different orientations, the direction of the combustion air exhaust in the illustration's description is after the furnace has been rotated, if needed.*

Table 25. Combustion Air Venting Options

Refer to the illustrations below to find the approved venting options for upflow and horizontal left furnace models.

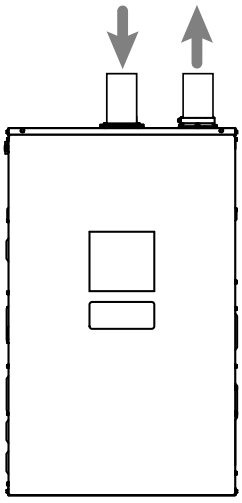
Important: *The combustion air exhaust must be vented to the outdoors.*

Note: *The combustion air inlet does not have to be on the same side as the combustion air exhaust.*

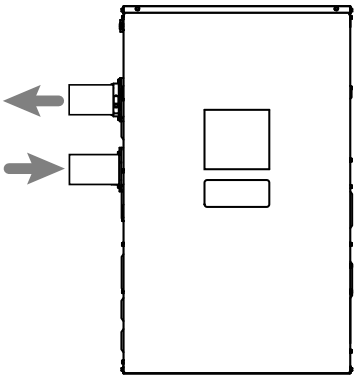
Note: *Right side combustion air entry is allowed in upflow applications.*

Upflow Orientation or Installation

Combustion air exhaust vented out top.

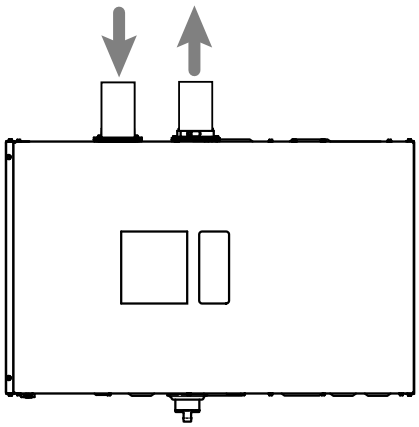


Combustion air exhaust vented through left side.



Horizontal Left Orientation or Installation

Combustion air exhaust vented out top.



Combustion air exhaust vented through left side.

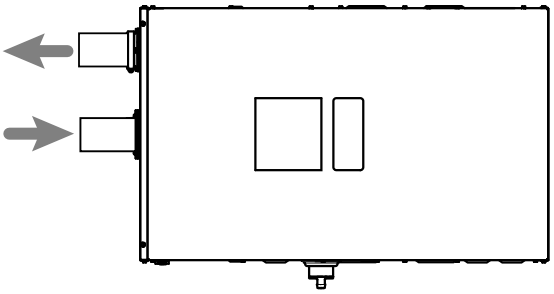


Table 26. Combustion Air Venting Options Continued

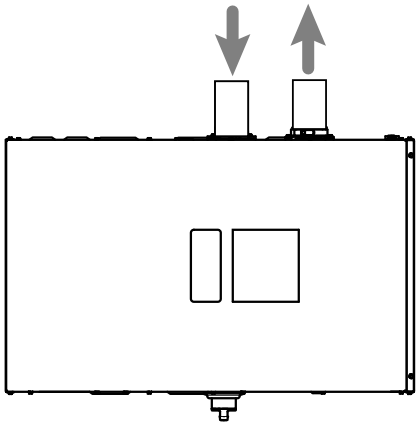
Refer to the illustrations below to find the approved venting options for horizontal right furnace models.

Important: *The combustion air exhaust must be vented to the outdoors.*

Note: *The combustion air inlet does not have to be on the same side as the combustion air exhaust.*

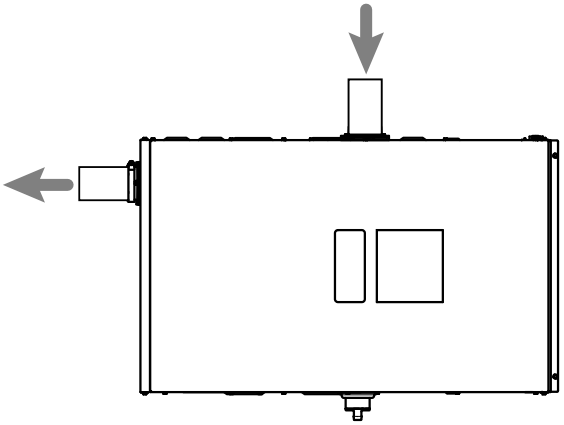
Horizontal Right Orientation or Installation

Combustion air exhaust vented out top.



Combustion air exhaust vented through left side.

Note: *Requires a hole to be drilled in the case.*



Refer to the illustrations below to find the approved venting options for downflow furnace models.

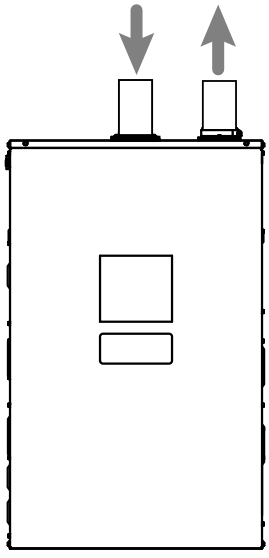
Important: *The combustion air exhaust must be vented to the outdoors.*

Note: *The combustion air inlet does not have to be on the same side as the combustion air exhaust.*

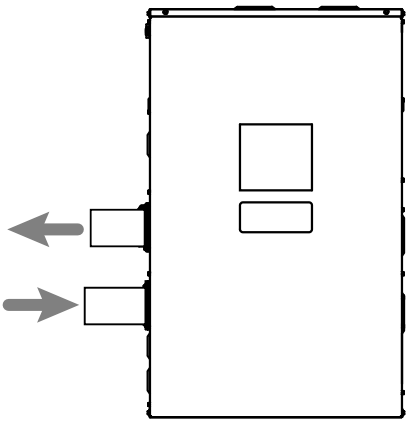
Note: *Right side combustion air entry is allowed.*

Downflow Orientation or Installation

Combustion air exhaust vented out top.



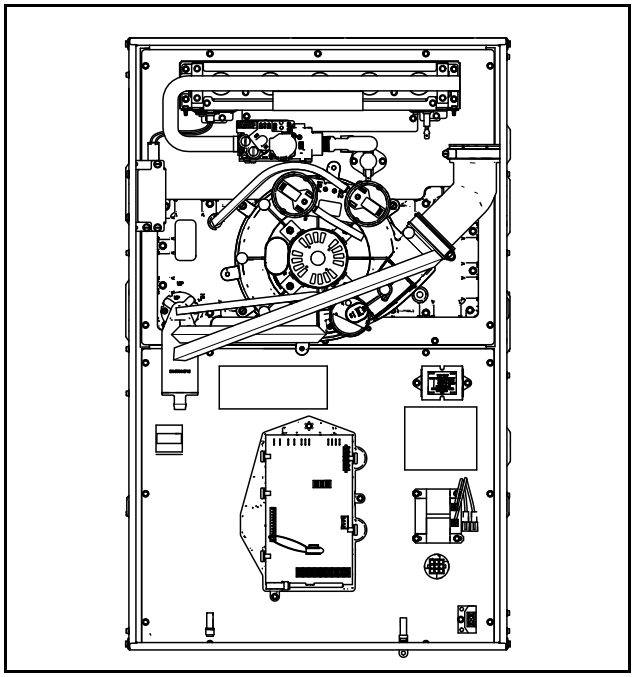
Combustion air exhaust vented through left side.



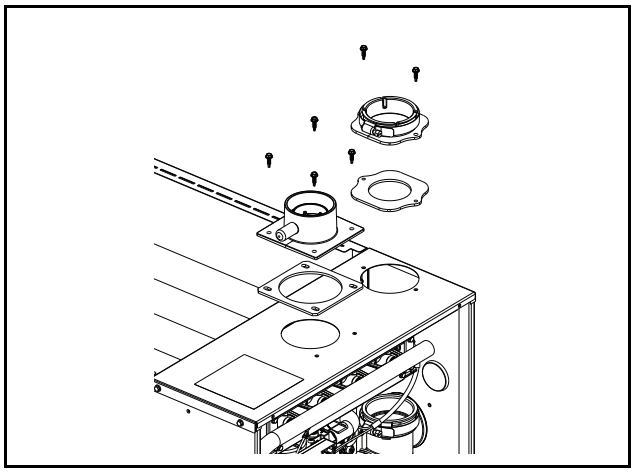
Upflow Furnace in Upflow Position - Top Vented Combustion Air

No changes need to be made to the inducer when installing the upflow furnace with the combustion air vented through the top.

Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*



1. Attach the vent outlet gasket to the vent outlet.
2. Install vent outlet to top of cabinet using 2 screws supplied in the doc pack.
3. Install vent inlet gasket and vent inlet using 4 screws supplied in the doc pack.

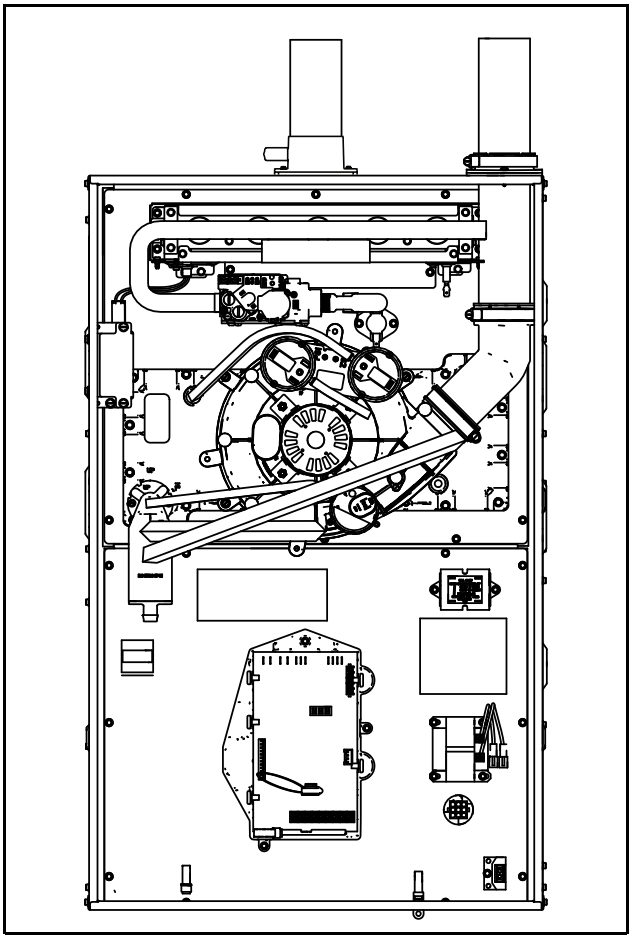


4. Slide PVC pipe through vent outlet adaptor and insert into inducer outlet.
5. Twist to insure PVC is fully inserted.
6. Tighten the clamp on the end of the 45 degree elbow.
7. Tighten the clamp on the outlet vent adapter.

Note: *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*

8. Install the combustion air inlet PVC pipe.

Note: *If required, transition to larger venting within 2' of the cabinet. CPL01544 – 2" x 3" offset coupling may be used and is factory supplied with 120 KBTUH furnaces. Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.*



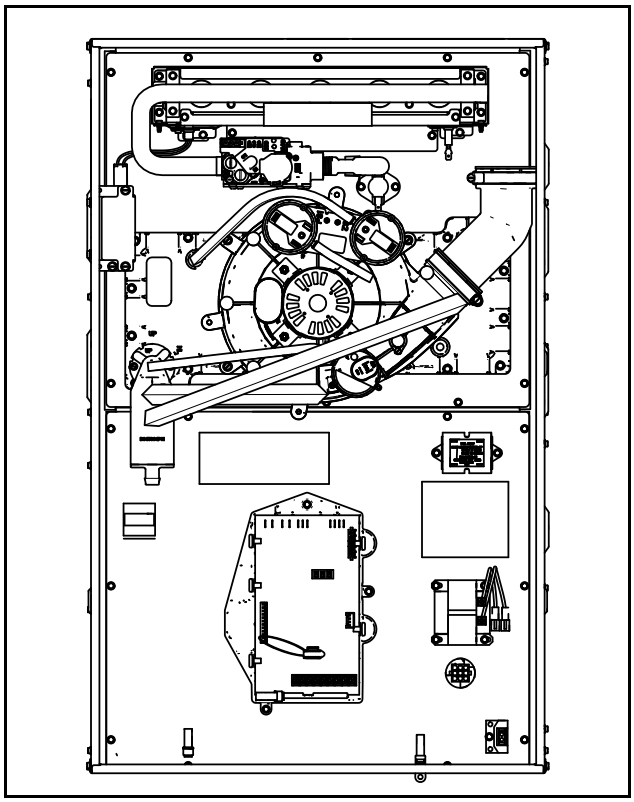
Upflow Furnace in Upflow Position - Left Side Vented Combustion Air

Changes need to be made to the inducer orientation when installing the upflow furnace with the combustion air vented through the side. Additional changes are needed for hose routing and PS2 rotation.

The below figure shows the furnace as it is sent from the factory.

Use the following steps to modify the furnace for upflow with side venting of combustion air.

Important: *Right side vent outlet is not allowed because condensate will not drain.*

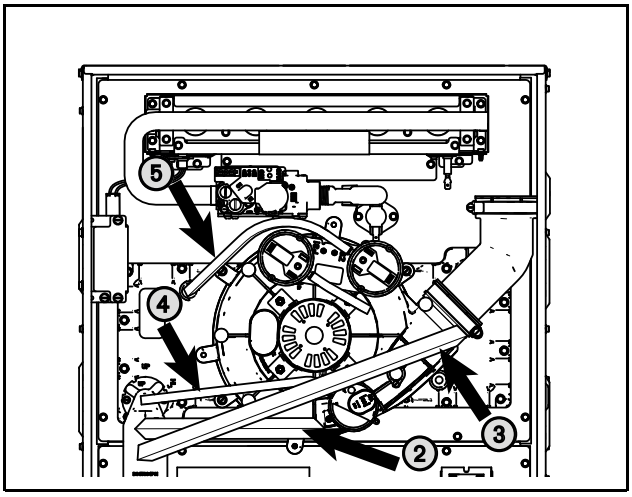


Before proceeding, lay unit on its back to make conversion easier.

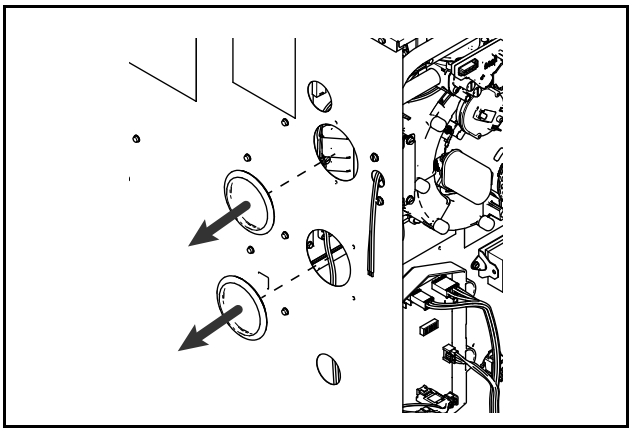
1. Disconnect all drain tubes from condensate trap.

Note: *When removing condensate hoses from the condensate trap, hold the trap with your hand to prevent the trap from breaking. Removing the trap before the hoses is also an option.*

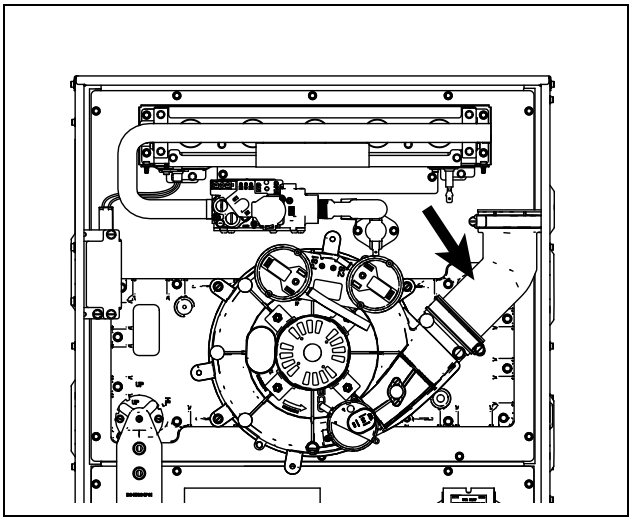
2. Remove drain tubing from bottom of inducer housing.
3. Remove rain gutter tubing from inducer outlet.
4. Remove tubing from condensate pressure switch.
5. Remove tubing from PS2 to cold header.



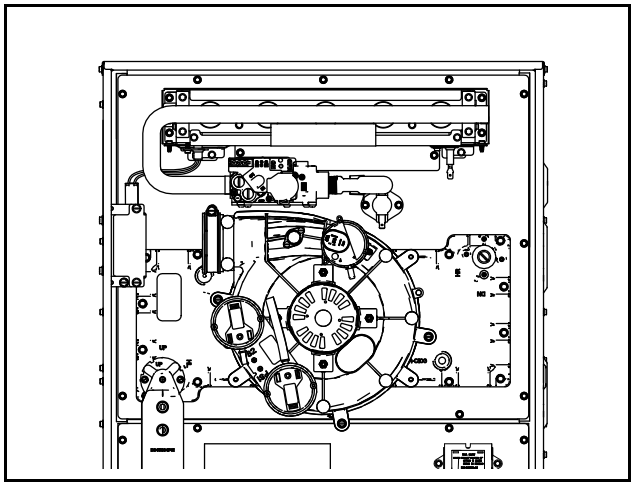
6. Remove two 3″ plugs on left side of cabinet. To be used for combustion air and vent exhaust.
7. Install the two 3″ plugs into the two 3″ default openings on the top of the cabinet.



8. Loosen the clamp holding the 45° elbow. Remove the elbow and discard.

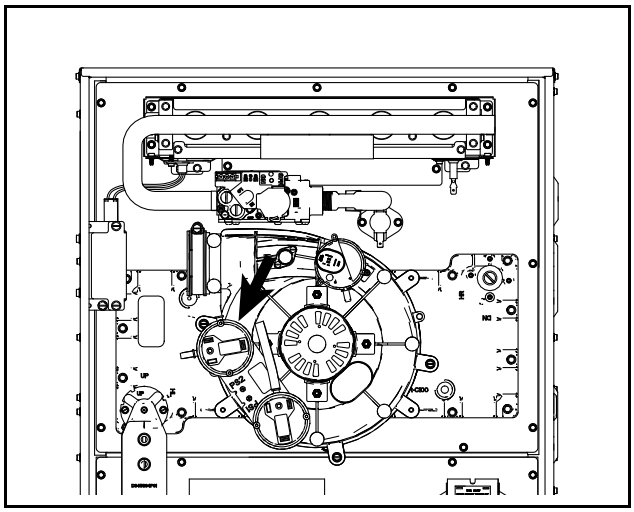


9. Remove the three inducer mounting screws.
10. Rotate inducer counter-clockwise so that the inducer outlet aligns with the exhaust vent outlet.
11. Insert and re-tighten screws to 30 in.-lbs. Do not overtighten.

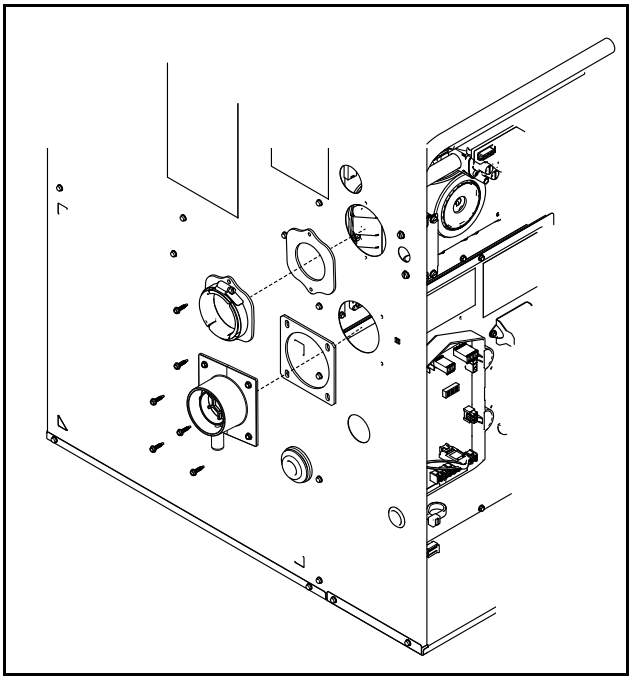


12. Remove the pressure switch bracket assembly.
13. Remove the screw that holds PS2, rotate 90 degrees clockwise, and reattach.
14. Reattach the pressure switch bracket assembly.

Note: *Illustration shows the PS2 pressure switch in the final rotated position.*



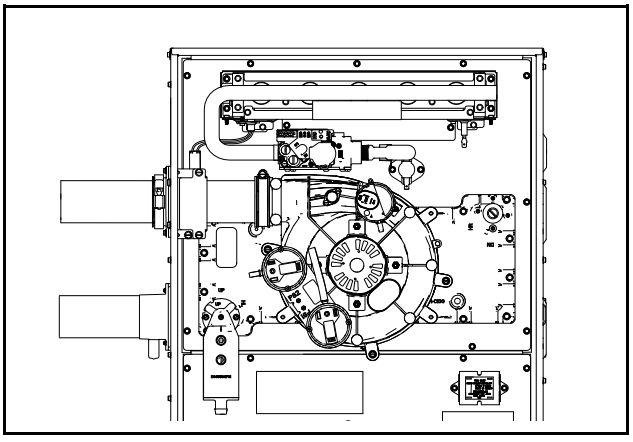
15. Attach the vent outlet gasket to the vent outlet.
16. Install vent outlet to top of cabinet using 2 screws supplied in the dock pack.
17. Install vent inlet gasket and vent inlet using 4 screws supplied in the dock pack.
18. Install the grommet for the condensate drain tube. The drain may be located on either side of the cabinet.



19. Slide PVC through vent outlet adaptor and insert into inducer outlet.
20. Twist to insure PVC is fully inserted.
21. Tighten the two clamps.
22. Install the combustion air inlet pipe.

Note: *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*

Note: *If required, transition to larger venting within 2' of the cabinet. An 2" x 3" offset coupling is required if the transition is made in a horizontal plane. Use coupling CPL01544 (Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.) See Horizontal Venting section for proper orientation of 2" x 3" offset coupling.*



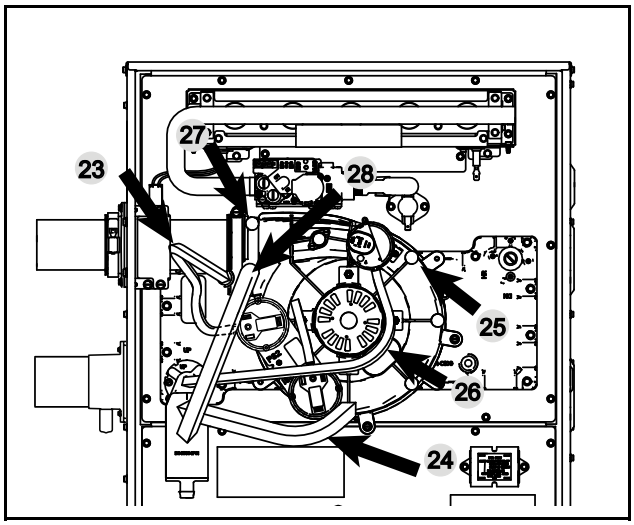
23. Connect PS2 tubing to switch and sensing location.

Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created*

24. Remove port cap at bottom of inducer and connect inducer condensate tubing. Connect other end of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.
25. Install previously removed port cap onto bottom port of the inducer. (As viewed in upflow)
26. Connect condensate pressure switch tubing to pressure port on the condensate trap.

    Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*

27. Remove port plug from rain gutter and install in new position on opposite side of the rain gutter.
28. Connect rain gutter condensate hose to the rain gutter and the lower port of the condensate trap. Cut to length, if necessary.

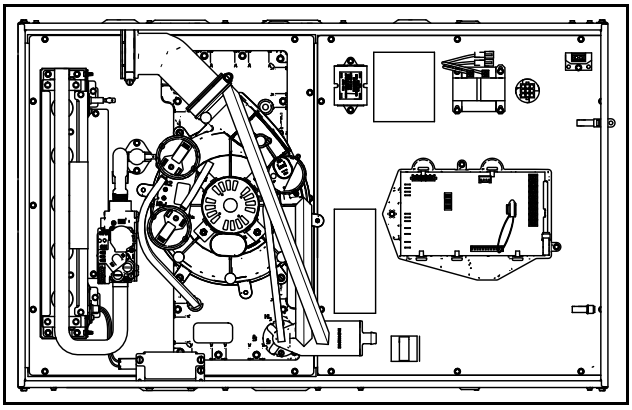


Upflow Furnace in Horizontal Left Position - Top Vented Combustion Air

Changes need to be made to the inducer orientation when installing the upflow furnace in the horizontal left position with the combustion air vented through the side. Additional changes are needed for hose routing, condensate trap orientation, and inducer hoses.

The figure to the top right shows the furnace as it is sent from the factory.

Use the following steps to modify the furnace for horizontal left with side venting of combustion air.



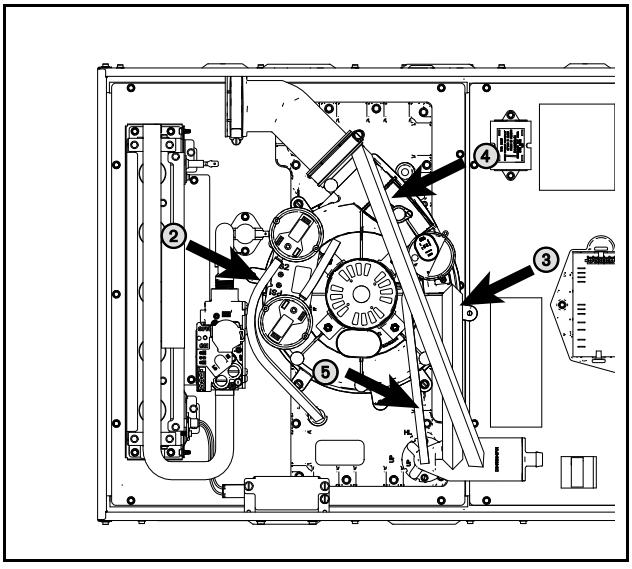
Before proceeding, lay unit on its back to make the conversion easier.

1. Remove all drain hoses from condensate trap.

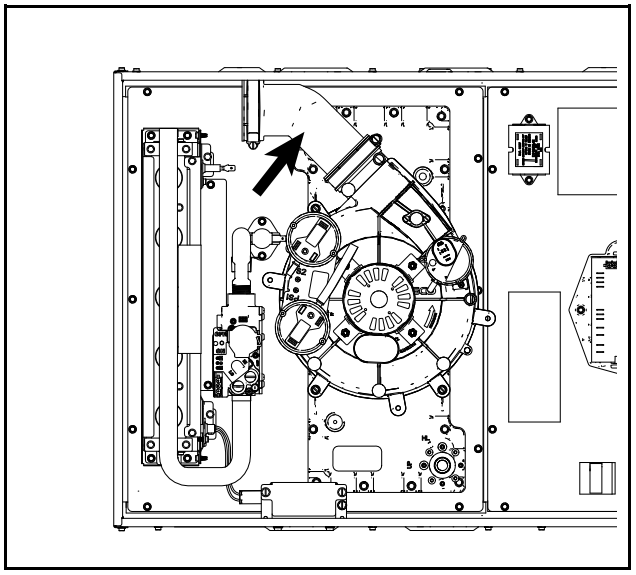
Note: *When removing condensate hoses from the condensate trap, hold the trap with your hand to prevent the trap from breaking. Removing the trap before the hoses is also an option.*

2. Remove tubing from PS2 to cold header.
3. Remove drain tubing from bottom of inducer housing.
4. Remove rain gutter tubing from inducer outlet.
5. Remove tubing from condensate pressure switch.
6. Remove the screws that hold the condensate trap bracket. The condensate trap should not be removed from the condensate trap bracket. Remove assembly and retain for later installation.

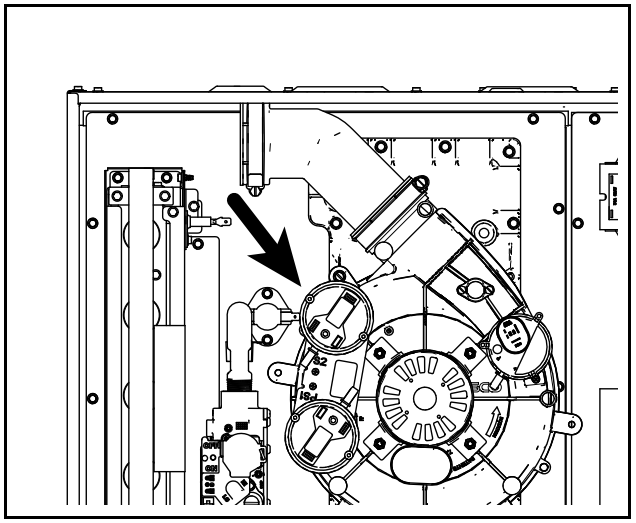
Note: *There is a plastic adapter with O-rings located inside the cold header that is held in place by the condensate trap bracket. Do not lose this adapter. This adapter needs to be in place when the condensate trap bracket is reattached.*

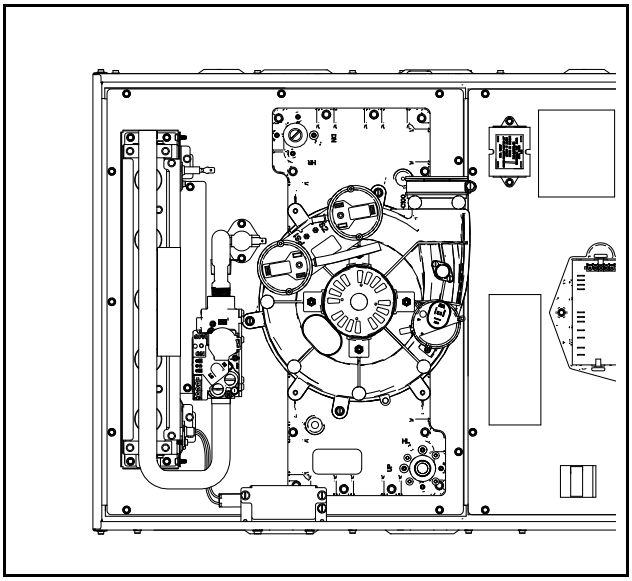


7. Loosen the clamp holding the 45° elbow. Remove the elbow and discard.

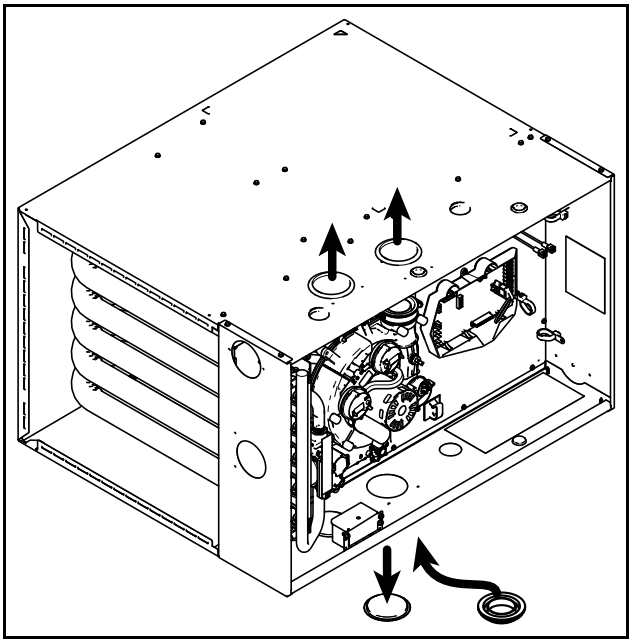


8. Remove three inducer screws.
9. Rotate the inducer so that the outlet is pointing vertically.
10. Use the three screws to reattach the inducer to the cold header to 30 in.-lbs. Do not overtighten.

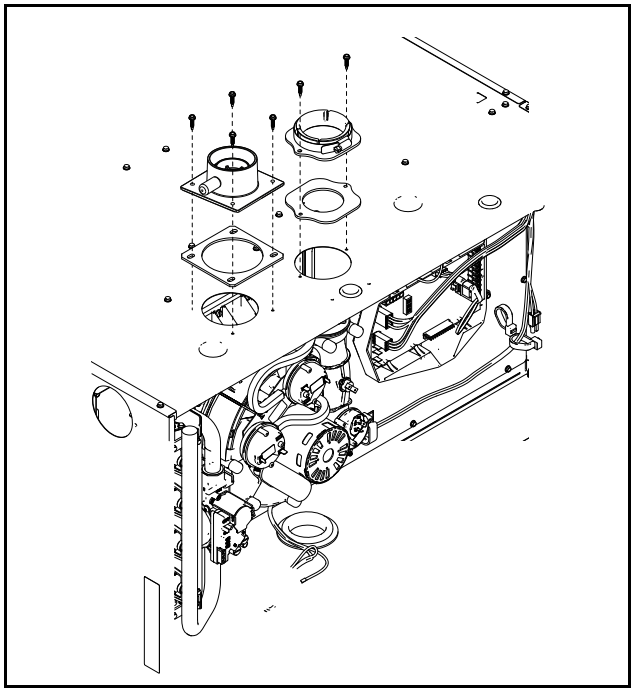




11. Remove 3″ plug on left side of unit. To be used for condensate trap.
12. Install condensate trap grommet.
13. Remove two 3″ plugs on right side of cabinet. To be used for combustion air exhaust and inlet.
14. Reuse the two 3″ plugs to seal the two 3″ default openings on the top of the furnace.



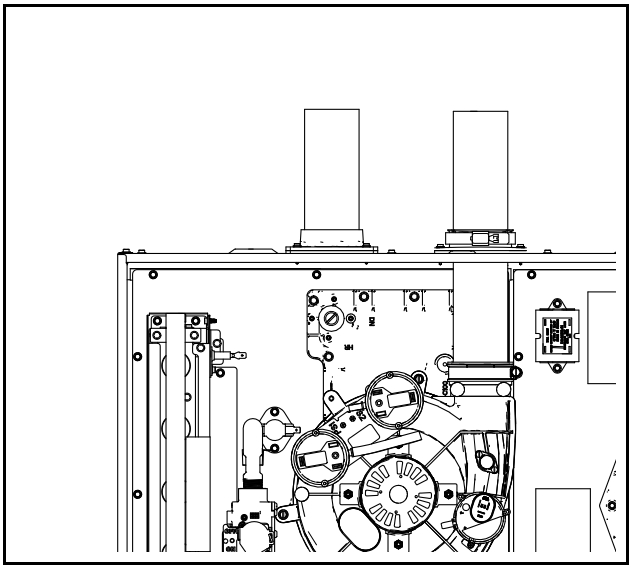
15. Attach the vent outlet gasket to the vent outlet.
16. Install vent outlet to top of cabinet using 2 screws supplied in the dock pack..
17. Install vent inlet gasket and vent inlet using 4 screws supplied in the dock pack.



18. Slide PVC through vent outlet adaptor and insert into inducer outlet.
19. Twist to insure PVC is fully inserted.
20. Tighten the two clamps.
21. Install the combustion air inlet PVC pipe.

Note: *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*

Note: *If required, transition to larger venting within 2' of the cabinet. CPL01544 – 2" x 3" offset coupling may be used and is factory supplied with 120 MBTUH furnaces. Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.*



Condensate Trap Installation

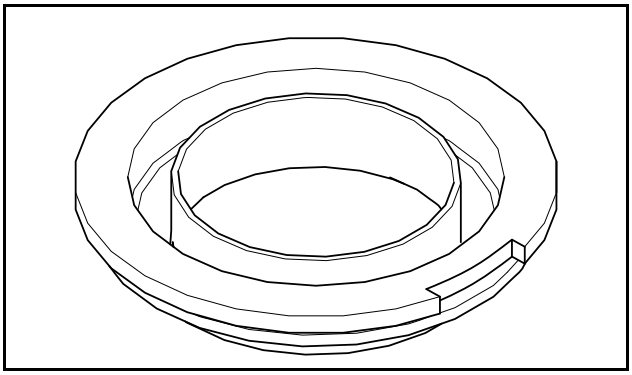
22. Reinstall the condensate adapter if it was earlier removed or ensure adapter is still in place.

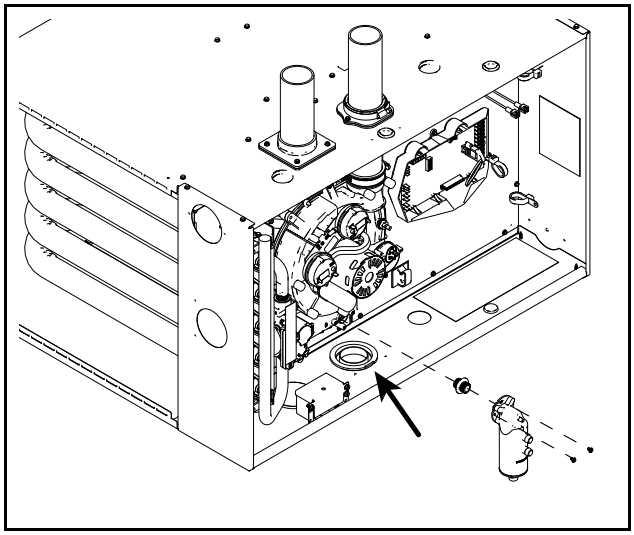
Important: *The condensate adapter must be present for proper condensate drain operation.*

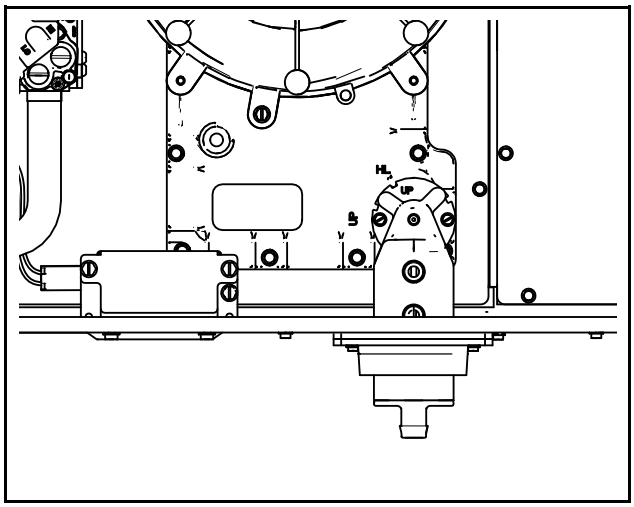
23. Install condensate trap into new location by fitting into grommet and aligning the hole on the condensate trap with the hole labeled “HL”.

Important: *When installing a 21.0” wide S-Series furnace, the condenser trap grommet must be rotated so that the notch in the grommet faces the outer edge of the furnace cabinet as shown in the illustrations below and to the top left in next page. This allows the rain gutter tubing to fully seat onto the lower condensate port trap.*

24. Hand tighten screws.







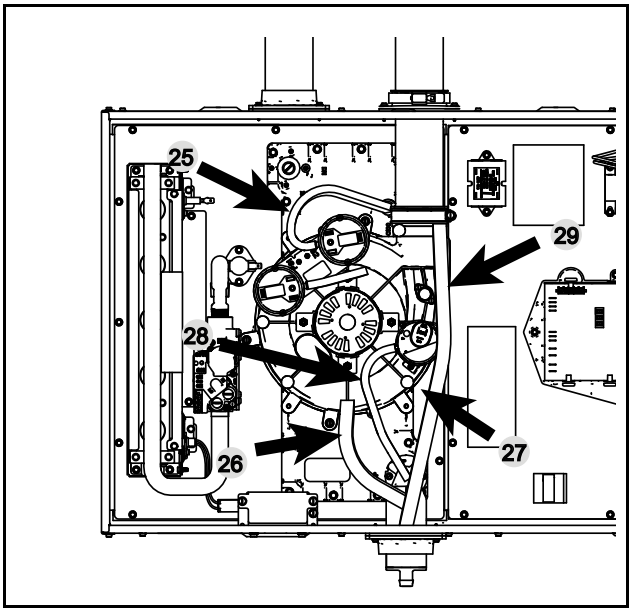
25. Connect PS2 tubing to switch and new sensing location.

Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*

26. Remove port cap on left of inducer and connect inducer condensate tubing. Connect other end of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.
27. Install previously removed port cap onto bottom port of the inducer.
28. Connect condensate pressure switch tubing to pressure port on the condensate trap.

    Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created*

29. Connect rain gutter condensate hose to the rain gutter and the lower port of the condensate trap.

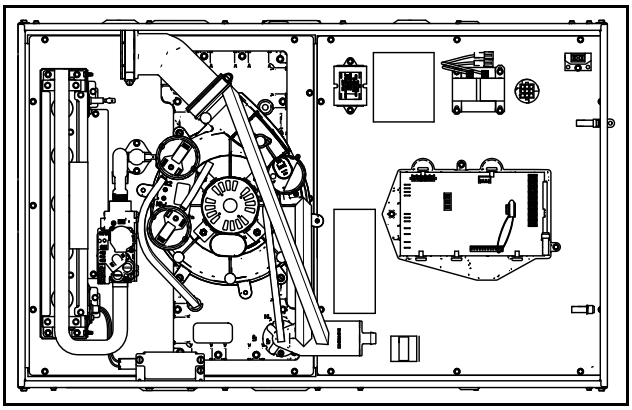


Upflow Furnace in Horizontal Left Position - Side Vented Combustion Air

Changes do not need to be made to the inducer orientation when installing the upflow furnace in the horizontal left position with the combustion air vented through the top. Changes are needed for hose routing, condensate trap orientation, and inducer port caps.

The below figure shows the furnace as it is sent from the factory.

Use the following steps to modify the furnace for horizontal left with top venting of combustion air.



Before proceeding, lay unit on its back to make the conversion easier.

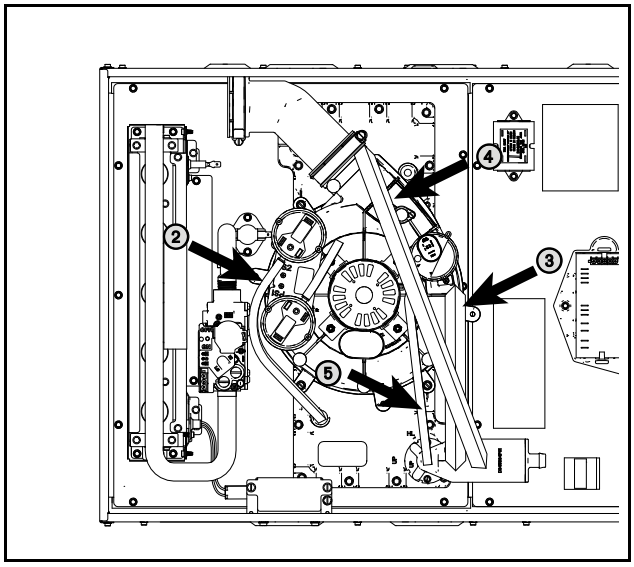
1. Remove all drain hoses from condensate trap.

Note: *When removing condensate hoses from the condensate trap, hold the trap with your hand to prevent the trap from breaking. Removing the trap before the hoses is also an option.*

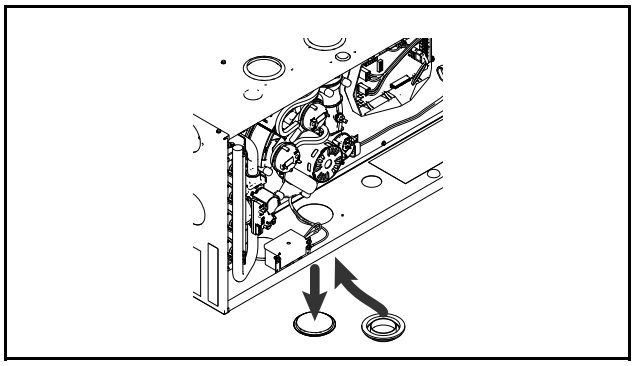
2. Remove tubing from PS2 to cold header.

3. Remove drain tubing from bottom of inducer housing.
4. Remove rain gutter tubing from inducer outlet.
5. Remove tubing from condensate pressure switch.
6. Remove the screws that hold the condensate trap bracket. The condensate trap should not be removed from the condensate trap bracket. Remove assembly and retain for later installation.

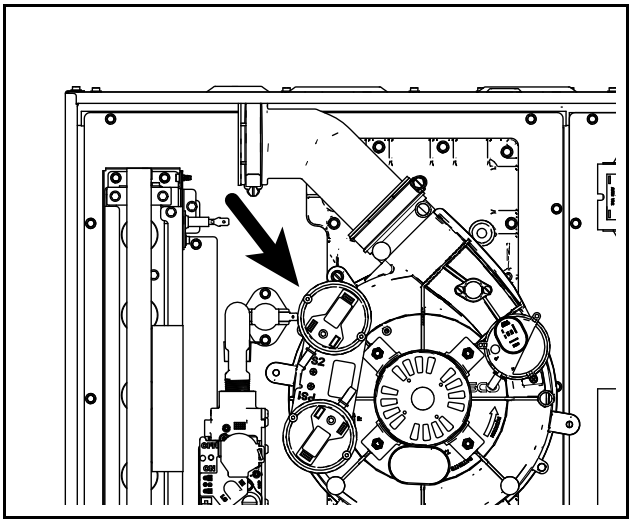
Note: *There is a plastic adapter with O-rings located inside the cold header that is held in place by the condensate trap bracket. Do not lose this adapter. This adapter needs to be in place when the condensate trap bracket is reattached.*

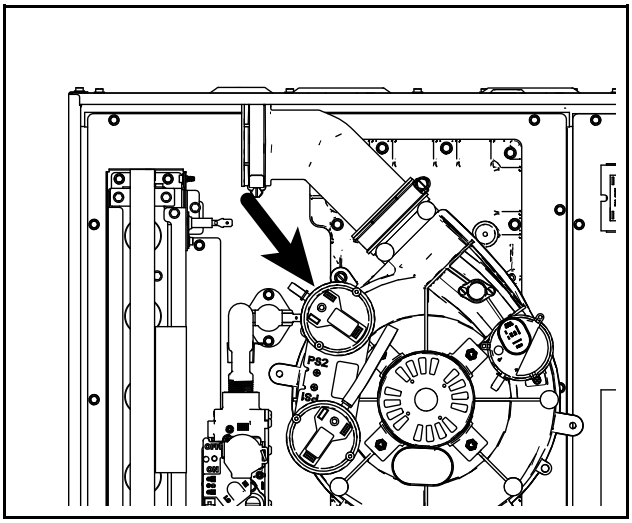


7. Remove plug from 3" hole.
8. Install condensate trap grommet.

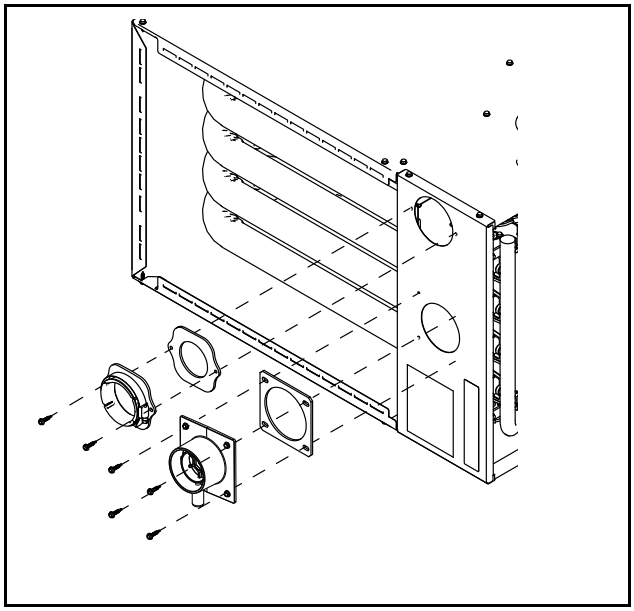


9. Remove the pressure switch bracket assembly.
10. Remove the screw that holds PS2, rotate 90 degrees clockwise, and reattach.
11. Reattach the pressure switch bracket assembly.





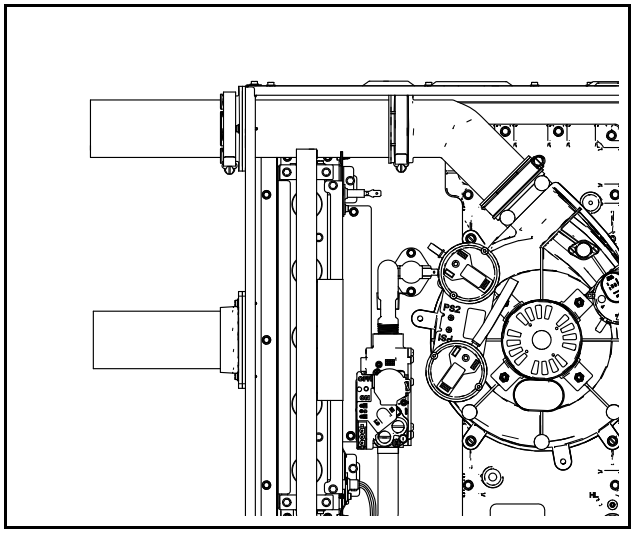
12. Attach the vent outlet gasket to the vent outlet.
13. Install vent outlet to top of cabinet using 2 screws supplied in the doc pack.
14. Install vent inlet gasket and vent inlet using 4 screws supplied in the doc pack.



15. Slide PVC through vent outlet adaptor and insert into inducer outlet.
16. Twist to insure PVC is fully inserted.
17. Tighten the two clamps.
18. Install the combustion air inlet PVC pipe.

Note: *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*

Note: *If required, transition to larger venting within 2' of the cabinet. An 2" x 3" offset coupling is required if the transition is made in a horizontal plane. Use coupling CPL01544 (Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.) See Horizontal Venting section for proper orientation of 2" x 3" offset coupling.*



Condensate Trap Installation

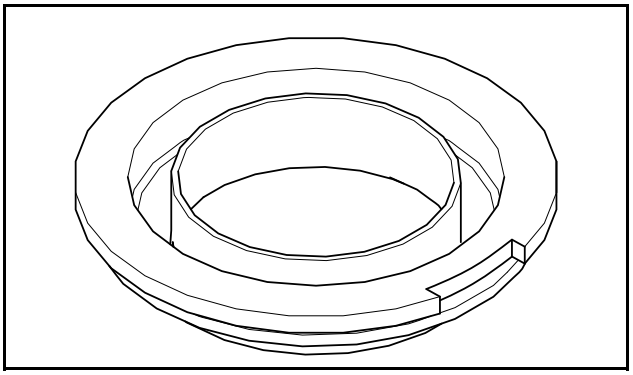
19. Reinstall the condensate adapter if it was earlier removed or ensure adapter is still in place.

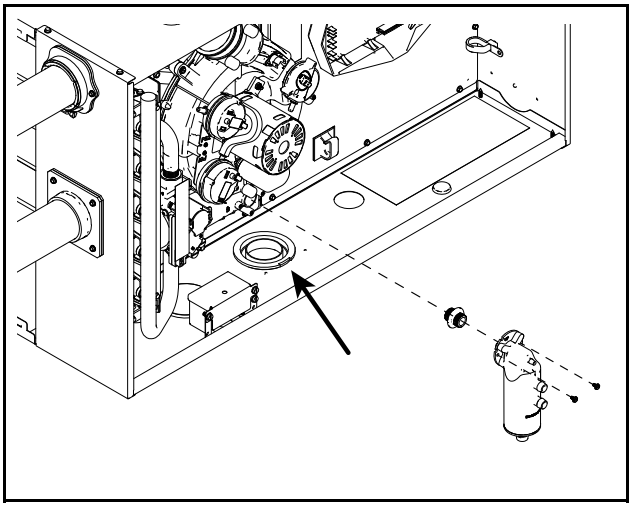
Important: *The condensate adapter must be present for proper condensate drain operation.*

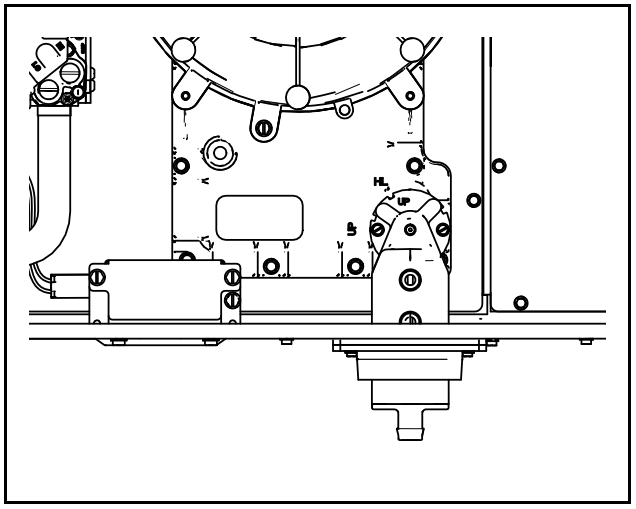
20. Install condensate trap into new location by fitting into grommet and aligning the hole on the condensate trap with the hole labeled "HL".

When installing a 21.0" wide S-Series furnace, the condenser trap grommet must be rotated so that the notch in the grommet faces the outer edge of the furnace cabinet as shown in the illustrations below and to the top right. This allows the rain gutter tubing to fully seat onto the lower condensate port trap.

21. Hand tighten screws.







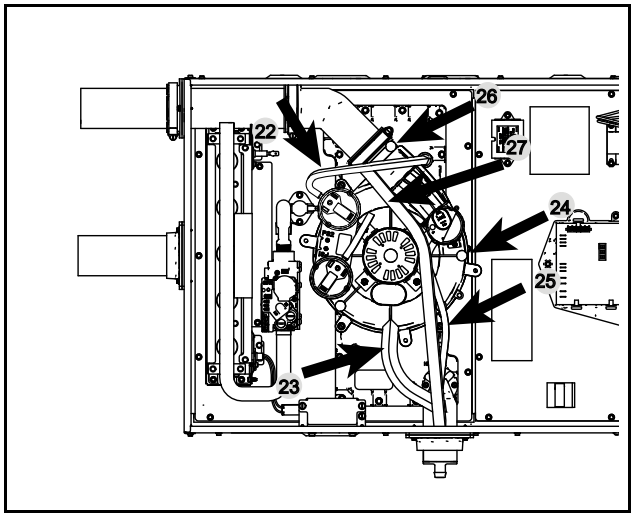
22. Connect PS2 tubing to switch and new sensing location.

Important: *Cut to length but insure there is a rise in the tubing to avoid condensed flue gases from entering pressure switch.*

23. Remove port cap on left side of inducer and connect inducer condensate tubing. Connect other end of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.
24. Install previously removed port cap onto bottom port of the inducer. (As viewed in upflow)
25. Connect condensate pressure switch tubing to pressure port on the condensate trap.

    Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*

26. Remove port plug from rain gutter and install in new position on opposite side of the rain gutter.
27. Connect rain gutter condensate hose to the rain gutter and the lower port of the condensate trap. Route rain gutter condensate hose to the right of the inducer motor.

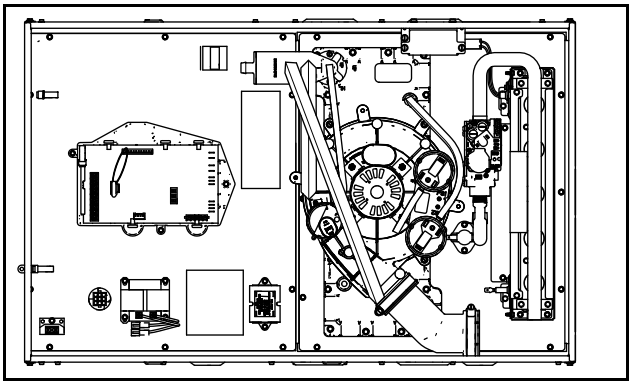


Upflow Furnace in Horizontal Right Position - Top Vented Combustion Air

Changes need to be made to the inducer orientation when installing the upflow furnace in the horizontal right position with the combustion air vented through the left side. Additional changes are needed for hose routing, condensate trap location, and inducer port caps, and the condensate plug.

The below figure shows the furnace as it is sent from the factory.

Use the following steps to modify the furnace for horizontal right with left side venting of combustion air.



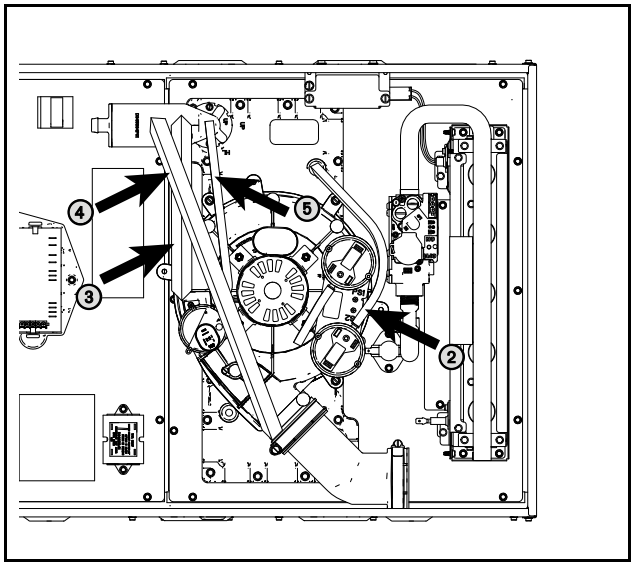
Before proceeding, lay unit on its back to make the conversion easier.

1. Remove all drain hoses from condensate trap.

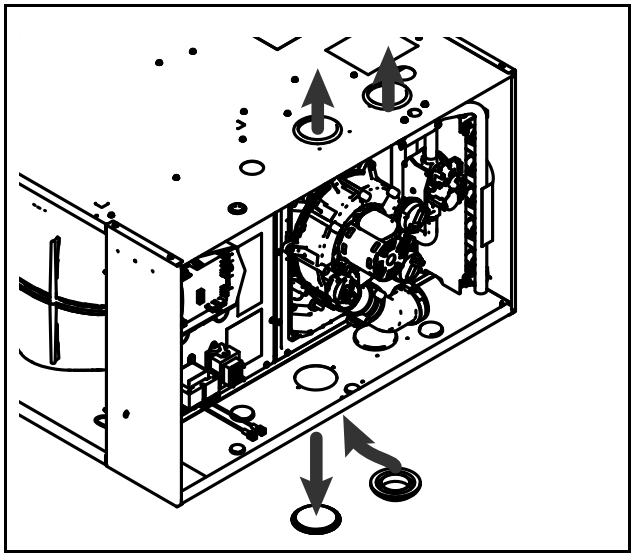
Note: *When removing condensate hoses from the condensate trap, hold the trap with your hand to prevent the trap from breaking. Removing the trap before the hoses is also an option.*

2. Remove tubing from PS2 to cold header.
3. Remove drain tubing from bottom of inducer housing.
4. Remove rain gutter tubing from inducer outlet.
5. Remove tubing from condensate pressure switch.
6. Remove the screws that hold the condensate trap bracket. The condensate trap should not be removed from the condensate trap bracket. Remove assembly and retain for later installation.
7. Remove the adapter located inside the condensate trap connection on the cold header and retain for later installation.

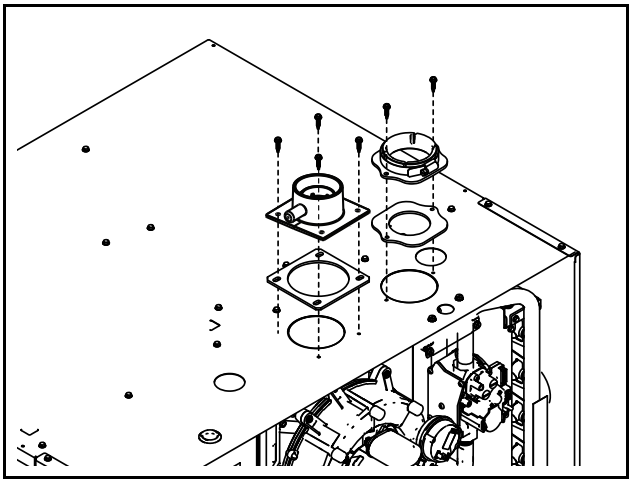
Note: *The plastic adapter with O-rings located inside the cold header that is held in place by the condensate trap bracket. Do not lose this adapter. This adapter needs to be in place when the condensate trap bracket is reattached.*



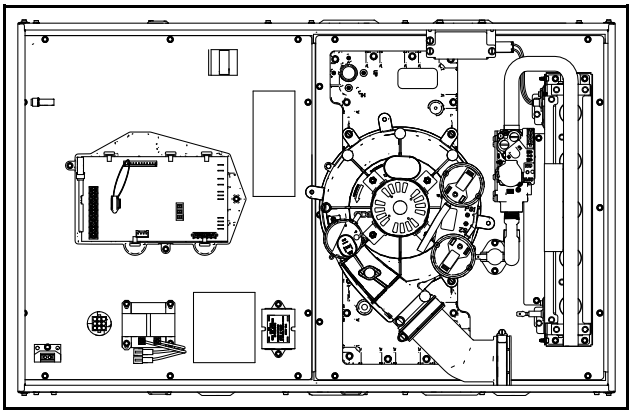
8. Remove 3″ plug on right side of unit. To be used for condensate trap.
9. Install condensate trap grommet.
10. Remove two 3″ plugs on left side of cabinet.
11. Reuse the two 3″ plugs to seal the two 3″ default openings on the top of the cabinet.

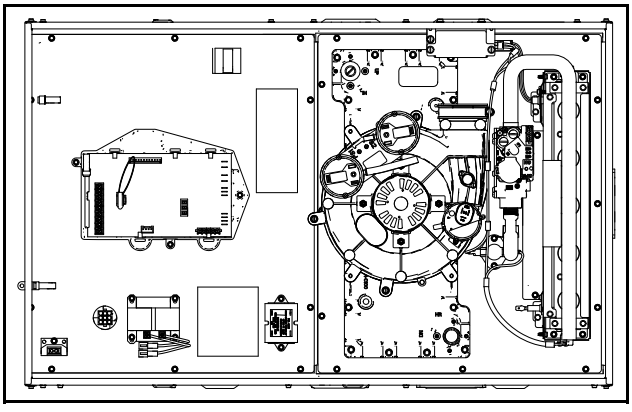


12. Attach the vent outlet gasket to the vent outlet.
13. Install vent outlet to top of cabinet using 2 screws supplied in the doc pack.
14. Install vent inlet gasket and vent inlet using 4 screws supplied in the doc pack.

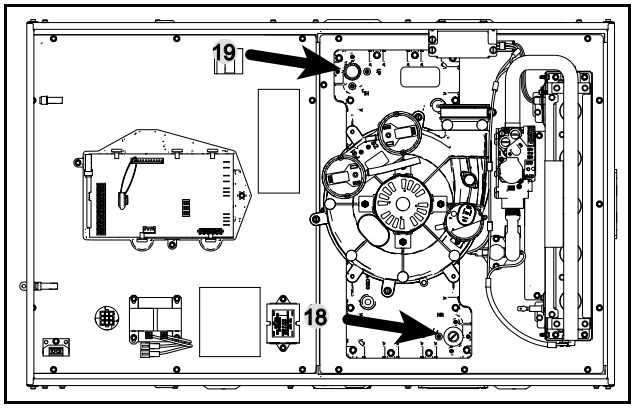


15. Remove three inducer screws.
16. Rotate the inducer so that the outlet is pointing vertically.
17. Use the three inducer screws to reattach the inducer to the cold header. Torque to 30 in.-lbs. Do not overtighten.





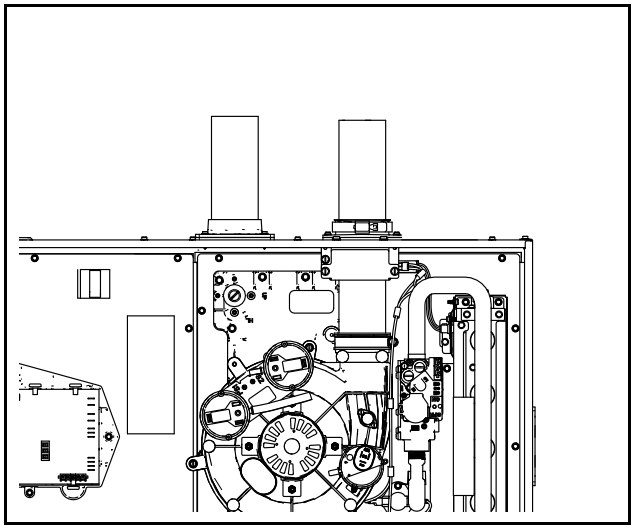
18. Remove condensate drain plug from top right location on cold header.
19. Place condensate drain plug onto the cold header outlet located on the bottom left of the cold header.



20. Slide PVC through vent outlet adaptor and insert into inducer outlet.
21. Twist to insure PVC is fully inserted.
22. Tighten the two clamps.
23. Install the combustion air inlet PVC pipe.

Note: *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*

Note: *If required, transition to larger venting within 2' of the cabinet. CPL01544 – 2" x 3" offset coupling may be used and is factory supplied with 120 MBTUH furnaces. Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.*



Condensate Trap Installation

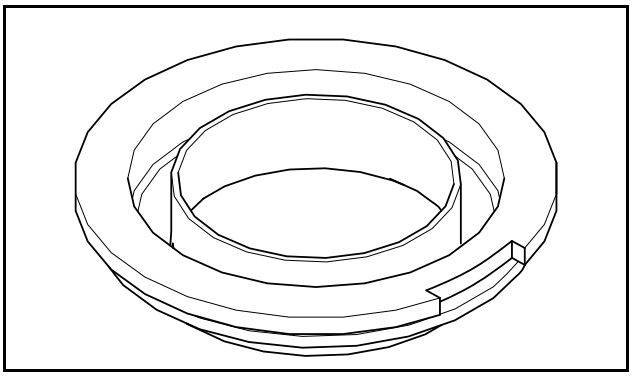
24. Reinstall the condensate adapter if it was earlier removed or ensure adapter is still in place.

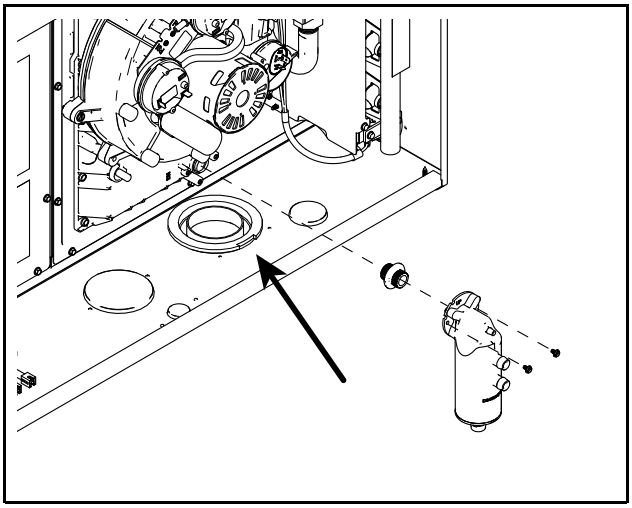
Important: *The condensate adapter must be present for proper condensate drain operation.*

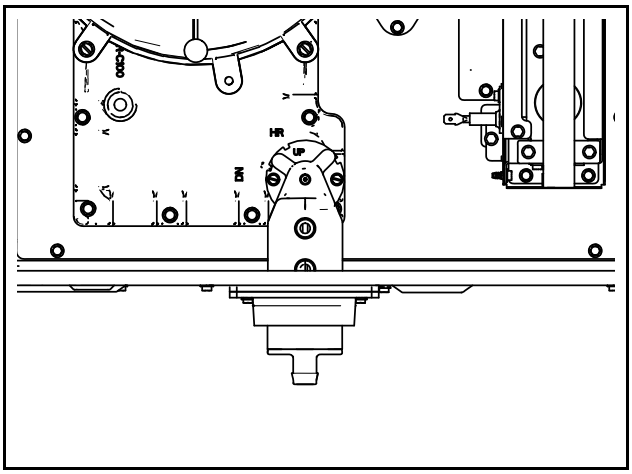
25. Install condensate trap into new location by fitting into grommet and aligning the hole on the condensate trap with the hole labeled "HR".

Important: *When installing a 21.0" wide S-Series furnace, the condenser trap grommet must be rotated so that the notch in the grommet faces the outer edge of the furnace cabinet as shown in the illustrations below and to the top right. This allows the rain gutter tubing to fully seat onto the lower condensate port trap.*

26. Hand tighten screw.







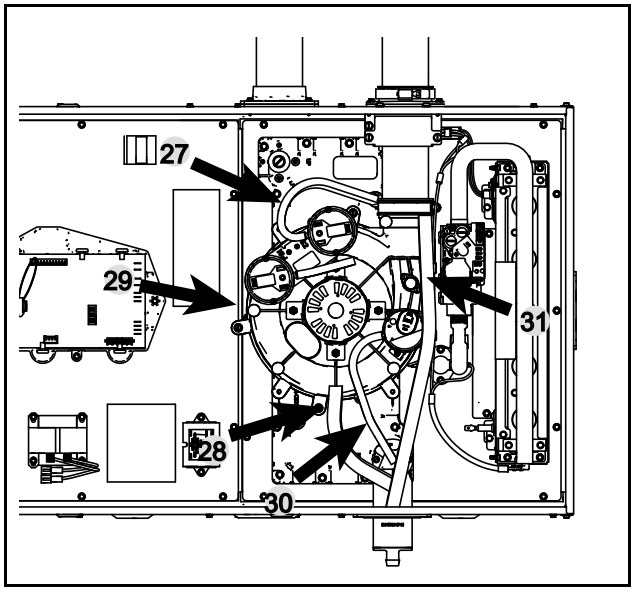
27. Connect PS2 tubing to switch and new sensing location.

Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*

28. Remove port cap on the right side of the inducer and connect inducer condensate tubing. Connect other end of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.
29. Install previously removed port cap onto bottom port of the inducer.
30. Connect condensate pressure switch tubing to pressure port on the condensate trap.

    Important: *Cut to length to ensure there is no sag or trap created.*

31. Connect rain gutter condensate hose to the rain gutter and the lower port of the condensate trap.

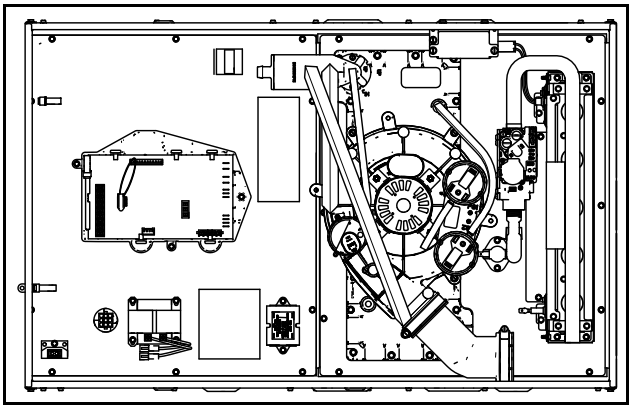


Upflow Furnace in Horizontal Right Position - Left Side Vented Combustion Air

Changes need to be made to the inducer orientation when installing the upflow furnace in the horizontal right position with the combustion air vented through the bottom. Additional changes are needed for hose routing, condensate trap location, and inducer port caps, and the condensate plug.

The below figure shows the furnace as it is sent from the factory.

Use the following steps to modify the furnace for horizontal right with bottom venting of combustion air.



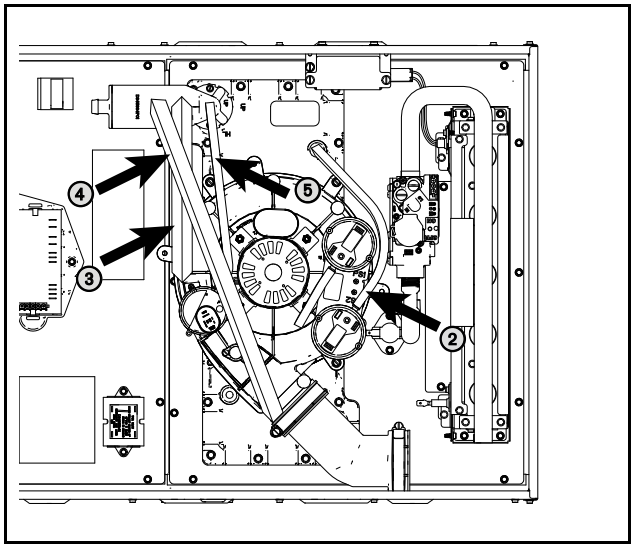
Before proceeding, lay unit on its back to make the conversion easier.

1. Remove all drain hoses from condensate trap.

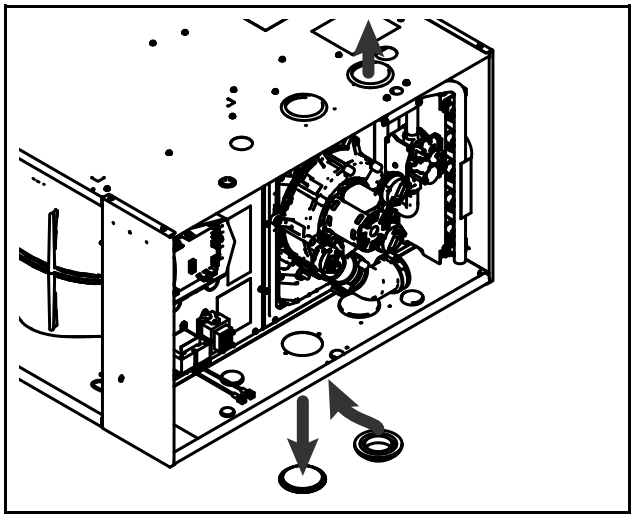
Note: *When removing condensate hoses from the condensate trap, hold the trap with your hand to prevent the trap from breaking. Removing the trap before the hoses is also an option.*

2. Remove tubing from PS2 pressure switch.
3. Remove drain tubing from bottom of inducer housing.
4. Remove rain gutter tubing from inducer outlet.
5. Remove tubing from condensate pressure switch.
6. Remove the screws that hold the condensate trap bracket. The condensate trap should not be removed from the condensate trap bracket. Remove assembly and retain for later installation.
7. Remove the condensate adapter located inside the condensate trap connection on the cold header and retain for later installation.

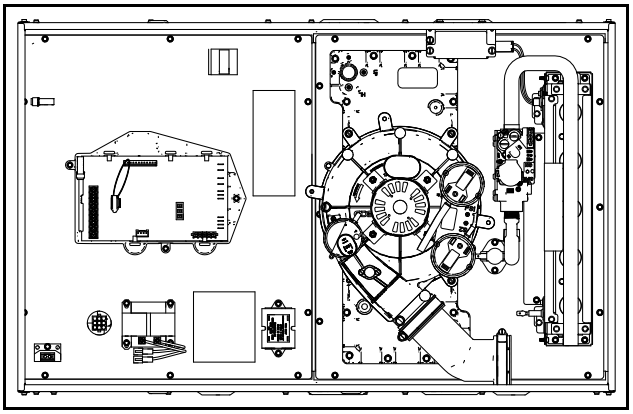
Note: *The plastic condensate adapter with O-rings located inside the cold header that is held in place by the condensate trap bracket. Do not lose this adapter. The condensate adapter needs to be in place when the condensate trap bracket is reattached.*

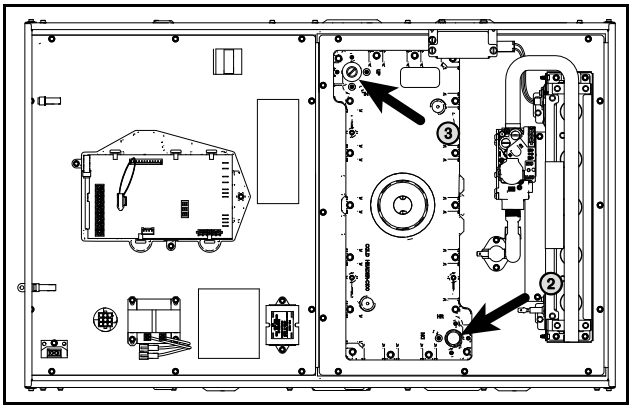


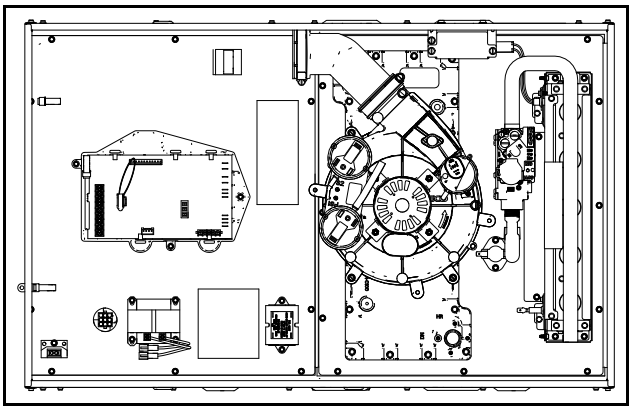
8. Remove 3″ plug on right side of unit. To be used for condensate trap.
9. Install condensate trap grommet.
10. Remove 3″ plugs on the left side of the cabinet. To be used for combustion air inlet.
11. Reuse the two 3″ plugs to seal the two 3″ default openings on the top of the furnace.



12. Remove three inducer screws.
13. While the inducer is loose, remove condensate drain plug from top right location on cold header.
14. Place condensate drain plug onto the cold header outlet located on the bottom left of the cold header.
15. Rotate the inducer 180 degrees so that the elbow is pointing towards the left.
16. Use the three inducer screws to reattach the inducer to the cold header. Torque to 30 in.-lbs. Do not overtighten.

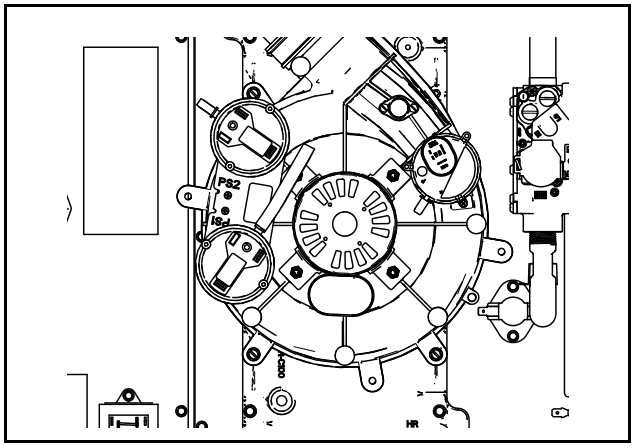




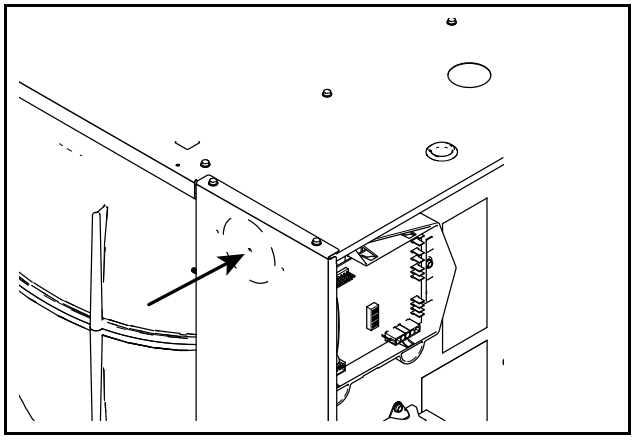


17. Remove the pressure switch bracket assembly.
18. Remove the screw that holds PS2, rotate 90 degrees clockwise, and reattach.
19. Reattach the pressure switch bracket assembly.

Note: *The inducer is shown rotated into its final position in the illustration in next page.*



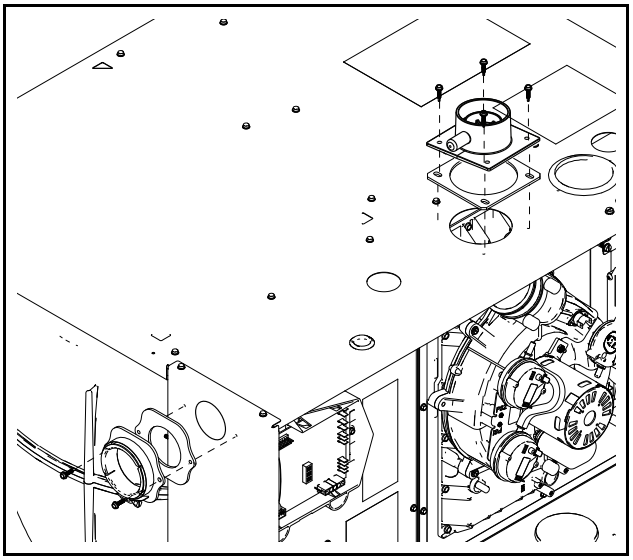
20. Cut 3” hole in bottom panel using large dimple as guide.



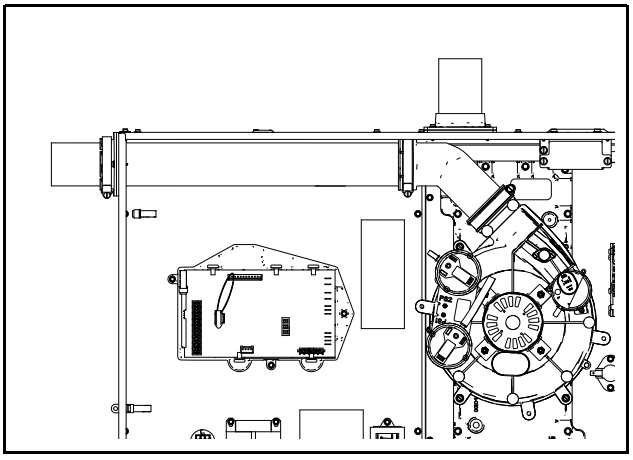
21. Attach the vent outlet gasket to the vent outlet.
22. Install vent outlet to top of cabinet using 2 screws supplied in the doc pack.
23. Install vent inlet gasket and vent inlet using 4 screws supplied in the doc pack.

Note: *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*

Note: *If required, transition to larger venting within 2' of the cabinet. An 2" x 3" offset coupling is required if the transition is made in a horizontal plane. Use coupling CPL01544 (Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.) See Horizontal Venting section for proper orientation of 2” x 3” offset coupling.*



24. Slide PVC through vent outlet adaptor and insert into inducer outlet.
25. Twist to insure PVC is fully inserted.
26. Tighten the two clamps.
27. Install the combustion air inlet PVC pipe.



Condensate Trap Installation

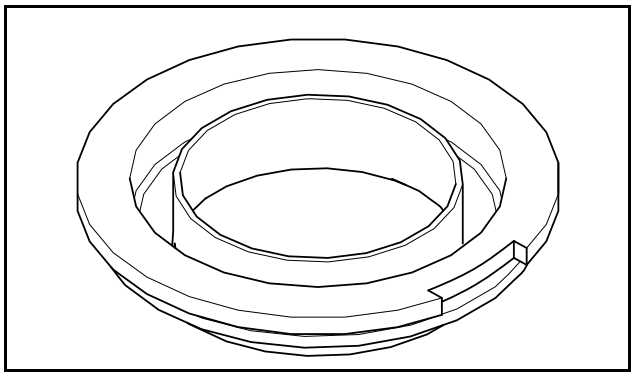
28. Reinstall the condensate adapter if it was earlier removed or ensure adapter is still in place.

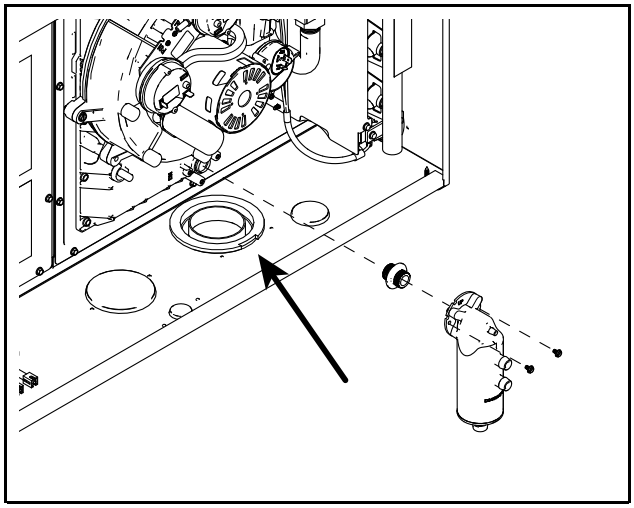
Important: *The condensate adapter must be present for proper condensate drain operation.*

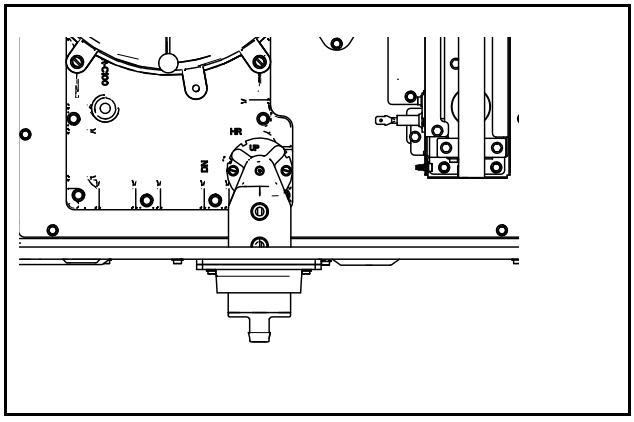
29. Install condensate trap into new location by fitting into grommet and aligning the hole on the condensate trap with the hole labeled “HR”.

Important: *When installing a 21.0" wide S-Series furnace, the condenser trap grommet must be rotated so that the notch in the grommet faces the outer edge of the furnace cabinet as shown in the illustrations below and to the top left in next page. This allows the rain gutter tubing to fully seat onto the lower condensate port trap.*

30. Hand tighten screw.







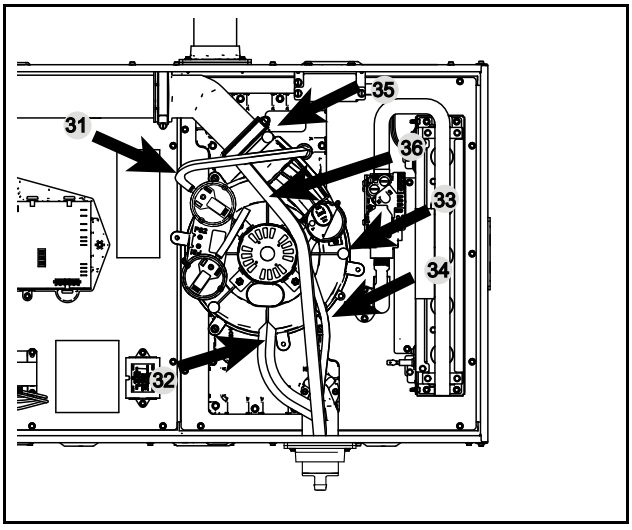
31. Connect PS2 tubing to switch and new sensing location. Use additional tubing in ship with bag, if necessary.

Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*

32. Remove port cap on the right side of inducer and connect inducer condensate tubing. Connect other end of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.
33. Install previously removed port cap onto bottom port of the inducer. (As viewed in upflow)
34. Connect condensate pressure switch tubing to pressure port on the condensate trap.

    Important: *Cut to length to ensure there is no sag or trap created.*

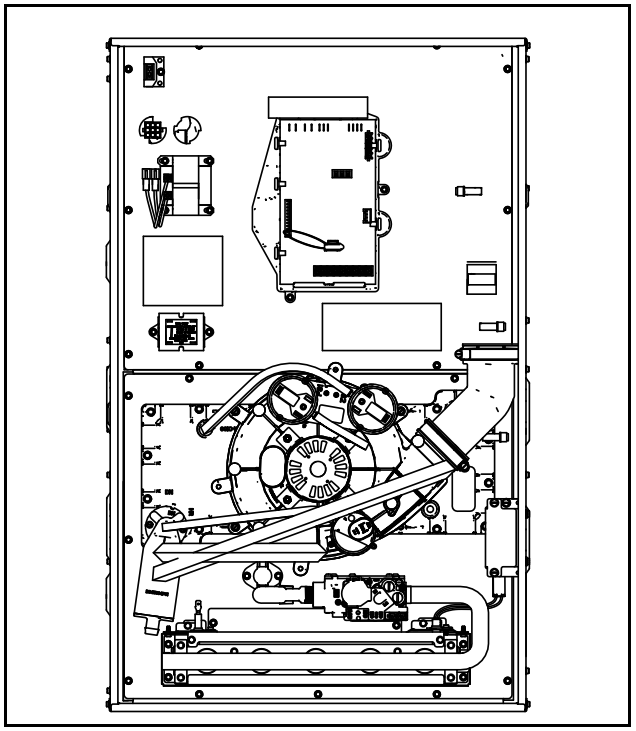
35. Remove port plug from rain gutter and install in new position on opposite side of the rain gutter.
36. Connect rain gutter condensate hose to the rain gutter and the lower port of the condensate trap. Route rain gutter condensate hose to the right of the inducer motor.



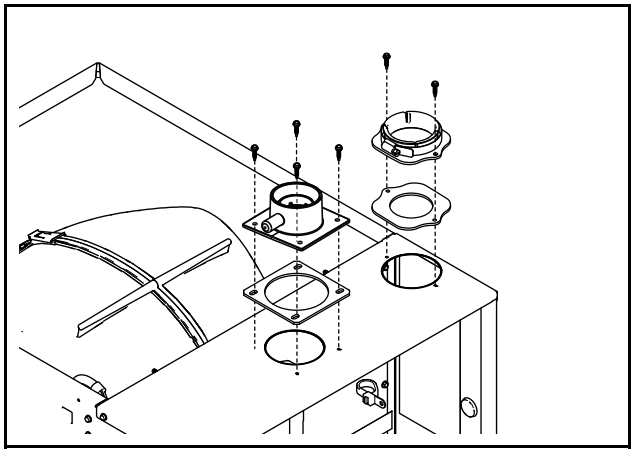
Downflow Furnace - Top Vented Combustion Air

No changes need to be made to the inducer when installing the downflow furnace with the combustion air vented through the top.

Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*



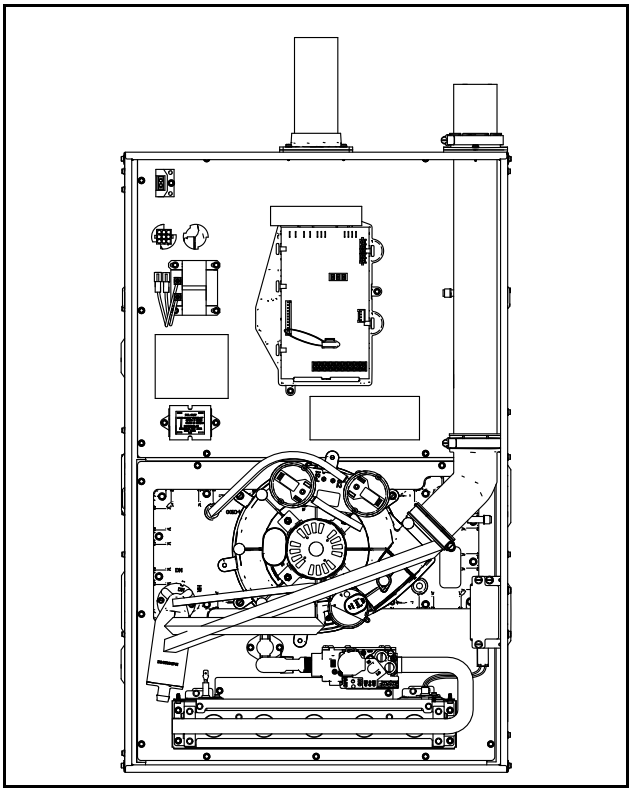
1. Attach the vent outlet gasket to the vent outlet.
2. Install vent outlet to top of cabinet using 2 screws supplied in the doc pack.
3. Install vent inlet gasket and vent inlet using 4 screws supplied in the doc pack.



4. Slide PVC pipe through vent outlet adaptor and insert into inducer outlet.
5. Twist to insure PVC is fully inserted.
6. Tighten the two clamps.
7. Install the combustion air inlet PVC pipe.

Note: *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*

Note: *If required, transition to larger venting within 2' of the cabinet. CPL01544 – 2" x 3" offset coupling may be used and is factory supplied with 120 MBTUH furnaces. Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.*



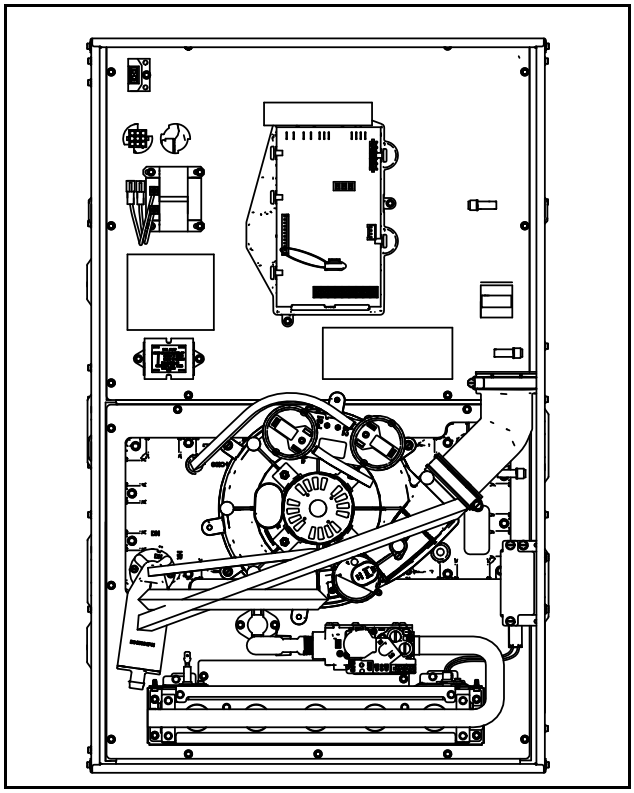
Downflow Furnace - Left Side Vented Combustion Air

Changes need to be made to the inducer orientation when installing the downflow furnace with the combustion air vented through the side. Additional changes are needed for hose routing and PS2 rotation.

The figure to the top right shows the furnace as it is sent from the factory.

Use the following steps to modify the furnace for downflow with side venting of combustion air.

Important: *Right side vent outlet is not allowed because condensate will not drain.*

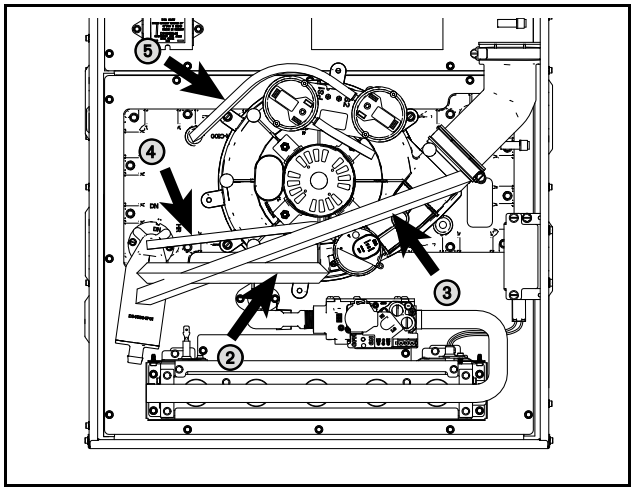


Before proceeding, lay unit on its back to make conversion easier.

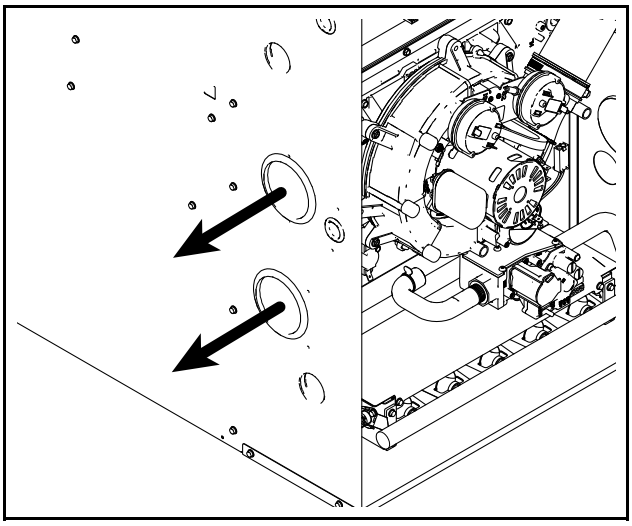
1. Disconnect all drain tubes from condensate trap.

Note: *When removing condensate hoses from the condensate trap, hold the trap with your hand to prevent the trap from breaking.*

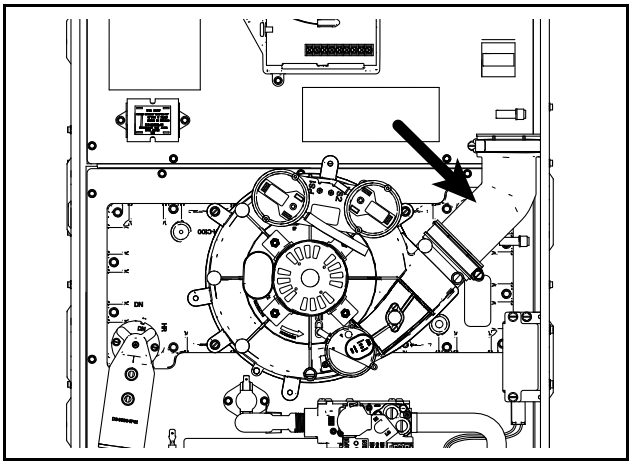
2. Remove drain tubing from bottom of inducer housing.
3. Remove rain gutter tubing from inducer outlet.
4. Remove tubing from condensate pressure switch.
5. Remove tubing from PS2 to cold header.



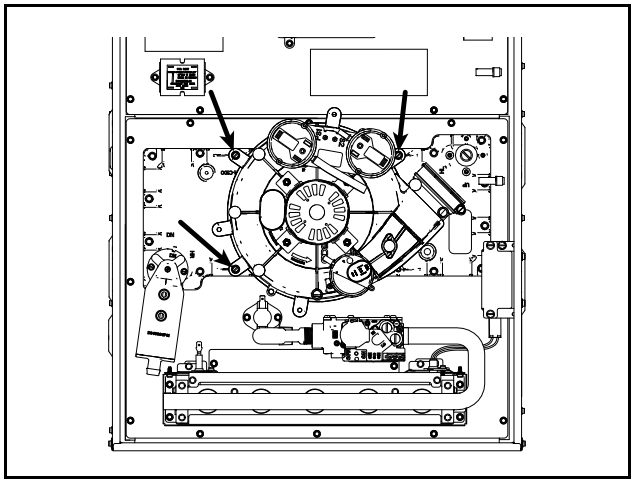
6. Remove two 3″ plugs on left side of cabinet. To be used for combustion air exhaust and inlet.
7. Reuse the two 3″ plugs to seal the two 3″ default openings on the top of the cabinet.

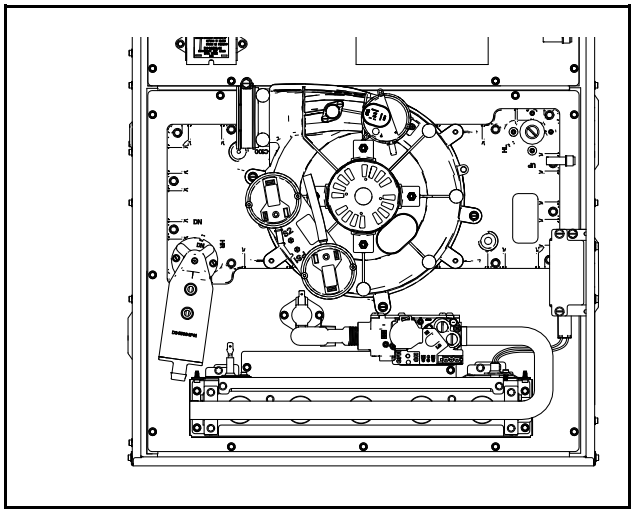


8. Loosen the clamp holding the 45° elbow. Remove the elbow and discard.



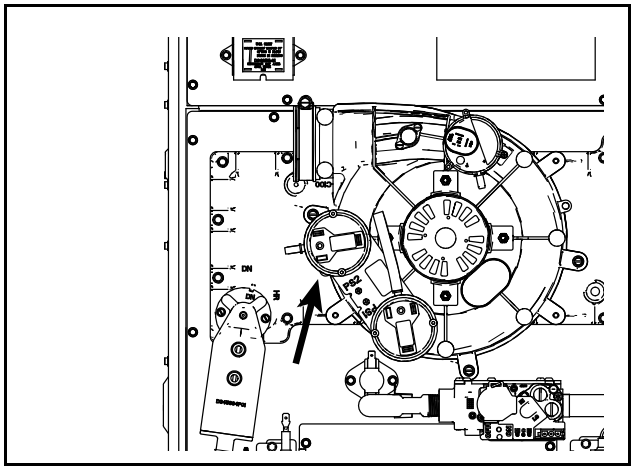
9. Remove the three inducer mounting screws.
10. Rotate inducer counterclockwise so that the inducer outlet aligns with the exhaust vent outlet.
11. Reinsert and tighten screws to 30 in.-lbs. Do not overtighten.



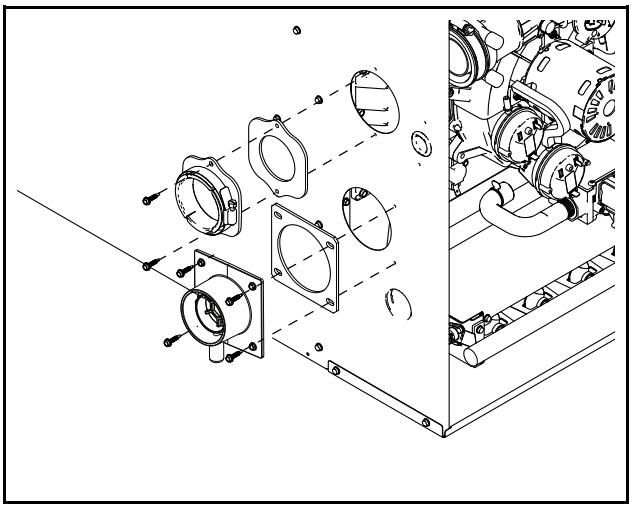


12. Remove the pressure switch bracket assembly.
13. Remove the screw that holds PS2, rotate 90 degrees counterclockwise, and reattach.
14. Reattach the pressure switch bracket assembly.

Note: *The illustration shows PS2 in its final position after being rotated.*



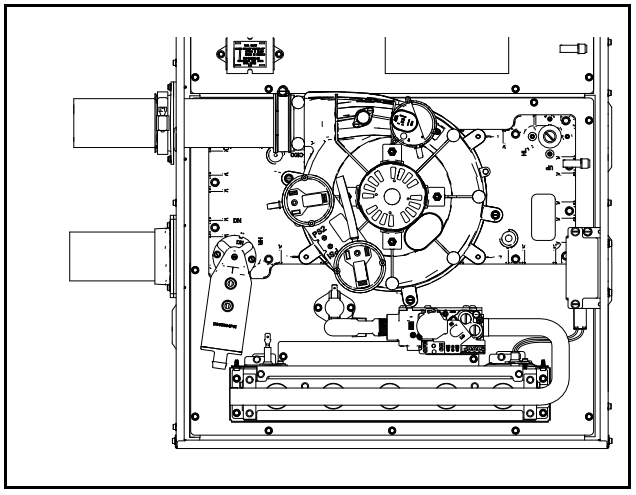
15. Attach the vent outlet gasket to the vent outlet.
16. Install vent outlet to cabinet using 2 screws supplied in the doc pack.
17. Install vent inlet gasket and vent inlet using 4 screws supplied in the doc pack.
18. Install the grommet for the condensate drain tube. The drain may be located on either side of the cabinet.



19. Slide PVC through vent outlet adaptor and insert into inducer outlet.
20. Twist to insure PVC is fully inserted.
21. Tighten the two clamps.
22. Install the combustion air inlet PVC pipe.

Note: *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*

Note: *If required, transition to larger venting within 2' of the cabinet. An 2" x 3" offset coupling is required if the transition is made in a horizontal plane. Use coupling CPL01544 (Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.) See Horizontal Venting section for proper orientation of 2" x 3" offset coupling.*



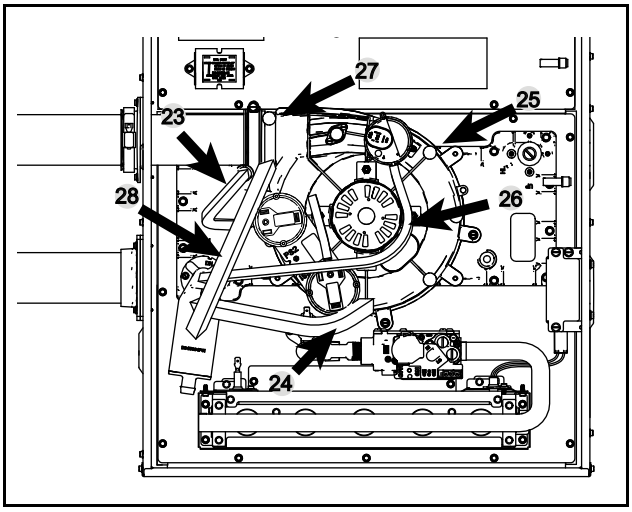
23. Connect PS2 tubing to switch and sensing location.

Important: *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*

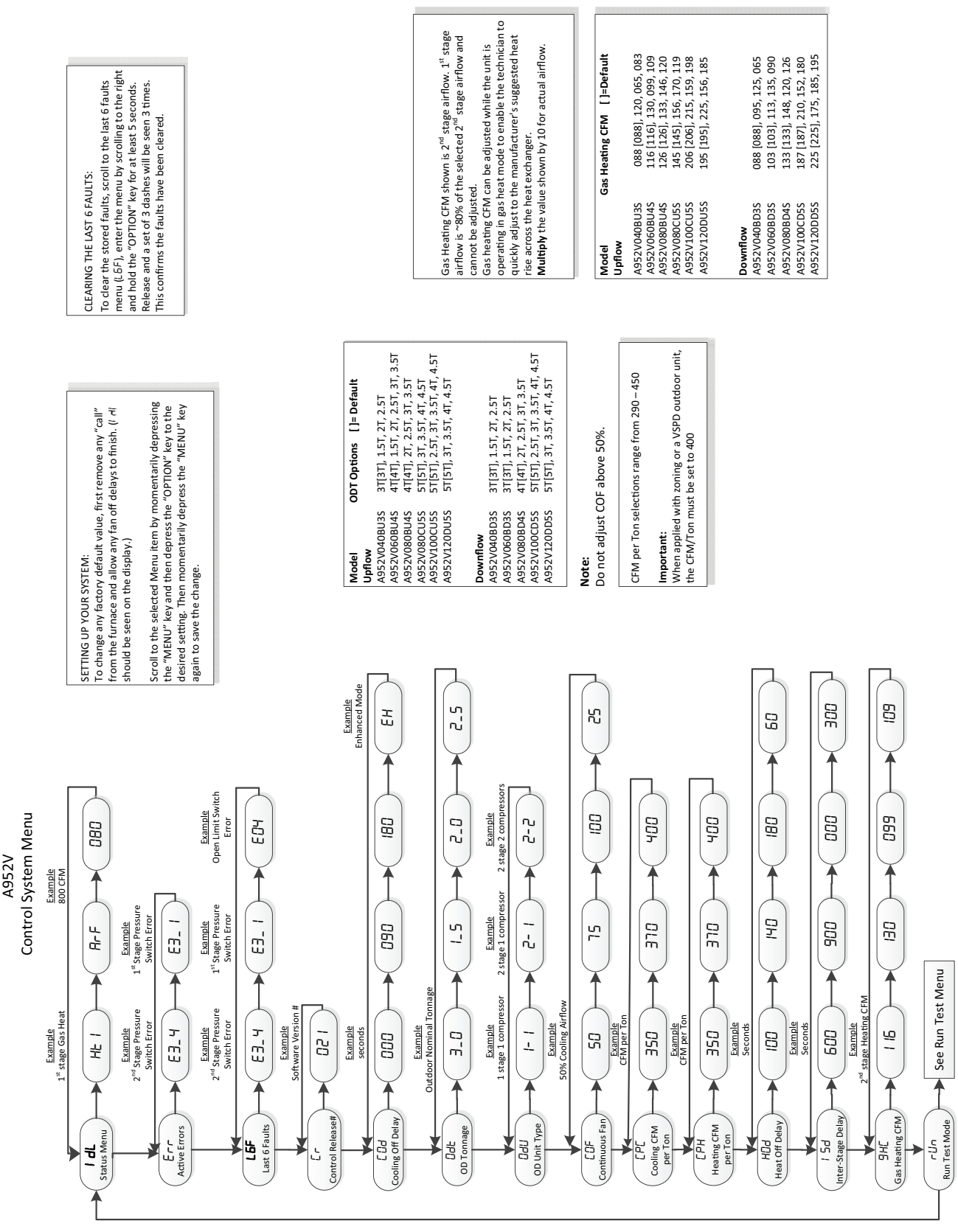
24. Remove port cap at bottom of inducer and connect inducer condensate tubing. Connect other end of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.
25. Install previously removed port cap onto bottom port of the inducer.
26. Connect condensate pressure switch tubing to pressure port on the condensate trap.

Important: *Cut to length to ensure there is no sag or trap created.*

27. Remove port plug from rain gutter and install in new position on opposite side of the rain gutter.
28. Connect rain gutter condensate hose to the rain gutter and the lower port of the condensate trap. Cut to length, as required.



Integrated Furnace Control Menu



SETTING UP YOUR SYSTEM:
To change any factory default value, first remove any "call" from the furnace and allow any fan off delays to finish. (*HI* should be seen on the display.)

Scroll to the selected Menu item by momentarily depressing the "MENU" key and then depress the "OPTION" key to the desired setting. Then momentarily depress the "MENU" key again to save the change.

CLEARING THE LAST 6 FAULTS:
To clear the stored faults, scroll to the last 6 faults menu (*LSF*), enter the menu by scrolling to the right and hold the "OPTION" key for at least 5 seconds. Release and a set of 3 dashes will be seen 3 times. This confirms the faults have been cleared.

Model	ODT Options [ ]= Default
Upflow	
A952V040BU3S	3T[3T], 1.5T, 2T, 2.5T
A952V060BU4S	4T[4T], 1.5T, 2T, 2.5T, 3T, 3.5T
A952V080BU4S	4T[4T], 2T, 2.5T, 3T, 3.5T
A952V080CU5S	5T[5T], 3T, 3.5T, 4T, 4.5T
A952V100CU5S	5T[5T], 2.5T, 3T, 3.5T, 4T, 4.5T
A952V120DU5S	5T[5T], 3T, 3.5T, 4T, 4.5T
Downflow	
A952V040BD3S	3T[3T], 1.5T, 2T, 2.5T
A952V060BD3S	3T[3T], 1.5T, 2T, 2.5T
A952V080BD4S	4T[4T], 2T, 2.5T, 3T, 3.5T
A952V100CD5S	5T[5T], 2.5T, 3T, 3.5T, 4T, 4.5T
A952V120DD5S	5T[5T], 3T, 3.5T, 4T, 4.5T

Note:
Do not adjust COF above 50%.

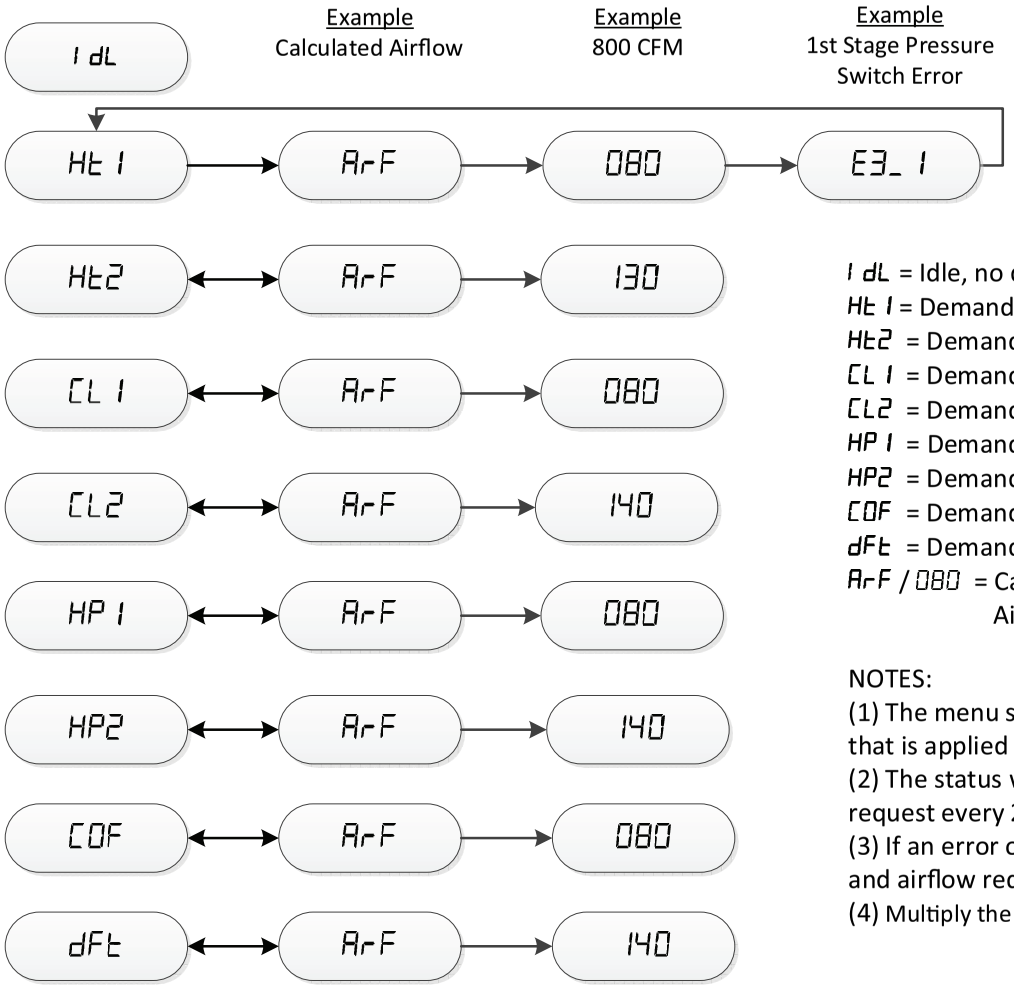
CFM per Ton selections range from 290 – 450

Important:
When applied with zoning or a VSPD outdoor unit, the CFM/Ton must be set to 400

Gas Heating CFM shown is 2nd stage airflow. 1st stage airflow is ~80% of the selected 2nd stage airflow and cannot be adjusted.
Gas heating CFM can be adjusted while the unit is operating in gas heat mode to enable the technician to quickly adjust to the manufacturer's suggested heat rise across the heat exchanger.
Multiply the value shown by 10 for actual airflow.

Model	Gas Heating CFM [ ]=Default
Upflow	
A952V040BU3S	088 [088], 120, 065, 083
A952V060BU4S	116 [116], 130, 099, 109
A952V080BU4S	126 [126], 133, 146, 120
A952V080CU5S	145 [145], 156, 170, 119
A952V100CU5S	206 [206], 215, 159, 198
A952V120DU5S	195 [195], 225, 156, 185
Downflow	
A952V040BD3S	088 [088], 095, 125, 065
A952V060BD3S	103 [103], 113, 135, 090
A952V080BD4S	133 [133], 148, 120, 126
A952V100CD5S	187 [187], 210, 152, 180
A952V120DD5S	225 [225], 175, 185, 195

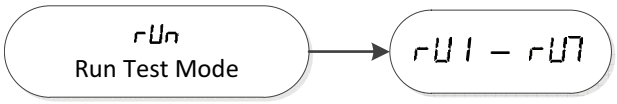
A952V
Examples of System Status



I dL = Idle, no demand for cooling, heating, or fan
Ht 1 = Demand for 1st stage gas heat
Ht2 = Demand for 2nd stage gas heat
CL 1 = Demand for 1st stage cooling
CL2 = Demand for 2nd stage cooling
HP 1 = Demand for 1st stage heat pump
HP2 = Demand for 2nd stage heat pump
COF = Demand for continuous fan
dFt = Demand for outdoor unit defrost, furnace running in gas heat mode
ArF / 080 = Calculated airflow is 800 CFM.
Airflow display is rounded down to the nearest 10 cfm

NOTES:
(1) The menu status displayed is solely dependent on the input of 24VAC that is applied to the low voltage terminal strip.
(2) The status will alternate between the system mode and the airflow request every 2 seconds.
(3) If an error occurs, an E*.* will alternately flash with the system mode and airflow request. See first example
(4) Multiply the value shown by 10 for actual airflow

Note: During run test mode, depressing the option key will allow the user to hold (HLD) that test sequence if measurements want to be taken. The exception is RU3 (ignitor).



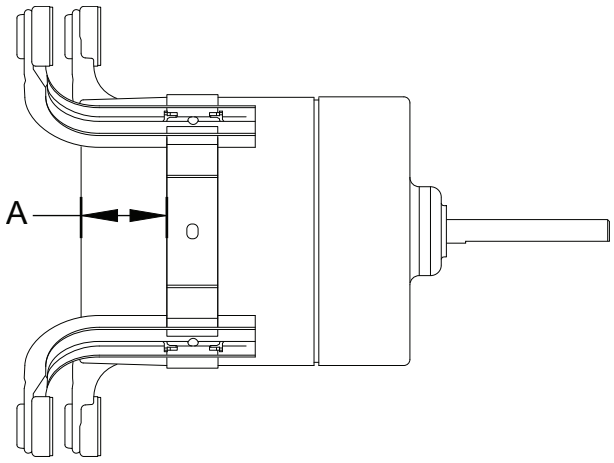
Run Test Mode:
To enter Run Test Mode, scroll to rUn using the Menu key, then push the option key. The LED will flash rUn three times, then begin the test.
To exit the test mode, momentarily push the Menu key, cycle power to the furnace, or make a valid thermostat call for capacity or fan.

Sequence of Run Test Mode
rU1 -Turns the inducer on in 1st stage for 30 seconds
rU2 – Turns on the inducer on 2nd stage for 30 seconds
rU3 – Turns the ignitor on for 10 seconds
rU4 – Turns the circulating blower on 1st stage compressor speed for 10 seconds
rU5 – Turns the circulating blower on 2nd stage compressor speed for 10 seconds
rU6 – Turns the circulating blower on 1st stage gas heat speed for 10 seconds
rU7 – Turns on the circulating blower on 2nd stage gas heat speed for 10 seconds
The above sequence will repeat two more times unless the Run Test Mode is exited, see above

Important: The Run Test Mode does not test fire the furnace or bring the outdoor unit on. It is designed to allow the technician to observe each mode to ensure the IFC, inducer, and circulating blower are performing as intended.

Belly Band Location

Distance from belly band to the front face of motor for minimum vibration



Blower housings and wheel removed from view for clarity.

For C Models only	
Furnace Cabinet Size	**Dimension "A" (inches)**
B	2.705
C	1.790
D	1.790

For D Models only	
Furnace Cabinet Size	**Dimension "A" (inches)**
B	2.75
C	3.54
D	3.79

Integrated Furnace Control Display Codes

2 Stage Inducer with ECM Blower Motor Status Codes	
IdL	Idle
Ht1	First Stage Heating
Ht2	Second Stage Heating
ArF	Calculated airflow times 10 (080=800 CFM)
COF	Continuous Fan
CL1	First Stage Cooling
CL2	Second Stage Cooling
HP1	First Stage Heat Pump
HP2	Second Stage Heat Pump
dFt	Defrost Mode
Menu Options	
Err	Active Alarm Menu
LbF	Last 6 Faults (To clear — Hold Option button down for 5 seconds)
Cr	Code Release Number
COd	Cooling Off Delay (Seconds)
Odt	Outdoor Tonnage
OdU	Outdoor Unit
COF	Blower Constant Fan Airflow Multiplier (Percentage)
CPC	Cooling (CFM/Ton)
CPH	Heat Pump Heating (CFM/Ton)
Hod	Heat Off Delay (Seconds)
I Sd	Inter-Stage Delay (Seconds)
GHC	Gas Heating CFM 2nd Stage (1st Stage is not adjustable)
rUn	Run Test Mode

Error Codes	
Alarm Error Code	Alarm Explanation
E01	Loss of the IRQ or other internal failures (Internal IFC error)
E2_1	Retry Exceeded (Flame never sensed, one hour lockout after 3 times)
E2_2	Recycles Exceeded (Flame sensed then lost, one hour lockout after 10 times)
E2_3	1st Stage Gas Valve Not Energized When It Should Be exceeded after 10 times
E3_1	Shorted Pressure Switch, 1st Stage
E3_2	Open Pressure Switch, 1st Stage
E3_3	Shorted Pressure Switch, 2nd Stage
E3_4	Open Pressure Switch, 2nd Stage
E04	Open Limit (Main Thermal, Rollout Switch, or Reverse Airflow Switch)
E05	Flame detected, should not be present

E6_1	Voltage reversed polarity
E6_2	Bad grounding
E6_3	(1) Igniter relay fails
	(2) Igniter open
E7_1	1st stage gas valve (MVL) is energized when it should be off
E08	Flame current is low, but still strong enough to allow operation
E09	Open Inducer Limit Switch or Condensate Pressure Switch
E11	(1) 1st stage gas valve not energized when it should be
	(2) 1st stage gas valve relay stuck closed
	(3) 2nd stage gas valve relay stuck closed
	(4) 2nd stage gas valve energized when it should not be
	(5) 2nd stage gas valve not energized when it should be
E12	Open fuse
E13	Blower HP/OEM ID
E14	No PM and local copy bad
E15	Both of unit Data File in PM and local Unit Data File are corrupt
E17	Blower motor no communication response
E18	Blower communication failure on the control

Fault Code Recovery

Fault Code Recovery

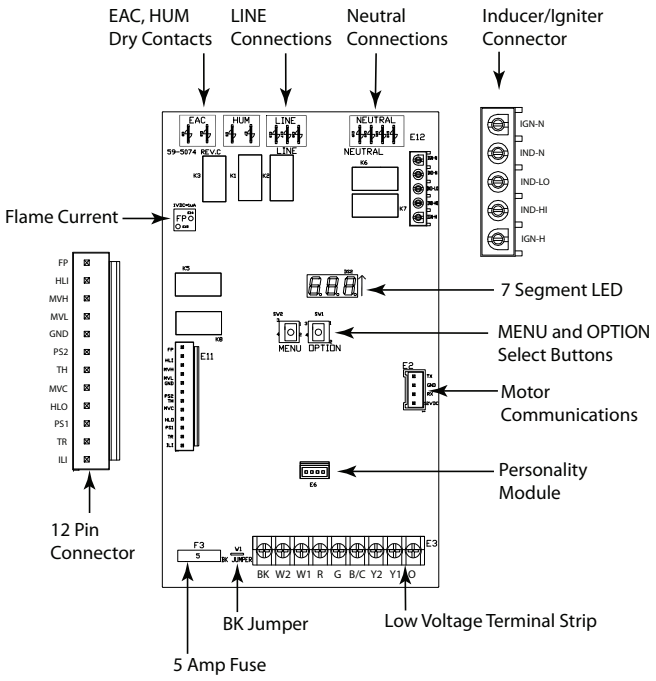
1. To view the last 6 faults, press the "Menu" key until the "Last 6 Faults" (L6F) menu appears.
2. Enter the menu by pressing the "Option" key.
3. The last 6 faults can be viewed.

Clearing the Last 6 Faults

1. To clear the last 6 faults, press the "Menu" key until the "Last 6 Faults" (L6F) menu appears.
2. Enter the menu by pressing the "Option" key.
3. Hold the "Option" key for at least 5 seconds.
4. Release and a set of 3 dashes with be seen 3 times. This confirms the faults have been cleared.

Resetting Factory Defaults

1. Display must be in Idle Mode.
2. Push the "Menu" and "Option" buttons at the same time for 15 seconds then release.
3. The 7 segment will flash "Fd" 3 times. This confirms the unit has been reset to the factory defaults.

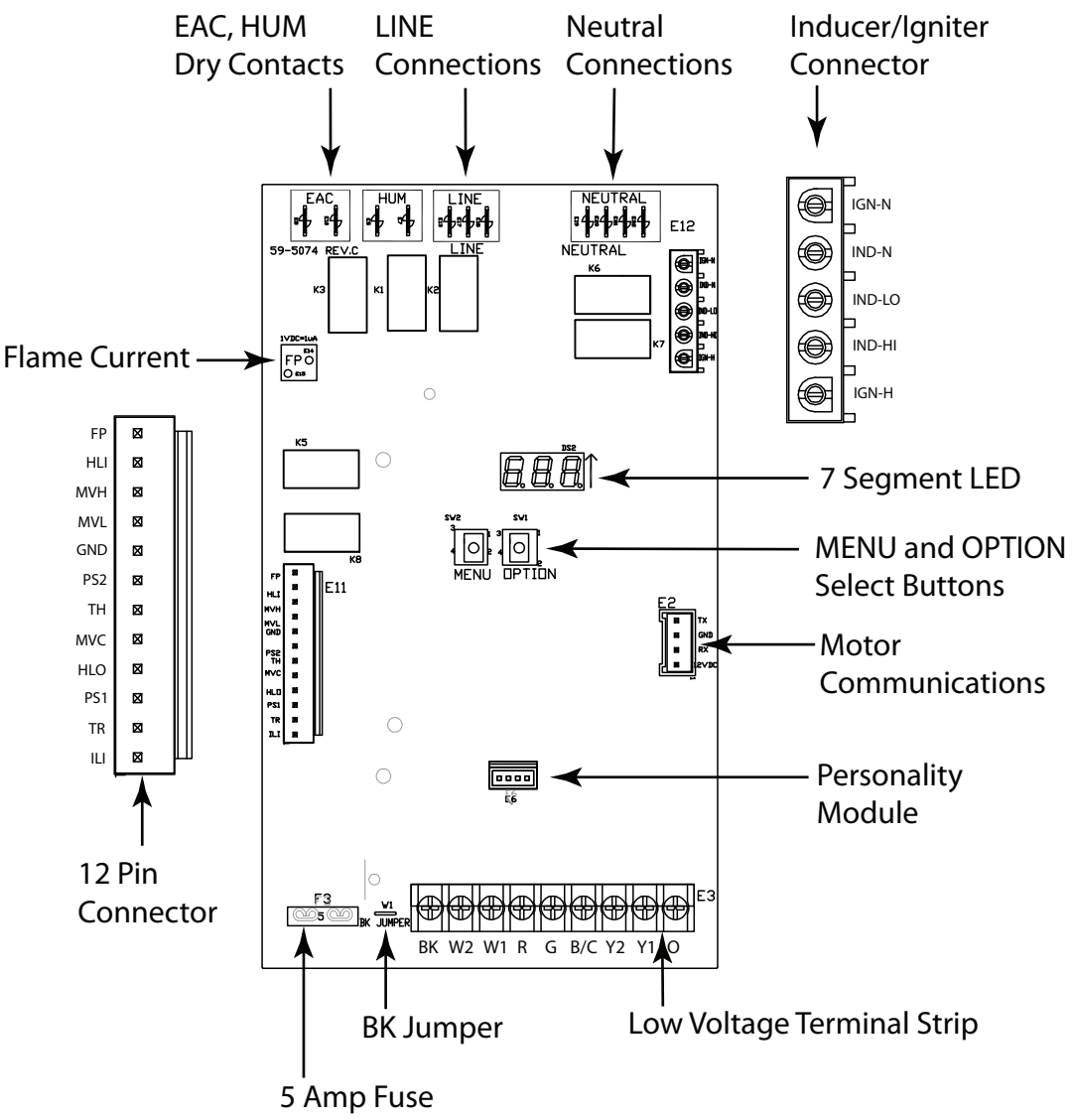


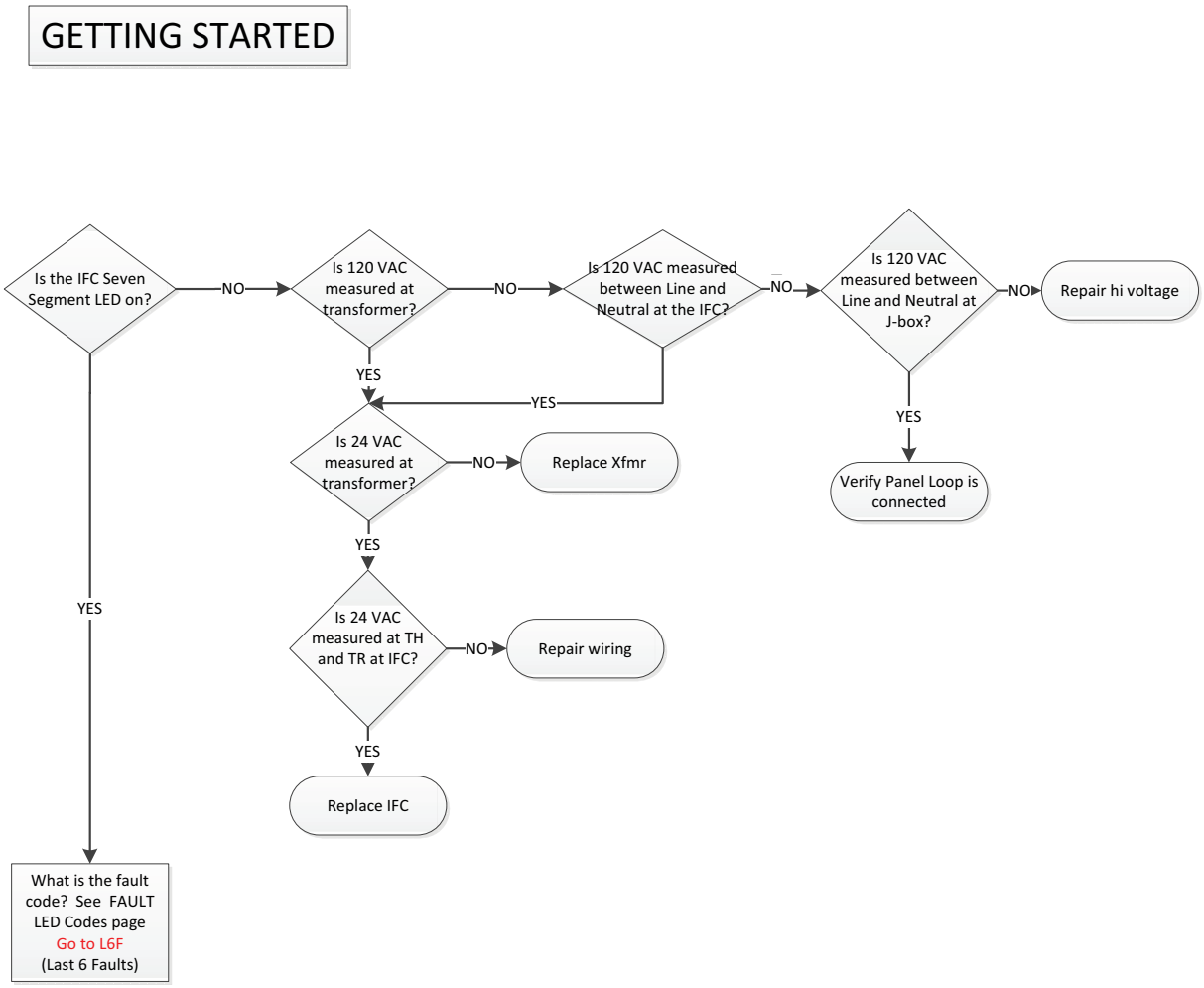
Troubleshooting

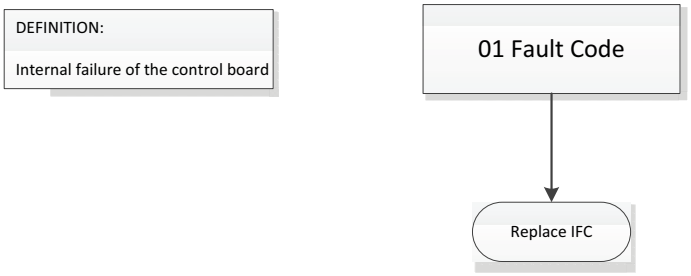
The following pages include troubleshooting flowcharts in reference for the 2 Stage A952V family of furnaces only.
The information contained is for reference only and does not cover all scenarios or problems that may be encountered.
ONLY qualified technicians should attempt to install, troubleshoot, or repair this appliance.
Failure to follow all cautions and /or warnings could result in personal or property damage, including death.

Error Codes	
Alarm Error Code	Alarm Explanation
E01	Loss of the IRQ or other internal failures (Internal IFC error)
E2_1	Retry Exceeded (Failed to Establish Flame)
E2_2	Recycles exceeded (Loss of Established Flame) or 10X PS1 Open
E2_3	1st Stage Gas Valve Not Energized When It Should Be exceeded after 10 times
E2_4	Redundant Relay (HLO output) Not Energized when it should be exceeded after 10 times
E3_1	Shorted Pressure Switch, 1st Stage
E3_2	Open Pressure Switch, 1st Stage
E3_3	Shorted Pressure Switch, 2nd Stage
E3_4	Open Pressure Switch, 2nd Stage
E04	Open Limit (Main Thermal, Rollout Switch, or Reverse Airflow Switch)
E05	Flame detected, should not be present
E06	Voltage reversed polarity or Bad Grounding
E6_3	(1) Igniter relay fails
	(2) Igniter open
E7_1	1st stage gas valve (MVL) is energized when it should be off
E7_2	Redundant Relay (HLO output) Energized when it should Not be
E08	Flame current is low, but still strong enough to allow operation
E09	Open Inducer Limit Switch or Condensate Pressure Switch
E 10	Communication error between variable speed inducer and blower motor microprocessor
E11	(1) 2nd stage gas valve energized when it should NOT be
	(2) 2nd stage gas valve not energized when it should be
	(3) 1st stage gas valve not energized when it should be
	(4) Redundant relay (HLO output) not energized when it should be
E12	Open fuse
E13	Blower HP/OEM ID
E14	No PM and local copy bad
E15	Both of unit Data File in PM and local Unit Data File are corrupt
E17	Blower motor no communication response
E18	Blower communication failure on the control

IFC Component Layout




GETTING STARTED
Is the IFC Seven Segment LED on?
NO
Is 120 VAC measured at transformer?
NO
Is 120 VAC measured between Line and Neutral at the IFC?
NO
Is 120 VAC measured between Line and Neutral at J-box?
NO
Repair hi voltage
YES
YES
YES
Is 24 VAC measured at transformer?
NO
Replace Xfmr
YES
Verify Panel Loop is connected
YES
Is 24 VAC measured at TH and TR at IFC?
NO
Repair wiring
YES
Replace IFC
What is the fault code? See FAULT LED Codes page
Go to L6F
(Last 6 Faults)


DEFINITION:
Internal failure of the control board
01 Fault Code
Replace IFC

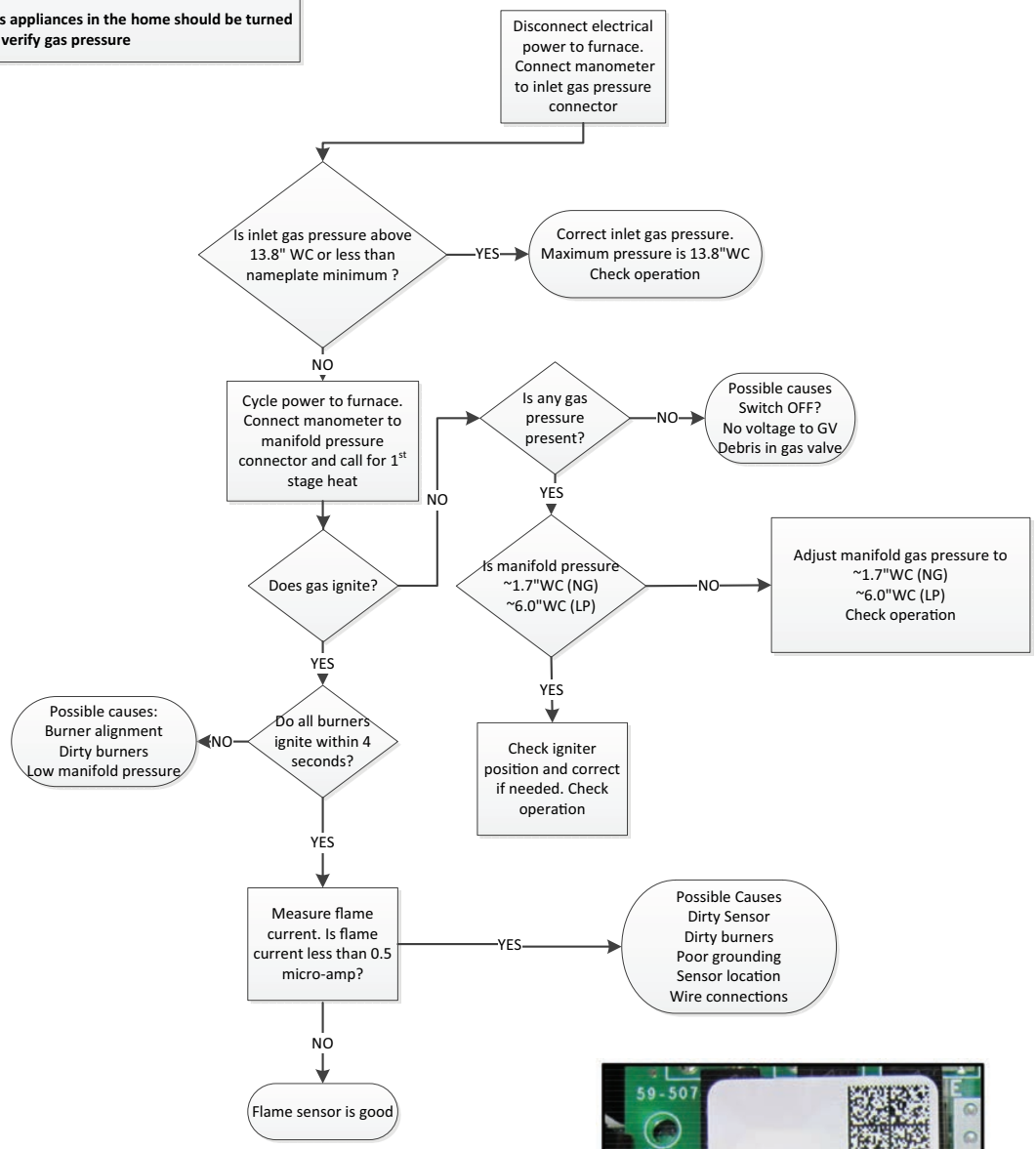
DEFINITION

RETRY Lock Out = 3 unsuccessful tries for ignition within a single call for heat. Lockout period is for one hour

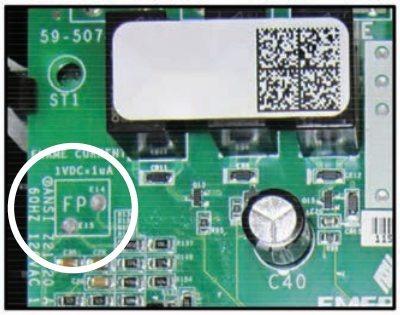
Flame has never been sensed

All gas appliances in the home should be turned on to verify gas pressure

2.1 Fault Code



There are two flame sense pads located on the IFC, marked “FP”. To measure flame current, use a VOM set to DC volts. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3.0 VDC)



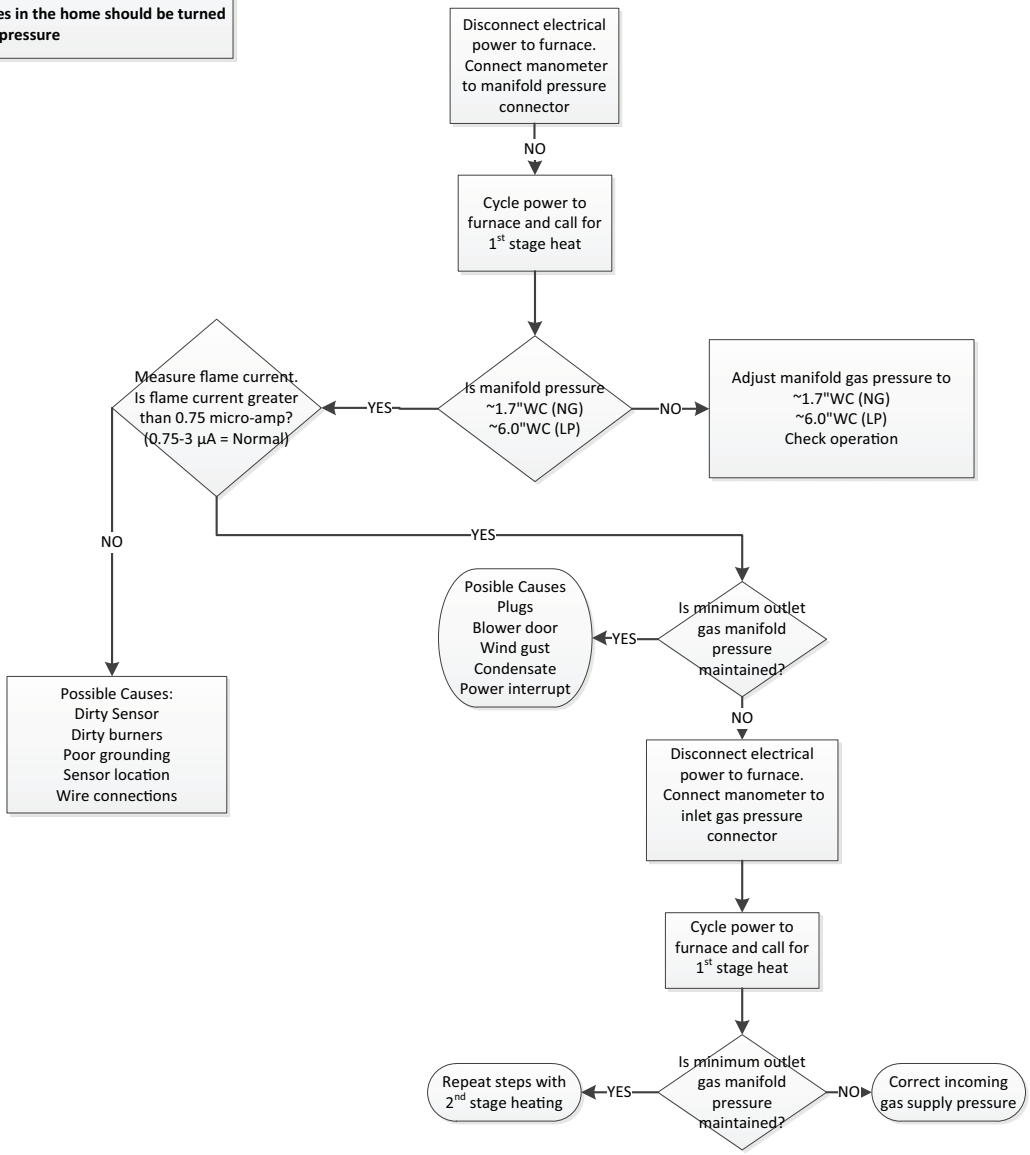
DEFINITION

RECYCLE Lock Out = 10 recycles within a single call for heat. Lockout period is for one hour.

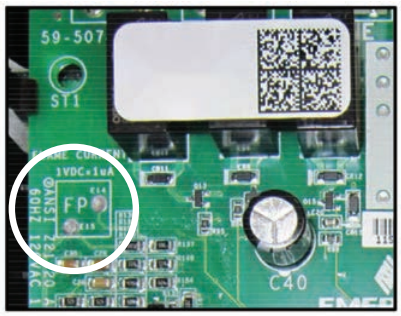
Flame is sensed & then lost

All gas appliances in the home should be turned on to verify gas pressure

2.2 Fault Code



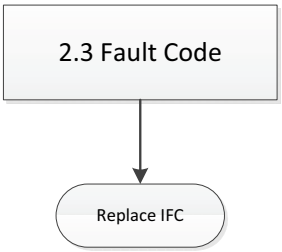
There are two flame sense pads located on the IFC, marked “FP”. To measure flame current, use a VOM set to DC volts. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3.0 VDC)



DEFINITION

1st Stage Gas Valve not energized when it should be 10 times within the same call for heat .

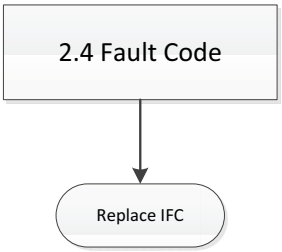
24VAC not sensed on MVL 10 times



DEFINITION

High limit output relay is not closed when it should be

24VAC not sensed on HLO 10 times

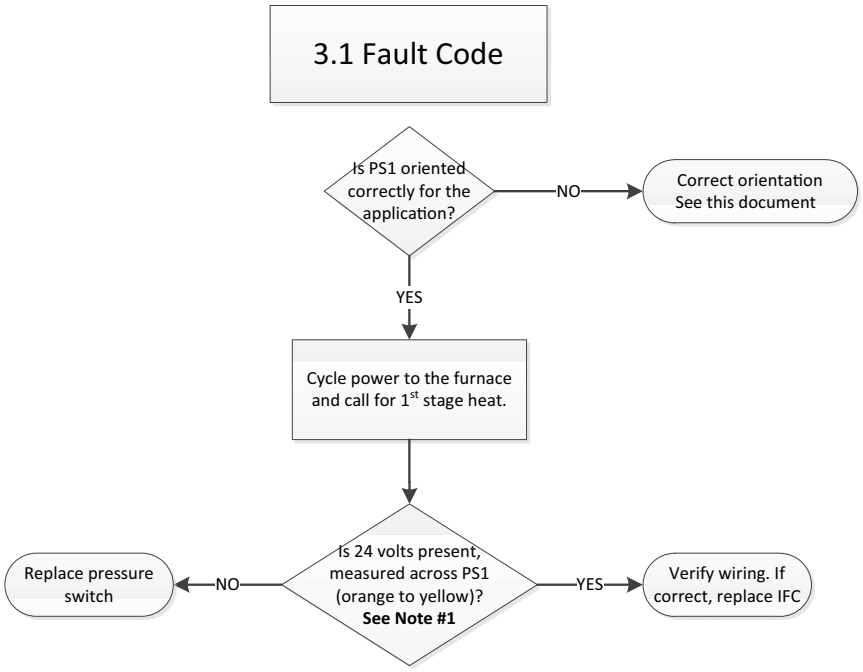


DEFINITION
An error has occurred with the PS1, indicating that the pressure switch is closed when it should be open.

In most cases, the pressure switch is not the problem.

NOTE: Verify pressure switch wiring and tube routing are correct.

Note #1
24 volts = Open Switch
0 volts = Closed Switch



DEFINITION
An error has occurred with the PS1 indicating that the pressure switch is open when it should be closed.

In most cases, the pressure switch is not the problem.

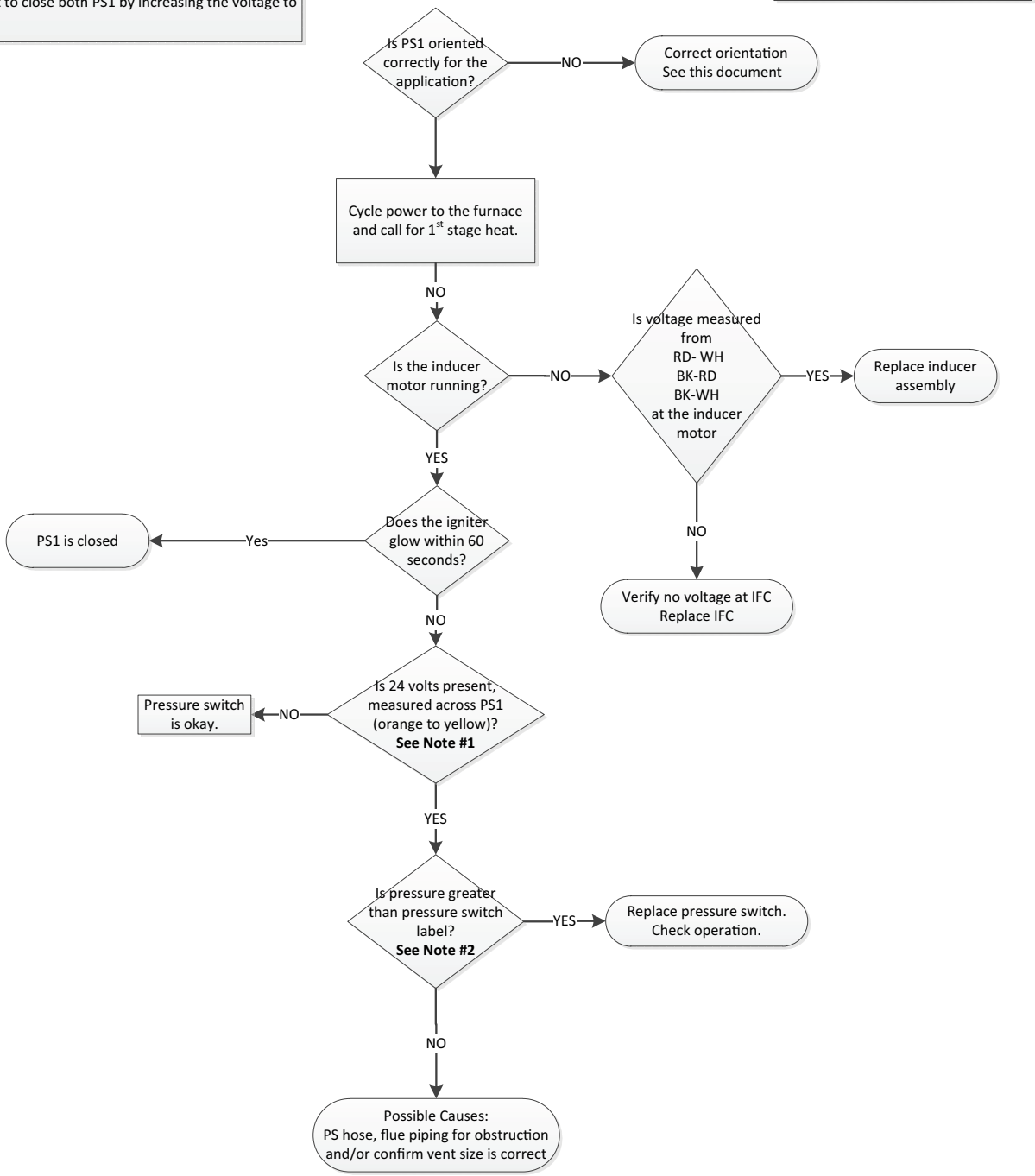
NOTE: Verify pressure switch wiring and tube routing are correct.

PS1 Open errors can occasionally occur when wind gusts occur. The IFC will attempt to close both PS1 by increasing the voltage to the inducer motor

3.2 Fault Code

Note #1
24 volts = Open Switch
0 volts = Closed Switch

Note #2
Measured pressure is negative, greater than refers to magnitude only.



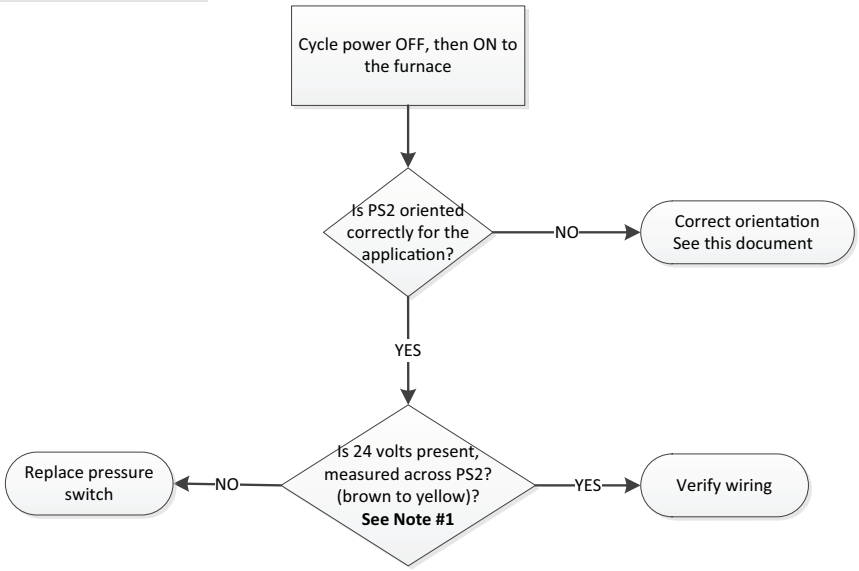
DEFINITION
An error has occurred with the PS2, indicating that the pressure switch is closed when it should be open.

In most cases, the pressure switch is not the problem.

NOTE: Verify pressure switch wiring and tube routing are correct.

3.3 Fault Code

Note #1
24 volts = Open Switch
0 volts = Closed Switch



DEFINITION
An error has occurred with the PS2 indicating that the pressure switch is open when it should be closed.

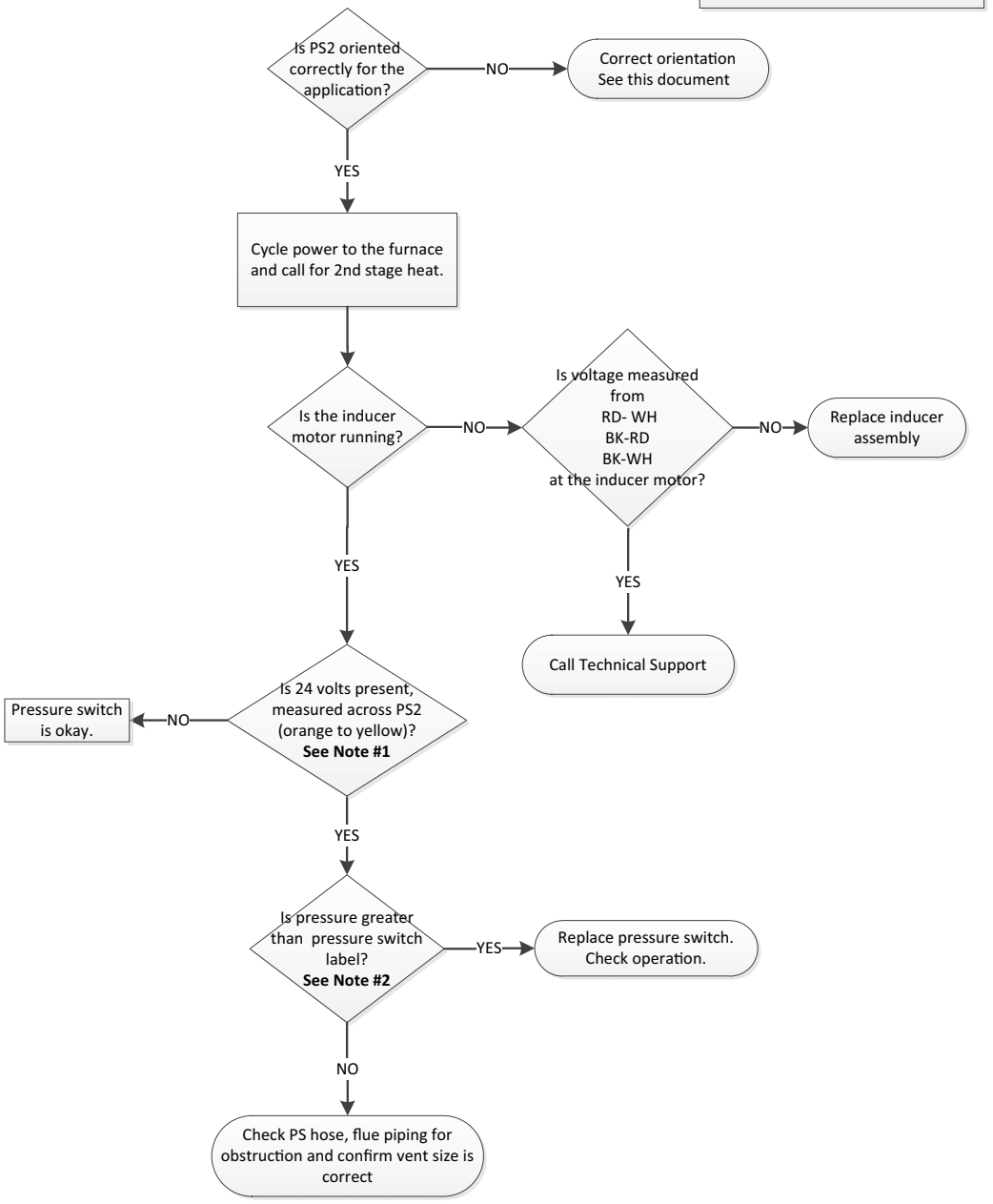
In most cases, the pressure switch is not the problem.

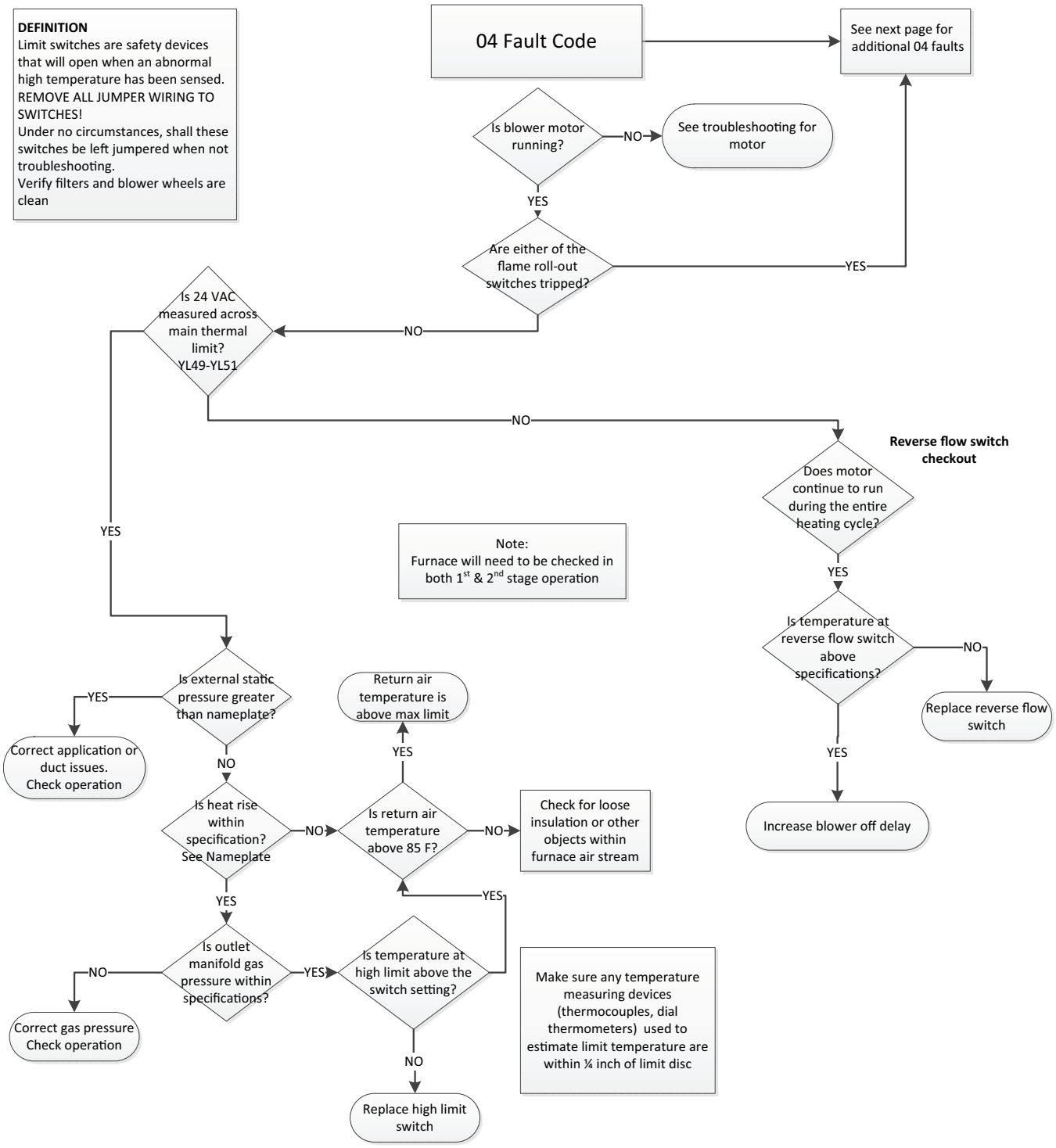
NOTE: Verify pressure switch wiring and tube routing are correct.

3.4 Fault Code

Note #1
24 volts = Open Switch
0 volts = Closed Switch

Note #2
Measured pressure is negative, greater than refers to magnitude only.

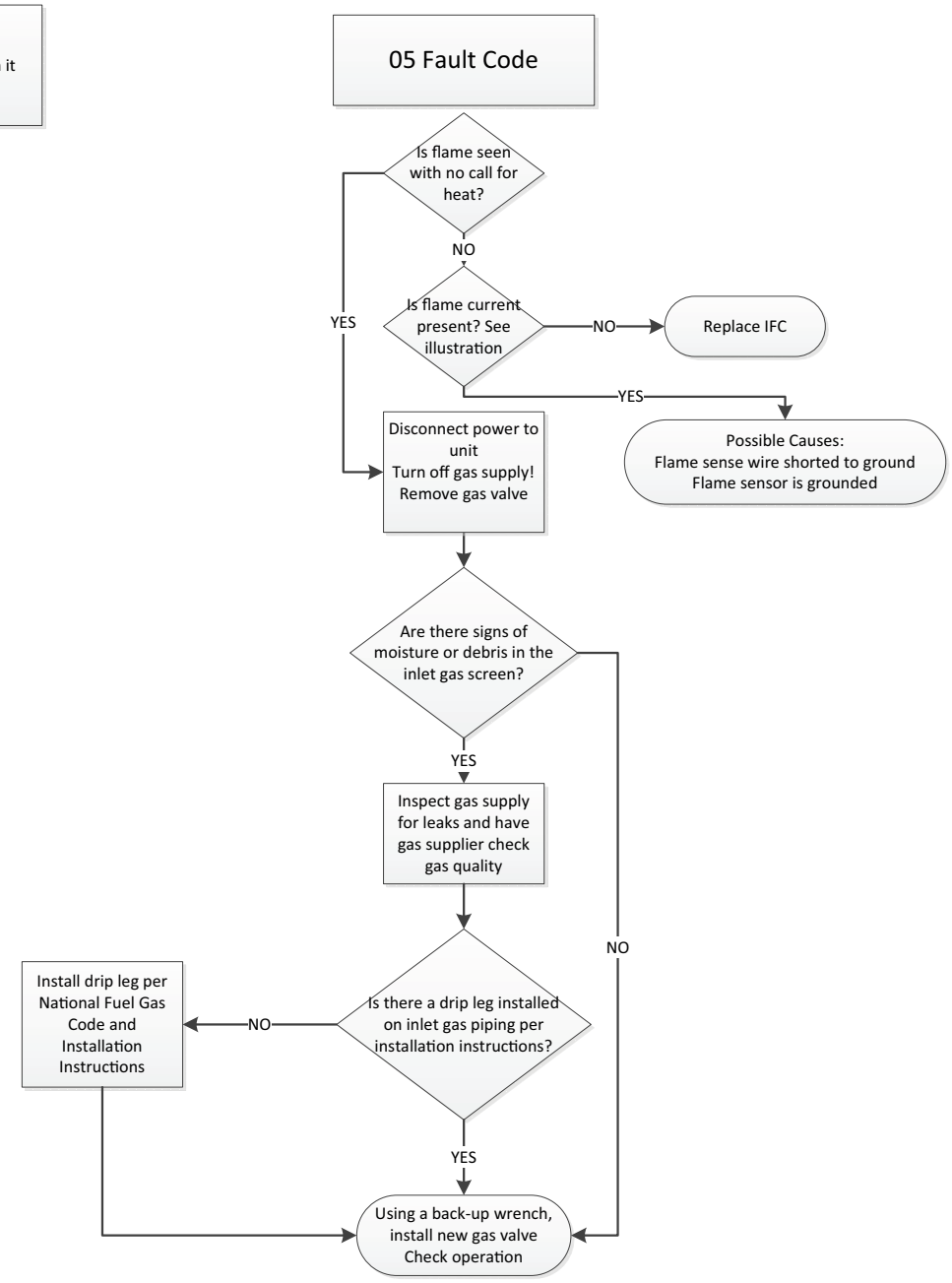



DEFINITION
Limit switches are safety devices that will open when an abnormal high temperature has been sensed.
REMOVE ALL JUMPER WIRING TO SWITCHES!
Under no circumstances, shall these switches be left jumpered when not troubleshooting.
Verify filters and blower wheels are clean
04 Fault Code
See next page for additional 04 faults
Is blower motor running?
NO
See troubleshooting for motor
YES
Are either of the flame roll-out switches tripped?
YES
NO
Is 24 VAC measured across main thermal limit? YL49-YL51
NO
YES
Reverse flow switch checkout
Does motor continue to run during the entire heating cycle?
YES
Is temperature at reverse flow switch above specifications?
NO
Replace reverse flow switch
YES
Increase blower off delay
Note:
Furnace will need to be checked in both 1st & 2nd stage operation
Is external static pressure greater than nameplate?
YES
Correct application or duct issues. Check operation
NO
Return air temperature is above max limit
YES
Is heat rise within specification? See Nameplate
NO
Is return air temperature above 85 F?
NO
Check for loose insulation or other objects within furnace air stream
YES
YES
Is outlet manifold gas pressure within specifications?
NO
Correct gas pressure Check operation
YES
Is temperature at high limit above the switch setting?
NO
Replace high limit switch
Make sure any temperature measuring devices (thermocouples, dial thermometers) used to estimate limit temperature are within ¼ inch of limit disc

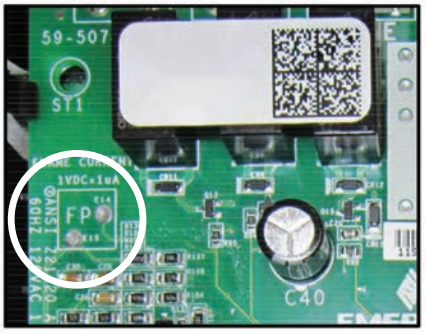
DEFINITION
Limit switches are safety devices that will open when an abnormal high temperature has been sensed.
REMOVE ALL JUMPER WIRING TO SWITCHES!
Under no circumstances, shall these switches be left jumpered when not troubleshooting.

DEFINITION:

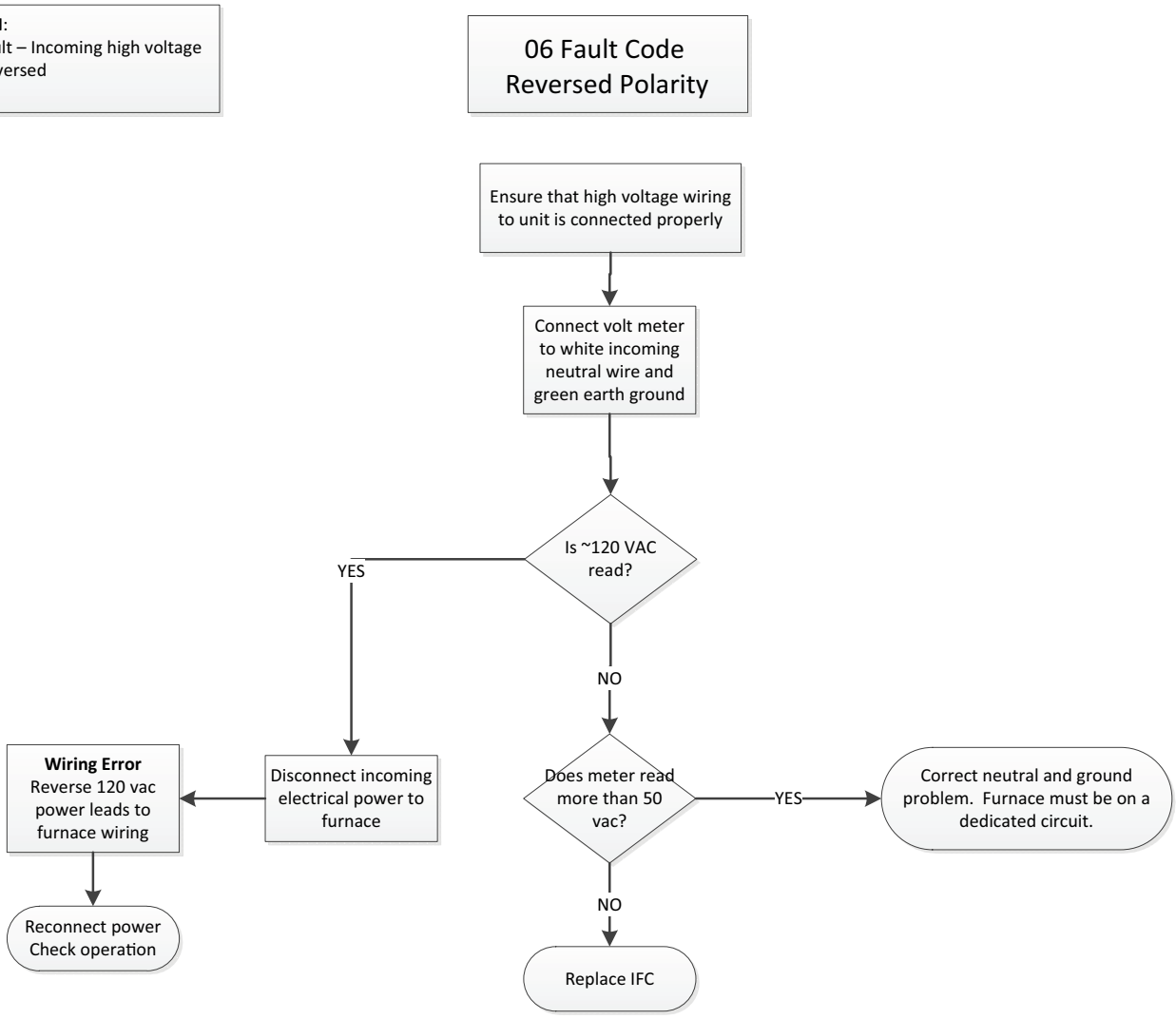
Flame is sensed when it should not be.



There are two flame sense pads located on the IFC, marked “FP”. To measure flame current, use a VOM set to DC volts. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3.0 VDC)

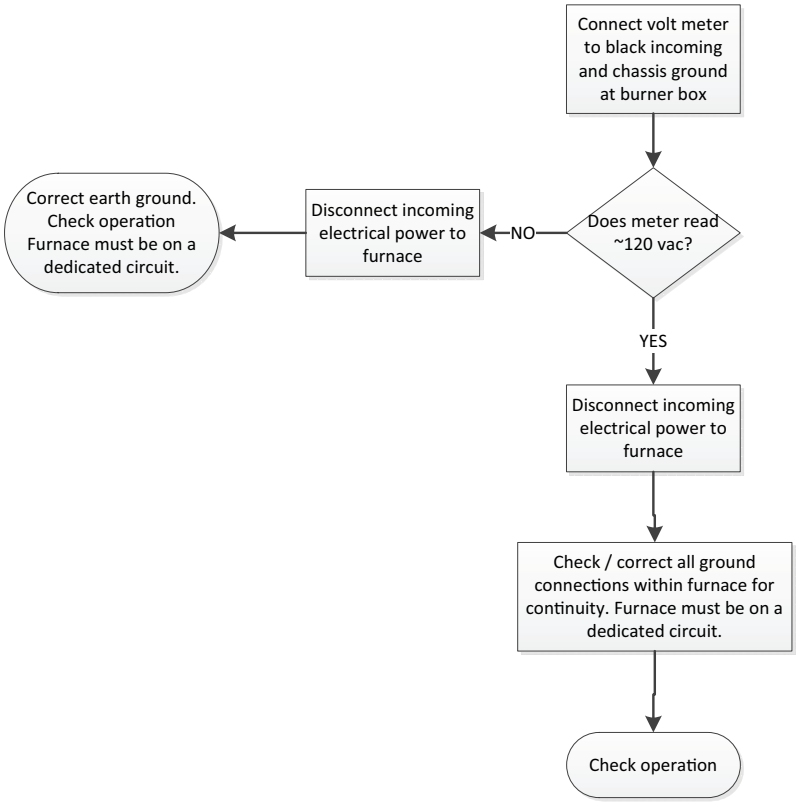


DEFINITION:
Polarity Fault – Incoming high voltage wiring is reversed



DEFINITION:
Ground Fault - Incoming or chassis ground connection is not sensed

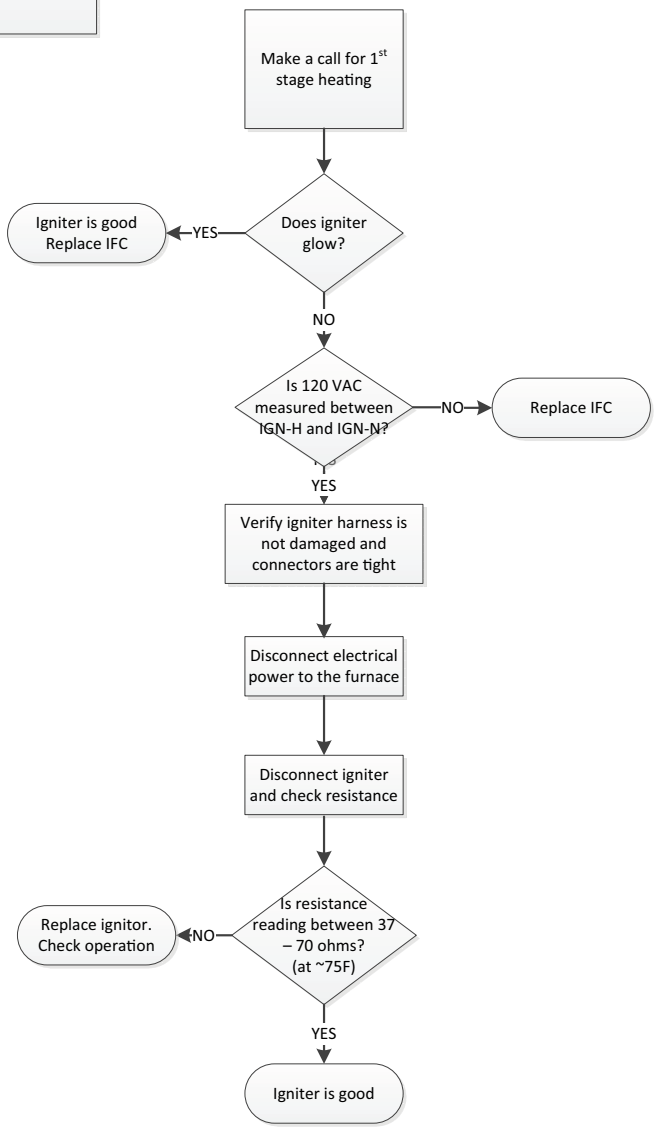
06 Fault Code
Faulty Ground



DEFINITION:
Igniter Relay Fault – The control board has sensed that the igniter relay has stuck closed

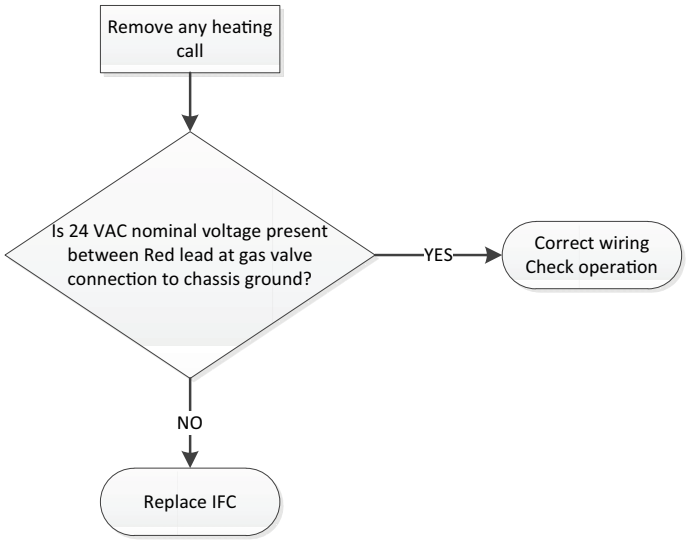
Ignitor Fault – The control board has sensed that the ignitor circuit is open or shorted.

6.3 Fault Code



DEFINITION: External Gas Valve Circuit Error (24 volts is present when it should not be present)

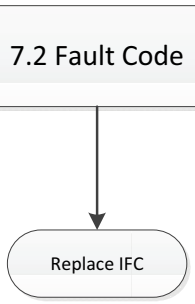
7.1 Fault Code



DEFINITION:

Internal control board error Redundant HLO relay closed when it should not be

7.2 Fault Code



DEFINITION:
The flame sense current is less than 0.5 micro-amp DC

08 Fault Code

Make a call for 1st stage heating

Once flame has been established, set meter to DC volts and measure flame current

Ensure all burner flames directed into heat exchanger with a tight pattern? (inadequately aired burners tend to roll back)

Is flame current measured less than 0.5 micro-amp DC?

YES

Is flame sensor located correctly? See figure

NO

Correct flame sensor location

YES

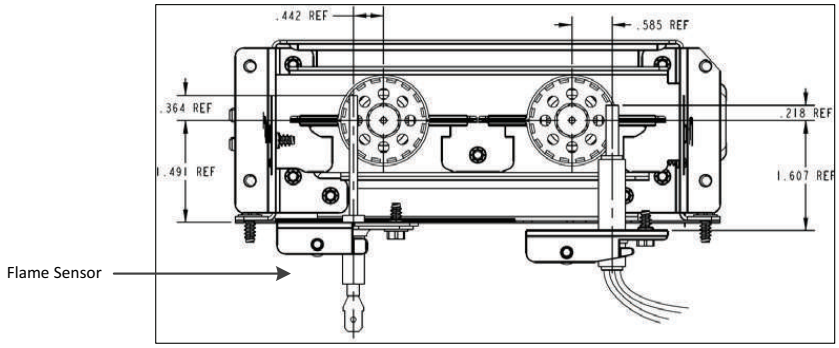
Replace flame sensor

Check operation

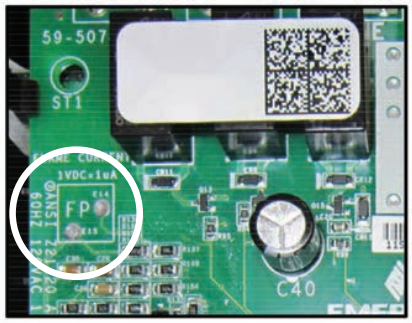
NO

Flame sensor is good. Check wiring and / or connections.

Important:
LP applications must have SEN02662 flame sensor installed. This sensor is identified by having a brown stripe / brown ceramic body



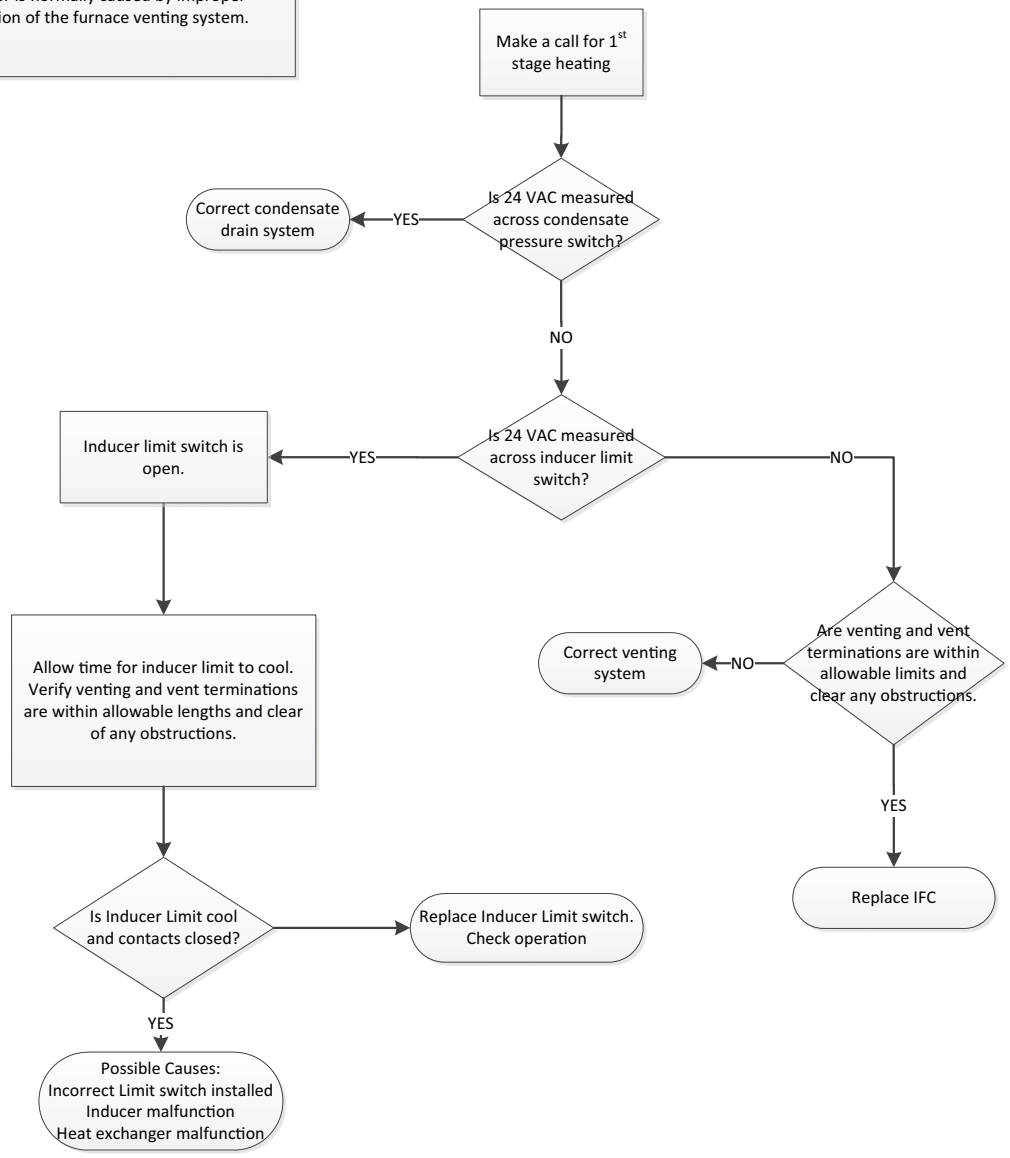
There are two flame sense pads located on the IFC, marked “FP”. To measure flame current, use a VOM set to DC volts. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3.0 VDC)



Definition:
Condensate Pressure Switch Open: The condensate system is not free flowing and opened the safety switch OR

Inducer Limit: This error is normally caused by improper installation or application of the furnace venting system.

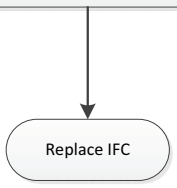
09 Fault Code



DEFINITION:

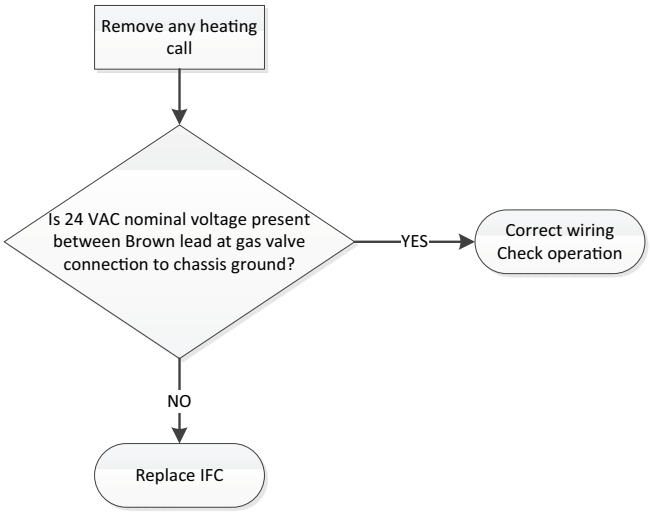
Internal control board error. Communication error between the inducer and blower motor micro-processors

10 Fault Code



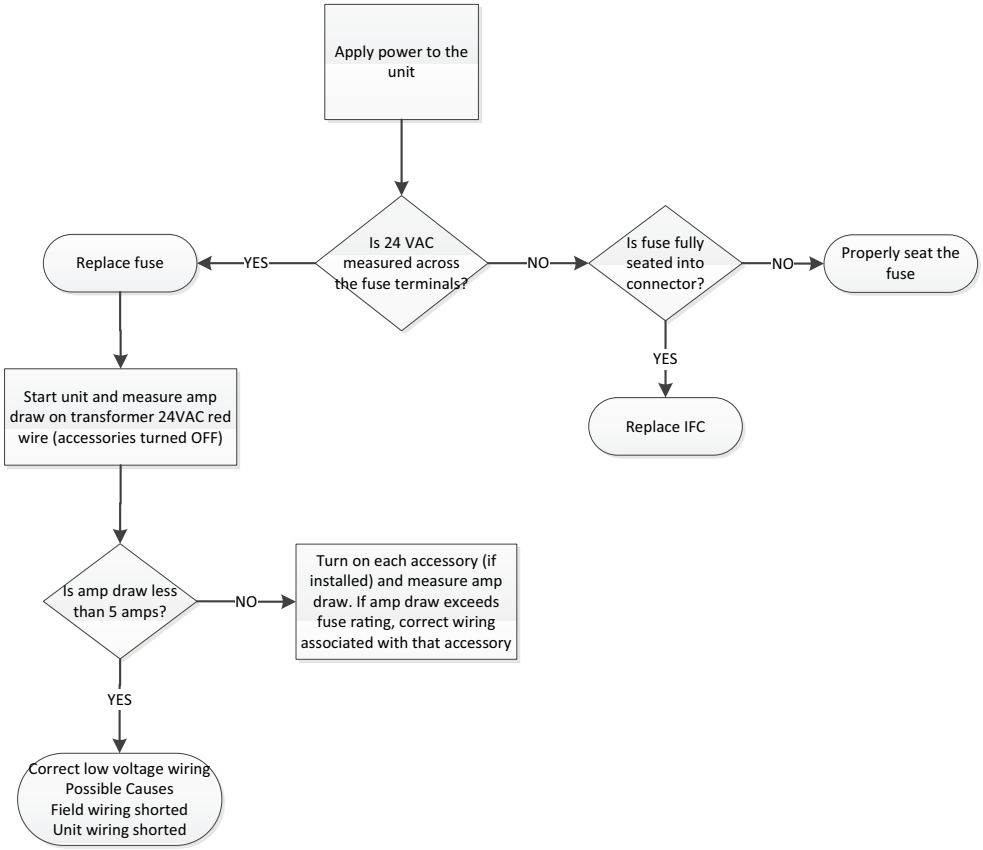
Definition
The IFC has detected that internal gas valve relays have failed OR 24 VAC is being sensed at 2nd stage gas valve

11 Fault Code

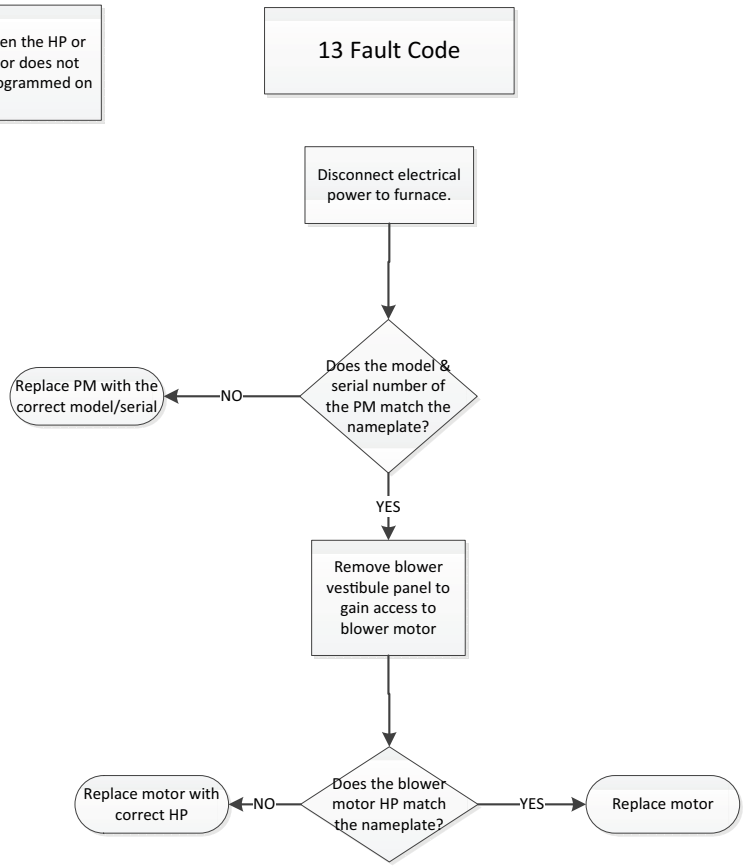


Definition:
The onboard 5 amp fuse is open or missing.

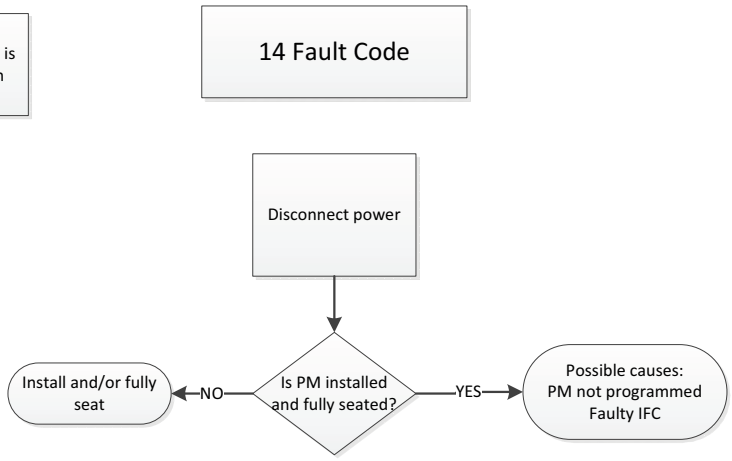
12 Fault Code



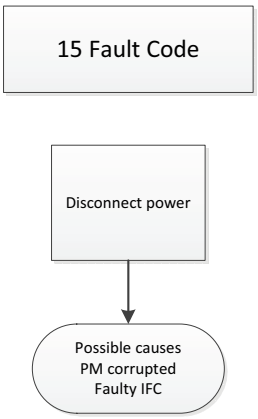
DEFINITION:
This fault is generated when the HP or OEM ID of the blower motor does not match the value that is programmed on the Personality Module



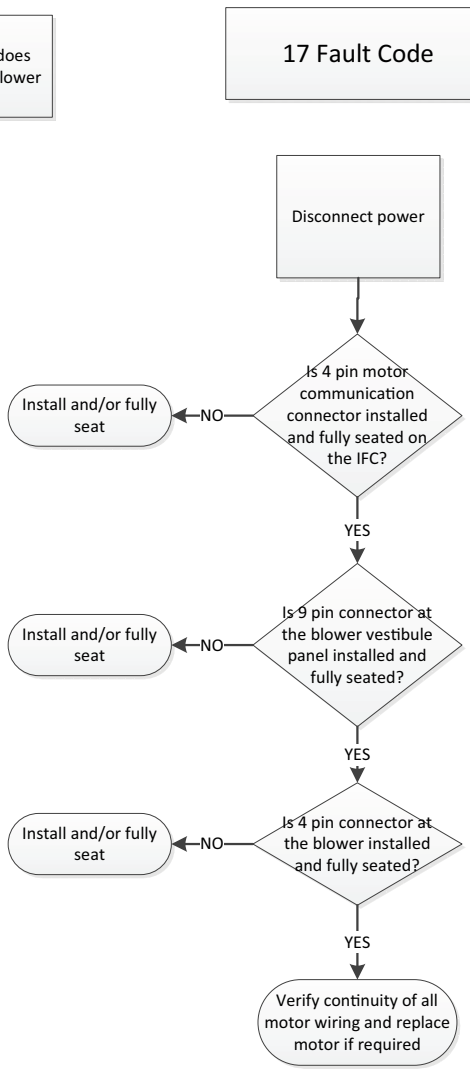
DEFINITION:
This fault is generated when the PM is missing and the onboard information cannot be read



DEFINITION:
This fault is generated when the PM and the IFC information is corrupted

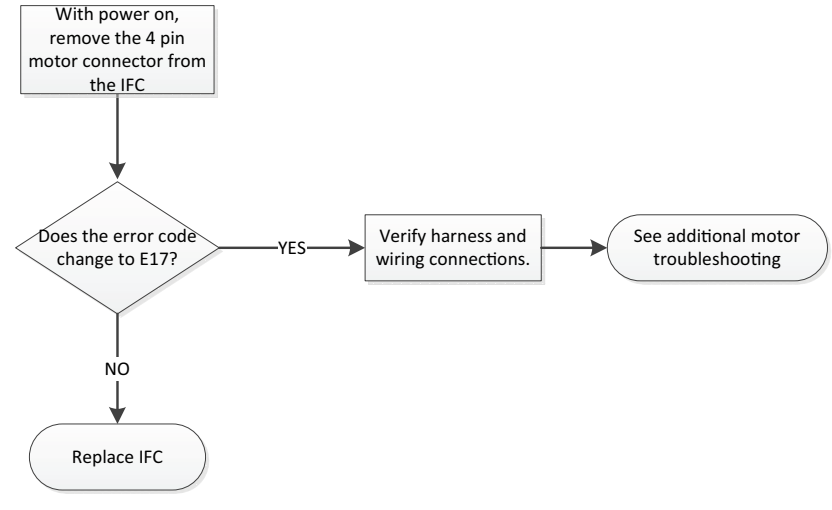


DEFINITION:
This fault is generated when IFC does not see a return signal from the blower motor



DEFINITION:
This fault is generated when the IFC does not see a send message itelf.

18 Fault Code



Serial Motor Troubleshoting

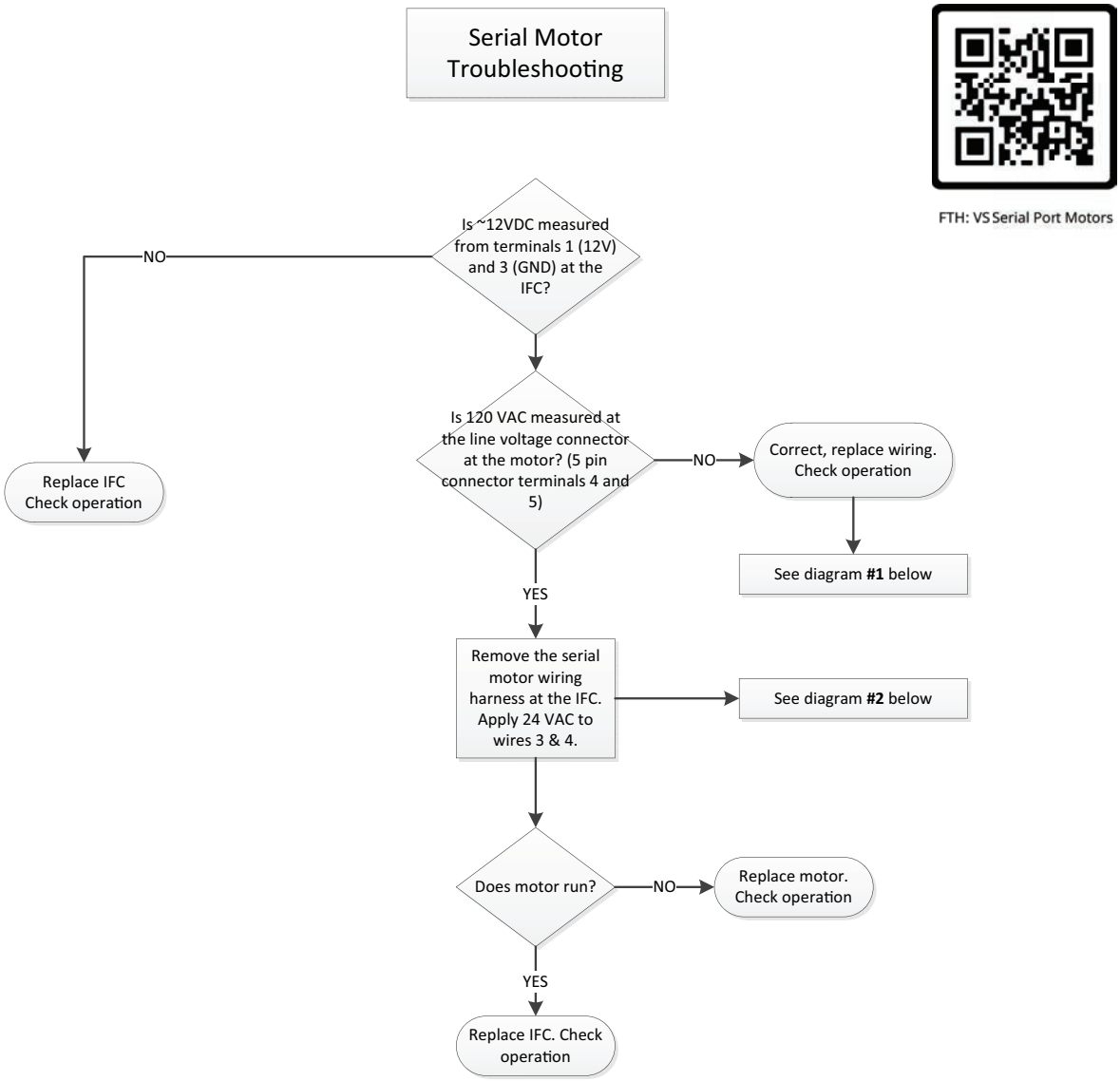


DIAGRAM #1

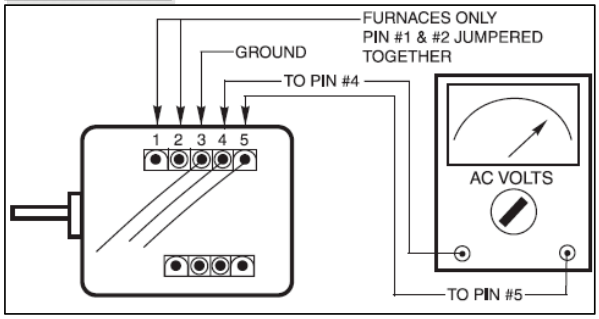
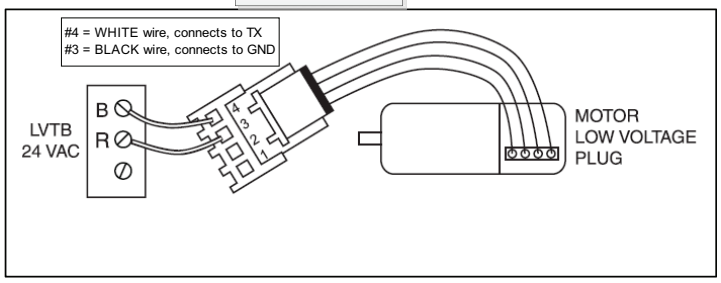


DIAGRAM #2



Sequence of Operation

Note: *The seven segment LED readout is based on thermostat input. During a simultaneous call for W1 and W2, the seven segment LED will read "HE2", although the IFC will process the call for 1st stage heat first.*

Note: *Numbers in Parenthesis ( ) refer to the 12 pin terminal positions.*

EAC and HUM Timing

- EAC relay closes approximately 2 seconds after the blower starts.
- EAC relay opens when the blower motor stops.
- HUM relay closes on any heating call (HP/Gas) approximately 1 second after the blower motor starts.
- HUM relay opens when any heating call (HP/Gas) is removed.

1st Stage Gas Heating

1. R – W1 contacts close on the thermostat sending 24VAC to the W1 low voltage terminal of the IFC. Technician should read 24VAC from W1 to B/C. The seven segment LED will read "HE 1".
2. The IFC performs a self-check routine and then confirms:
   a. Condensate pressure switch and Inducer limit switch are closed by sending 24VAC out the HLO terminal and monitoring the ILI (1) input.
   b. Flame roll-out switches (FRS) 1 & 2, main thermal limit (TCO), and any reverse air flow (RAF) switches are proved closed by sending 24VAC out the HLO (4) terminal and monitoring the HLI (11) input.
   c. Pressure switch 1 (PS1) and pressure switch 2 (PS2) are proved open by sending 24VAC out the HLO terminal, through the limit switches, and monitoring the PS1 and PS2 inputs.

   Note: *If a thermal limit is open, 24VAC <u>will not</u> be present at either pressure switch.*
3. After steps a, b, and c are confirmed, the inducer relay is closed energizing 1st stage inducer. As the inducer ramps up, PS1 will close.
4. When PS1 closes, the ignitor relay on the IFC will close. The ignitor is energized and warm up is approximately 20 seconds.
5. After the ignitor warm up, the 1st stage gas valve relay is closed, energizing the 1st stage gas valve solenoid to allow ignition.
6. The first burner will ignite and flame will crossover to the remaining burners, establishing current to the flame sensor. Flame sensing must take place within 4 seconds.

   Note: *There are two flame sense pads located on the IFC, marked "FP". To measure the flame current, use a VOM set to DC volts. 1VDC = 1 micro-amp. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3 VDC).*
7. Once flame sense has been achieved, a timer on the IFC starts and after the "Blower On" delay has completed, the indoor blower will energize and run at the 1st stage gas heating speed. The seven segment LED for <u>example</u> will alternately read:

   HE1 = Gas heating, Stage 1

   ArF = Airflow

   060 = 600 calculated cfm (value shown x 10)
8. When the temperature raises enough to satisfy the thermostat setting, contacts R-W1 will open.
9. The gas valve relay will open, closing the gas valve. The inducer will continue to run for approximately 5 seconds to remove any combustion byproducts from inside the furnace.
10. The indoor blower continues to run to remove heat from the heat exchangers. The blower off time is field adjustable through the IFC menu setup option. The seven segment LED will read "I dL" = Idle, no thermostat demand.

2nd Stage Gas Heating

Note: *2nd stage heating cannot operate without 1st stage operation.*

1. R – W1 contacts close on the thermostat sending 24VAC to the W1 low voltage terminal of the IFC. Technician should read 24VAC from W1 to B/C. The seven segment LED will read "HE 1"
2. The IFC performs a self-check routine and then confirms:
   a. Condensate pressure switch and Inducer limit switch are proved closed by sending 24VAC out the HLO terminal and monitoring the ILI (1) input.
   b. Flame roll-out switches (FRS) 1 & 2, main thermal limit (TCO), and any reverse air flow (RAF) switches are closed by sending 24VAC out the HLO (4) terminal and monitoring the HLI (11) input.
   c. Pressure switch 1 (PS1) and pressure switch 2 (PS2) are proved open by sending 24VAC out the HLO terminal, through the limit switches, and monitoring the PS1 (3) and PS2 (7) inputs.

   Note: *If a thermal limit is open, 24VAC <u>will not</u> be present at either pressure switch.*
3. After steps a, b, and c are confirmed, the inducer relay is closed energizing 1st stage inducer. As the inducer ramps up, PS1 will close.

4. When PS1 closes, the ignitor relay on the IFC will close. The ignitor is energized and warm up is approximately 20 seconds.
5. After the ignitor warm up, the 1st stage gas valve relay is closed, energizing the 1st stage gas valve solenoid to allow ignition.
6. The first burner will ignite and flame will crossover to the remaining burners, establishing current to the flame sensor. Flame sensing must take place within 4 seconds.

   Note: *There are two flame sense pads located on the IFC, marked "FP". To measure the flame current, use a VOM set to DC volts. 1VDC = 1 micro-amp. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3 VDC).*
7. Once flame sense has been achieved, a timer on the IFC starts and after the "Blower On" delay has completed, the indoor blower will energize and run at the 1st stage gas heating speed. The seven segment LED for <u>example</u> will alternately read:

   HE 1 = Gas heating, Stage 1

   ArF = Airflow

   060 = 600 calculated cfm (value shown x 10)
8. R-W2 contacts close on the thermostat sending 24VAC to the W2 low voltage terminal of the IFC. Technician should read 24VAC from W2 to B/C. The seven segment LED will read "HE2".
9. The IFC then energizes the 2nd stage inducer relay. The inducer ramps to 2nd stage, the second stage gas valve relay on the IFC closes, energizing second stage gas valve. The indoor blower motor will ramp up to the 2nd stage gas heating speed. The seven segment LED for <u>example</u> will alternately read:

   HE2 = Gas heating, Stage 2

   ArF = Airflow

   123 = 1230 calculated cfm (value shown x 10)
10. The IFC monitors PS2 for closure and if PS2 does not close within 45 seconds, a PS2 open error will be declared and the furnace will operate in 1st stage. If PS2 closes, 2nd stage gas heating will continue until the thermostat R-W2 contacts open.

Note: *If PS2 does not close within the 45 second time, the IFC will wait 10 minutes and repeat step 9. If on the third attempt during the same heating call, PS2 does not close within the 45 second proving time, the unit will lock out 2nd stage until the heating calls are removed or the power is cycled to the furnace.*

11. When the temperature raises enough to satisfy the thermostat setting, contacts R-W2 will open, 2nd stage gas valve will close, the indoor blower motor will ramp down to 1st stage, and the unit will continue to run until R-W1 contacts open.
12. When the temperature raises enough to satisfy the thermostat setting, contacts R-W1 will open.
13. The gas valve relay will open, closing the gas valve. The inducer will continue to run for approximately 5 seconds to remove any combustion byproducts from inside the furnace.
14. The indoor blower continues to run to remove heat from the heat exchangers. This blower off time is field adjustable through the IFC menu setup option. The seven segment LED will read "Idl" = Idle, no thermostat demand.

Single Stage Cooling

1. R-Y1-G contacts on the thermostat close sending 24VAC to the Y1 and G low voltage terminals on the IFC. Technician should read 24VAC between Y1-B/C and between G-B/C.

Note: *Factory supplied Y1-O jumper must remain in place for proper seven segment LED readout. If removed, seven segment LED will read "HP 1".*

2. 24VAC is sent to the OD unit via thermostat wiring.
3. The indoor blower ramps to the cooling airflow. The seven segment LED for <u>example</u> will alternately read:

   CL 1 = Cooling, Stage 1

   ArF = Airflow

   080 = 800 calculated cfm (value shown x 10)
4. When the temperature is lowered enough to satisfy the thermostat setting, contacts R-Y1-G will open.
5. The OD unit shuts off and the indoor blower shuts off, unless a blower off delay has been enabled in the IFC setup menu options. The seven segment LED will read "Idl" = Idle, no thermostat demand.

Two Stage Cooling

1. R-Y1-G contacts on the thermostat close sending 24VAC to the Y1 and G low voltage terminals on the IFC. Technician should read 24VAC between Y1-B/C and between G-B/C.

Note: *Factory supplied Y1-O jumper must remain in place for proper seven segment LED readout. If removed, seven segment LED will read "HP 1".*

2. 24VAC is sent to the OD unit via thermostat wiring energizing 1st stage compressor operation.
3. The indoor blower ramps to the 1st stage cooling airflow. The seven segment LED for <u>example</u> will alternately read:

   CL 1 = Cooling, Stage 1

   ArF = Airflow

   080 = 800 calculated cfm (value shown x 10)
4. R-Y2 contact on the thermostat closes sending 24VAC to Y2 low voltage terminal on the IFC.

   Technician should read 24VAC between Y2 and B/C.
5. 24VAC is sent to the OD unit via thermostat wiring.
6. The indoor airflow ramps to 2nd stage cooling airflow. The seven segment LED for example will read:

   CL2 = Cooling, Stage 2

ArF = Airflow

160 = 1600 calculated cfm (value shown x 10)

7. When the temperature is lowered enough to satisfy the thermostat setting, contacts R-Y1-Y2-G will open.
8. The OD unit shuts off and the indoor blower shuts off, unless a blower off delay has been enabled in the IFC setup menu options. The seven segment LED will read "idL" = Idle, no thermostat demand.

Periodic Servicing Requirements

1. GENERAL INSPECTION – ***Examine the furnace installation annually for the following items:***
   a. All flue product carrying areas external to the Furnace (i.e. chimney, vent connector) are clear and free of obstruction. A vent screen in the end of the Vent (flue) Pipe must be inspected for blockage annually, if applicable.
   b. The vent connector is in place, slopes upward and is physically sound without holes or excessive corrosion.
   c. The return air duct connection(s) is physically sound, is sealed to the Furnace and terminates outside the space containing the Furnace.
   d. The physical support of the Furnace should be sound without sagging, cracks, gaps, etc., around the base so as to provide a seal between the support and the base.
2. FILTERS – Filters should be cleaned or replaced (with high velocity filters only), monthly and more frequently during high use times of the year such as midsummer or midwinter.
3. BLOWERS – The Blower size and speed determine the air volume delivered by the Furnace. The Blower motor bearings are factory lubricated and under normal operating conditions do not require servicing. Annual cleaning of the Blower wheel and housing is recommended for maximum air output, and this must be performed only by a qualified servicer or service agency.
4. IGNITER – This unit has a special hot surface direct ignition device that automatically lights the burners. Please note that it is very fragile and should be handled with care. ! CAUTION Do NOT touch igniter. It is extremely hot.
5. BURNER – Gas burners do not normally require scheduled servicing, however, accumulation of foreign material may cause a yellowing flame or delayed ignition. Either condition indicates that a service call is required. For best operation, burners must be cleaned annually using brushes and vacuum cleaner. Turn off gas and electric power supply. To clean burners, remove burner bottom plate (2 screws) and bottom burner bracket (2 screws). Twist burner towards slot, lift, and push forward away from orifice. Remove burners.

Alternate method — Remove manifold assembly, bottom burner plate, and bottom burner bracket. Remove burners.

Note: *Be careful NOT to break igniter when removing burners.*

Clean burners with brush and/ or vacuum cleaner. Reassemble parts by reversal of the above procedure.

Note: *Natural gas units should not have any yellow tipped flames. This condition indicates that a service call is required. For best operation, burners must be cleaned annually using brushes and vacuum cleaner*

Note: *On Propane units, due to variations in BTU content and altitude, servicing may be required at shorter intervals.*

6. HEAT EXCHANGER/ FLUE PIPE – These items must be inspected for signs of corrosion, and/ or deterioration at the beginning of each heating season by a qualified service technician and cleaned annually for best operation. To clean flue gas passages, follow recommendations below:
   a. Turn off gas and electric power supply.
   b. Inspect flue pipe exterior for cracks, leaks, holes or leaky joints. Some discoloration of PVC pipe is normal.
   c. Remove door from Furnace.
   d. Inspect around insulation covering flue collector box. Inspect induced draft Blower connections from recuperative cell and to the flue pipe connection.
   e. Remove burners. (See 5. Burner)
   f. Use a mirror and flashlight to inspect interior of Heat Exchanger, be careful not to damage the Igniter, Flame Sensor or other components.
   g. If any corrosion is present, the Heat Exchanger should be cleaned by a qualified service technician.
   h. After inspection is complete replace burners and Furnace door.
   i. Restore gas supply. Check for leaks using a soap solution. Restore electrical supply. Check unit for normal operation.
7. COOLING COIL CONDENSATE DRAIN - If a cooling coil is installed with the Furnace, condensate drains should be checked and cleaned periodically to assure that condensate can drain freely from coil to drain. If condensate cannot drain freely water damage could occur.

About Trane and American Standard Heating and Air Conditioning

Trane and American Standard create comfortable, energy efficient indoor environments for residential applications. For more information, please visit www.trane.com or www.americanstandardair.com.

The manufacturer has a policy of continuous data improvement and it reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

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