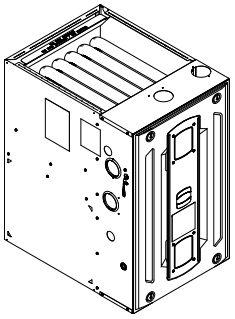
Installation, Operation, and Maintenance

Upflow/Horizontal and Dedicated Downflow Gas-Fired, Direct/Non-Direct Vent, Modulating Condensing Variable Speed Furnaces with Variable Speed Draft Inducer

Upflow, Convertible to Horizontal Right or Horizontal Left
S9VMB060U3VCAA
S9VMB060U4VCAA
S9VMB080U4VCAA
S9VMC100U5VCAA
S9VMD120U5VCAA

Downflow Only
S9VMB060D3VCAA
S9VMB080D4VCAA
S9VMC100D5VCAA
S9VMD120D5VCAA



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

FNR-SVX006B-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.

October 2026

FNR-SVX006B-EN

Introduction

Read this manual thoroughly before operating or servicing this unit.

This document is customer property and is to remain with this unit. Return to the service information pack upon completion of work.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/ sleeves, butyl gloves, safety glasses, hard hat/ bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

©2026

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, and lockout/tagout. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

⚠ WARNING

Cancer and Reproductive Harm!

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

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

This unit is not to be used by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

Do not allow children to play or climb on the unit or to clean or maintain the unit without supervision.

⚠ WARNING

Fire Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

For installations with flammable refrigeration system, the furnace must be powered at all times except during servicing. The furnace must be installed and connected according to installation instructions and wiring diagrams provided with the evaporator coil.

⚠ WARNING

Explosion Hazard!

Failure to follow instruction below could result in death or serious injury or property damage.

Install a gas detector for leak warnings. The manufacturer does not test or endorse any specific brand or type of detector.

⚠ WARNING

Fire or Explosion Hazard!

Failure to follow safety warnings exactly could result in serious injury, death, or 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 can result causing property damage, personal injury, or loss of life.

⚠ WARNING

Electrical Shock, Fire, or Explosion Hazard!

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

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

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

⚠ WARNING

Carbon Monoxide Poisoning!

Failure to follow instructions below could result in death or serious injury, or property damage.

- **To confirm the 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.**
- **Follow the service and/or periodic maintenance and installation and operation instructions for the furnace and the venting system. Do not attempt to change the venting system.**
- **Verify the blower door is in place and not ajar. Dangerous fumes could escape an improperly secured door.**
- **Inspect the chimney liner thoroughly to verify no cracks or other potential areas for flue gas leaks are present in the liner. Liner leaks will result in early damage to the chimney. Furnace venting into an unlined masonry chimney or concrete chimney is prohibited.**

⚠ WARNING

Carbon Monoxide Poisoning!

Failure to follow instructions below could cause result in death or serious injury, or property damage.

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

⚠ WARNING

Fire Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

Do not install the furnace directly on carpet or other combustible material other than wood flooring. Use subbase (BAYBASE205) between the furnace and combustible flooring for vertical downflow applications. When the downflow furnace is installed vertically with a cased coil, a subbase is not required.

⚠ WARNING

Explosion Hazard!

Failure to follow instruction below could result in death or serious injury or property damage.

Propane gas is heavier than air and can accumulate in low areas or confined spaces. Odorant fade may make it undetectable without a warning device. If a gas furnace is installed in a basement, excavated areas, or a confined space, it is strongly recommended to contact a gas supplier to install a gas detector for leak warnings. The manufacturer does not test or endorse any specific brand or type of detector.

⚠ WARNING

Electrical Shock Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

Do not bypass the door switch or the panel loop permanently.

⚠ WARNING

Electrical Shock Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

Do not touch any components other than the Menu and Option buttons on IFC when setting up the system or during fault code recovery.

⚠ WARNING

Risk of Fire or Explosion!

Failure to follow instruction below could result in death or serious injury or property damage.

Do NOT attempt to manually light the furnace.

⚠ WARNING

Electrical Shock Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

Disconnect power to the unit before removing the blower door and wait at least 10 seconds for the IFC power supply to discharge to 0 volts.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

These furnaces are not approved or intended for installation in trailers, recreational vehicles, or manufactured (mobile) housing.

⚠ WARNING

Explosion Hazard!

Failure to follow instruction below could result in death or serious injury or property damage.

If electrical, fuel, or mechanical failures occur, shut off the gas supply at the manual valve on the supply piping before turning off the furnace's electrical power. Contact your dealer's designated service agency.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

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

⚠ WARNING

High Voltage Moving Parts!

Failure to follow instructions below could result in death or serious injury or property damage due to high voltage electrical components, fast-moving fans, and combustible gas.

During installation and servicing, turn off the main gas valve and disconnect the electrical supply. If operating checks must be performed with the unit operating, the technician must recognize these hazards and proceed safely.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

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

⚠ 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:

- **Seal any unused openings in the venting system.**
- **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 Natural Gas and Propane Installation Code, CSA B149.1 and these instructions. Determine there is no blockage or restriction, leakage, corrosion, or other deficiencies which could cause an unsafe condition.**
- **As far as practical, close all building doors and windows and all doors between the space in which the appliance(s) connected to the venting system are located and other spaces of the building.**
- **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 and bathroom exhausts, 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, correct the venting system in accordance with the National Fuel Gas Code, ANSI Z223.1/NFPA and/or Natural Gas and Propane Installation Code, CSA B149.1 .**
- **After it has been determined that each appliance connected to the venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers, and any other gas-fired burning appliance to their previous conditions of use.**

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

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

⚠ WARNING

Shock Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

If a disconnect switch is present, always lock in the open position before servicing the unit.

⚠ WARNING

Electrical Shock Hazard!

Failure to follow this warning could result in an electric 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 in case of an electrical fault.

⚠ WARNING

Overheating and Explosion Hazard!

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

Should the gas supply fail to shut off or if overheating occurs, shut off the gas valve to the furnace before shutting off the electrical supply.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

The vent for this appliance must not terminate over public walkways, near soffit or crawl space vents, or where condensate could cause damage or be detrimental to the operation of regulators, relief valves, or other equipment.

⚠ WARNING

Hot Surface!

Failure to follow instructions below could result in minor to moderate injuries.

Do not touch igniter. It is extremely hot.

⚠ CAUTION

Improper Voltage Connection!

Failure to follow instructions below could result in personal injury or equipment damage.

Do NOT connect the furnace line voltage to a GFCI-protected circuit.

⚠ CAUTION

Corrosion Hazard!

Failure to follow instructions below could result in minor to moderate injury or property damage.

Do not install the furnace in a corrosive or contaminated atmosphere.

⚠ CAUTION

Sharp Edges!

Failure to follow instructions below could result in minor to moderate injury.

The service procedure described in this document involves working around sharp edges. To avoid being cut, technicians MUST put on all necessary Personal Protective Equipment (PPE), including gloves and arm guards.

⚠ CAUTION

Valve Damage!

Failure to follow instructions below could result in minor to moderate injury or equipment damage.

Use a backup wrench on the gas valve when installing gas piping to prevent damage to the valve and manifold assembly.

⚠ CAUTION

Freeze Damage!

Failure to follow instructions below could result in minor to moderate injury or property damage.

Insulate vent pipes with 1/2 inch (12.7 mm) Armaflex-type insulation or equivalent when passing through unheated spaces exposed to freezing temperatures. Insulation is not needed if the space is heated enough to prevent freezing. If domestic water pipes are not protected from freezing, the space is considered heated. Schedule qualified personnel to inspect the temperature if the house is vacant during freezing weather. A furnace failure could lead to frozen water pipes.

⚠ CAUTION

Freeze Damage!

Failure to follow instructions below could result in minor to moderate injury or property damage.

Take measures 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 instructions below could result in minor to severe injury and result in poor ignition characteristics.

Maintain manifold pressure in high altitude installations.

⚠ CAUTION

Water Damage!

Failure to follow instructions below could result in minor to moderate injury or property damage.

Install an external overflow drain pan in all applications over a finished ceiling to prevent leaking condensate.

⚠ CAUTION

Furnace Service Caution!

Failure to follow instructions below 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 instructions below could result in property damage or personal injury.

To prevent shortening its service life, do not use the furnace as a construction heater during the finishing phases of construction until the furnace installation guidelines are 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 Hazard!

Failure to follow instructions below could result in minor to moderate injury or property damage.

The integrated furnace control is polarity sensitive. Connect the hot leg of the 120 VAC power to the black field lead.

⚠ CAUTION

Venting Required!

Failure to follow instructions below could result in minor to moderate injury or property damage.

- **Condensing furnaces may be vented through unused chimneys. Do not vent through chimneys used for wood-burning, oil furnaces, incinerators or any other gas appliance. If remaining free area between single wall flue pipe and masonry chimney is used for another gas appliance, venting area must be sufficient and that appliance must be connected to the chimney with separate entry openings.**
- **The single wall flue pipe joints must be sealed. The 90° elbow connection to the vertical pipe must be sealed to prevent condensate leakage to base of the masonry chimney.**

⚠ CAUTION

Coil Requirement!

Failure to follow instructions below could result in minor to moderate injury or property damage.

For 4GXC* and 4MXC* coils 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 suitable for 400° F (205° C) or metal drain pan shield. Downflow furnaces do not require a metal drain pan shield or MAY*FERCOLKITAA kit.

NOTICE

Equipment Damage!

Failure to follow instructions below could result in equipment damage.

UV light exposure can deteriorate plastic blower material, potentially damaging the blower housing. For units with plastic blower housings, do not install third-party UV air cleaners where the blower housing is 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

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Revision History

Updated the title to remove the term Natural.

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Accessories

Table 1. Accessories

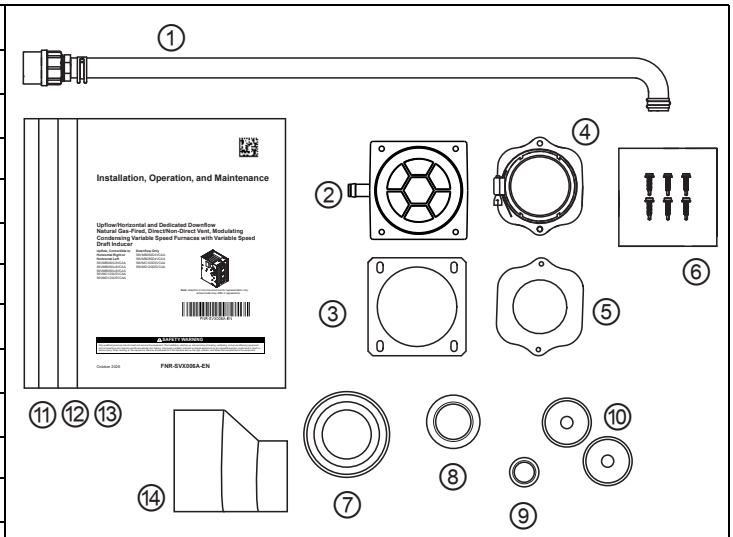
Model Number	Description	Use with
MAYBFERCOLKITA	Heat Shield Kit for B-sidth 4GXCB or 4MCXB Coils	B width 4GXCB or 4MCXB Coils when installed with Upflow Furnace in all orientations.
MAYCFERCOLKITA	Heat Shield Kit for C-sidth 4GXCC or 4MCXC Coils	C width 4GXCC or 4MCXC Coils when installed with Upflow Furnace in all orientations.
MAYDFERCOLKITA	Heat Shield Kit for D-sidth 4GXCD or 4MCXD Coils	D width 4GXCD or 4MCXD Coils when installed with Upflow Furnace in all orientations.
BAYSENSC360	Supply Air Temperature Sensor	All Furnaces
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 (Canada - CPVC)	All Furnaces
BAYLIFTB[a]	Dual Return Kit (B size extension)	B Cabinet Upflow Furnaces
BAYLIFTC[a]	Dual Return Kit (C size extension)	C Cabinet Upflow Furnaces
BAYLIFTD[a]	Dual Return Kit (D size extension)	D Cabinet Upflow Furnaces
BAYBASE205	Downflow Subbase	All Downflow Furnaces
BAYFLTR203	Horizontal Filter Kit	B Cabinet Furnaces in Downflow/Horizontal
BAYFLTR204	Horizontal Filter Kit	C Cabinet Furnaces in Downflow/Horizontal
BAYFLTR205	Horizontal Filter Kit	D Cabinet Furnaces in Downflow Horizontal
BAYFLTR206	Filter Access Door Kit (Downflow only)	All Downflow Furnaces
BAYSF1165[a][b]	1-in. SlimFit Cabinet with MERV 4 Filter	All Upflow Furnaces
BAYSF1255[b]	1-in. SlimFit Rack with MERV 4 Filter	All Furnaces[c]
FLRSF1255	1-in. Filter Replacement (Qty 12)	BAYSF1255[b]
BAYLPSS5AM22DA	Propane Conversion Kit	All Furnaces
BAYBURNERSS	All Stainless Steel Natural Gas Burners - Set of Six	All Upflow Furnaces - Special Case
BAYCNDTRAP2A	Inline Condensate Trap Kit used with Special Venting on 2-in. Vent Pipe	All Furnaces
BAYCNDTRAP3A	Inline Condensate Trap Kit used with Special Venting on 3-in. Vent Pipe	All Furnaces

[a] Airflow greater than 1600 CFM, Furnace will require return air openings and filters on: (1) both sides, (2) one side and the bottom, or (3) just on the bottom.
[b] Latest revision.
[c] Designed to fit all S-Series furnaces with or without transition when used in side return. Fits B width cabinet without a transition in upflow/downflow application.

Document Pack Contents S9VM

Table 2. Document pack contents

Item	Qty.	Description
1	1	Condensate Drain Tube Assembly
2	1	Inlet Vent (2-in. - ADP01586 and 3-in. - 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-in. to 3-in. Coupling – CPL01544[b]



[a] 3-inch inlet vent supplied with S9VMD120 only. 2-inch inlet vent supplied with all other models.
[b] Supplied with S9VMD120 only.

Product Specification

Table 3. Models S9VMB060U3VCAA, S9VMB060U4VCAA, S9VMB080U4VCAA, S9VMC100U5VCAA, and S9VMD120U5VCAA

Model	S9VMB060U3VCAA [a]	S9VMB060U4VCAA [a]	S9VMB080U4VCAA [a]	S9VMC100U5VCAA [a]	S9VMD120U5VCAA [a]
Type	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal
Ratings[b]	—				
40% (low) Input BTUH	24,000	24,000	32,000	40,000	48,000
40% (low) heat Capacity BTUH (ICS)[c]	23,280	23,280	31,040	38,800	46,560
100% (high) heat Input BTUH	60,000	60,000	80,000	100,000	120,000
100% (high) heat Capacity BTUH (ICS)	58,200	58,200	77,600	97,000	116,400
40% (low) Temp. Rise (Min. - Max.) ° F	25 - 55	25 - 55	30 - 60	25 - 55	35 - 65
100% (high) Temp. Rise (Min. - Max.) ° F	35 - 65	35 - 65	35 - 65	30 - 60	40 - 70
AFUE (%)[c]	97.0	97.0	97.0	97.0	97.0
Return Air Temp. (Min. - Max.) °F	45°F - 80°F	45°F - 80°F	45°F - 80°F	45°F - 80°F	45°F - 80°F
CEE Tier	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Energy Star Rated Region Before July 31, 2026	US - All/Canada	US - All/Canada	US - All/Canada	US - All/Canada	US - All/Canada
Energy Star Rated Region On or After July 31, 2026	US - All/Canada	US - All/Canada	US - All/Canada	US - All/Canada	US - All/Canada
Energy Star Orientation	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal
Integrated Furnace Control	—				
Input–Communication Protocol	Link or 24 Volts	Link or 24 Volts	Link or 24 Volts	Link or 24 Volts	Link or 24 Volts
Blower Drive	Direct	Direct	Direct	Direct	Direct
Diameter - Width (in.)	11 X 8	11 X 8	11 X 8	11 X 10	11 X 10
No. Used	1	1	1	1	1
Speeds (No.)	Variable	Variable	Variable	Variable	Variable
CFM vs. in. w.g.	See “Airflow Tables,” p. 21	See “Airflow Tables,” p. 21	See “Airflow Tables,” p. 21	See “Airflow Tables,” p. 21	See “Airflow Tables,” p. 21
Motor hp	1/2	3/4	3/4	1	1
R.P.M.	Variable	Variable	Variable	Variable	Variable
Volts / Ph / Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	6.4	9.6	9.6	10	10
Combustion Fan - Type	Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed
Drive - No. Speeds	Direct - Variable	Direct - Variable	Direct - Variable	Direct - Variable	Direct - Variable
Hp and Max Motor RPM	1/50 - 5000	1/50 - 5000	1/50 - 5000	1/50 - 5000	1/50 - 5000
Volts/Ph/Hz	33 - 110/3/60 - 180	33 - 110/3/60 - 180	33 - 110/3/60 - 180	33 - 110/3/60 - 180	33 - 110/3/60 - 180
FLA	0.77	0.77	0.77	0.77	0.77
Inducer Orifice	0.79	0.79	0.96	1.05	1.19
Filter - Furnished?	No	No	No	No	No

Table 3. Models S9VMB060U3VCAA, S9VMB060U4VCAA, S9VMB080U4VCAA, S9VMC100U5VCAA, and S9VMD120U5VCAA (continued)

Model	S9VMB060U3VCAA [a]	S9VMB060U4VCAA [a]	S9VMB080U4VCAA [a]	S9VMC100U5VCAA [a]	S9VMD120U5VCAA [a]
Type Recommended	High Velocity	High Velocity	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 - 16 X 25 - 1 in.	1 - 16 X 25 - 1 in.	1 - 16 X 25 - 1 in.	1 - 20 X 25 - 1 in.	1 - 24 X 25 - 1 in.
Vent Outlet Dia - Min. (in.) [d]	2 Round	2 Round	2 Round	2 Round	3 Round
Inlet Air Dia - Min. (in.)[d]	2 Round	2 Round	2 Round	2 Round	3 Round
Heat Exchanger – Type	—				
Fired	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel
Unfired	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20	20	20	20
Orifices - Main	—				
Nat. Gas (Qty. - Drill Size)	3 - 45	3 - 45	4 - 45	5 - 45	6 - 45
Propane Gas (Qty. - Drill Size)	3 - 56	3 - 56	4 - 56	5 - 56	6 - 56
Gas Valve	Modulating	Modulating	Modulating	Modulating	Modulating
Pilot Safety Device – Type	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
Burners - Type - Qty	Inshot - 3	Inshot - 3	Inshot - 4	Inshot - 5	Inshot - 6
Power Conn. - V/Ph/HZ [e]	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (Amps)	8.9	12.9	12.9	13.4	13.4
Max. Overcurrent Protection (Amps)	15	15	15	15	15
Pipe Conn. Size (in.)	1/2	1/2	1/2	1/2	1/2

[a] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 - latest edition.
[b] 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.
[c] Based on U.S. government standard tests.
[d] Refer to Vent Length Table in this document.
[e] The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

Table 4. Models S9VMB060D3VCAA, S9VMB080D4VCAA, S9VMC100D5VCAA, and S9VMD120D5VCAA

Model	S9VMB060D3VCAA [a]	S9VMB080D4VCAA [a]	S9VMC100D5VCAA [a]	S9VMD120D5VCAA [a]
Type	Downflow	Downflow	Downflow	Downflow
Ratings[b]	—			
40% (low) Input BTUH	24,000	32,000	40,000	48,000
40% (low) heat Capacity BTUH (ICS)	23,280	31,040	38,800	46,560
100% (high) heat Input BTUH	60,000	80,000	100,000	,20,000
2nd Stage Capacity BTUH (ICS)[c]	58,200	77,600	97,000	116,400
1st Stage Temp. Rise (Min. - Max.) °F	25 - 55	30 - 60	30 - 60	30 - 60
2nd Stage Temp. Rise (Min. - Max.) °F	35 - 65	35 - 65	35 - 65	35 - 65
AFUE (%)	97.0	97.0	97.0	97.0
Return Air Temp. (Min. - Max.) °F	45°F - 80°F	45°F - 80°F	45°F - 80°F	45°F - 80°F
CEE Tier	Tier 3	Tier 3	Tier 3	Tier 3
Energy Star Rated Region Before July 31, 2026	US - All/Canada	US - All/Canada	US - All/Canada	US - All/Canada
Energy Star Rated Region On or After July 31, 2026	US - All/Canada	US - All/Canada	US - All/Canada	US - All/Canada
Energy Star Orientation	Downflow	Downflow	Downflow	Downflow

Table 4. Models S9VMB060D3VCAA, S9VMB080D4VCAA, S9VMC100D5VCAA, and S9VMD120D5VCAA (continued)

Model	S9VMB060D3VCAA [a]	S9VMB080D4VCAA [a]	S9VMC100D5VCAA [a]	S9VMD120D5VCAA [a]
Integrated Furnace Control				
Input–Communication Protocol	Link or 24 Volts	Link or 24 Volts	Link or 24 Volts	Link or 24 Volts
Blower Drive	Direct	Direct	Direct	Direct
Diameter - Width (in.)	11 X 8	11 X 8	11 X 10	11 X 10
No. Used	1	1	1	1
Speeds (No.)	Variable	Variable	Variable	Variable
CFM vs. in. w.g.	See "Airflow Tables," p. 21	See "Airflow Tables," p. 21	See "Airflow Tables," p. 21	See "Airflow Tables," p. 21
Motor hp	1/2	3/4	1	1
R.P.M.	Variable	Variable	Variable	Variable
Volts / Ph / Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	6.4	9.6	10	10
Combustion Fan - Type	Variable Speed	Variable Speed	Variable Speed	Variable Speed
Drive - No. Speeds	Direct - Variable	Direct - Variable	Direct - Variable	Direct - Variable
Hp and Max Motor RPM	1/50 - 5000	1/50 - 5000	1/50 - 5000	1/50 - 5000
Volts/Ph/Hz	33 - 110/3/60 - 180	33 - 110/3/60 - 180	33 - 110/3/60 - 180	33 - 110/3/60 - 180
FLA	0.77	0.77	0.77	0.77
Inducer Orifice	0.79	0.96	1.05	1.19
Filter - Furnished?	No	No	No	No
Type Recommended	High Velocity	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 - 16 X 25 - 1 in.	1 - 16 X 25 - 1 in.	1 - 20 X 25 - 1 in.	1 - 24 X 25 - 1 in.
Vent Outlet Dia - Min. (in.)[d]	2 Round	2 Round	2 Round	3 Round
Inlet Air Dia - Min. (in.)	2 Round	2 Round	2 Round	3 Round
Heat Exchanger – Type	—			
Fired	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel
Unfired	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20	20	20
Orifices - Main	—			
Nat. Gas (Qty. - Drill Size)	3 - 45	4 - 45	5 - 45	6 - 45
Propane Gas (Qty. - Drill Size)	3 - 56	4 - 56	5 - 56	6 - 56
Gas Valve	Modulating	Modulating	Modulating	Modulating
Pilot Safety Device – Type	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
Burners - TYPE - QTY	Inshot - 3	Inshot - 4	Inshot - 5	Inshot - 6
Power Conn. - V/Ph/HZ[e]	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (Amps)	8.9	12.9	13.4	13.4
Max. Overcurrent Protection (Amps)	15	15	15	15
Pipe Conn. Size (in.)	1/2	1/2	1/2	1/2

[a] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 - latest edition.
[b] 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.
[c] Based on U.S. government standard tests.
[d] Refer to Vent Length Table in this document.
[e] 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,” p. 16 of these instructions.
3. Provide adequate combustion and ventilation air to the furnace space as specified in “Air for Combustion and Ventilation,” p. 60 of these instructions.
4. Combustion products must be discharged outdoors. Connect this furnace to an approved vent system only, as specified in the “General Venting,” p. 46 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,” p. 40 section of these instructions.
6. Always install the furnace to operate within the furnace 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 “Locations and Clearances,” p. 16 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 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-inch 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 instructions.
10. The installer must verify that at least one carbon monoxide alarm has been installed within the residential living space or home following the alarm manufacturer instructions and applicable local codes before putting the appliance into operation.

This furnace is certified to leak 1% or less of nominal air conditioning cfm delivered when pressurized to 0.5-inch 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,” p. 41.

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 National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts, 02169-7471, 1-800-344-3555, or www.nfpa.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 not approved for installation in Manufactured/Mobile housing.

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 the table below?

Table 5. Location and clearances

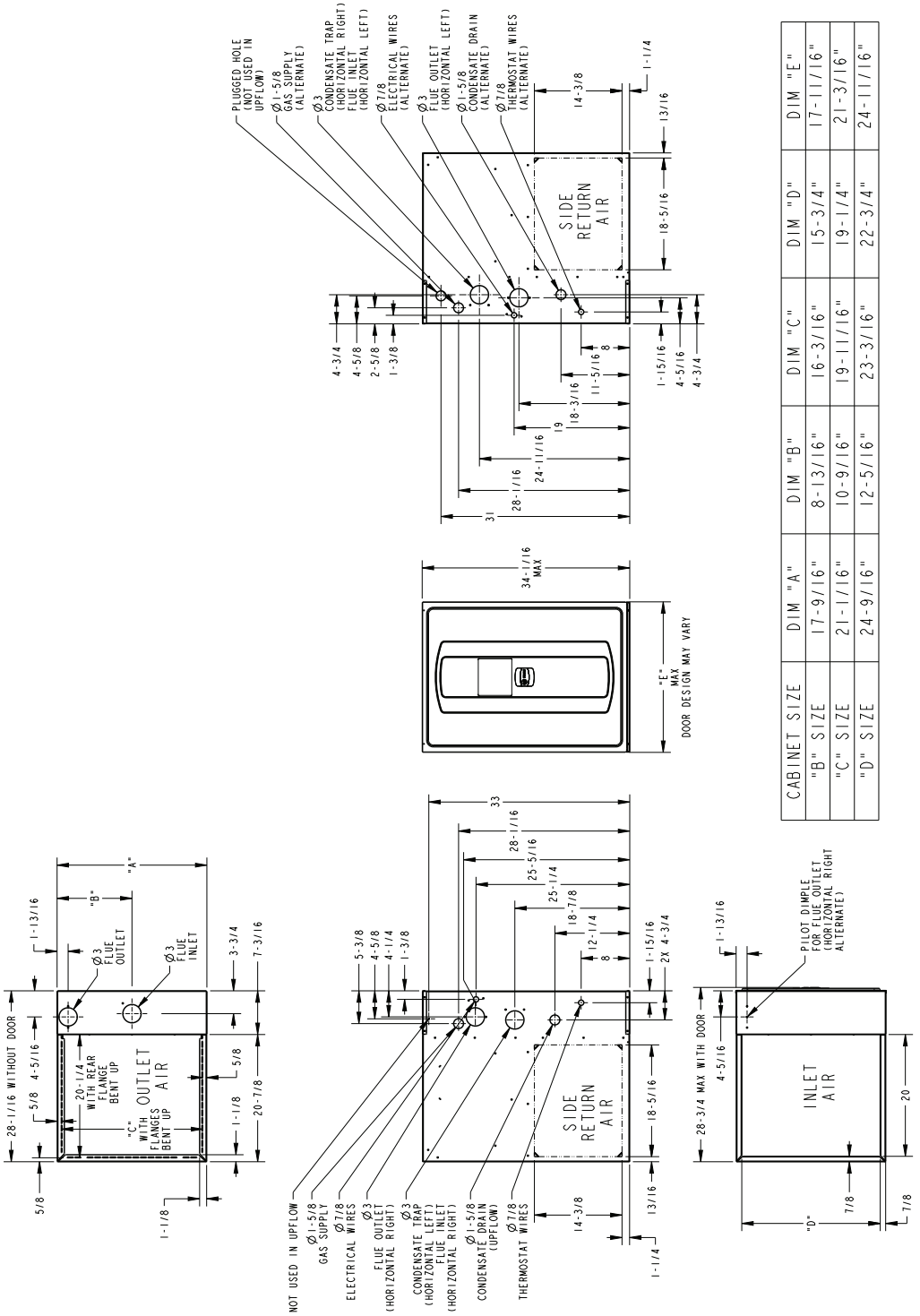
Minimum clearance to combustible materials (in.)	
Closet	
Sides	0
Back	1
Top	1
Front	0
Bottom	0
Flue	0
24-in. minimum front clearance recommended for service	
Horizontal Closet and Alcove	
Right Side	0
Left Side	0
Back	1
Top	1
Bottom	0
Flue	0
Horizontal Flue (discharge on left)	
Closet	
Right Side	0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

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-inch 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 should not be located where excessive exposure to contaminated combustion air will result in safety and performance related problems. Avoid the following contaminants:
    - Permanent wave solutions
    - Chlorinated waxes and cleaners
    - Chlorine based swimming pool chemicals
    - Water softening chemicals
    - De-icing salts or chemicals
    - Carbon tetrachloride
    - Halogen type refrigerants
    - Cleaning solvents (such as perchloroethylene)
    - Printing inks, paint removers, varnishes, etc.
    - Hydrochloric acid, Cements and glues
    - Antistatic fabric softeners for clothes dryers
    - 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 or downflow installations or slightly toward the front in horizontal installations. This is necessary for proper condensate drainage.*

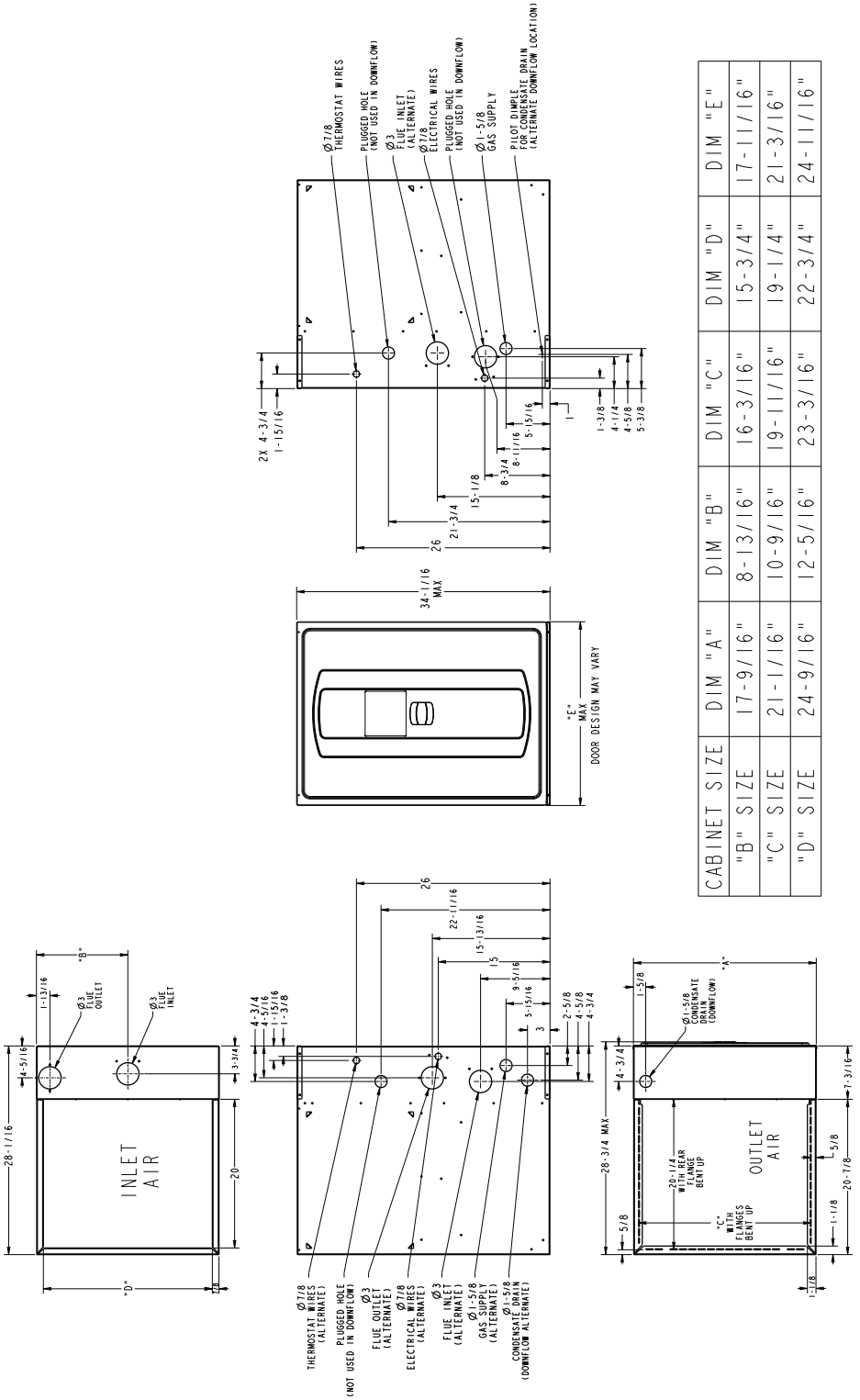
Dimensional Data

Figure 1. Upflow cabinets — 17.5-inch, 21-inch, and 24.5-inch



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"

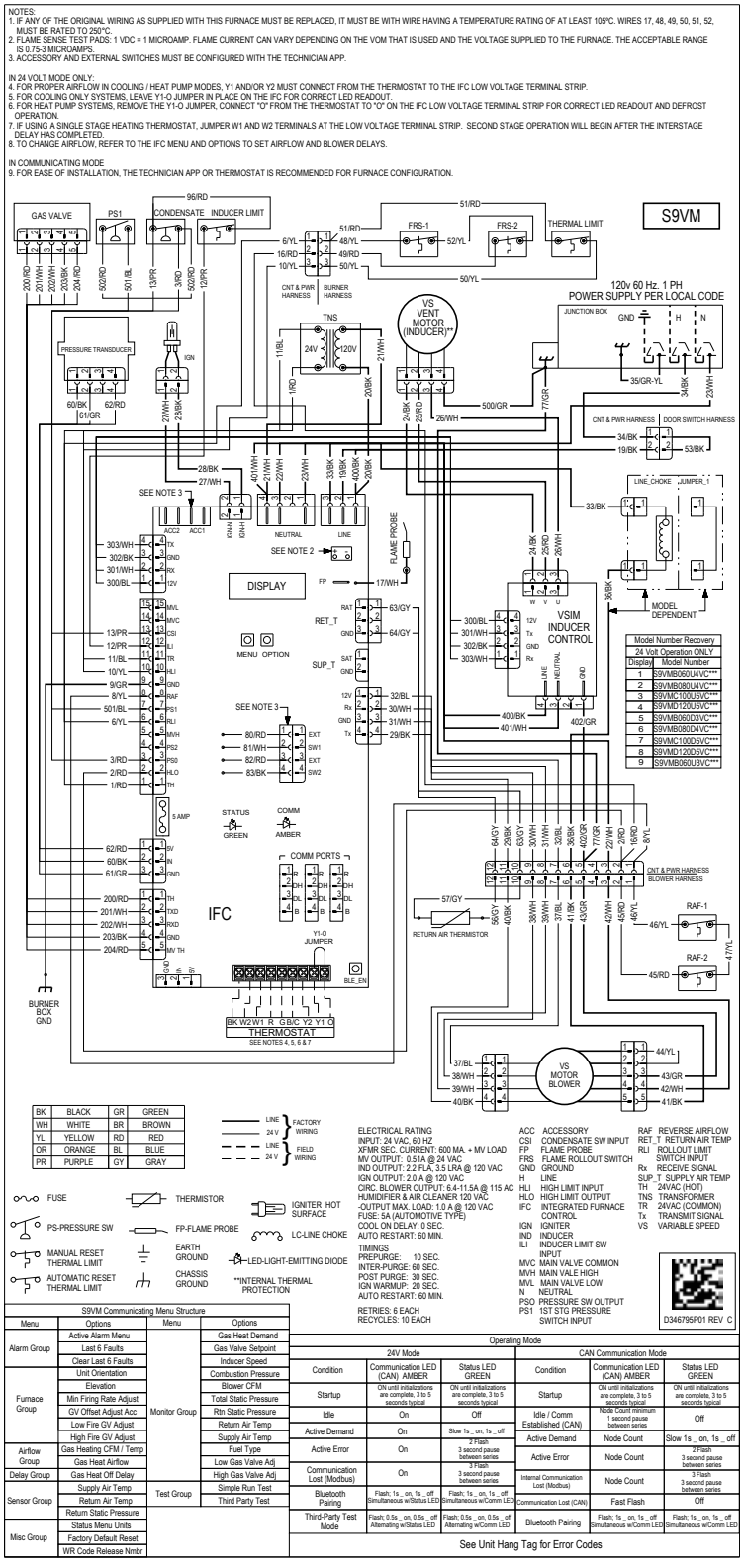
Figure 2. Downflow cabinets — 17.5-inch, 21-inch, and 24.5-inch



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

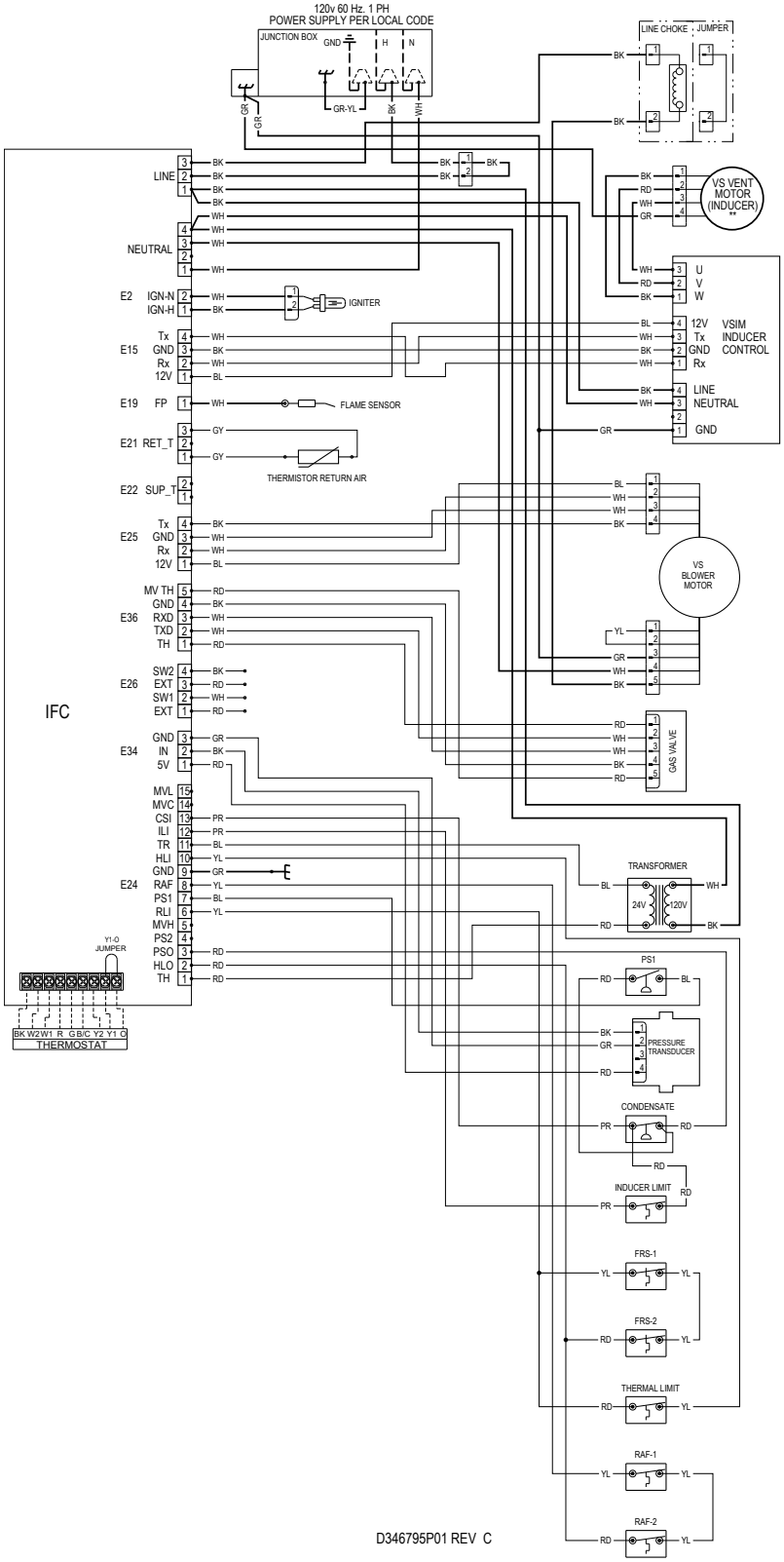
Figure 3. S9VM wiring diagram



S9VM Communicating Menu Structure			
Menu	Options	Menu	Options
Alarm Group	Active Alarm Menu	Monitor Group	Gas Heat Demand
	Last 6 Faults		Gas Valve Setpoint
	Clear Last 6 Faults		Inducer Speed
Furnace Group	Unit Orientation		Combustion Pressure
	Elevation		Blower CFM
	Min Firing Rate Adjust		Total Static Pressure
	GV Offset Adjust Acc.		Rtn Static Pressure
	Low Fire GV Adjust		Return Air Temp
	High Fire GV Adjust		Supply Air Temp
Airflow Group	Gas Heating CFM / Temp		Fuel Type
	Gas Heat Airflow		Low Gas Valve Adj
Delay Group	Gas Heat Off Delay		High Gas Valve Adj
Sensor Group	Supply Air Temp	Test Group	Simple Run Test
	Return Air Temp		Third Party Test
	Return Static Pressure		
Misc Group	Status Menu Units		
	Factory Default Reset		
	WR Code Release Nmbr		

Operating Mode					
24V Mode			CAN Communication Mode		
Condition	Communication LED (CAN) AMBER	Status LED GREEN	Condition	Communication LED (CAN) AMBER	Status LED GREEN
Startup	ON until initializations are complete, 3 to 5 seconds typical	ON until initializations are complete, 3 to 5 seconds typical	Startup	ON until initializations are complete, 3 to 5 seconds typical	ON until initializations are complete, 3 to 5 seconds typical
Idle	On	Off	Idle / Comm Established (CAN)	Node Count minimum 1 second pause between series	Off
Active Demand	On	Slow 1s _ on, 1s _ off	Active Demand	Node Count	Slow 1s _ on, 1s _ off
Active Error	On	2 Flash 3 second pause between series	Active Error	Node Count	2 Flash 3 second pause between series
Communication Lost (Modbus)	On	3 Flash 3 second pause between series	Internal Communication Lost (Modbus)	Node Count	3 Flash 3 second pause between series
Bluetooth Pairing	Flash; 1s _ on, 1s _ off, Simultaneous w/Status LED	Flash; 1s _ on, 1s _ off, Simultaneous w/Comm LED	Communication Lost (CAN)	Fast Flash	Off
Third-Party Test Mode	Flash; 0.5s _ on, 0.5s _ off Alternating w/Status LED	Flash; 0.5s _ on, 0.5s _ off Alternating w/Comm LED	Bluetooth Pairing	Flash; 1s _ on, 1s _ off, Simultaneous w/Comm LED	Flash; 1s _ on, 1s _ off, Simultaneous w/Comm LED
See Unit Hang Tag for Error Codes					

Figure 4. S9VM ladder diagram



Airflow Tables

Table 6. S9VMB060U3VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Airflow Setting	**Heating Stage**	**Target Airflow**		**External Static Pressure (in. w. c.)**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
880	40% (Low)	470	CFM / Watts	474 / 25	472 / 49	470 / 74	468 / 98	466 / 123
			Temp. Rise	47	47	47	47	47
	65% (Medium)	728	CFM / Watts	743 / 51	735 / 87	727 / 124	719 / 161	711 / 198
			Temp. Rise	47	47	47	47	47
	100% (High)	880	CFM / Watts	943 / 80	937 / 125	931 / 171	925 / 216	919 / 262
			Temp. Rise	57	57	57	57	57
1055	40% (Low)	535	CFM / Watts	538 / 31	536 / 58	534 / 85	532 / 112	530 / 139
			Temp. Rise	42	42	42	42	43
	65% (Medium)	845	CFM / Watts	848 / 73	846 / 115	845 / 157	844 / 199	842 / 240
			Temp. Rise	42	42	42	42	42
	100% (High)	1055	CFM / Watts	1058 / 121	1055 / 172	1052 / 223	1050 / 274	1047 / 325
			Temp. Rise	52	52	52	52	52
1100[a]	40% (Low)	570	CFM / Watts	565 / 33	567 / 61	570 / 88	572 / 115	574 / 143
			Temp. Rise	40	40	40	39	39
	65% (Medium)	893	CFM / Watts	893 / 82	892 / 124	892 / 166	892 / 208	892 / 251
			Temp. Rise	40	40	40	40	39
	100% (High)	1100	CFM / Watts	1102 / 139	1103 / 192	1105 / 244	1106 / 296	1108 / 349
			Temp. Rise	49	49	49	49	49
1160	40% (Low)	583	CFM / Watts	588 / 37	586 / 63	583 / 88	580 / 114	578 / 140
			Temp. Rise	38	38	37	37	36
	65% (Medium)	927	CFM / Watts	932 / 93	929 / 137	926 / 180	923 / 224	920 / 268
			Temp. Rise	38	38	38	38	38
	100% (High)	1160	CFM / Watts	1149 / 157	1146 / 212	1144 / 267	1141 / 321	1139 / 376
			Temp. Rise	48	48	48	48	48
1200	40% (Low)	588	CFM / Watts	613 / 39	600 / 67	587 / 94	574 / 122	561 / 150
			Temp. Rise	35	35	35	35	35
	65% (Medium)	968	CFM / Watts	962 / 100	965 / 146	967 / 192	970 / 237	973 / 283
			Temp. Rise	36	35	35	35	35
	100% (High)	1200	CFM / Watts	1202 / 168	1202 / 226	1201 / 284	1200 / 342	1199 / 400
			Temp. Rise	45	45	45	45	45
1270	40% (Low)	672	CFM / Watts	655 / 45	664 / 76	672 / 106	680 / 137	689 / 168
			Temp. Rise	33	33	33	34	34
	65% (Medium)	1028	CFM / Watts	1019 / 124	1023 / 171	1027 / 218	1032 / 265	1036 / 311
			Temp. Rise	33	33	33	33	33
	100% (High)	1270	CFM / Watts	1260 / 211	1264 / 274	1268 / 337	1273 / 400	1277 / 463
			Temp. Rise	43	43	43	43	43

[a] Factory setting.

Table 7. S9VMB060D3VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Airflow Setting	Heating Stage	Target Airflow		External Static Pressure (in. w. c.)				
				0.1	0.3	0.5	0.7	0.9
1005	40% (Low)	402	CFM / Watts	459 / 27	446 / 55	433 / 82	421 / 109	408 / 136
			Temp. Rise	47	47	48	48	49
	65% (Medium)	653	CFM / Watts	782 / 72	775 / 115	768 / 158	761 / 201	754 / 244
			Temp. Rise	45	45	46	46	46
	100% (High)	1005	CFM / Watts	972 / 111	965 / 166	959 / 220	952 / 275	945 / 330
			Temp. Rise	56	56	56	57	57
1055	40% (Low)	422	CFM / Watts	476 / 29	460 / 55	445 / 82	429 / 108	413 / 135
			Temp. Rise	45	46	47	48	49
	65% (Medium)	686	CFM / Watts	811 / 77	802 / 121	792 / 164	782 / 207	773 / 250
			Temp. Rise	43	44	44	45	46
	100% (High)	1055	CFM / Watts	1010 / 124	1004 / 180	997 / 236	990 / 292	984 / 348
			Temp. Rise	53	54	54	55	55
1135	40% (Low)	454	CFM / Watts	509 / 32	501 / 61	492 / 90	483 / 119	474 / 148
			Temp. Rise	42	42	43	44	45
	65% (Medium)	738	CFM / Watts	871 / 93	862 / 138	853 / 184	844 / 229	835 / 274
			Temp. Rise	40	41	41	41	42
	100% (High)	1135	CFM / Watts	1084 / 155	1076 / 212	1067 / 268	1058 / 324	1049 / 381
			Temp. Rise	50	51	51	51	52
1175[a]	40% (Low)	470	CFM / Watts	526 / 34	519 / 65	512 / 96	505 / 127	498 / 158
			Temp. Rise	41	41	42	42	42
	65% (Medium)	764	CFM / Watts	890 / 99	889 / 149	888 / 199	887 / 249	886 / 299
			Temp. Rise	39	39	40	40	40
	100% (High)	1175	CFM / Watts	1107 / 163	1103 / 223	1099 / 284	1094 / 344	1090 / 404
			Temp. Rise	49	49	49	50	50
1240	40% (Low)	496	CFM / Watts	548 / 36	543 / 65	538 / 95	533 / 125	528 / 155
			Temp. Rise	39	39	39	39	38
	65% (Medium)	806	CFM / Watts	934 / 115	929 / 165	925 / 215	920 / 265	915 / 316
			Temp. Rise	38	38	38	38	38
	100% (High)	1240	CFM / Watts	1173 / 195	1161 / 255	1149 / 316	1137 / 377	1125 / 438
			Temp. Rise	46	47	47	48	48
1325	40% (Low)	530	CFM / Watts	576 / 41	565 / 73	554 / 106	543 / 139	532 / 171
			Temp. Rise	37	38	39	39	40
	65% (Medium)	861	CFM / Watts	1000 / 134	993 / 185	986 / 235	978 / 286	971 / 336
			Temp. Rise	35	35	35	36	36
	100% (High)	1325	CFM / Watts	1245 / 233	1232 / 296	1219 / 359	1206 / 421	1193 / 484
			Temp. Rise	44	44	45	45	46

[a] Factory setting.

Table 8. S9VMB060U3VC / S9VMB060D3VC cooling airflow

S9VMB060U3VC / S9VMB060D3VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
1.5	450	CFM	677	673	668	659	648
		WATTS	54	90	129	169	209
	420	CFM	632	628	622	614	602
		WATTS	46	82	120	157	198
	400	CFM	602	598	592	583	572
		WATTS	42	77	112	149	189
	370	CFM	556	552	546	537	526
		WATTS	36	68	104	139	178
	350	CFM	526	522	516	507	496
		WATTS	33	64	97	133	169
	330	CFM	495	491	485	476	465
		WATTS	30	60	91	125	162
	310	CFM	465	460	454	445	434
		WATTS	26	55	87	120	156
	290	CFM	434	429	423	414	403
		WATTS	24	51	82	114	149
2.0	450	CFM	899	896	891	883	872
		WATTS	98	145	192	239	289
	420	CFM	841	837	832	823	813
		WATTS	85	129	170	222	267
	400	CFM	801	798	793	784	773
		WATTS	76	119	161	209	252
	370	CFM	742	739	733	724	713
		WATTS	65	104	146	188	231
	350	CFM	702	699	692	684	673
		WATTS	58	95	137	177	219
	330	CFM	662	658	652	644	633
		WATTS	51	87	126	166	206
	310	CFM	622	618	612	604	592
		WATTS	45	80	117	155	196
	290	CFM	581	578	571	563	552
		WATTS	40	72	109	145	184

Table 8. S9VMB060U3VC / S9VMB060D3VC cooling airflow (continued)

S9VMB060U3VC / S9VMB060D3VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
2.5	450	CFM	1117	1114	1109	1101	1090
		WATTS	160	221	277	336	394
	420	CFM	1045	1042	1036	1029	1018
		WATTS	138	193	249	301	355
	400	CFM	997	994	988	980	970
		WATTS	124	175	229	282	329
	370	CFM	924	921	916	907	896
		WATTS	104	152	200	252	302
	350	CFM	875	872	867	859	847
		WATTS	92	138	181	230	281
	330	CFM	826	822	818	809	798
		WATTS	82	127	166	215	263
	310	CFM	776	773	768	759	748
		WATTS	71	112	153	199	244
	290	CFM	727	723	717	710	698
		WATTS	62	101	143	182	227
3.0[(a)]	450	CFM	1330	1326	1321	1314	1303
		WATTS	242	319	385	449	514
	420	CFM	1245	1242	1237	1229	1219
		WATTS	208	276	336	400	464
	400	CFM	1188	1185	1180	1172	1162
		WATTS	185	251	309	374	429
	370	CFM	1103	1099	1094	1086	1076
		WATTS	156	216	271	329	385
	350	CFM	1045	1042	1036	1029	1018
		WATTS	138	193	249	302	355
	330	CFM	987	984	979	971	960
		WATTS	121	172	224	276	329
	310	CFM	929	926	920	912	901
		WATTS	105	154	201	251	305
	290	CFM	870	867	862	853	843
		WATTS	91	137	180	230	277

[(a)] Factory setting.

Table 9. S9VMB060U4VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Airflow Setting	**Heating Stage**	**Target Airflow**		**External Static Pressure (in. w. c.)**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
880	40% (Low)	420	CFM / Watts	446 / 29	433 / 58	420 / 87	406 / 116	393 / 145
			Temp. Rise	48	49	49	50	51
	65% (Medium)	695	CFM / Watts	703 / 61	699 / 101	695 / 142	690 / 182	686 / 222
			Temp. Rise	49	50	50	50	50
	100% (High)	880	CFM / Watts	891 / 94	887 / 144	883 / 195	880 / 245	876 / 295
			Temp. Rise	61	61	61	61	61
980	40% (Low)	471	CFM / Watts	489 / 34	480 / 64	470 / 94	461 / 124	452 / 154
			Temp. Rise	43	44	44	44	45
	65% (Medium)	766	CFM / Watts	771 / 77	768 / 119	766 / 162	763 / 204	761 / 246
			Temp. Rise	45	45	45	45	45
	100% (High)	980	CFM / Watts	984 / 121	982 / 177	980 / 232	979 / 288	977 / 344
			Temp. Rise	55	55	55	55	55
1050	40% (Low)	516	CFM / Watts	517 / 38	516 / 70	516 / 102	515 / 134	514 / 166
			Temp. Rise	41	41	41	41	41
	65% (Medium)	821	CFM / Watts	818 / 90	819 / 134	821 / 178	822 / 222	824 / 267
			Temp. Rise	43	42	42	42	42
	100% (High)	1055	CFM / Watts	1047 / 144	1048 / 203	1050 / 262	1051 / 321	1053 / 380
			Temp. Rise	52	52	52	51	51
1100[(a)]	40% (Low)	529	CFM / Watts	538 / 41	534 / 73	529 / 105	524 / 138	520 / 170
			Temp. Rise	39	40	40	40	40
	65% (Medium)	852	CFM / Watts	858 / 98	855 / 143	851 / 188	847 / 233	844 / 278
			Temp. Rise	41	41	41	41	41
	100% (High)	1100	CFM / Watts	1069 / 159	1077 / 219	1084 / 280	1092 / 341	1099 / 401
			Temp. Rise	50	50	50	50	49
1160	40% (Low)	556	CFM / Watts	576 / 45	566 / 76	556 / 108	546 / 140	536 / 171
			Temp. Rise	37	37	37	38	38
	65% (Medium)	893	CFM / Watts	889 / 113	890 / 159	892 / 205	894 / 252	896 / 298
			Temp. Rise	39	39	39	39	38
	100% (High)	1160	CFM / Watts	1135 / 189	1138 / 252	1142 / 315	1145 / 378	1148 / 441
			Temp. Rise	48	48	48	47	47
1220	40% (Low)	601	CFM / Watts	582 / 46	591 / 81	600 / 115	610 / 150	619 / 185
			Temp. Rise	37	36	35	34	34
	65% (Medium)	937	CFM / Watts	929 / 128	933 / 175	936 / 221	940 / 268	943 / 315
			Temp. Rise	37	37	37	37	36
	100% (High)	1220	CFM / Watts	1166 / 217	1174 / 280	1181 / 343	1189 / 407	1197 / 470
			Temp. Rise	46	46	46	46	45

[(a)] Factory setting.

Table 10. S9VMB060U4VC cooling airflow

S9VMB060U4VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
1.5	450	CFM	668	663	662	658	650
		WATTS	50	83	119	158	198
	420	CFM	623	617	615	610	601
		WATTS	43	75	110	147	186
	400	CFM	592	586	583	578	568
		WATTS	39	70	104	140	178
	370	CFM	547	539	536	530	519
		WATTS	33	63	95	130	168
	350	CFM	516	508	504	497	486
		WATTS	30	58	90	125	162
	330	CFM	486	476	472	464	452
		WATTS	26	54	85	119	156
	310	CFM	456	445	439	431	419
		WATTS	24	50	81	114	151
	290	CFM	420	412	407	398	385
		WATTS	20	47	77	110	147
2.0	450	CFM	894	894	895	894	888
		WATTS	96	137	181	226	272
	420	CFM	834	832	833	832	825
		WATTS	82	121	162	206	250
	400	CFM	794	792	792	790	783
		WATTS	73	111	151	193	236
	370	CFM	733	730	730	727	719
		WATTS	61	97	135	175	217
	350	CFM	693	689	688	685	676
		WATTS	54	88	125	164	205
	330	CFM	653	648	646	642	633
		WATTS	47	80	116	154	194
	310	CFM	612	606	604	600	590
		WATTS	41	73	108	144	183
	290	CFM	572	565	562	557	546
		WATTS	36	66	100	136	174
2.5	450	CFM	1119	1122	1124	1124	1119
		WATTS	168	216	267	320	373
	420	CFM	1044	1046	1048	1048	1043
		WATTS	141	187	235	286	337
	400	CFM	994	995	997	997	991
		WATTS	125	169	216	264	314
	370	CFM	919	919	921	919	914
		WATTS	103	145	189	235	282
	350	CFM	869	868	869	868	862
		WATTS	90	130	173	217	263
	330	CFM	819	817	818	816	809
		WATTS	78	117	158	201	245
	310	CFM	769	766	766	764	756
		WATTS	68	105	144	185	228
	290	CFM	718	715	714	711	703
		WATTS	58	93	131	171	212

Table 10. S9VMB060U4VC cooling airflow (continued)

S9VMB060U4VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
3.0	450	CFM	1342	1347	1351	1351	1347
		WATTS	268	324	382	443	504
	420	CFM	1253	1257	1261	1261	1257
		WATTS	224	277	333	390	448
	400	CFM	1194	1197	1200	1200	1196
		WATTS	197	249	302	357	413
	370	CFM	1104	1106	1109	1109	1104
		WATTS	162	210	261	313	366
	350	CFM	1044	1046	1048	1048	1043
		WATTS	141	187	235	286	337
	330	CFM	984	985	987	986	981
		WATTS	122	166	212	260	310
	310	CFM	924	924	926	925	919
		WATTS	104	146	191	237	284
	290	CFM	864	863	864	863	856
		WATTS	89	129	171	216	261
3.5	450	CFM	1563	1570	1574	1575	1571
		WATTS	401	465	531	599	668
	420	CFM	1460	1466	1470	1471	1467
		WATTS	334	395	457	522	587
	400	CFM	1391	1397	1401	1401	1397
		WATTS	294	352	412	474	537
	370	CFM	1288	1292	1296	1296	1292
		WATTS	240	295	351	410	469
	350	CFM	1218	1222	1225	1226	1221
		WATTS	208	260	315	371	427
	330	CFM	1149	1152	1155	1155	1150
		WATTS	179	229	281	334	389
	310	CFM	1079	1081	1084	1084	1079
		WATTS	153	200	250	301	353
	290	CFM	1009	1010	1013	1012	1007
		WATTS	129	174	222	271	321
4.0[a]	450	CFM	1780	1789	1794	1795	1791
		WATTS	573	645	718	794	870
	420	CFM	1664	1673	1677	1678	1674
		WATTS	477	544	614	685	757
	400	CFM	1587	1594	1599	1600	1595
		WATTS	419	483	550	619	688
	370	CFM	1470	1476	1480	1481	1476
		WATTS	341	401	464	529	594
	350	CFM	1391	1397	1401	1401	1397
		WATTS	294	352	412	474	537
	330	CFM	1313	1317	1321	1321	1317
		WATTS	253	308	365	424	485
	310	CFM	1233	1237	1240	1241	1236
		WATTS	215	267	322	379	436
	290	CFM	1154	1157	1160	1160	1155
		WATTS	181	231	283	337	392

[a] Factory setting.

Table 11. S9VMB080U4VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Outdoor Tonnage - Odt	Heating Stage	Target Airflow		External Static Pressure (in. w. c.)				
				0.1	0.3	0.5	0.7	0.9
1260	40% (Low)	559	CFM / Watts	563 / 47	561 / 78	559 / 108	556 / 139	554 / 170
			Temp. Rise	51	51	51	51	51
	65% (Medium)	907	CFM / Watts	901 / 123	904 / 167	906 / 212	909 / 256	912 / 301
			Temp. Rise	52	52	52	52	52
	100% (High)	1260	CFM / Watts	1248 / 266	1253 / 330	1258 / 393	1263 / 457	1268 / 520
			Temp. Rise	58	58	57	57	57
1380	40% (Low)	614	CFM / Watts	615 / 56	614 / 89	613 / 123	613 / 157	612 / 191
			Temp. Rise	47	47	47	47	47
	65% (Medium)	987	CFM / Watts	986 / 151	986 / 201	987 / 251	987 / 301	987 / 352
			Temp. Rise	47	48	48	48	48
	100% (High)	1380	CFM / Watts	1367 / 345	1366 / 416	1366 / 486	1366 / 556	1365 / 626
			Temp. Rise	53	53	53	53	53
1450[(a)]	40% (Low)	640	CFM / Watts	648 / 62	644 / 97	640 / 133	636 / 168	632 / 204
			Temp. Rise	44	44	44	44	45
	65% (Medium)	1039	CFM / Watts	1040 / 172	1039 / 223	1038 / 275	1037 / 327	1037 / 378
			Temp. Rise	45	45	45	45	45
	100% (High)	1450	CFM / Watts	1435 / 397	1431 / 471	1428 / 545	1424 / 619	1420 / 693
			Temp. Rise	50	50	50	50	51
1510	40% (Low)	661	CFM / Watts	670 / 67	665 / 101	660 / 136	655 / 171	650 / 205
			Temp. Rise	43	44	45	45	46
	65% (Medium)	1070	CFM / Watts	1073 / 191	1071 / 244	1070 / 298	1068 / 351	1067 / 405
			Temp. Rise	44	44	44	44	44
	100% (High)	1510	CFM / Watts	1486 / 447	1479 / 521	1473 / 594	1466 / 668	1460 / 742
			Temp. Rise	48	49	49	49	49
1640	40% (Low)	716	CFM / Watts	717 / 78	716 / 116	715 / 155	715 / 193	714 / 231
			Temp. Rise	40	40	40	40	40
	65% (Medium)	1140	CFM / Watts	1156 / 240	1148 / 294	1140 / 347	1131 / 401	1123 / 454
			Temp. Rise	41	41	41	41	41
	100% (High)	1640	CFM / Watts	1609 / 577	1594 / 650	1579 / 723	1564 / 796	1548 / 869
			Temp. Rise	45	45	46	46	46
1775	40% (Low)	765	CFM / Watts	778 / 92	771 / 129	764 / 166	758 / 203	751 / 240
			Temp. Rise	37	38	38	39	39
	65% (Medium)	1229	CFM / Watts	1239 / 292	1233 / 352	1228 / 411	1223 / 471	1218 / 531
			Temp. Rise	38	38	38	38	39
	100% (High)	1775	CFM / Watts	1725 / 720	1677 / 751	1628 / 783	1580 / 815	1532 / 846
			Temp. Rise	42	43	44	45	47

[(a)] Factory setting.

Table 12. S9VMB080D4VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Airflow Setting	**Heating Stage**	**Target Airflow**		**External Static Pressure (in. w. c.)**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
1285	40% (Low)	528	CFM / Watts	545 / 38	536 / 71	528 / 105	519 / 138	510 / 172
			Temp. Rise	53	53	53	53	54
	65% (Medium)	875	CFM / Watts	901 / 96	888 / 142	874 / 188	861 / 234	848 / 280
			Temp. Rise	51	52	53	54	54
	100% (High)	1285	CFM / Watts	1255 / 210	1241 / 271	1228 / 332	1214 / 393	1201 / 453
			Temp. Rise	57	58	58	59	59
1415	40% (Low)	562	CFM / Watts	605 / 44	584 / 79	562 / 113	540 / 147	518 / 182
			Temp. Rise	47	49	51	52	54
	65% (Medium)	952	CFM / Watts	982 / 119	967 / 170	951 / 220	936 / 271	920 / 321
			Temp. Rise	47	48	49	49	50
	100% (High)	1415	CFM / Watts	1400 / 274	1379 / 341	1358 / 408	1337 / 476	1316 / 543
			Temp. Rise	51	52	53	53	54
1455[a]	40% (Low)	595	CFM / Watts	627 / 47	611 / 80	594 / 114	578 / 147	562 / 180
			Temp. Rise	46	47	48	49	51
	65% (Medium)	976	CFM / Watts	1026 / 130	1001 / 180	976 / 230	950 / 280	925 / 330
			Temp. Rise	45	46	47	49	50
	100% (High)	1455	CFM / Watts	1436 / 308	1414 / 370	1392 / 431	1370 / 493	1348 / 555
			Temp. Rise	50	51	51	52	53
1530	40% (Low)	629	CFM / Watts	647 / 51	638 / 85	628 / 118	619 / 152	610 / 186
			Temp. Rise	44	45	46	46	47
	65% (Medium)	1026	CFM / Watts	1064 / 149	1045 / 197	1026 / 246	1006 / 294	987 / 342
			Temp. Rise	44	44	45	46	47
	100% (High)	1530	CFM / Watts	1503 / 346	1482 / 413	1462 / 480	1442 / 547	1421 / 614
			Temp. Rise	48	48	49	50	50
1650	40% (Low)	672	CFM / Watts	699 / 59	686 / 96	672 / 134	658 / 172	645 / 209
			Temp. Rise	41	42	43	43	44
	65% (Medium)	1113	CFM / Watts	1150 / 178	1131 / 232	1113 / 286	1095 / 340	1076 / 394
			Temp. Rise	40	41	41	42	43
	100% (High)	1650	CFM / Watts	1592 / 424	1576 / 496	1559 / 569	1543 / 642	1526 / 714
			Temp. Rise	45	45	46	46	47
1730	40% (Low)	713	CFM / Watts	734 / 64	723 / 102	712 / 141	701 / 180	690 / 218
			Temp. Rise	39	39	40	41	41
	65% (Medium)	1172	CFM / Watts	1192 / 196	1182 / 256	1171 / 317	1160 / 377	1150 / 437
			Temp. Rise	39	39	39	40	40
	100% (High)	1730	CFM / Watts	1674 / 467	1653 / 549	1632 / 632	1611 / 714	1590 / 796
			Temp. Rise	43	43	44	44	45

[a] Factory setting.

Table 13. S9VMB080U4VC / S9VMB080D4VC cooling airflow

S9VMB080U4VC / S9VMB080D4VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
2.0	450	CFM	911	907	903	897	891
		WATTS	103	147	191	235	279
	420	CFM	850	846	841	835	829
		WATTS	88	130	171	213	254
	400	CFM	809	805	800	793	787
		WATTS	79	119	159	199	239
	370	CFM	747	743	737	730	723
		WATTS	66	104	141	179	217
	350	CFM	706	701	694	687	680
		WATTS	59	95	131	167	204
	330	CFM	664	658	652	644	636
		WATTS	52	86	121	156	191
	310	CFM	622	616	609	601	593
		WATTS	45	78	111	145	179
	290	CFM	580	573	565	557	548
		WATTS	40	71	102	135	168
2.5	450	CFM	1134	1131	1128	1123	1118
		WATTS	177	230	282	335	387
	420	CFM	1060	1058	1054	1049	1043
		WATTS	149	199	249	299	348
	400	CFM	1011	1008	1004	999	993
		WATTS	133	181	229	276	323
	370	CFM	936	933	928	923	917
		WATTS	110	155	200	245	289
	350	CFM	885	882	877	872	865
		WATTS	97	140	183	226	268
	330	CFM	835	831	826	820	813
		WATTS	85	125	166	207	248
	310	CFM	783	779	774	767	760
		WATTS	73	112	151	190	229
	290	CFM	732	727	721	714	707
		WATTS	63	100	137	175	212
3.0	450	CFM	1350	1347	1344	1339	1334
		WATTS	279	340	402	463	524
	420	CFM	1264	1262	1258	1254	1249
		WATTS	234	292	351	408	465
	400	CFM	1207	1204	1201	1196	1191
		WATTS	207	263	319	374	429
	370	CFM	1119	1117	1113	1109	1103
		WATTS	171	223	275	327	379
	350	CFM	1060	1058	1054	1049	1043
		WATTS	149	199	249	299	348
	330	CFM	1001	998	994	989	983
		WATTS	130	177	225	272	319
	310	CFM	941	938	933	928	922
		WATTS	112	157	202	247	291
	290	CFM	880	877	872	866	860
		WATTS	96	138	181	224	266

Table 13. S9VMB080U4VC / S9VMB080D4VC cooling airflow (continued)

S9VMB080U4VC / S9VMB080D4VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
3.5	450	CFM	1557	1554	1550	1546	1540
		WATTS	414	484	554	624	694
	420	CFM	1461	1459	1455	1451	1445
		WATTS	347	413	479	545	610
	400	CFM	1396	1394	1390	1386	1381
		WATTS	306	369	433	496	559
	370	CFM	1298	1295	1292	1287	1282
		WATTS	251	310	370	429	488
	350	CFM	1231	1228	1225	1220	1215
		WATTS	218	275	332	388	444
	330	CFM	1163	1161	1157	1153	1147
		WATTS	189	243	297	350	403
	310	CFM	1095	1092	1088	1084	1078
		WATTS	162	213	264	315	366
	290	CFM	1026	1023	1019	1014	1008
		WATTS	138	186	235	283	331
4.0[(a)]	450	CFM	1757	1753	1749	1743	1737
		WATTS	586	665	744	822	900
	420	CFM	1652	1648	1644	1639	1634
		WATTS	490	564	638	712	785
	400	CFM	1580	1577	1573	1568	1563
		WATTS	431	502	573	644	715
	370	CFM	1471	1468	1464	1460	1454
		WATTS	353	419	486	552	618
	350	CFM	1396	1394	1390	1386	1381
		WATTS	306	369	433	496	559
	330	CFM	1321	1319	1315	1311	1306
		WATTS	264	324	384	444	504
	310	CFM	1245	1243	1239	1235	1230
		WATTS	225	282	340	397	453
	290	CFM	1168	1166	1162	1157	1152
		WATTS	191	245	299	353	406

[(a)] Factory setting.

Table 14. S9VMC100U5VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Airflow Setting	Heating Stage	Target Airflow		External Static Pressure (in. w. c.)				
				0.1	0.3	0.5	0.7	0.9
1620	40% (Low)	712	CFM / Watts	749 / 53	730 / 93	711 / 132	692 / 172	674 / 212
			Temp. Rise	48	50	51	53	54
	65% (Medium)	1175	CFM / Watts	1182 / 140	1178 / 198	1175 / 256	1171 / 314	1168 / 371
			Temp. Rise	49	49	50	50	50
	100% (High)	1620	CFM / Watts	1644 / 324	1641 / 405	1639 / 486	1637 / 567	1635 / 648
			Temp. Rise	55	55	55	55	55
1700	40% (Low)	757	CFM / Watts	783 / 58	770 / 98	757 / 138	743 / 178	730 / 218
			Temp. Rise	46	47	48	49	50
	65% (Medium)	1230	CFM / Watts	1235 / 156	1232 / 216	1229 / 275	1227 / 335	1224 / 394
			Temp. Rise	47	47	47	47	48
	100% (High)	1700	CFM / Watts	1715 / 368	1712 / 456	1708 / 544	1704 / 632	1701 / 720
			Temp. Rise	52	52	52	53	53
1800	40% (Low)	815	CFM / Watts	827 / 64	821 / 107	815 / 149	808 / 192	802 / 234
			Temp. Rise	44	44	44	45	45
	65% (Medium)	1300	CFM / Watts	1304 / 183	1302 / 245	1299 / 308	1297 / 370	1295 / 433
			Temp. Rise	45	45	45	45	45
	100% (High)	1800	CFM / Watts	1809 / 429	1803 / 522	1796 / 616	1790 / 710	1784 / 804
			Temp. Rise	50	50	50	50	50
1910[a]	40% (Low)	861	CFM / Watts	874 / 72	867 / 115	860 / 157	854 / 200	847 / 243
			Temp. Rise	42	42	42	43	43
	65% (Medium)	1369	CFM / Watts	1373 / 209	1371 / 273	1368 / 337	1366 / 401	1363 / 465
			Temp. Rise	42	42	42	43	43
	100% (High)	1910	CFM / Watts	1896 / 505	1890 / 605	1884 / 704	1877 / 804	1871 / 903
			Temp. Rise	47	47	48	48	48
1980	40% (Low)	888	CFM / Watts	896 / 77	892 / 122	887 / 166	883 / 210	879 / 255
			Temp. Rise	41	41	41	41	41
	65% (Medium)	1417	CFM / Watts	1421 / 233	1419 / 302	1417 / 372	1414 / 441	1412 / 510
			Temp. Rise	41	41	41	41	41
	100% (High)	1980	CFM / Watts	1974 / 579	1962 / 680	1949 / 780	1937 / 881	1925 / 981
			Temp. Rise	45	46	46	46	46
2100	40% (Low)	930	CFM / Watts	944 / 87	937 / 133	930 / 179	922 / 225	915 / 272
			Temp. Rise	38	39	39	39	40
	65% (Medium)	1498	CFM / Watts	1496 / 267	1497 / 343	1497 / 419	1498 / 495	1498 / 571
			Temp. Rise	39	39	39	39	39
	100% (High)	2100	CFM / Watts	2075 / 679	2052 / 775	2028 / 870	2005 / 966	1982 / 1061
			Temp. Rise	43	44	44	45	45

[a] Factory setting.

Table 15. S9VMC100D5VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Airflow Setting	**Heating Stage**	**Target Airflow**		**External Static Pressure (in. w. c.)**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
1550	40% (Low)	631	CFM / Watts	700 / 45	665 / 79	631 / 112	596 / 146	561 / 179
			Temp. Rise	52	54	57	59	62
	65% (Medium)	1106	CFM / Watts	1140 / 118	1123 / 169	1105 / 220	1088 / 271	1070 / 322
			Temp. Rise	51	52	53	54	55
	100% (High)	1550	CFM / Watts	1622 / 269	1606 / 343	1590 / 416	1574 / 490	1558 / 563
			Temp. Rise	55	56	56	57	57
1600	40% (Low)	657	CFM / Watts	721 / 47	689 / 81	657 / 114	624 / 148	592 / 181
			Temp. Rise	50	53	55	57	60
	65% (Medium)	1143	CFM / Watts	1187 / 128	1165 / 179	1143 / 230	1120 / 281	1098 / 332
			Temp. Rise	49	50	51	52	53
	100% (High)	1600	CFM / Watts	1658 / 297	1638 / 371	1617 / 445	1596 / 519	1576 / 594
			Temp. Rise	54	55	55	56	57
1700	40% (Low)	704	CFM / Watts	764 / 52	733 / 87	703 / 121	673 / 156	642 / 191
			Temp. Rise	47	49	51	53	55
	65% (Medium)	1212	CFM / Watts	1264 / 149	1238 / 200	1212 / 252	1186 / 303	1160 / 354
			Temp. Rise	46	47	48	49	50
	100% (High)	1700	CFM / Watts	1769 / 341	1755 / 418	1741 / 494	1728 / 571	1714 / 647
			Temp. Rise	51	51	51	52	52
1800[(a)]	40% (Low)	737	CFM / Watts	806 / 58	772 / 95	737 / 131	702 / 168	668 / 205
			Temp. Rise	45	47	49	51	53
	65% (Medium)	1283	CFM / Watts	1327 / 165	1305 / 225	1283 / 284	1261 / 344	1239 / 403
			Temp. Rise	44	45	46	46	47
	100% (High)	1800	CFM / Watts	1875 / 397	1845 / 481	1816 / 566	1786 / 650	1756 / 735
			Temp. Rise	48	48	49	50	51
1850	40% (Low)	760	CFM / Watts	828 / 62	793 / 98	759 / 134	725 / 171	691 / 207
			Temp. Rise	44	46	47	49	51
	65% (Medium)	1319	CFM / Watts	1359 / 178	1339 / 240	1319 / 301	1299 / 363	1279 / 424
			Temp. Rise	43	44	44	45	46
	100% (High)	1850	CFM / Watts	1926 / 434	1900 / 522	1875 / 609	1850 / 697	1824 / 785
			Temp. Rise	46	47	48	48	49
2000	40% (Low)	828	CFM / Watts	892 / 72	860 / 110	828 / 147	796 / 185	764 / 222
			Temp. Rise	41	42	44	45	47
	65% (Medium)	1424	CFM / Watts	1479 / 216	1451 / 283	1424 / 349	1396 / 415	1369 / 481
			Temp. Rise	39	40	41	42	43
	100% (High)	2000	CFM / Watts	2065 / 531	2040 / 629	2015 / 726	1990 / 823	1966 / 921
			Temp. Rise	43	44	44	45	46

[(a)] Factory setting.

Table 16. S9VMC100U5VC / S9VMC100D5VC cooling airflow

S9VMC100U5VC / S9VMC100D5VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
2.5	450	CFM	1148	1143	1134	1120	1102
		WATTS	118	171	226	284	343
	420	CFM	1071	1065	1053	1037	1019
		WATTS	100	150	202	257	314
	400	CFM	1019	1012	999	982	962
		WATTS	89	137	187	241	296
	370	CFM	942	932	917	897	875
		WATTS	74	119	167	218	272
	350	CFM	890	878	861	840	816
		WATTS	65	108	155	204	257
	330	CFM	837	823	804	782	757
		WATTS	57	98	143	191	243
	310	CFM	784	768	747	723	696
		WATTS	50	89	133	180	230
	290	CFM	731	712	689	663	634
		WATTS	43	81	123	169	219
3.0	450	CFM	1375	1374	1367	1357	1343
		WATTS	187	248	312	378	445
	420	CFM	1285	1282	1275	1263	1248
		WATTS	157	215	275	338	402
	400	CFM	1224	1221	1213	1200	1184
		WATTS	139	194	252	312	374
	370	CFM	1132	1128	1118	1103	1085
		WATTS	114	166	221	278	337
	350	CFM	1071	1065	1053	1038	1019
		WATTS	100	150	202	257	314
	330	CFM	1009	1001	988	971	950
		WATTS	87	134	185	238	293
	310	CFM	947	937	922	903	881
		WATTS	75	120	168	220	274
	290	CFM	884	872	855	834	810
		WATTS	64	107	154	203	255
3.5	450	CFM	1598	1597	1592	1584	1572
		WATTS	279	350	422	497	573
	420	CFM	1495	1494	1488	1479	1467
		WATTS	233	299	368	438	510
	400	CFM	1425	1424	1418	1408	1395
		WATTS	205	269	334	402	471
	370	CFM	1320	1318	1311	1300	1285
		WATTS	168	227	289	353	418
	350	CFM	1249	1247	1239	1227	1211
		WATTS	146	202	262	323	386
	330	CFM	1178	1174	1165	1152	1135
		WATTS	126	180	236	295	355
	310	CFM	1107	1102	1091	1076	1058
		WATTS	108	159	213	269	327
	290	CFM	1035	1028	1015	999	979
		WATTS	92	140	192	246	302

Table 16. S9VMC100U5VC / S9VMC100D5VC cooling airflow (continued)

S9VMC100U5VC / S9VMC100D5VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
4.0	450	CFM	1817	1815	1810	1801	1790
		WATTS	399	478	560	643	728
	420	CFM	1701	1699	1695	1686	1675
		WATTS	331	406	483	561	641
	400	CFM	1623	1622	1617	1608	1597
		WATTS	291	362	436	512	588
	370	CFM	1505	1504	1498	1489	1477
		WATTS	237	304	373	443	516
	350	CFM	1425	1424	1418	1408	1395
		WATTS	205	269	334	402	471
	330	CFM	1345	1343	1337	1326	1312
		WATTS	177	237	299	364	430
	310	CFM	1265	1262	1254	1242	1227
		WATTS	151	208	267	329	392
	290	CFM	1183	1180	1171	1157	1140
		WATTS	127	181	238	297	358
4.5	450	CFM	2031	2027	2020	2011	1999
		WATTS	548	637	727	820	913
	420	CFM	1903	1900	1895	1886	1875
		WATTS	455	538	623	710	798
	400	CFM	1817	1815	1810	1801	1790
		WATTS	399	478	560	643	728
	370	CFM	1686	1685	1680	1672	1660
		WATTS	324	397	474	552	631
	350	CFM	1598	1597	1592	1584	1572
		WATTS	279	350	422	497	573
	330	CFM	1509	1508	1503	1494	1482
		WATTS	239	306	375	446	519
	310	CFM	1420	1419	1413	1403	1390
		WATTS	203	267	332	400	469
	290	CFM	1330	1328	1321	1310	1296
		WATTS	171	231	293	357	423
5.0[(a)]	450	CFM	2240	2234	2225	2214	2200
		WATTS	731	829	929	1030	1133
	420	CFM	2101	2096	2089	2080	2067
		WATTS	605	697	791	886	983
	400	CFM	2007	2004	1997	1988	1976
		WATTS	530	617	707	798	891
	370	CFM	1865	1862	1857	1849	1837
		WATTS	429	510	594	679	766
	350	CFM	1768	1767	1762	1754	1743
		WATTS	370	447	527	608	691
	330	CFM	1671	1670	1666	1657	1646
		WATTS	316	389	465	542	621
	310	CFM	1574	1573	1568	1559	1547
		WATTS	268	337	409	482	557
	290	CFM	1475	1474	1468	1459	1446
		WATTS	225	290	358	428	499

[(a)] Factory setting.

Table 17. S9VMD120U5VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Airflow Setting	**Heating Stage**	**Target Airflow**		**External Static Pressure (in. w. c.)**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
1730	40% (Low)	740	CFM / Watts	769 / 52	754 / 85	740 / 118	725 / 151	711 / 184
			Temp. Rise	57	58	58	58	59
	65% (Medium)	1228	CFM / Watts	1225 / 134	1226 / 186	1227 / 238	1228 / 290	1229 / 342
			Temp. Rise	57	57	57	57	57
	100% (High)	1730	CFM / Watts	1734 / 319	1733 / 395	1733 / 471	1732 / 546	1732 / 622
			Temp. Rise	62	62	62	62	62
1850	40% (Low)	792	CFM / Watts	810 / 60	801 / 94	791 / 128	782 / 162	773 / 195
			Temp. Rise	52	51	51	51	50
	65% (Medium)	1300	CFM / Watts	1307 / 160	1304 / 215	1300 / 270	1296 / 325	1292 / 381
			Temp. Rise	52	52	52	52	52
	100% (High)	1850	CFM / Watts	1847 / 389	1844 / 469	1841 / 550	1838 / 630	1835 / 710
			Temp. Rise	58	58	58	58	58
1950[(a)]	40% (Low)	811	CFM / Watts	858 / 67	834 / 98	810 / 130	787 / 162	763 / 194
			Temp. Rise	50	50	49	49	49
	65% (Medium)	1371	CFM / Watts	1384 / 185	1378 / 243	1371 / 302	1364 / 360	1357 / 418
			Temp. Rise	50	50	50	50	50
	100% (High)	1950	CFM / Watts	1937 / 436	1939 / 531	1940 / 625	1942 / 720	1944 / 815
			Temp. Rise	55	55	55	55	55
2050	40% (Low)	803	CFM / Watts	895 / 73	848 / 105	802 / 137	756 / 169	709 / 201
			Temp. Rise	48	49	50	51	51
	65% (Medium)	1440	CFM / Watts	1455 / 208	1447 / 266	1440 / 324	1432 / 382	1424 / 440
			Temp. Rise	48	48	48	49	49
	100% (High)	2050	CFM / Watts	2040 / 519	2035 / 612	2030 / 704	2025 / 796	2020 / 889
			Temp. Rise	53	53	53	53	54
2150	40% (Low)	984	CFM / Watts	933 / 79	959 / 116	984 / 153	1009 / 191	1034 / 228
			Temp. Rise	45	45	44	44	43
	65% (Medium)	1524	CFM / Watts	1510 / 230	1517 / 294	1524 / 359	1530 / 423	1537 / 487
			Temp. Rise	45	45	45	45	46
	100% (High)	2150	CFM / Watts	2143 / 577	2140 / 679	2137 / 782	2133 / 885	2130 / 987
			Temp. Rise	50	50	50	50	50
2250	40% (Low)	853	CFM / Watts	988 / 85	920 / 127	852 / 170	784 / 212	716 / 255
			Temp. Rise	43	43	42	42	42
	65% (Medium)	1610	CFM / Watts	1580 / 257	1595 / 327	1609 / 397	1624 / 468	1639 / 538
			Temp. Rise	43	43	43	43	42
	100% (High)	2250	CFM / Watts	2236 / 687	2225 / 779	2214 / 871	2203 / 963	2193 / 1055
			Temp. Rise	48	48	48	48	49

[(a)] Factory setting.

Table 18. S9VMD120D5VC heating airflow

Furnace Heating Airflow (CFM), Power (Watts), and Temp. Rise (°F) vs. External Static Pressure with Filter (iwc)								
Airflow Setting	**Heating Stage**	**Target Airflow**		**External Static Pressure (in. w. c.)**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
1900	40% (Low)	793	CFM / Watts	793 / 55	793 / 89	793 / 123	793 / 157	793 / 191
			Temp. Rise	54	53	52	51	49
	65% (Medium)	1289	CFM / Watts	1285 / 149	1287 / 200	1288 / 251	1290 / 303	1292 / 354
			Temp. Rise	55	55	56	56	56
	100% (High)	1900	CFM / Watts	1792 / 353	1798 / 432	1804 / 511	1810 / 589	1816 / 668
			Temp. Rise	60	60	60	60	60
2050	40% (Low)	814	CFM / Watts	848 / 63	830 / 97	813 / 131	796 / 166	778 / 200
			Temp. Rise	52	52	52	52	53
	65% (Medium)	1407	CFM / Watts	1389 / 182	1398 / 237	1406 / 293	1415 / 348	1424 / 403
			Temp. Rise	51	51	50	50	49
	100% (High)	2050	CFM / Watts	1912 / 442	1924 / 523	1935 / 605	1946 / 686	1958 / 767
			Temp. Rise	57	57	56	56	56
2100	40% (Low)	863	CFM / Watts	867 / 66	865 / 101	862 / 135	859 / 170	857 / 205
			Temp. Rise	50	49	48	47	46
	65% (Medium)	1414	CFM / Watts	1412 / 192	1413 / 248	1414 / 304	1415 / 360	1416 / 416
			Temp. Rise	50	49	49	49	49
	100% (High)	2100	CFM / Watts	1962 / 476	1961 / 555	1960 / 635	1959 / 714	1957 / 793
			Temp. Rise	55	55	55	55	55
2200	40% (Low)	921	CFM / Watts	933 / 73	927 / 105	920 / 137	914 / 169	908 / 201
			Temp. Rise	46	46	46	47	47
	65% (Medium)	1559	CFM / Watts	1482 / 214	1520 / 278	1558 / 342	1596 / 406	1634 / 470
			Temp. Rise	47	46	45	44	43
	100% (High)	2200	CFM / Watts	2056 / 542	2076 / 632	2096 / 723	2115 / 814	2135 / 904
			Temp. Rise	53	52	52	52	51
2250[(a)]	40% (Low)	1009	CFM / Watts	954 / 77	981 / 116	1008 / 156	1035 / 195	1062 / 234
			Temp. Rise	45	44	42	41	40
	65% (Medium)	1594	CFM / Watts	1507 / 232	1550 / 291	1593 / 351	1636 / 411	1680 / 471
			Temp. Rise	46	45	44	43	42
	100% (High)	2250	CFM / Watts	2100 / 569	2127 / 671	2154 / 772	2181 / 873	2208 / 975
			Temp. Rise	51	50	50	50	50
2350	40% (Low)	1133	CFM / Watts	981 / 83	1057 / 131	1132 / 179	1208 / 226	1283 / 274
			Temp. Rise	44	42	40	39	37
	65% (Medium)	1655	CFM / Watts	1558 / 250	1606 / 322	1655 / 394	1703 / 466	1752 / 538
			Temp. Rise	45	44	43	41	40
	100% (High)	2350	CFM / Watts	2196 / 669	2196 / 744	2195 / 818	2195 / 893	2194 / 968
			Temp. Rise	48	48	48	48	48

[(a)] Factory setting.

Table 19. S9VMD120U5VC / S9VMD120D5VC cooling airflow

S9VMD120U5VC / S9VMD120D5VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
3.0	450	CFM	1357	1366	1360	1340	1309
		WATTS	167	228	291	355	419
	420	CFM	1272	1275	1264	1241	1206
		WATTS	140	198	258	318	380
	400	CFM	1215	1213	1199	1173	1138
		WATTS	124	180	237	296	355
	370	CFM	1129	1118	1099	1071	1031
		WATTS	103	155	209	264	320
	350	CFM	1071	1054	1031	1000	960
		WATTS	90	140	192	245	299
	330	CFM	1012	989	962	928	887
		WATTS	79	126	176	227	279
	310	CFM	953	923	892	856	813
		WATTS	68	114	161	210	261
	290	CFM	893	856	820	782	737
		WATTS	59	102	148	195	244
3.5	450	CFM	1568	1589	1592	1579	1553
		WATTS	248	317	389	461	534
	420	CFM	1470	1486	1485	1469	1440
		WATTS	207	273	340	409	477
	400	CFM	1405	1416	1412	1395	1364
		WATTS	183	246	311	376	443
	370	CFM	1305	1310	1301	1280	1246
		WATTS	150	209	270	332	395
	350	CFM	1239	1239	1226	1202	1167
		WATTS	131	187	246	305	365
	330	CFM	1172	1166	1149	1122	1085
		WATTS	113	167	223	280	337
	310	CFM	1105	1092	1071	1041	1002
		WATTS	98	149	202	256	311
	290	CFM	1037	1016	991	959	918
		WATTS	83	132	183	234	287
4.0	450	CFM	1778	1805	1814	1807	1785
		WATTS	352	430	510	591	672
	420	CFM	1666	1690	1696	1687	1663
		WATTS	293	367	442	518	595
	400	CFM	1592	1613	1617	1605	1579
		WATTS	258	328	401	474	548
	370	CFM	1480	1496	1495	1480	1452
		WATTS	211	277	345	413	482
	350	CFM	1405	1416	1412	1395	1364
		WATTS	183	246	311	376	443
	330	CFM	1329	1336	1328	1307	1275
		WATTS	158	218	279	342	406
	310	CFM	1253	1254	1242	1219	1184
		WATTS	135	192	251	311	371
	290	CFM	1177	1171	1155	1128	1091
		WATTS	115	169	224	281	339

Table 19. S9VMD120U5VC / S9VMD120D5VC cooling airflow (continued)

S9VMD120U5VC / S9VMD120D5VC Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
Outdoor Tonnage - Odt	Airflow Setting (CFM/ton)		External Static Pressure (in. w. c.)				
			0.1	0.3	0.5	0.7	0.9
4.5	450	CFM	1986	2016	2029	2025	2006
		WATTS	483	569	658	747	836
	420	CFM	1861	1890	1901	1895	1875
		WATTS	401	483	566	650	734
	400	CFM	1778	1805	1814	1807	1785
		WATTS	352	430	510	591	672
	370	CFM	1652	1676	1682	1672	1647
		WATTS	286	359	434	510	586
	350	CFM	1568	1589	1592	1579	1553
		WATTS	248	317	389	461	534
	330	CFM	1484	1501	1500	1485	1457
		WATTS	213	279	347	416	485
	310	CFM	1400	1411	1407	1389	1359
		WATTS	181	244	309	374	440
	290	CFM	1315	1320	1312	1291	1258
		WATTS	153	213	274	336	399
5.0[(a)]	450	CFM	2193	2225	2239	2236	2219
		WATTS	644	738	835	932	1030
	420	CFM	2055	2086	2100	2096	2078
		WATTS	533	622	713	805	898
	400	CFM	1963	1993	2005	2002	1982
		WATTS	467	553	640	728	817
	370	CFM	1824	1852	1862	1856	1835
		WATTS	379	459	540	623	706
	350	CFM	1731	1757	1765	1757	1734
		WATTS	327	403	481	560	639
	330	CFM	1638	1661	1667	1656	1632
		WATTS	280	352	426	501	577
	310	CFM	1545	1564	1566	1553	1526
		WATTS	238	306	377	448	520
	290	CFM	1452	1466	1464	1448	1419
		WATTS	200	265	332	399	467

[(a)] Factory setting.

Furnace General Installation

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

S-Series Furnace Panel Removal

Note: *Use a 5/16-inch Allen wrench to turn the four latches on the front panel a quarter turn.*

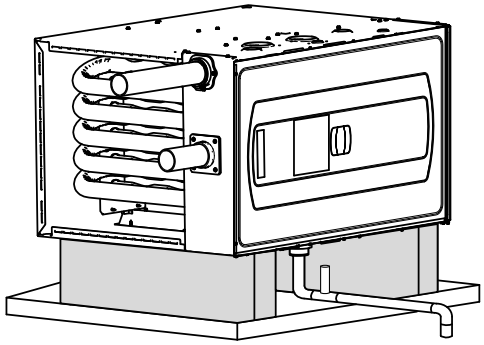
Horizontal Installation in an Attic or Crawlspace

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 "Locations and Clearances," p. 16. 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.*

Figure 5. Horizontal installation in an attic or crawlspace



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

TO APPROVED OPEN / VENTED DRAIN

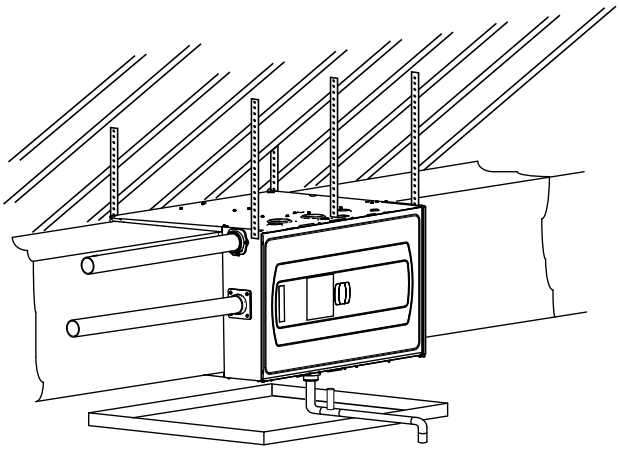
Note: The overflow stand pipe termination must be even with or slightly below the bottom of the condensate trap.

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

Figure 6. Horizontal installation hanging using straps



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.*

Figure 7. Representative vertical furnace with gas piping on left side

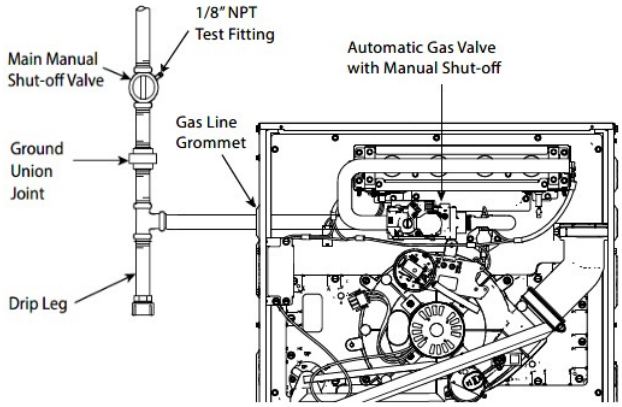


Figure 8. Representative vertical furnace with gas piping on right side

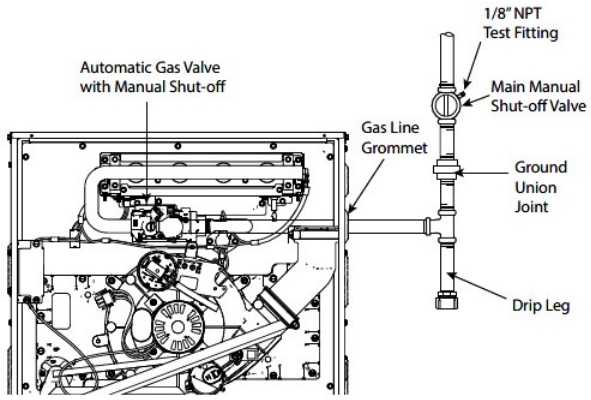
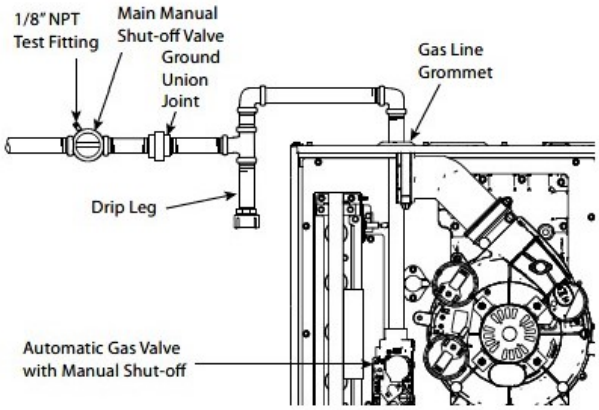


Figure 9. Representative horizontal left furnace with gas piping out right side



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).

Notes:

- *Maximum pressure to the gas valve for natural gas is 13.8-inch W.C. Minimum pressure is 5.0-inch W.C.*
- *Maximum pressure to the gas valve for propane is 13.8-inch W.C. Minimum pressure is 11.0-inch W. C.*

Table 20. Cubic feet per hour of gas for various pipe sizes and lengths (natural gas only)

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

Notes:

1. This table is based on Pressure Drop of 0.3-inch W.C. and 0.6 SP.GR. Gas.
2. Excerpted from NFPA Table 6.2.1(a).

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 S9VM furnaces, use BAYLPSS5AM22DA conversion kit with all stainless steel burners.

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.

Table 21. Gas flow in cubic feet per hour

2 Cubic Foot Dial							
Sec.	**Flow**	**Sec.**	**Flow**	**Sec.**	**Flow**	**Sec.**	**Flow**
30	244	46	159	64	114	100	73
31	236	47	156	66	111	104	70
32	229	48	153	68	108	108	68
33	222	49	149	70	105	112	65
34	215	50	146	72	102	116	63
35	209	51	144	74	99	120	61
36	203	52	141	76	96	130	56
37	198	53	138	78	94	140	52
38	193	54	136	80	92	150	49
39	188	55	133	82	89	160	46
40	183	56	131	84	87	170	43
41	179	57	128	86	85	180	41
42	174	58	126	88	83	190	39
43	170	59	124	90	81	200	37
44	166	60	122	94	78	—	—
45	163	62	118	98	75	—	—

Note: Excerpted from NFPA 54/ANSI Z223.1 Table A.11.1.1

Gas Valve Adjustment - Communicating Mode

NOTICE

Notice!

For optimum operation the Low/High Fire Gas Valve Manifold Pressure (OUTP) must be checked and adjusted, if needed, per the unit nameplate during installation. Refer to the IOM manual or BAYLPSS5AM22DA Installer Guide for adjustment instructions.
Important: Adjustments must be done electronically via the Technician App, IFC, or UX360 Smart Thermostat. Manual gas valve adjustment is not available.

Note: *Gas valve adjustments in 24V mode must be made using the 3rd party test mode. See to TEST Group in 24V menu.*

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-inch hex wrench.

Note: *The pressure tap adjustment kit (KIT07611) contains a 3/32-inch hex wrench, a 5/16-inch hose, and a connector and can be ordered through global parts.*

3. Attach a manometer with flexible tubing to the outlet pressure boss marked OUT P.
4. Turn the system power ON.
5. Open the Technician App and connect to the S9VM or the Hub via BLE.
6. Once connected, go to **Test Modes > Test Indoor Heat > Start**

Figure 10. Test modes

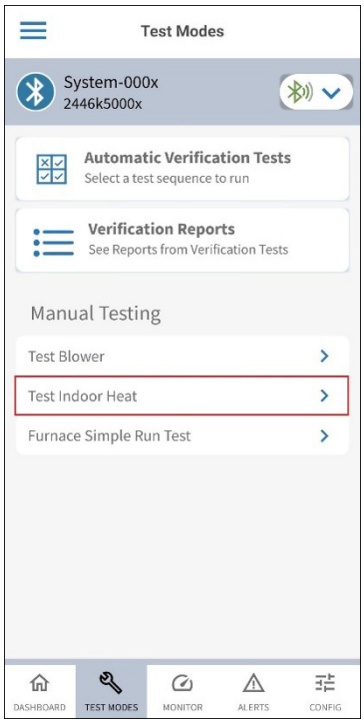
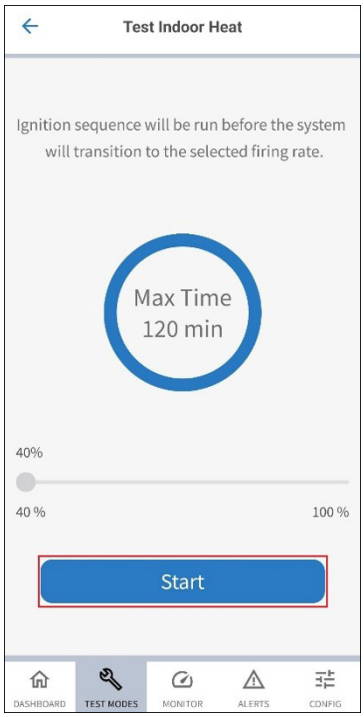


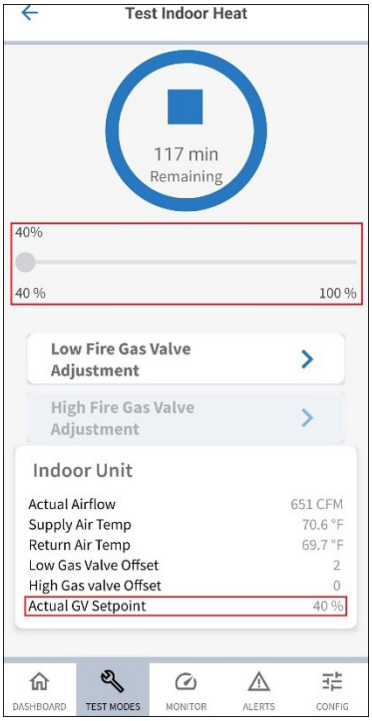
Figure 11. Gas valve adjustment



7. Allow the furnace to ignite and the blower to begin. Using the slider, adjust to 40% low fire. The furnace begins the transition with the inducer and gas valve ramping down. This transition takes less than 30 seconds.

Important: *The actual GV setpoint must be at 40% before manifold adjustment is made.*

Figure 12. Low fire gas valve adjustment



8. Once the actual GV setpoint is at 40%, verify the manifold pressure on the manometer. Low fire manifold pressure should be ~0.7-in. W.C. for natural gas and ~ 2.1-in. W.C. for propane gas. If adjustment is required, push the low fire GV adjustment to adjust the pressure up or down:
   - Positive number adjustments will raise the manifold pressure.
   - Negative number adjustments will lower the manifold pressure.

Figure 13. Low fire gas valve adjustment

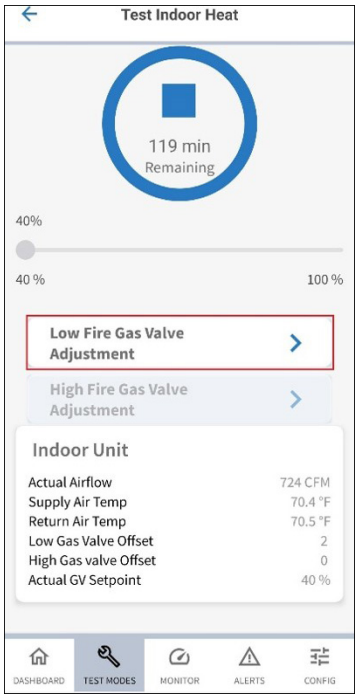
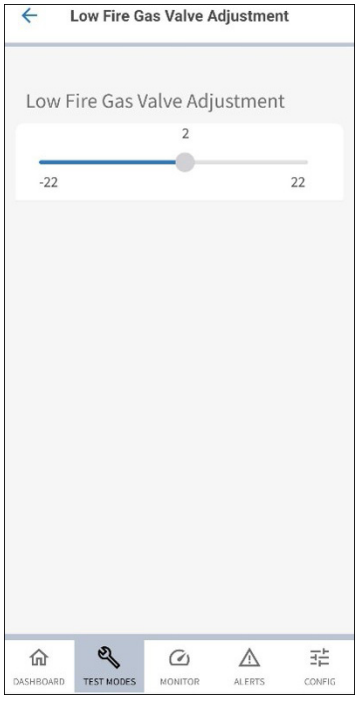


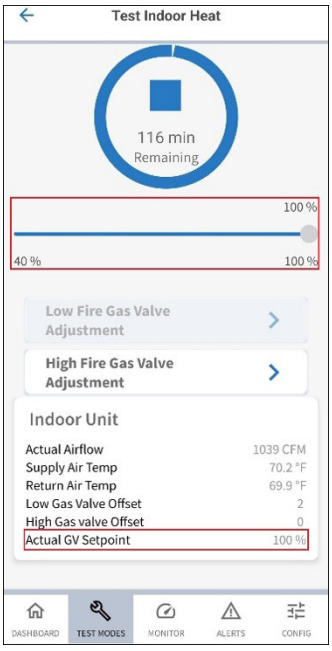
Figure 14. Low fire gas valve adjustment



9. After setting the low fire manifold pressure, use the slider to adjust to 100% high fire.

Important: *The actual GV setpoint must be at 100% before manifold adjustment is made.*

Figure 15. High fire gas valve adjustment



10. Once the actual GV setpoint is at 100%, verify the manifold pressure on the manometer. High fire manifold pressure should be ~3.5-in. W.C. for natural gas and ~ 10.0-in. W.C. for propane gas. If adjustment is required, push the high fire GV adjustment to adjust the pressure up or down:
    - Positive number adjustments will raise the manifold pressure.
    - Negative number adjustments will lower the manifold pressure.

Figure 16. High fire gas valve adjustment

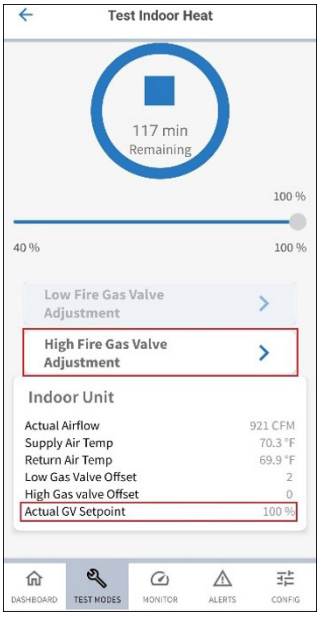


Figure 17. High fire gas valve adjustment

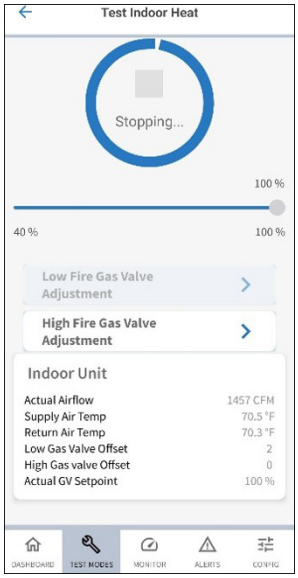


11. After both low and high fire adjustments, cycle low and high fire rates using the slider to verify the pressures remain the same. Adjust the pressure as needed.

Note: *Due to the gas valve design limitations, high fire gas valve adjustments may be limited to less than 22. An ERR 91.11, Gas Valve Offset Error may be declared when the offset request cannot be met. The gas valve will set itself to the maximum offset if this occurs.*

12. To stop the test, push the square button inside the timer circle.

Figure 18. Gas valve adjustment



13. Once the blower off delay is complete, remove the manometer and tubing from the gas valve outlet boss and tighten the outlet tap test screw using the 3/32-inch hex wrench.
14. Using a leak detection solution or soap suds, check for leaks at the pressure outlet boss and pressure tap test screw.
15. Check operation of the unit.

Figure 19. Gas valve adjustment

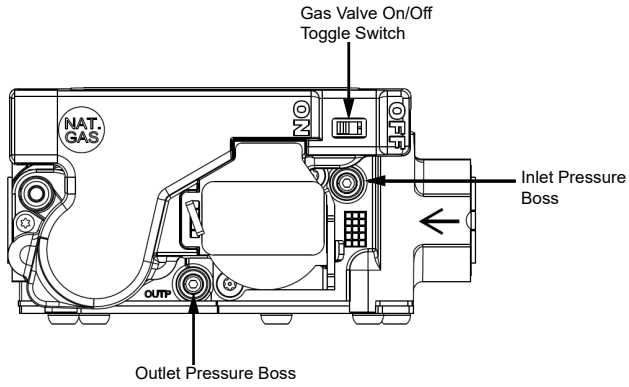


Table 22. Fuel manifold pressure settings (inches w. c.)

Fuel	100% High Fire	65% Not Adjustable	40% Low Fire
Natural Gas	3.5-in. W.C.	1.6-in. W. C.	0.7-in. W.C.
Propane	10.0-in. W.C.	6.0-in. W. C.	2.1-in. 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 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.

Slide the main gas valve control switch within the unit to OFF. 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. Slide the control switch on the gas valve in the unit to ON.

Table 23. Part numbers for replacement orifices

Drill Size	Part Number	Drill Size	Part Number
44	ORF00501	54	ORF00555
45	ORF00644	55	ORF00693

Table 23. Part numbers for replacement orifices (continued)

Drill Size	Part Number	Drill Size	Part Number
—	—	56	ORF00907
47	ORF00910	—	—
—	—	58	ORF01338
49	ORF00503	59	ORF01339

Note: If 46, 48, 50, or 57 orifice is required, use the next smaller drill size and reduce the manifold pressure to achieve rate.

The table below 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.* Installation of this furnace at altitudes above 2,000 ft (610 m) shall be made in accordance with the listed high altitude conversion kit available with the furnace.

Table 24. Main burner orifices

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

Note: Excerpted from NFPA 54 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-inch clearance from combustible materials to non-metallic vent pipe.

The recommended system is assembled from 2-inch or 3-inch plastic pipe and fittings found in the Table 25, p. 52. 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-inch 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: *Confirm that vent piping is sloped 1/4-inch per foot and that piping is supported properly to prevent sags and condensate pooling.*

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.*
- *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, that is, when it passes through unheated spaces, 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-Inch and Horizontal Venting Requirements

Important:

- *To determine if your application requires 3-inch venting, see the* *“Maximum Vent Length Table,” p. 52*
- *Horizontal venting application must use the 2-inch x 3-inch offset reducing coupling. Vertical venting applications do not require the reducing coupling to be offset.*

Notes:

- *If your furnace comes with a factory supplied 2-inch x 3-inch offset reducing coupling it is used for 3-inch 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.*
- *For Canadian applications, BAYREDUCE 2-inch x 3-inch 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.*

Figure 20. Horizontal coupling

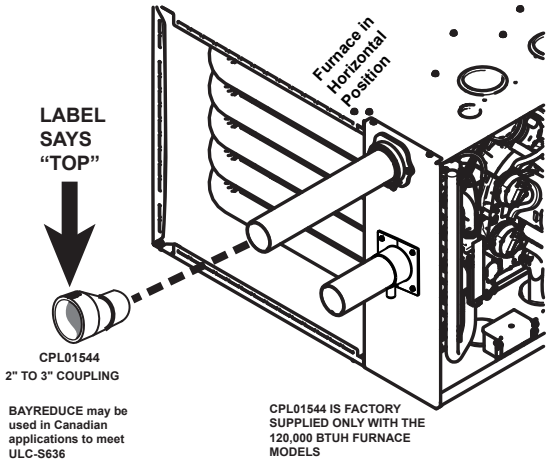
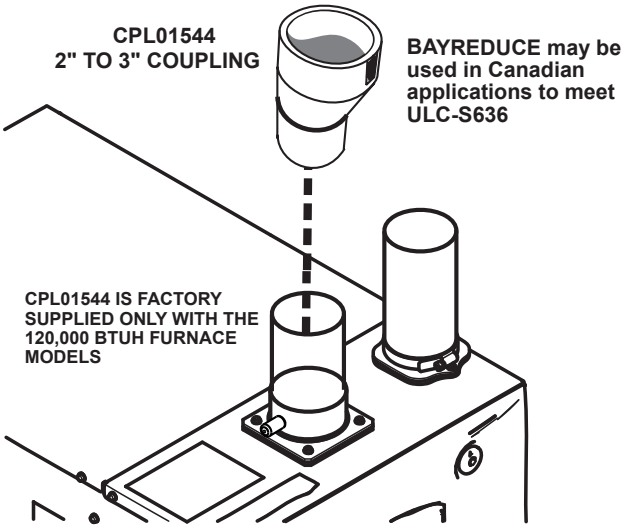


Figure 21. Vertical coupling



Typical Venting

This combustion air intake has a built-in condensate collection system. Condensate that may collect is drained

by field supplied 1/2-inch ID tubing. The tubing must be routed to form a trap and water seal (See Figure 22, p. 48, Figure 23, p. 48, and Figure 24, p. 48).

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 22. Upflow top entry

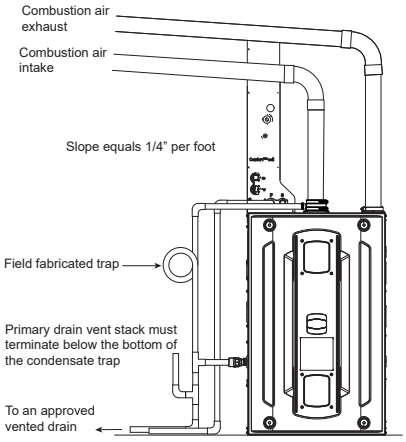


Figure 23. Horizontal top entry

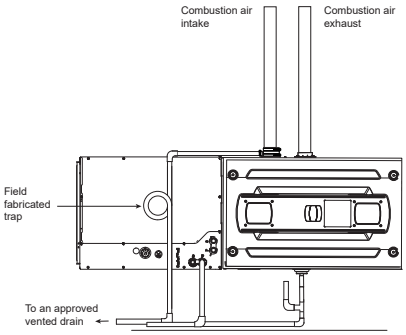
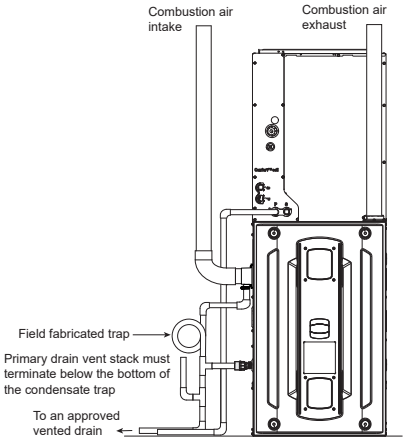


Figure 24. Upflow side entry



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.

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

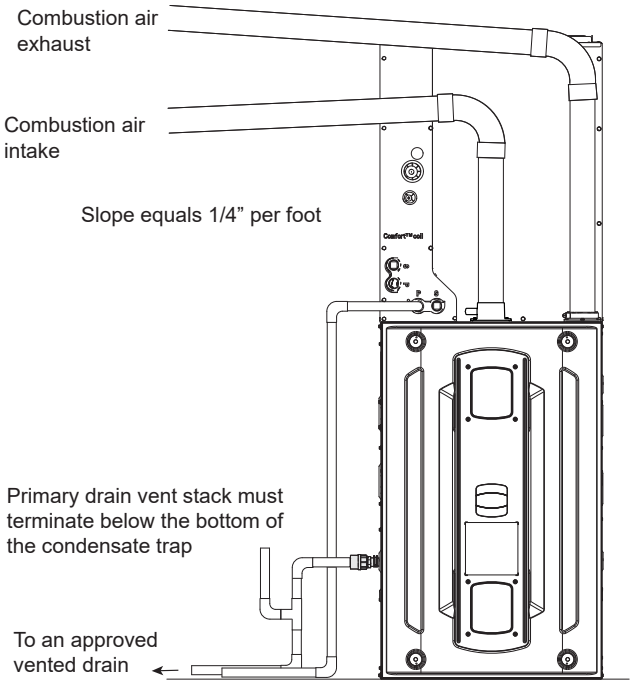
We recommend following one of the options to prevent this condition from occurring and possibly damaging components within the furnace:

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 exhaust must be sloped back to the furnace.

Note: *Combustion air drain fitting must remain capped if not using the drain function. See "Condensate Drain Instructions," p. 73 section.*

Figure 25. Option 1

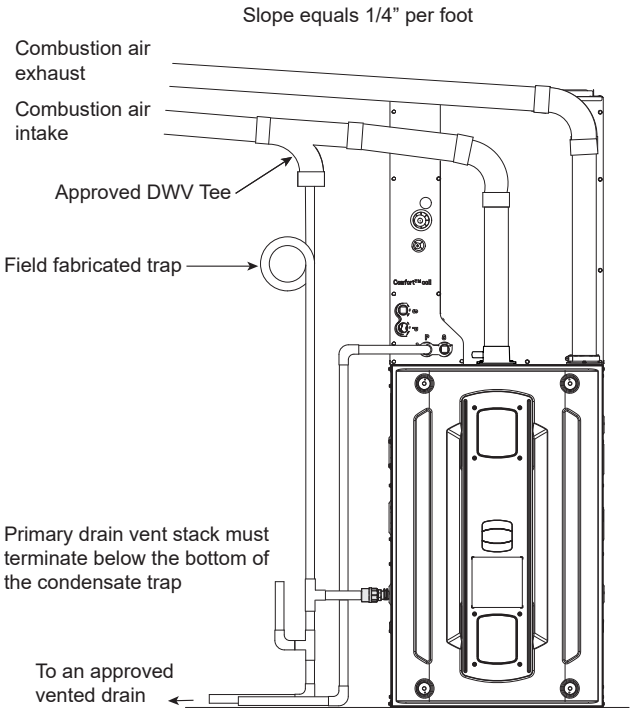


Option 2

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. 73 section.*

Figure 26. Option 2

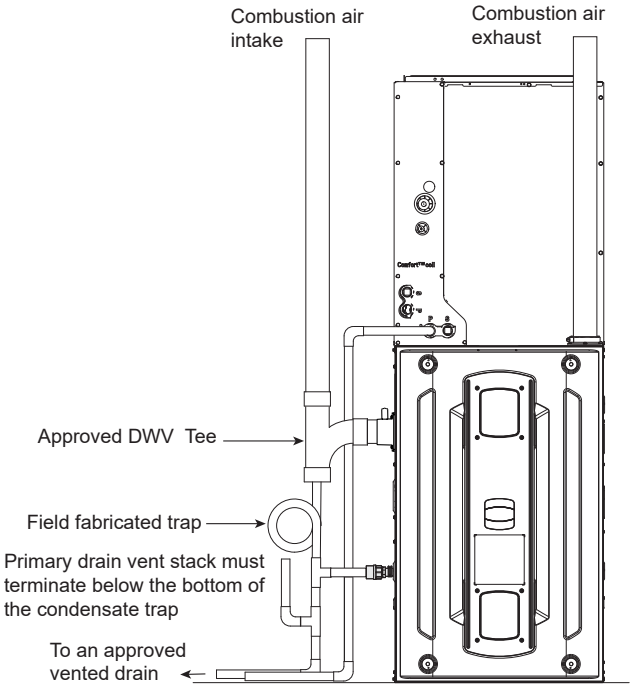


Option 3

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. 73 section.*

Figure 27. Option 3



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 **Non-direct 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," p. 60).

Vent terminations

- BAYVENT200B
- BAYAIR30AVENTA

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

- BAYVENTCN200B
- BAYAIR30CNVENT

Furnace Vent / Inlet Pipe Installation in Two Pressure Zone Configurations

There are many different variations of the vent / inlet air pipe combination. The vent / inlet air combination used for installation of these Furnaces depends on the needs of the location. However, these guidelines must be followed:

1. The Furnace must vent outside the structure.
2. Furnace combustion air requirements must be met for non-direct, single pipe applications.
3. For direct vent application of these Furnaces, the vent pipe and air inlet pipe do not have to exit in the same air space or even on the same surface of the structure. However, the longest individual pipe will determine the value for the longest allowable equivalent vent/ inlet air length as shown in the vent length table.

Note: *For single pressure zone applications, see the "3-Inch and Horizontal Venting Requirements," p. 47 section.*

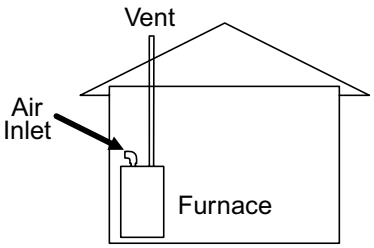
The following are **Examples Only**.

Example 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," p. 60.

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.*

Figure 28. Example 1 - single pipe venting

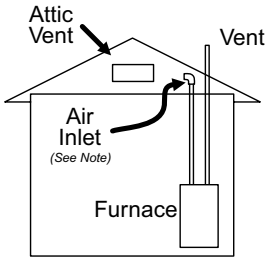


Example 2

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," p. 60.

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.*

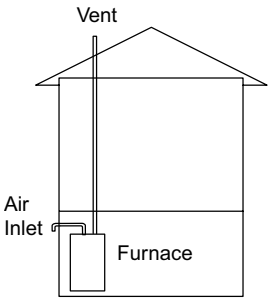
Figure 29. Example 2 - single pipe venting



Example 3

Example 3 shows that the exhaust vent may go vertical while the inlet air may be on any side of the structure. The vent pipe would decide the maximum equivalent length for the pipe depending on the furnace and pipe size.

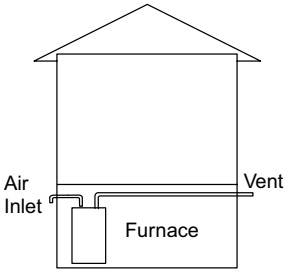
Figure 30. Example 3 - two pipe venting



Example 4

Example 4 shows the vent exiting one side of the house while the inlet air is on the opposite side of the structure. Here the vent pipe length must be within the allowable length for the size of Furnace and size of the vent pipe. This example demonstrates that the pipes do not have to exit on the same side of the structure.

Figure 31. Example 4 - two pipe venting



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-inch and 3-inch 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!

Failure to follow instructions below could result in death or serious injury, or property damage.
Refer to the Approved Vent Pipe Materials table for manufactured modular venting systems approved for use with this product. Follow the manufacturer's installation instructions when installing the venting system.

⚠ WARNING

Carbon Monoxide Poisoning!

Failure to follow instructions below could result in death or serious injury, or property damage.
Do not use cement on polypropylene venting systems. Follow the manufacturer's installation instructions when installing the venting system.

Important: *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, and 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.*

Figure 32. Sealing inlet air pipe

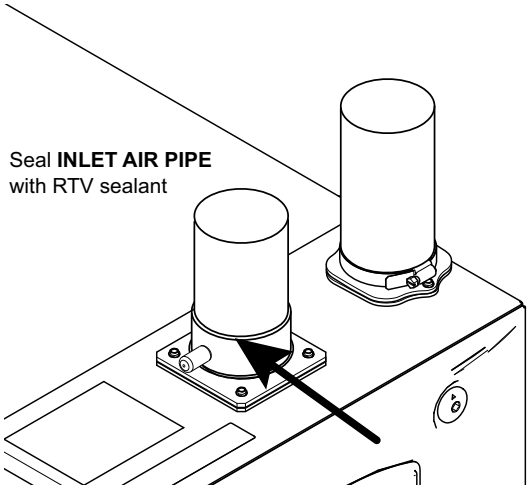


Table 25. Approved non-metallic vent pipe and fitting materials

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
D2665	DWV Pipe	158	ASTM D2665
D1785	SCH 40	158	ASTM 1785 - Type 1
D2241	SDR 17, 21, 26, 32.5 Series	158	ASTM D2241
CPVC			
ASTM Standard	Pipe Type	Allowable Temperature °F	Marking
F441	SCH 40	212	ASTM F441
F442	SDR 17, 21, 26, 32.5 Series	212	ASTM F442
ABS			
ASTM Standard	Pipe Type	Allowable Temperature °F	Marking
D2661	SCH 40 DWV	180	ASTM D2661
Polypropylene			
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

Maximum Vent Length Table

Table 26. Maximum vent length table

Model	1.5-inch Pipe	2-inch Pipe	2.5-inch Pipe	3-inch Pipe	4-inch Pipe
Altitude 0-2,000 FT.					
S9VMB060	50	200	200	200	250

Table 26. Maximum vent length table (continued)

Model	1.5-inch Pipe	2-inch Pipe	2.5-inch Pipe	3-inch Pipe	4-inch Pipe
S9VMB080	30	100	200	200	250
S9VMC100	(a)	50	100	200	250
S9VMD120	(a)	(a)	(a)	200	250
Altitude 2,001- 5400 FT					
S9VMB060	50	200	200	200	250
S9VMB080	20	80	120	120	200
S9VMC100	(a)	50	100	150	200
S9VMD120	(a)	(a)	(a)	200	250
Altitude 5,401-7,800 FT					
S9VMB060	25	100	150	150	200
S9VMB080	(a)	50	70	70	140
S9VMC100	(a)	(a)	(a)	100	200
S9VMD120	(a)	(a)	(a)	100	200
Altitude 7,801-10,100 FT					
S9VMB060	(a)	50	90	90	180
S9VMB080	(a)	(a)	(a)	50	100
S9VMC100	(a)	(a)	(a)	50	100
S9VMD120	(a)	(a)	(a)	50	100

Notes:

1. Installation Instructions must be followed for installation of the venting system.
2. These fittings are available from your Gas Furnace Distributors.
3. 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.
4. Minimum vent length for all models: 15ft equivalent.
5. 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.
6. 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).
7. One short radius 90° elbow is equivalent to 10' of 4-in. pipe, 10' of 3-in. pipe, or 8' of 2-in. pipe. One LONG radius elbow is equivalent to 6' of 4-in. pipe, 7' of 3-in. pipe, or 5' of 2-in. pipe. Two 45° elbows equal one 90° long elbow. One mitered elbow is equivalent to 12' of 3-in. pipe or 12' of 2-in. pipe.
8. 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.
9. For Canadian applications, venting systems must meet ULC-S636 requirements.
10. 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).

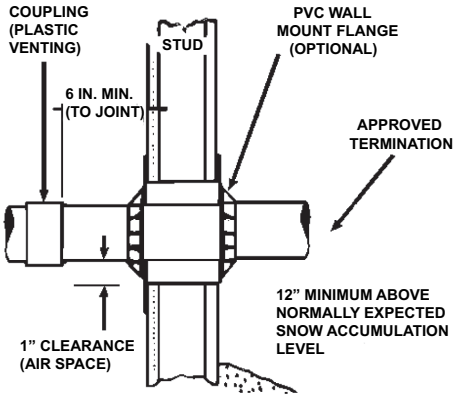
(a) Not allowed.

Combustible Material Wall

A minimum clearance of 1-inch 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-inch x 12-inch. 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.

Figure 33. Combustible material wall



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

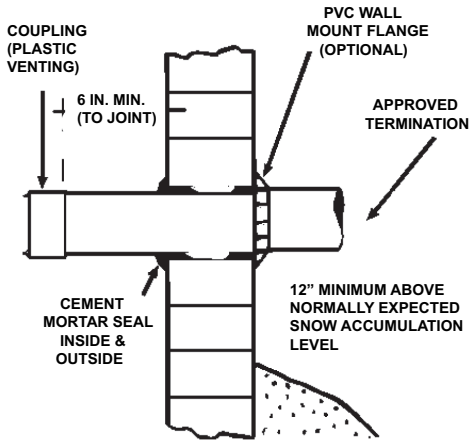
CLEARANCE (0" ACCEPTABLE FOR PVC VENT PIPE)
(1" ACCEPTABLE FOR TYPE 29-4C STAINLESS STEEL VENT PIPE)

Non-combustible 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.

Figure 34. Non-combustible material wall



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

Horizontal Venting Through Wall

The vent for this appliance shall not terminate:

- Over public walkways.
- Near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage.
- 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-inch minimum clearance above highest anticipated snow level or grade, whichever is greater.*

Note: *All distances are center line to center line.*

Figure 35. Configurations for two pipe venting systems — type 1

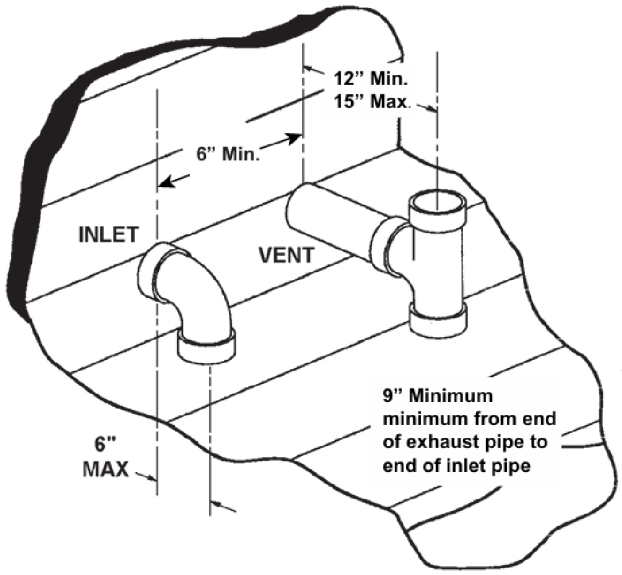


Figure 36. Configurations for two pipe venting systems — type 2

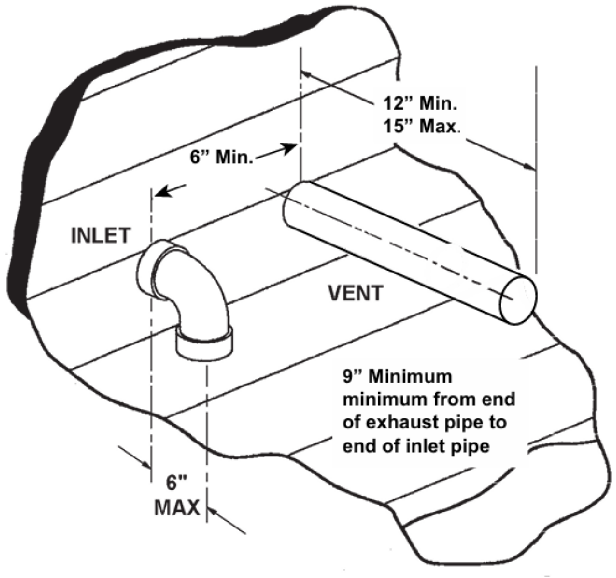


Figure 37. Configurations for two pipe venting systems — type 3

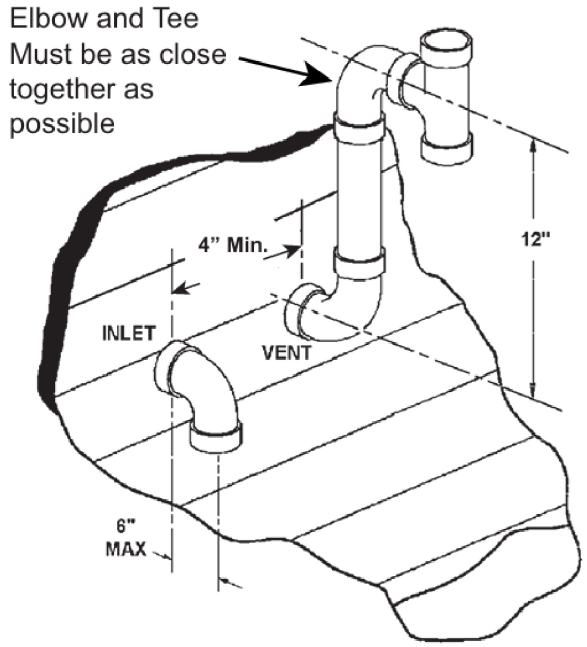


Figure 38. Configurations for two pipe venting systems — type 4

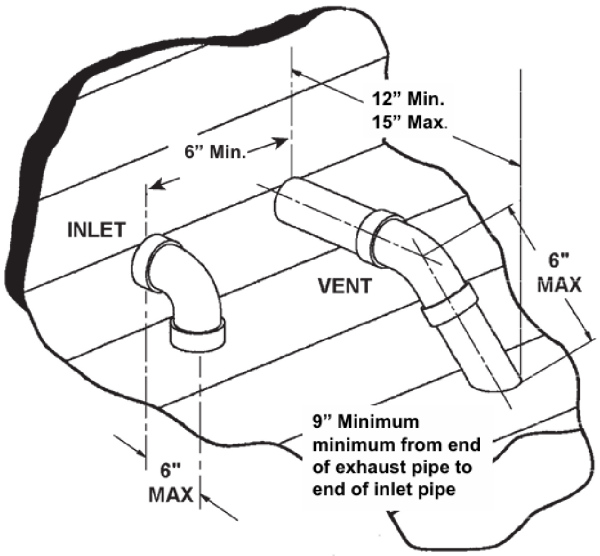


Figure 39. Configurations for two pipe venting systems — type 5

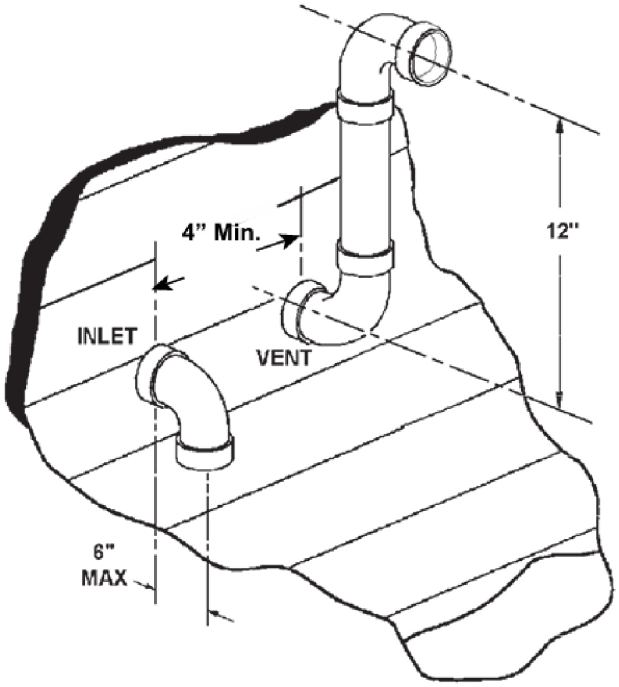
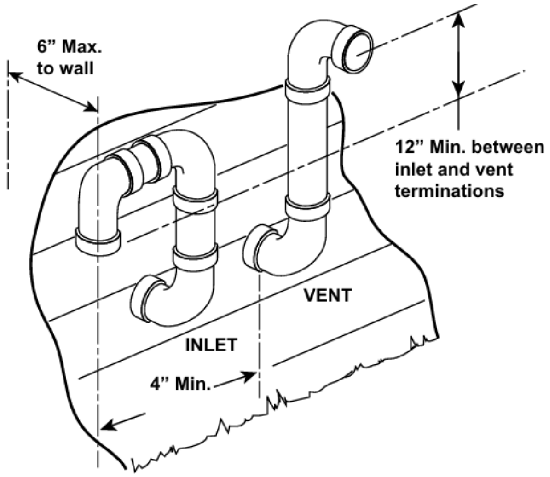


Figure 40. Configurations for two pipe venting systems — type 6



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 and inlet terminals kits must be located at least 12-inch 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-inch 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:

- Over public walkways
- Near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage
- 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 41. BAYVENT200B / BAYVENTCN200B

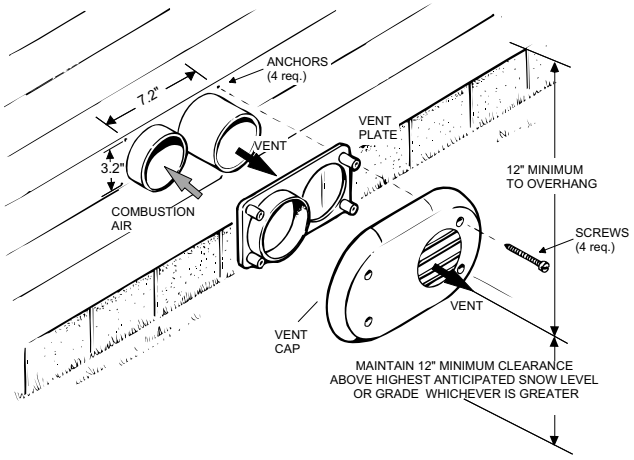
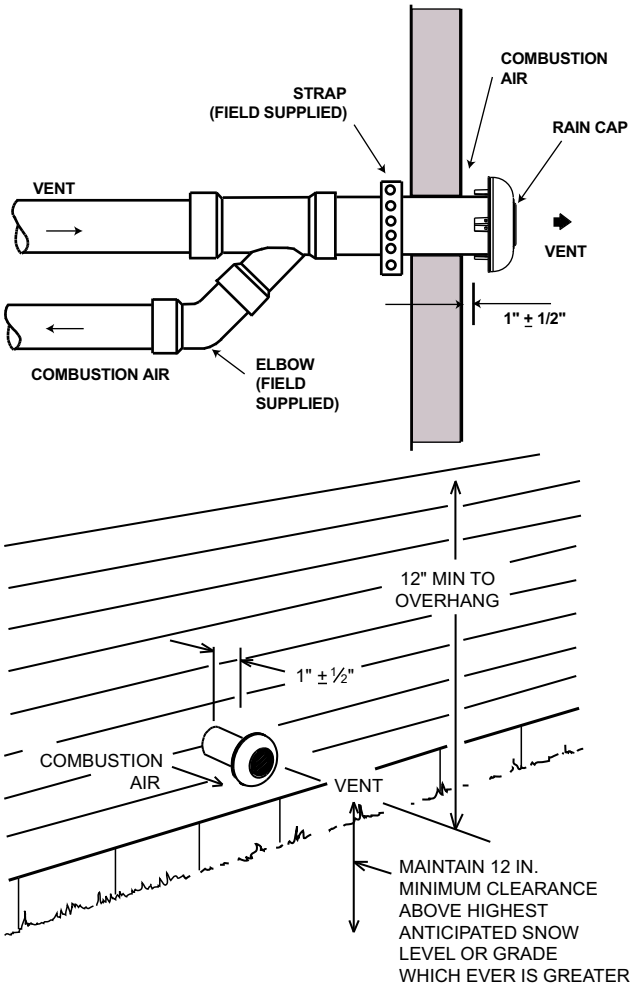


Figure 42. BAYAIR30AVENTA / BAYAIR30CNVENT (side wall)



Horizontal Vent Clearances

Figure 43. Horizontal vent clearances

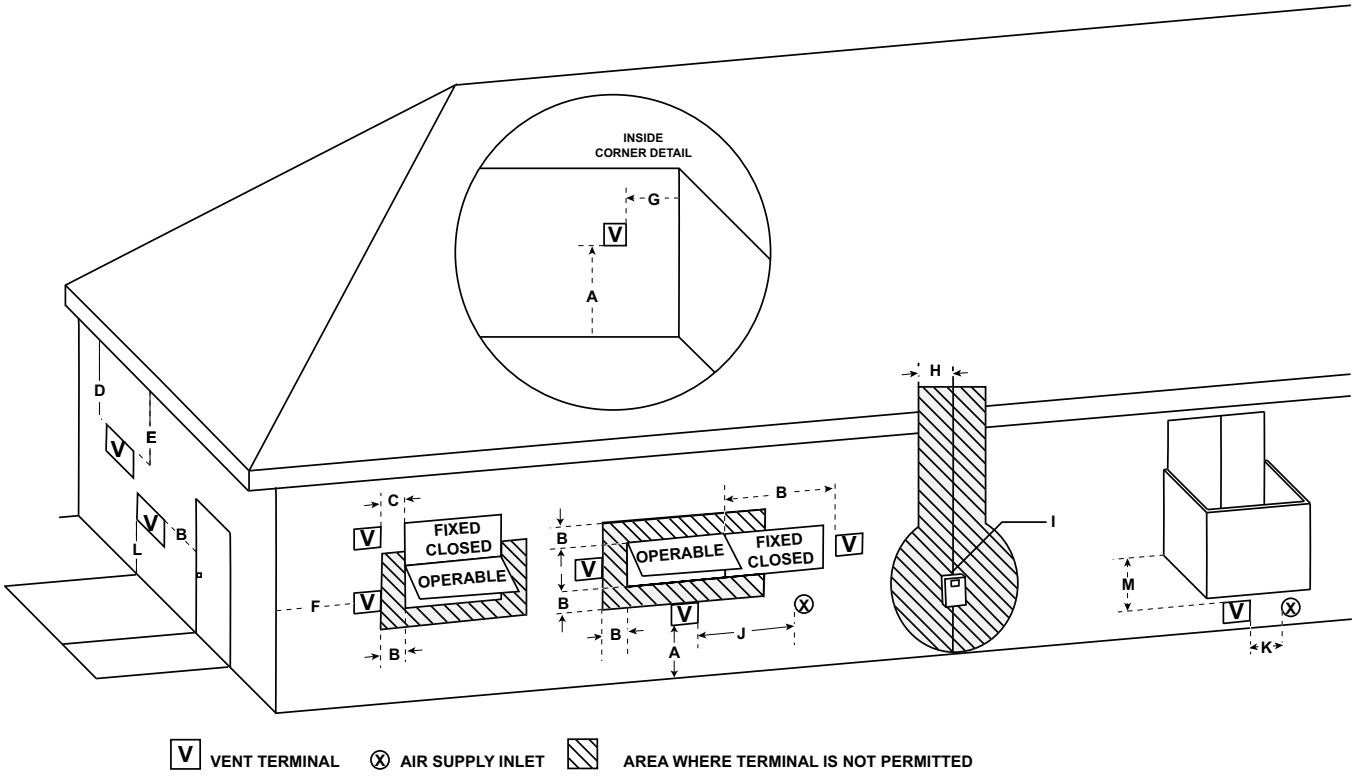


Table 27. Vent termination clearances - direct/non-direct

Vent Termination Clearances- Direct/Non-Direct				
		Canadian Installations	**US Installations Non-Direct**	**US Installations Direct**
A=	Clearance above grade, veranda, porch, deck, or balcony	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	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	(a)	(a)	(a)
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	(a)	(a)	(a)
E=	Clearance to unventilated soffit	(a)	(a)	(a)
F=	Clearance to outside corner	(a)	(a)	(a)
G=	Clearance to inside corner	(a)	(a)	(a)
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	(a)	(a)
I=	Clearance to service regulator vent outlet	3 feet (91 cm)	(a)	(a)

Table 27. Vent termination clearances - direct/non-direct (continued)

Vent Termination Clearances- Direct/Non-Direct				
		Canadian Installations	**US Installations Non-Direct**	**US Installations Direct**
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	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	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		
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.

(a) Clearance in accordance with local installation codes and the requirements of the gas supplier.

Venting Through the Roof

Support horizontal pipe every 3-feet 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.

Figure 44. Vent support example

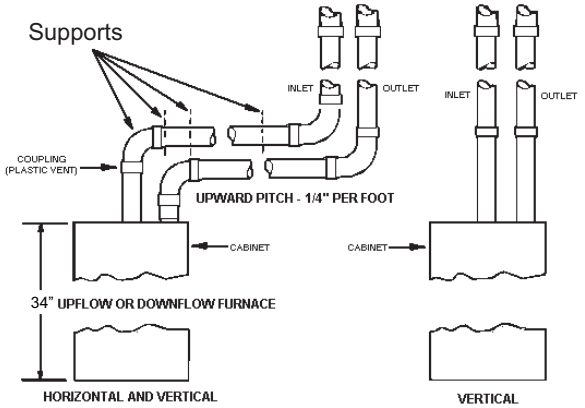
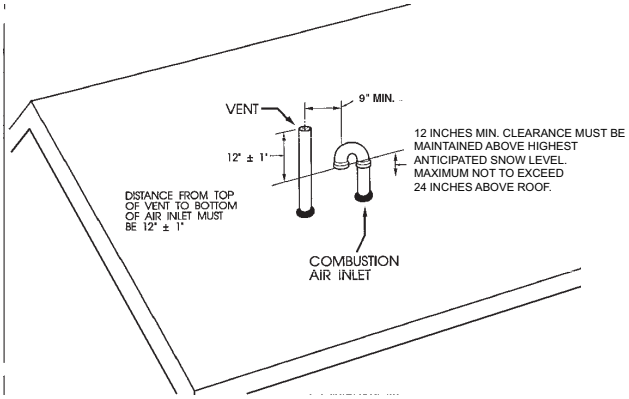


Figure 45. Venting through roof



Note: *All measurements are from center line to center line.*

Figure 46. BAYAIR30AVENTA / BAYAIR30CNVENT

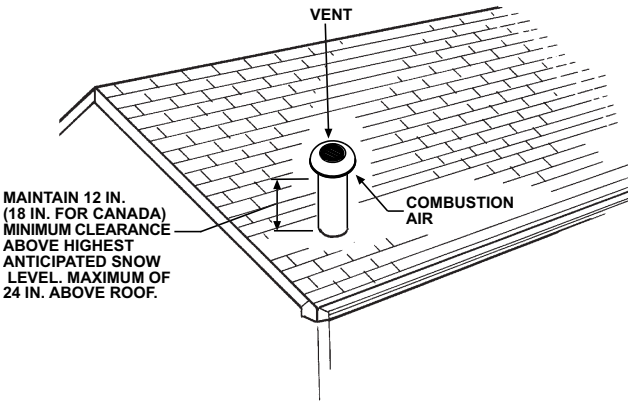
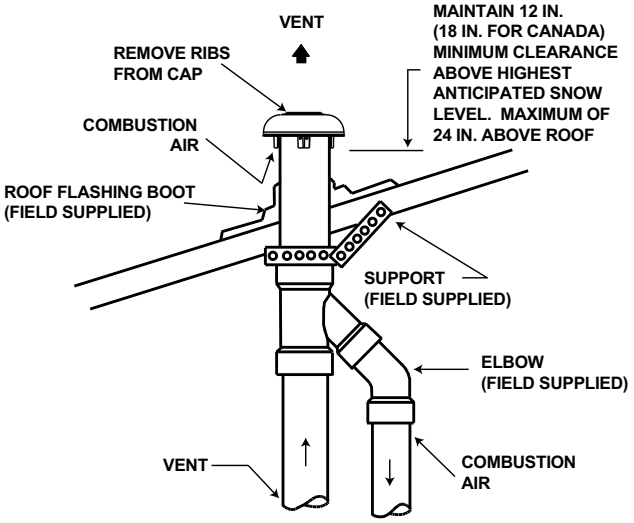


Figure 47. BAYAIR30AVENTA / BAYAIR30CNVENT



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)

Notes:

- *No vent cap is the preferred method for vertical vent termination in extremely cold climates.*
- *In extreme climate conditions, insulate the exposed pipe above the roof line with Armaflex type insulation.*

Figure 48. Venting through ceiling

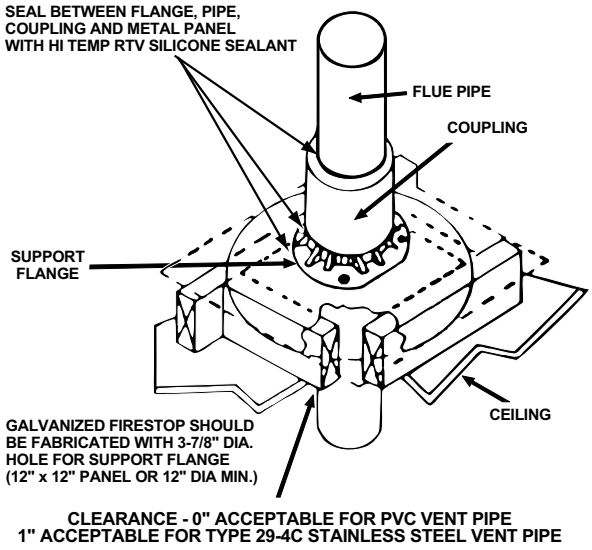
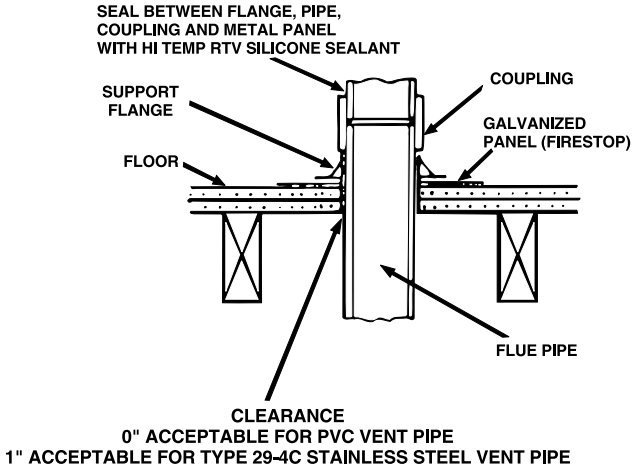


Figure 49. Venting through floor

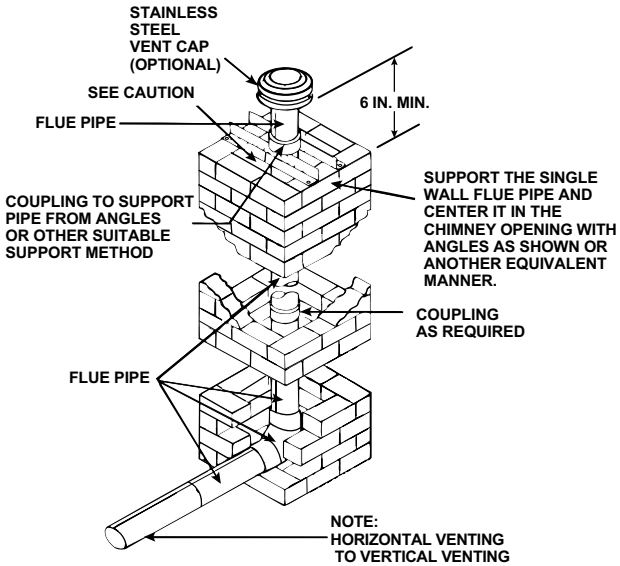


Venting Through an Unused Chimney / Venting Routed Through a Masonry Chimney

Important:

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

Figure 50. PVC plastic venting through unused chimney



Venting Through an UNUSED Chimney

Important:

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

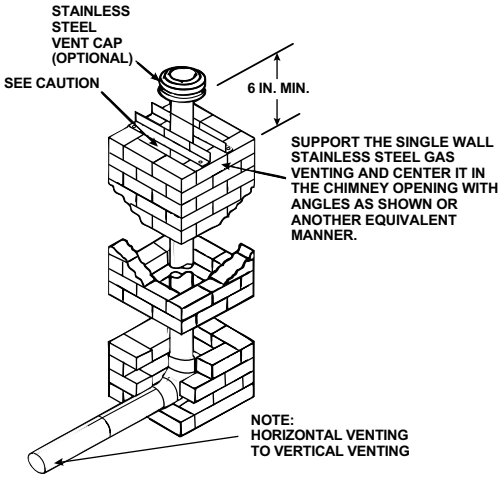
All stainless steel fitting must be installed with male end towards the Furnace.

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.

Figure 51. Type 29–4C stainless steel venting through unused chimney



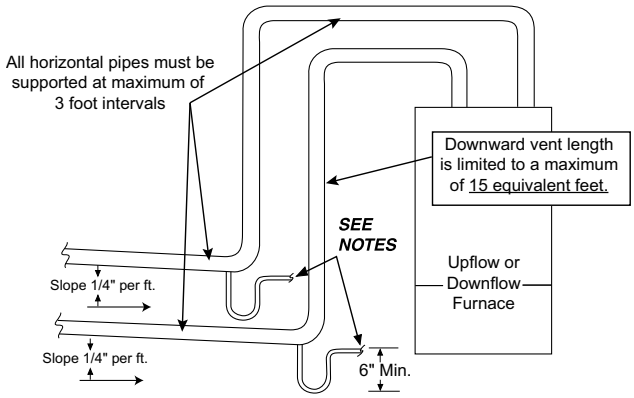
Downward Venting

Furnace may be in vertical or horizontal configuration.

Notes:

- *Condensate trap for vent pipe must be a minimum of 6 inches in height.*
- *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.*
- *The condensate trap should be primed at initial start up prior to heating season operation.*

Figure 52. Downward venting



Important: *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.

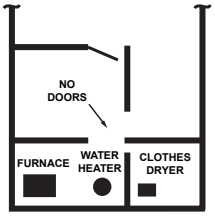
Unconfined space are installations with 50 cu. ft. or more per 1000 BTU/hr input from all equipment installed. Unconfined spaces are defined in the table and illustration for various furnace sizes. These spaces may have adequate air by infiltration to provide air for combustion, ventilation, and dilution 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.

Table 28. 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

Figure 53. Unconfined space

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 might 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 near chemical storage areas

Exposure to the following substances in the combustion air supply might 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.*

Table 29. 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	50

[a] 1 Square inch per 4000 BTU/hr Vertical Duct.
[b] 1 Square inch per 2000 BTU/hr Horizontal Duct.

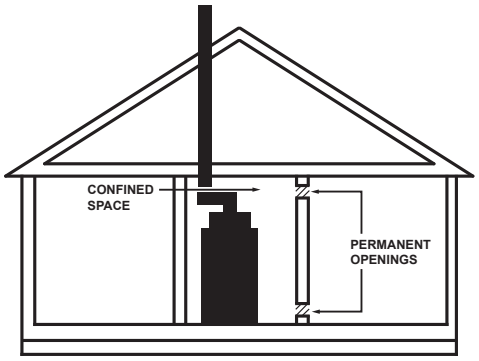
Figure 54. Confined space

LESS THAN 50 CU. FT. PER 1000 BTU/HR INPUT ALL EQUIP. INSTALLED



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.

Figure 55. Air from inside building



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.

Figure 56. Air from outdoors

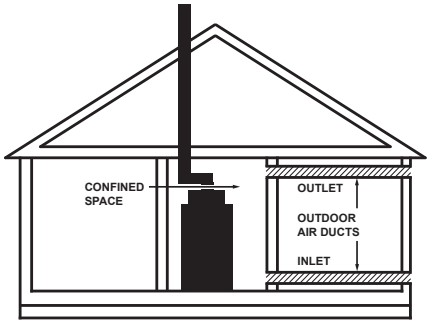


Figure 57. Air from ventilated attic/crawl space

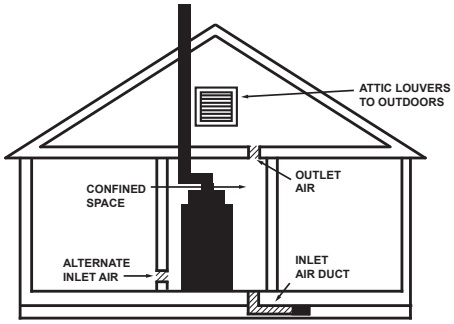
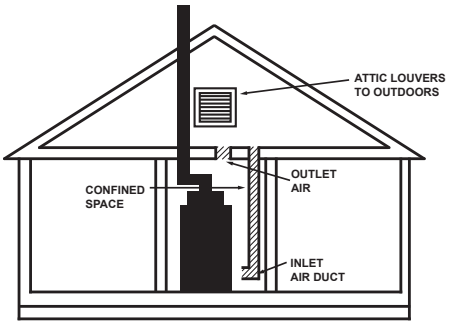


Figure 58. Air from ventilated attic



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. Verify electrical supply controls.

Central furnaces, when used in connection with cooling units, must be installed in parallel or on the upstream side of the cooling units to avoid condensation in the heating element, unless specifically approved for downstream installation. With a parallel flow arrangement, the dampers or other means used to control flow of air must 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 produces audible noise. Route the return air ducts under the floor or through the attic allowing installation of air return away from the living area.

When the furnace is installed for supply ducts to carry circulated air by the furnace to areas outside the space containing the furnace, the return air is 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 must 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. Seal removable cover to prevent air leaks.

Where there is no complete return duct system, the return connection must run full size from the furnace to a location outside the utility room, basement, attic, or crawl space.

Important: *Do not install return air through the back of the furnace cabinet and through the side of the furnace cabinet on horizontal applications without following the guidelines in ","*.

Carbon monoxide, fire or smoke can cause serious bodily injury, death, and/or property damage. Carbon monoxide can be found in places 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 and fire and smoke detectors per the manufacturer's installation instructions. 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.

Notes:

- *The manufacturer of your Furnace DOES NOT test any detectors and makes no representations regarding any brand or type of detector.*
- *Seal per local codes.*

Supply Duct Connections

⚠ CAUTION

Coil Requirement!

Failure to follow instructions below could result in minor to moderate injury or property damage.
For 4GXC* and 4MXC* coils 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 suitable for 400° F (205° C) or metal drain pan shield. Downflow furnaces do not require a metal drain pan shield or MAY*FERCOLKITAA kit.

Table 30. Supply duct connections

Furnace Orientation	Steps to be followed	Images for Reference
Upflow and Horizontal Furnace - without Coil	Step 1., Step 12., Step 4., Step 5.	Figure 59, p. 63,
Upflow Furnace with Coil	Step 1., Step 2., Step 10., Step 3., Step 4.	Figure 59, p. 63, , Figure 62, p. 63
Furnace in Horizontal Left with Coil	Step 1., Step 6., Step 10., Step 3., Step 4.	Figure 59, p. 63, , Figure 63, p. 64
Furnace in Horizontal Right with "A" Coil	Step 6., Step 7., Step 8., Step 9., Step 10., Step 4.	Figure 59, p. 63, , Figure 64, p. 64
Downflow Furnace with Coil	Step 7., Step 8., Step 9., Step 11., Step 4.	Figure 59, p. 63, , Figure 65, p. 64
Downflow Furnace without Coil with or without BAYBASE	Step 1., Step 12., Step 4., Step 5.,	Figure 59, p. 63,

Figure 59. Initial position

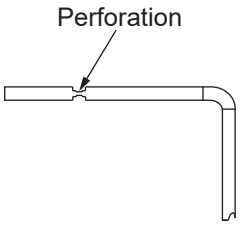


Figure 60. Flange orientation for upflow and horizontal left

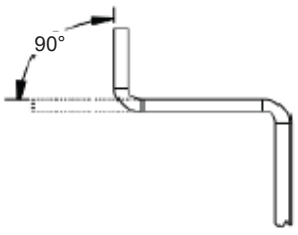


Figure 61. Flange orientation for downflow and horizontal right

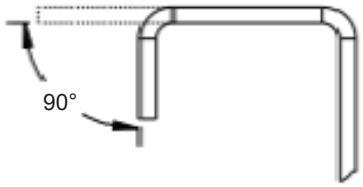


Figure 62. Upflow furnace with coil

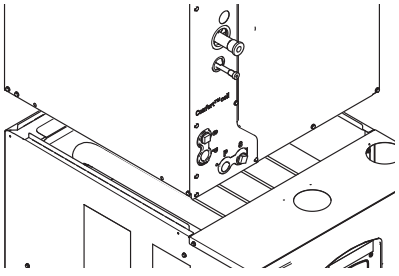


Figure 63. Horizontal left with or without coil

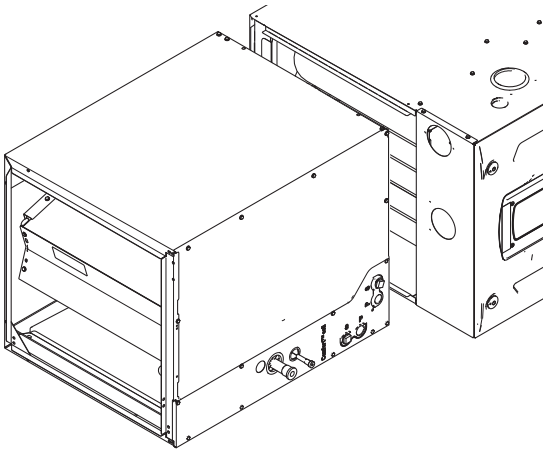


Figure 64. Horizontal right furnace with or without coil

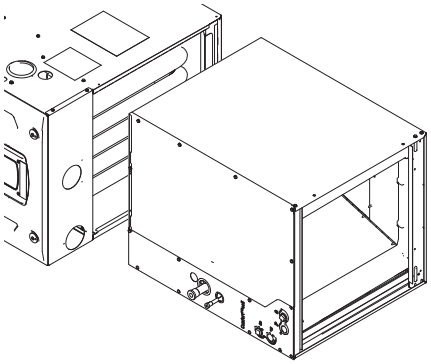
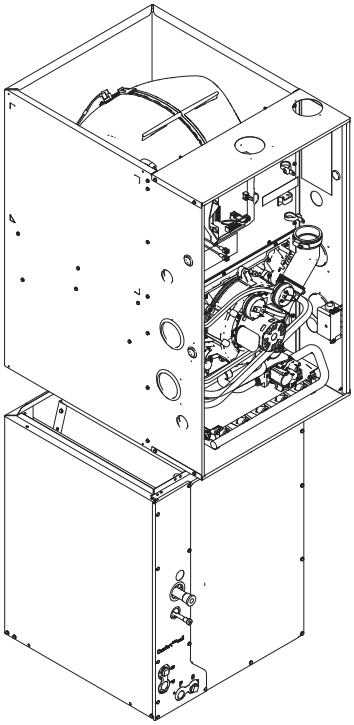


Figure 65. Downflow furnace with coil



Installation Steps

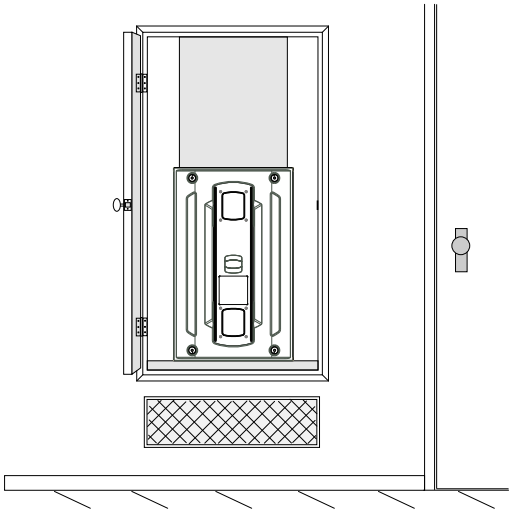
1. Bend furnace flanges up.
2. Set the coil on top of the furnace.
3. Screw through the coil cabinet into the furnace flange. Guide holes are located on the coil.
4. Seal per local codes and requirements.
5. Insulate the first 6 to 12 inches of the supply duct.
6. Support the furnace and coil independently.
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

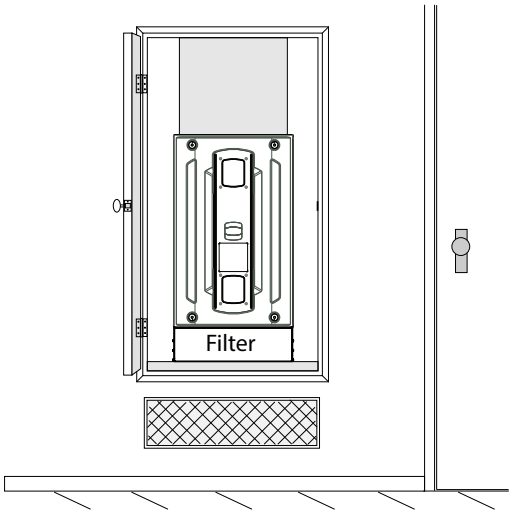
- Back returns are not allowed on any S-Series furnaces.
- Side returns are not allowed on downflow or horizontal S-Series furnaces..
- Mounting flanges must be located on ducting.
- Shoot screws through the mount flanges into the furnace cabinet.
- Always seal per local codes and requirements.
- Furnace, 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.

Figure 66. Upflow furnace with bottom return in closet with remote filter



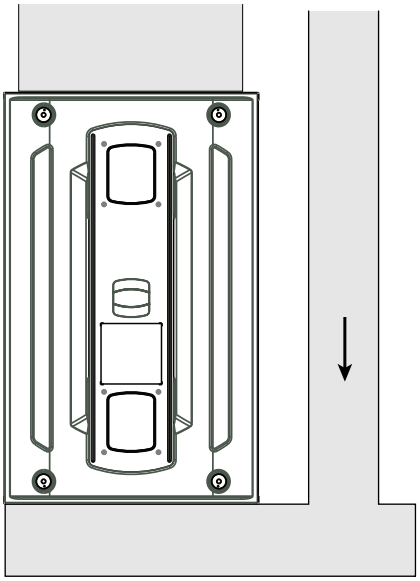
See Step 1., Step 2., Step 3., Step 4.

Figure 67. Upflow furnace with bottom return in closet with filter box



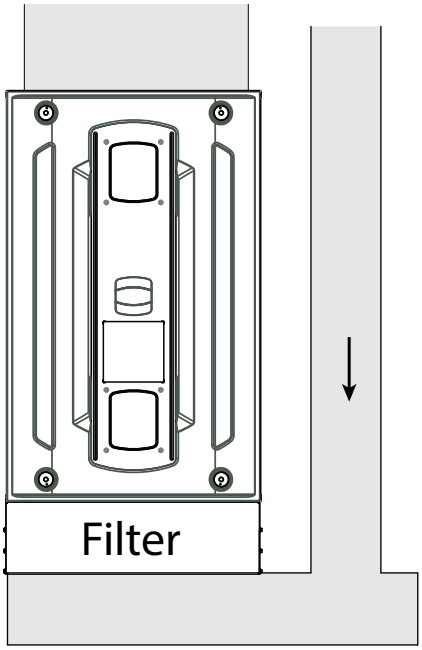
See Step 1., Step 5., Step 6., Step 4.

Figure 68. Upflow furnace with bottom return mounted on a ducted pedestal



See Step 1., Step 7., Step 8., Step 4.

Figure 69. Upflow furnace with bottom return mounted on a ducted pedestal with filter box

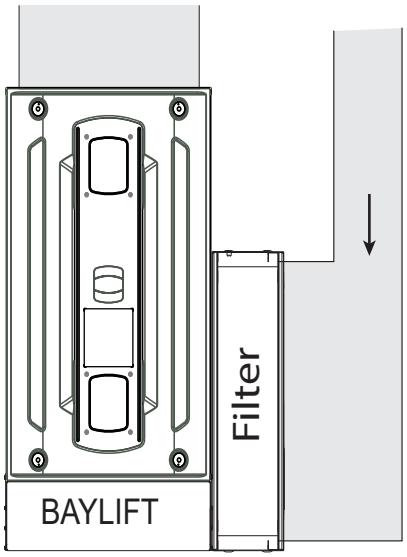


See Step 1., Step 9., Step 4.

Notes:

- *Use optional BAYLIFT kit to lift furnace. Follow kit instructions.*
- *The furnace bottom pedestal must be a minimum of 6-inch in height.*

Figure 70. Upflow furnace with bottom and side returns mounted on a ducted pedestal with side return and filter box



See Step 1., Step 10., Step 11., Step 12., Step 13., Step 14., Step 15., Step 4.

Figure 71. 17.5–inch filter cabinet with BAYLIFT kit

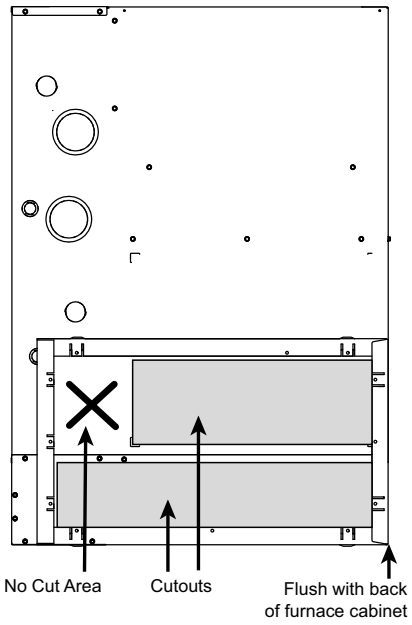
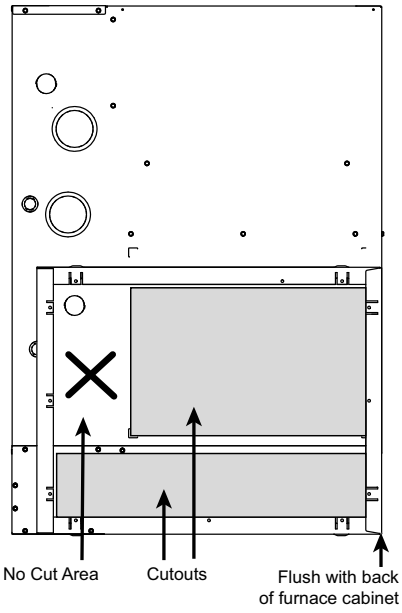


Figure 72. 21–inch filter cabinet with BAYLIFT kit



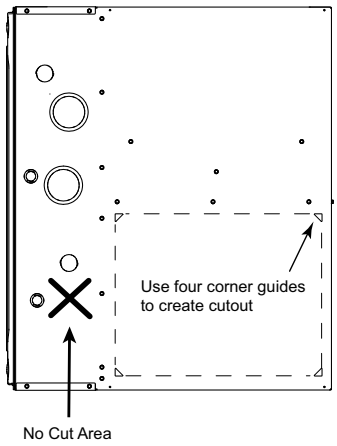
Important:

- *Confirm 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.*
- *Do not cut the cabinet in the "No Cut" area.*

Notes:

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

Figure 73. Upflow furnace with side return



See Step 16., Step 17., Step 18., Step 19.

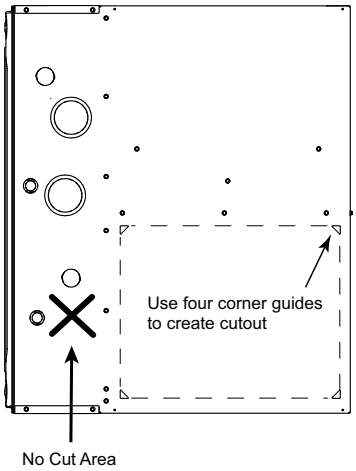
Important:

- *One of the sides must have a transition to allow the condensate and thermostat wiring to exit the cabinet.*
- *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.*
- *Do not cut the cabinet in the "No Cut" area.*

Notes:

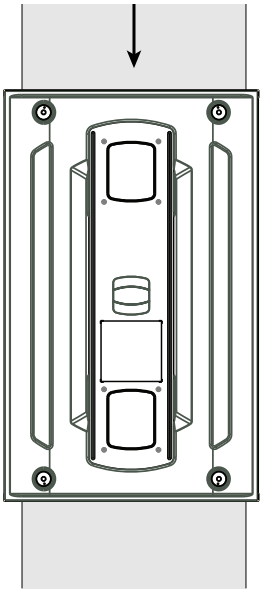
- *If using one transition, the condensate and thermostat wiring will exit on the transition side.*
- *If using a filter boxes, use transitions, if possible, to attach the filter boxes to the furnace cabinet. If transitions are not used, condensate may exit through the bottom of the furnace.*

Figure 74. Upflow furnace with two side returns



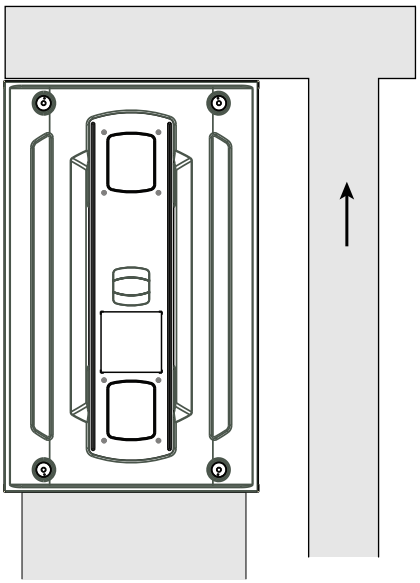
See Step 16., Step 17., Step 18., Step 19.

Figure 75. Downflow furnace with top return



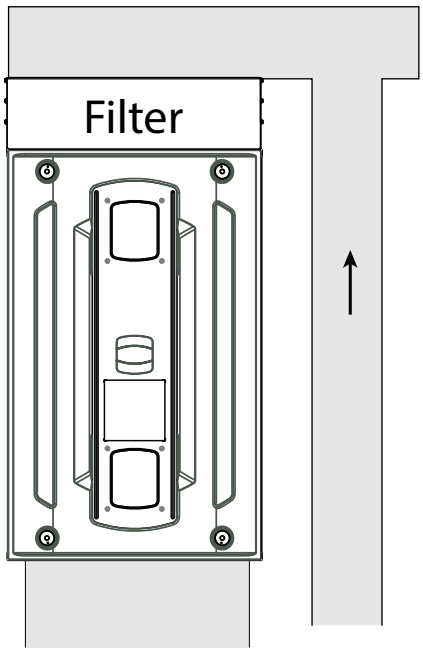
See Step 20., Step 21., Step 3., Step 4.

Figure 76. Downflow furnace with top return and plenum



See Step 20., Step 22., Step 3., Step 4.

Figure 77. Downflow furnace with top return and plenum with filter box



See Step 20., Step 23., Step 24., Step 4.

Installation Steps

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 31. Upflow return air filters

Furnace Width (in.)	Filter Qty and Size(in.)
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.

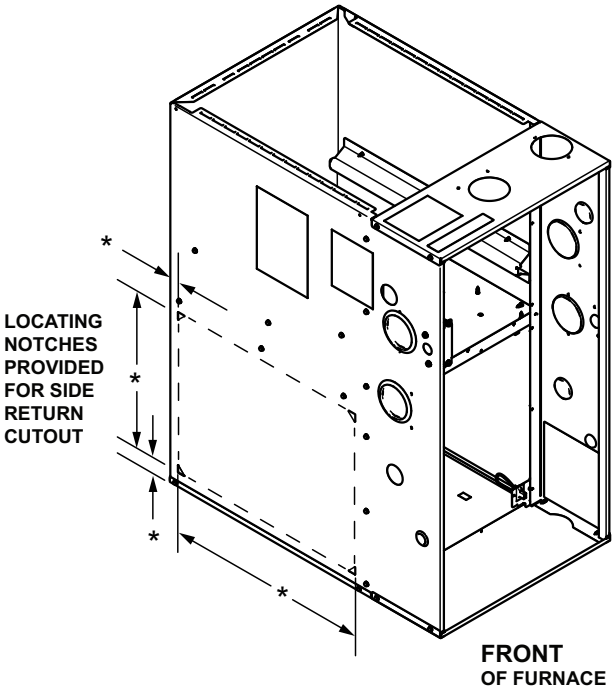
Preparation for Upflow Bottom and Side Return Air Filter Installations

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.

Figure 78. Upflow furnaces only



Note: *See outline drawing.*

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, see Figure 79, p. 69 or the filters may be installed in the duct work upstream of the furnace, refer to Figure 80, p. 69.

Filter kits are available for horizontal applications.

Note: *Direct coupled side returns are not allowed to the furnace cabinet.*

Figure 79. Remote filter installation

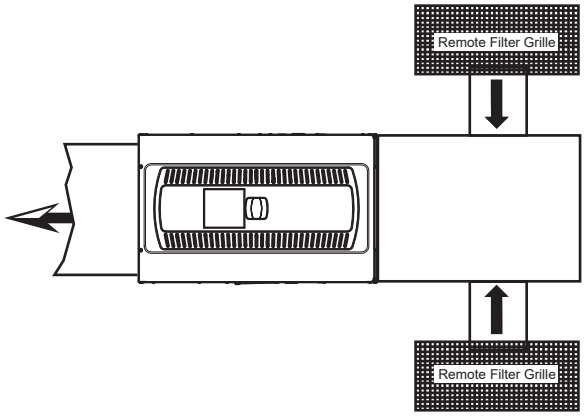
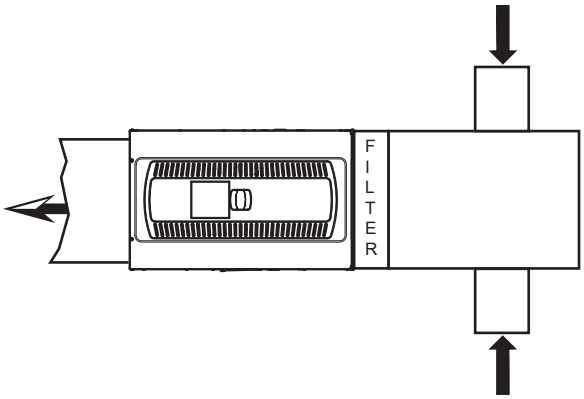


Figure 80. Duct filter installation



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 32. Downflow return air filters

Furnace Width (in.)	Filter Qty and Size (in.)
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

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.

See the "Wiring Diagrams," p. 19 and unit wiring diagram attached to furnace.

Field Wiring

Figure 81. Link communicating low voltage hook-up diagrams

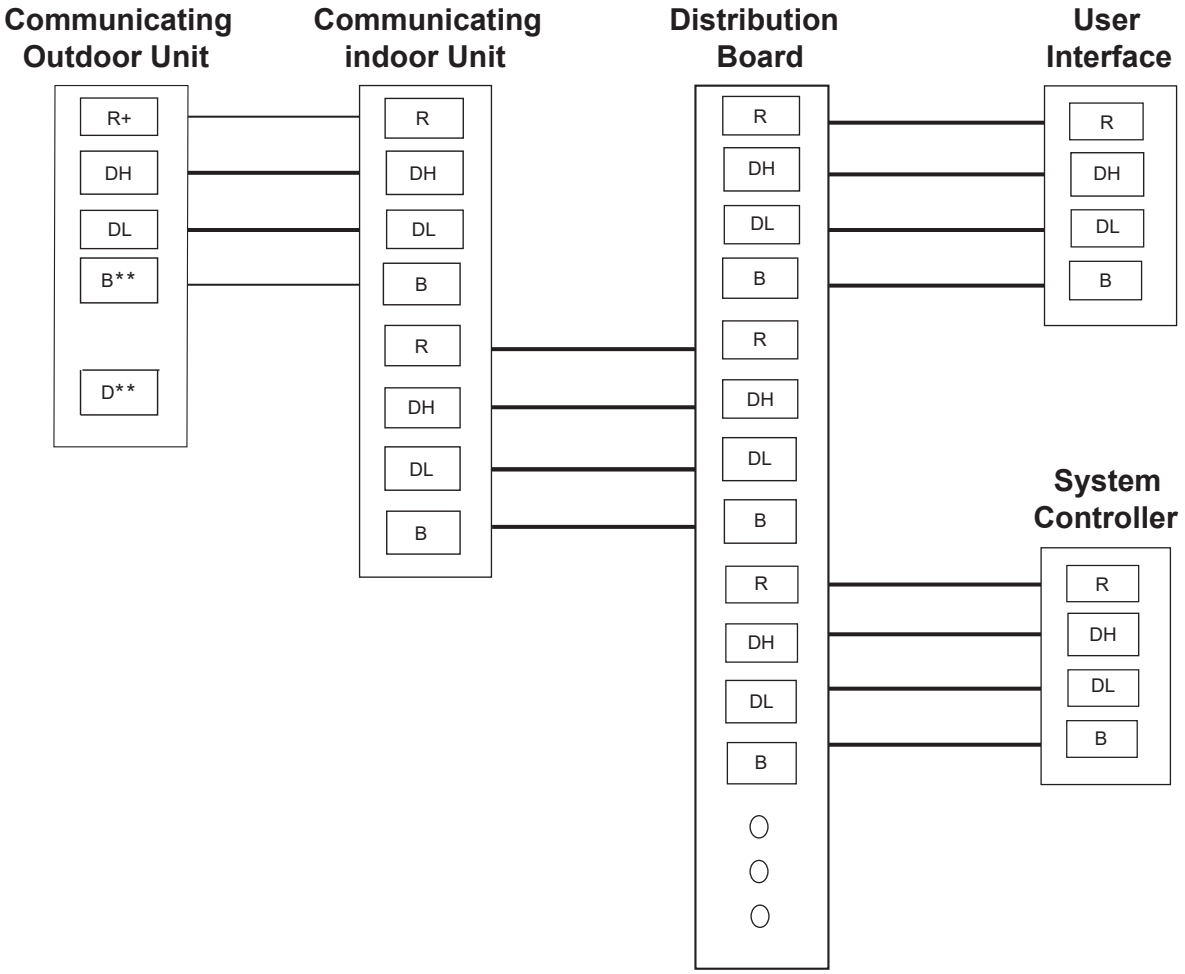


Table 33. Wire colors

Wire Colors	
R	Red
DH	White
DL	Green
B	Blue

Notes:

- ** — Accessory terminals are dry contact outputs only.*
- *+ — R connection to the outdoor unit is required only in applications utilizing an outdoor load shed device or when using a 24Vac charging solenid during automatic weigh-in charging.*
- *** — B connection to the outdoor unit is optional for 2 wire outdoor applications, but is recommended in other applications.*
- ****— DATA (Brown) wire only used in Clii mode.*
- *Wire colors are for illustration purposes only. If using a different color, ensure it lands at the correct terminal throughout all of the communicating control wiring.*
- *Drawing is for reference only. Wiring can be done in many different ways.*

External Switches and Accessories

When connecting a humidifier or electronic air cleaner to the furnace use ACC1 or ACC2. Configuration is required.

- Accessory 1 and 2 are dry contacts need source voltage from the accessory.
- External switches 1 and 2 have 24 Vac source voltage and are to be connected to Normally Closed (NC) contact on the device, i.e smoke detector.

Notes:

- *In link communicating mode, accessories and external switches can be configured in the UX360 smart thermostat or technician app.*
- *In 24V mode, accessories and external switches can be configured in the technician app.*
- *Do not use the condensate cooling option in 24V mode of operation. See Figure 84, p. 72 and Figure 85, p. 72.*

Figure 82. Accessories terminal

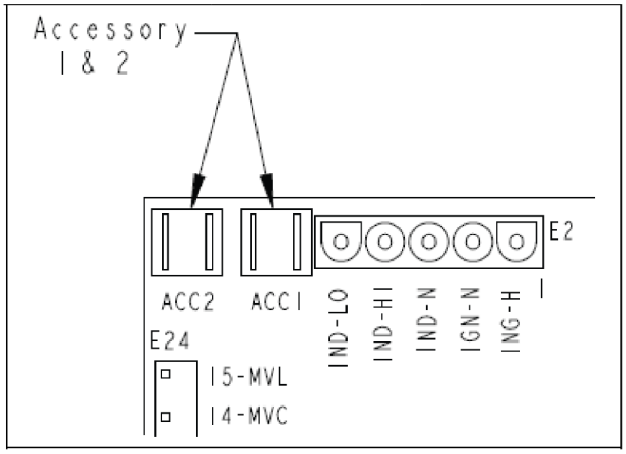


Figure 83. External switch pin-outs

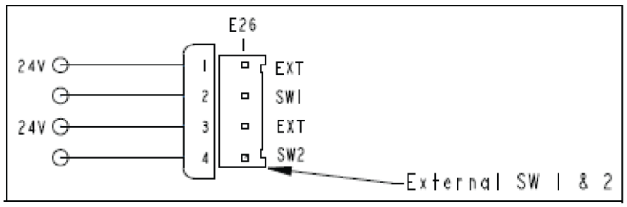
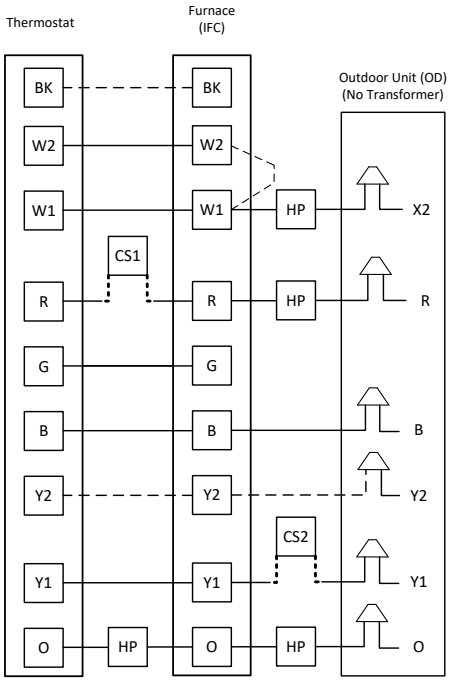


Figure 84. Field wiring diagram (24V) with one or two stage AC or heat pump



Notes:
1) HP = Wiring used for Heat Pump System.
2) CS = wiring used for Condensate Switch (2 Options).
3) Y1 and/or Y2 must be connected from the thermostat to the IFC for proper airflow.
4) Remove Y1-O jumper for HP systems. O terminal must be connected as shown for gas heating operation during defrost.
5) If the thermostat does not have a W2, or there are not enough conductors, jumper W1 to W2 at the IFC.
6) A/TCONT824 thermostats do not require the use of X2.
7) For PWM (BK) enabled thermostats, the BK setting must be enabled in the Technician app or IFC menu/options and connect wiring.

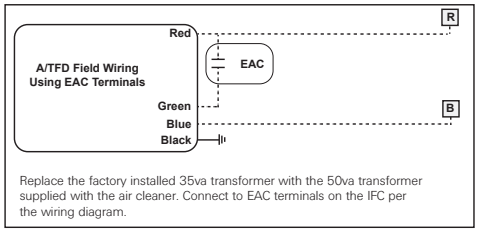
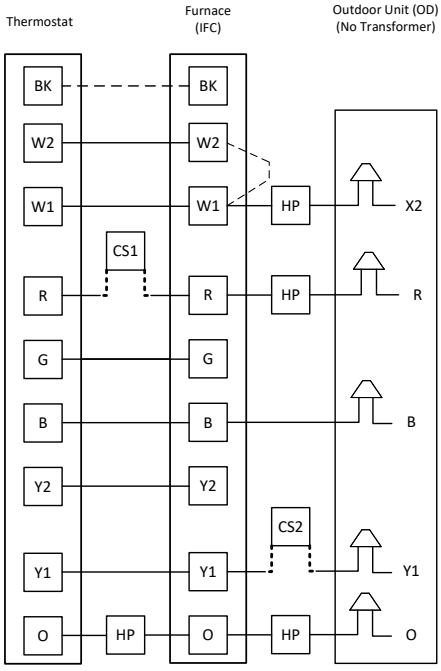
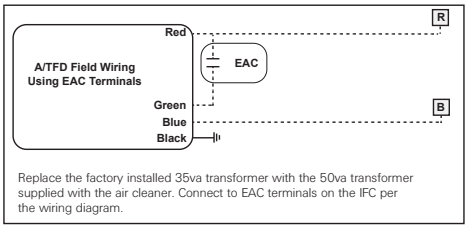


Figure 85. Field wiring diagram (24V) with single stage AC or heat pump with 2 stage airflow



Notes:
1) HP = Wiring used for Heat Pump System.
2) CS = wiring used for Condensate Switch (2 Options).
3) Y1 and Y2 must be connected from the thermostat to the IFC for proper airflow.
4) Thermostat must be setup for 2 stage OD.
5) IFC Must be setup for 2 stage OD using the Menu/Option Buttons.
6) Remove Y1-O jumper for HP systems. O terminal must be connected as shown for gas heating operation during defrost.
7) If the thermostat does not have a W2, or there are not enough conductors, jumper W1 to W2 at the IFC.
8) A/TCONT824 thermostats do not require the use of X2.
9) For PWM (BK) enabled thermostats, BK setting must be enabled in the Technician app or IFC menu/options and connect wiring.



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.

Notes:

- *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-inch 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-inch coupling is supplied to connect to systems that are using 3/4-inch piping with an air conditioner coil.*
- *A corrosion resistant condensate pump must be used if a pump is required for a specific drain system.*

⚠ CAUTION

Water Damage!

Failure to follow instructions below could result in minor to moderate injury or equipment damage
Install a drain pan under the furnace to prevent leaking condensate.

Figure 86. Condensate management



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

Upflow furnace – Remove the plug from the side panel where the condensate will exit. Install the condensate grommet in to 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.*

Figure 87. Upflow furnace with left side drain

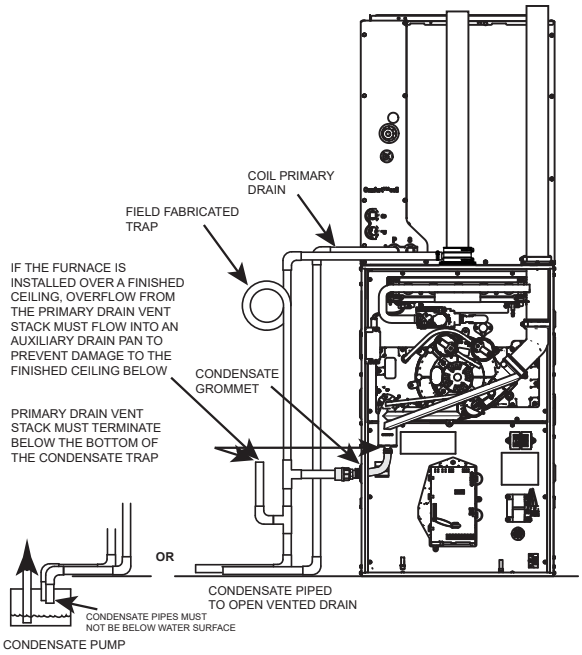
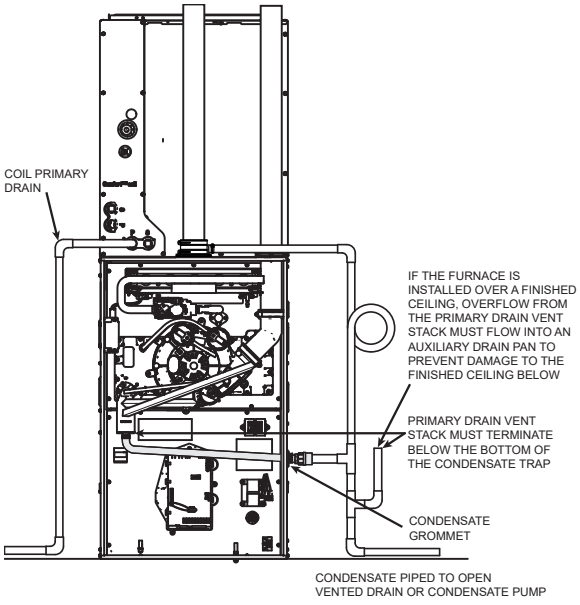
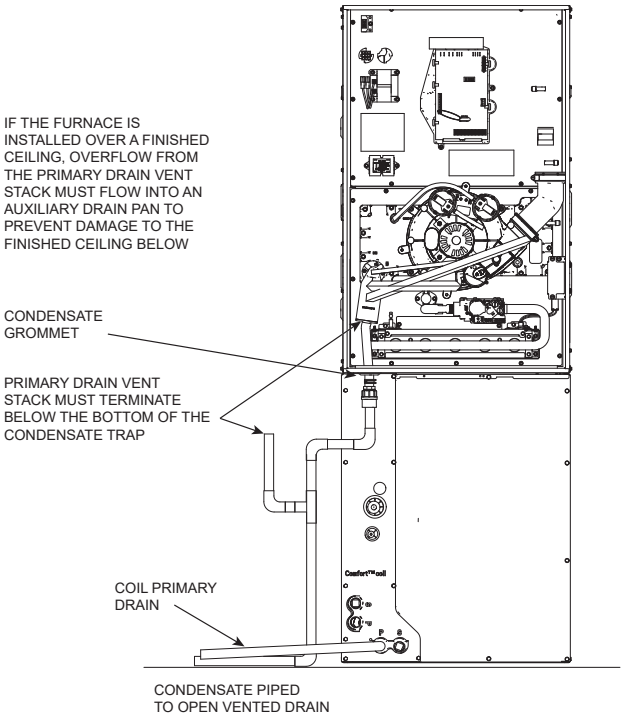


Figure 88. Upflow furnace with right side drain



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.

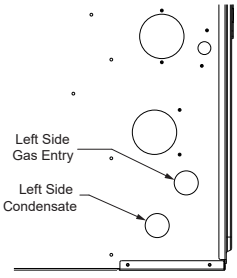
Figure 89. Downflow furnaces with bottom drain



Downflow furnace with left side condensate

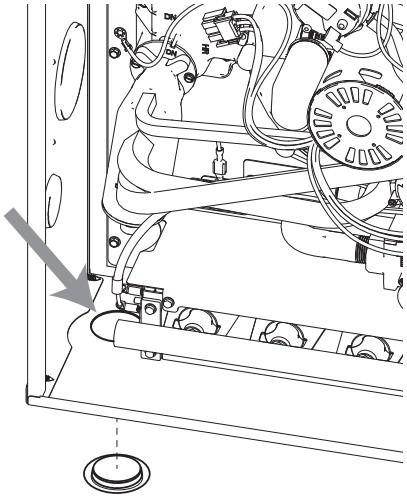
1. Remove left hand condensate plug.
2. Install into bottom cross member.

Figure 90. Downflow furnace with left side condensate



3. Plug the bottom hole with plug provided in document pack.
4. Follow the same step for right side condensate.

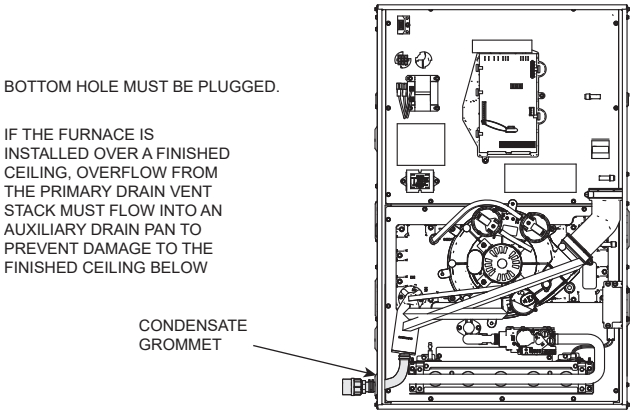
Figure 91. Downflow furnace with right side condensate — plug installation



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-inch 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.

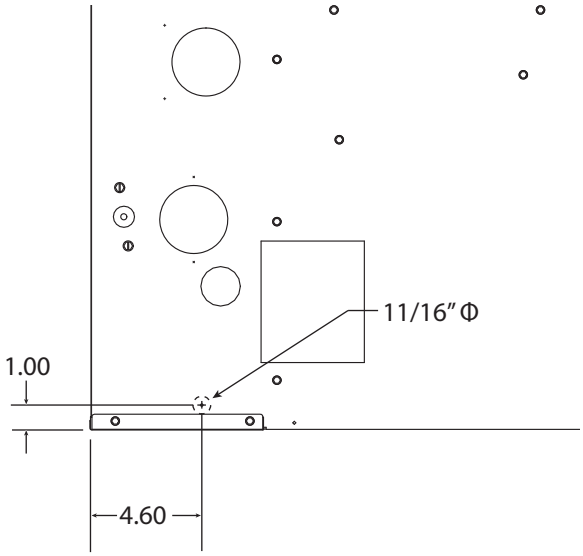
Figure 92. Downflow furnaces with left side drain



Downflow furnace with right side condensate

Drill an 11/16-inch diameter hole in the right side of the case (see dimensions). Plug the bottom hole with plug provided in the bottom pack. See Figure 91, p. 75.

Figure 93. Downflow furnace with right side condensate



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-inch CPVC pipe though the 11/16-inch 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.*

Figure 94. Downflow furnaces with right side drain

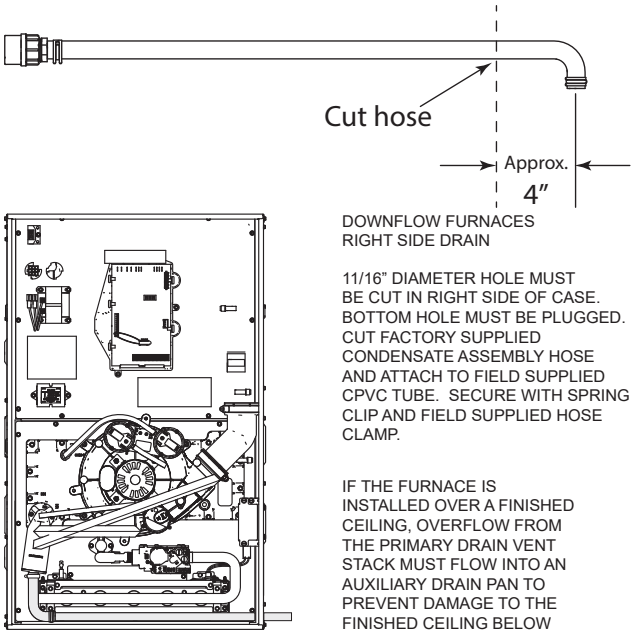
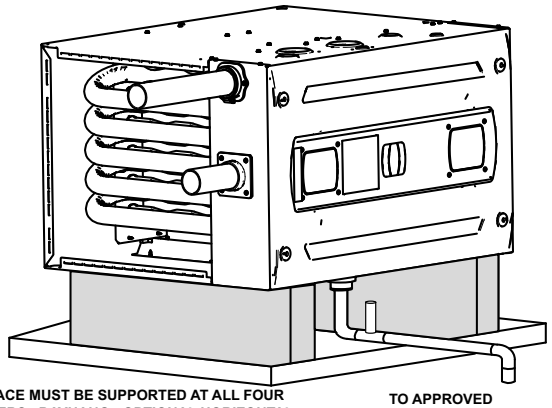


Figure 95. Horizontal applications



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 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.

Notes:

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

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

- The overflow stand pipe termination must be even with or slightly below than the bottom of the condensate trap.
- Water from the overflow pipe must drain into the emergency drain pan.
- It is recommended to use the secondary drain. The secondary drain pipe must terminate over the emergency drain pan.
- Emergency drain pan.

NOTICE

Equipment Damage!

Failure to follow instructions below could result in intermittent or improper operation, or equipment damage.

A blocked main drain with an overflow standpipe that is higher than the bottom of the condensate trap and/ or a condensate pressure switch hose that is not trimmed to fit can result in an E9.2 Condensate Pressure Switch Trip error or in extreme cases, an E4.2 Rollout Thermal Limit Trip error.

An overflow standpipe with an opening even with or slightly below the bottom of the condensate trap must be installed. The condensate pressure switch hose must be trimmed to fit.

Figure 96. Horizontal right

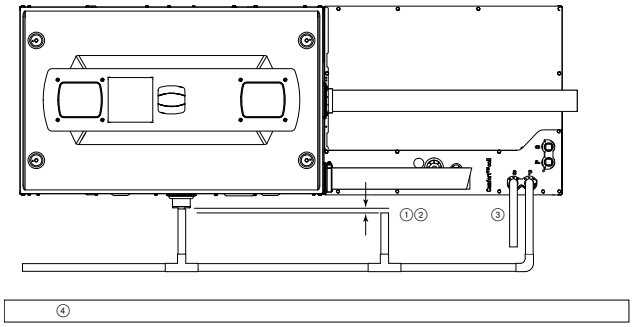
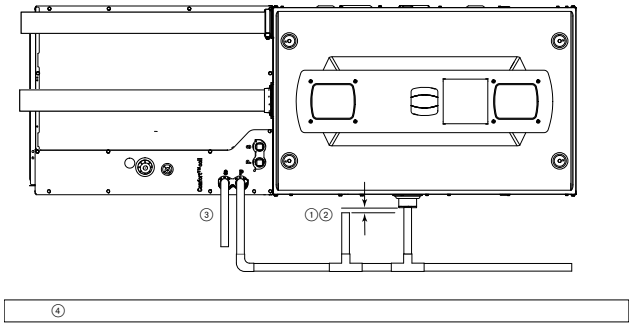


Figure 97. Horizontal left



General Start-Up and Adjustment

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

Preliminary Inspections

With gas and electrical power OFF, confirm:

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

Slide the control switch on main gas valve within the unit to OFF. 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. Slide the control switch on the gas valve in the unit to ON.

Propane gas being heavier than air may require forced ventilation. Slide the control switch on the gas valve in the unit to ON.

Lighting Instructions

Lighting instructions appear on each unit. Each installation must be checked out at the time of initial start up to confirm 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 and 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

Risk of Fire or Explosion!

Failure to follow instruction below could result in death or serious injury or property damage.
Do NOT attempt to manually light the furnace.

For complete shutdown, slide the control switch located on the main gas valve inside the unit to OFF and the external main gas shutoff valve to OFF. Disconnect the electrical supply to the unit.

Inspect temperature in a vacant house especially during freezing weather. If for any reason your furnace should fail to operate damage could result, such as frozen water pipes.

⚠ CAUTION

Freeze Damage!

Failure to follow instructions below could result in minor to moderate injury or property damage.
Insulate vent pipes with 1/2 inch (12.7 mm) Armaflex-type insulation or equivalent when passing through unheated spaces exposed to freezing temperatures. Insulation is not needed if the space is heated enough to prevent freezing. If domestic water pipes are not protected from freezing, the space is considered heated. Schedule qualified personnel to inspect the temperature if the house is vacant during freezing weather. A furnace failure could lead to frozen water pipes.

Furnace Combustion Air Exhaust Options

Important:

- *All plugs must be in place for sealed combustion.*
- *If the locations are changed from the defaults, the default holes not being used must be plugged.*
- *The combustion air exhaust must be vented to the outdoors.*

Notes:

- *For electric and natural gas connections, default is left side . For the combustion air inlet and exhaust, default is top of the furnace.*
- *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.*
- *The grommets are different for the natural gas and condensate connections.*
- *The combustion air inlet does not have to be on the same side as the combustion air exhaust.*
- *Right side combustion air entry is allowed in upflow applications.*

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

Note: *Choose any combination such that it must have one inlet and one outlet.*

Figure 98. Upflow application

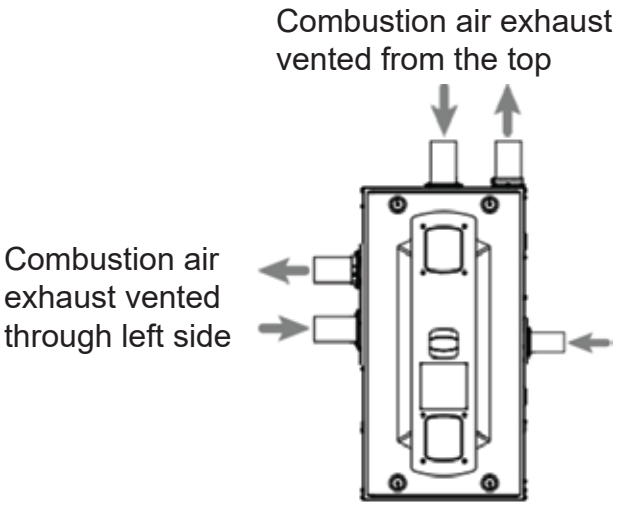


Figure 99. Horizontal left application

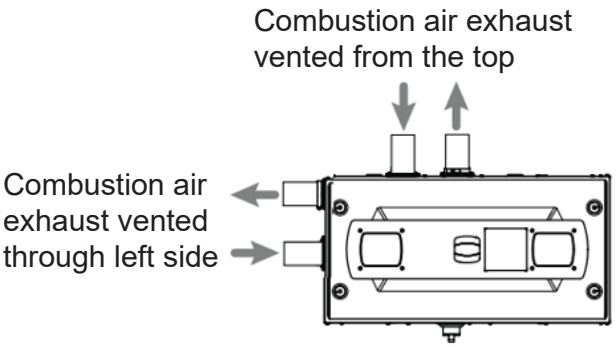


Figure 100. Horizontal right application

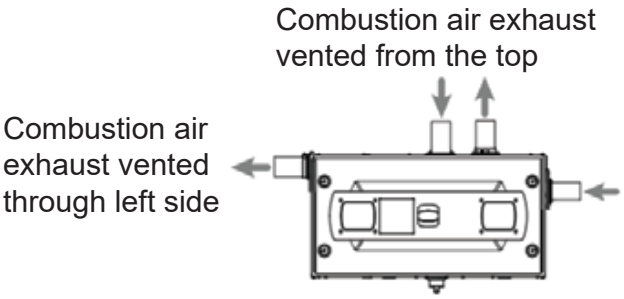
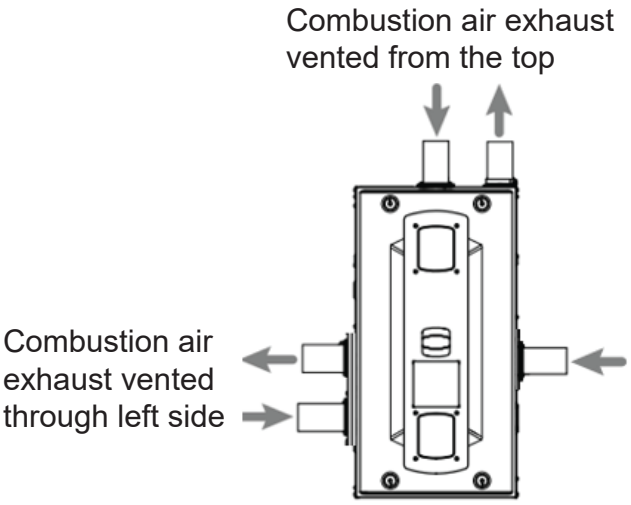


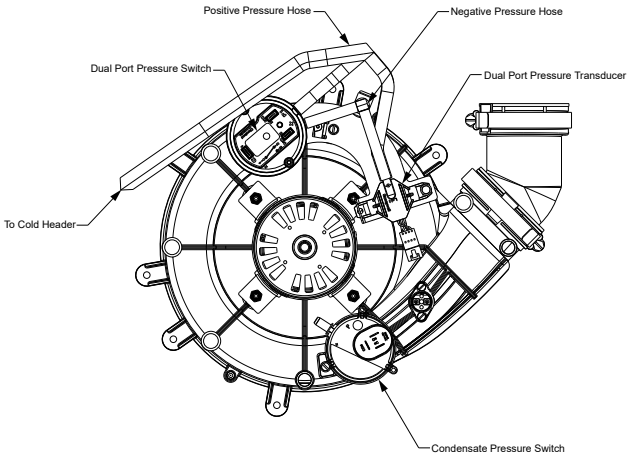
Figure 101. Downflow application



Inducer Rotation

Important: *If the inducer assembly must be removed, disconnect only the tubing connected to the cold header. Do not alter any pressure switch or transducer tubing.*

Figure 102. Inducer rotation



Pressure Sensing Tubing and Condensate Trap Connections

Figure 103. Upflow — pressure sensing tubing and condensate trap connections

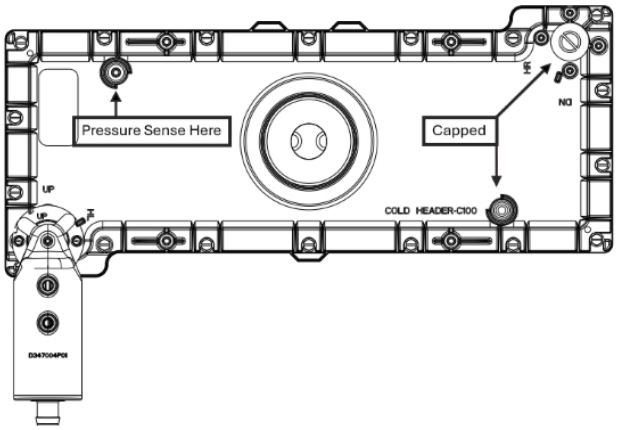


Figure 104. Horizontal left — pressure sensing tubing and condensate trap connections

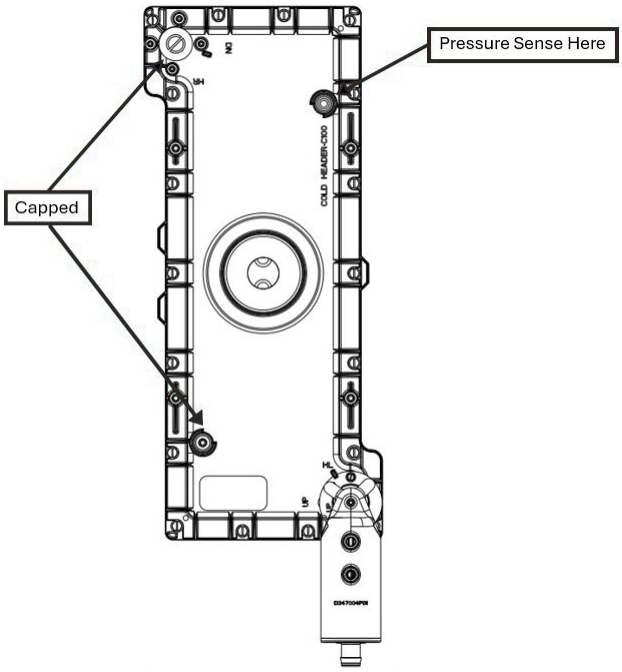


Figure 105. Horizontal right — pressure sensing tubing and condensate trap connections

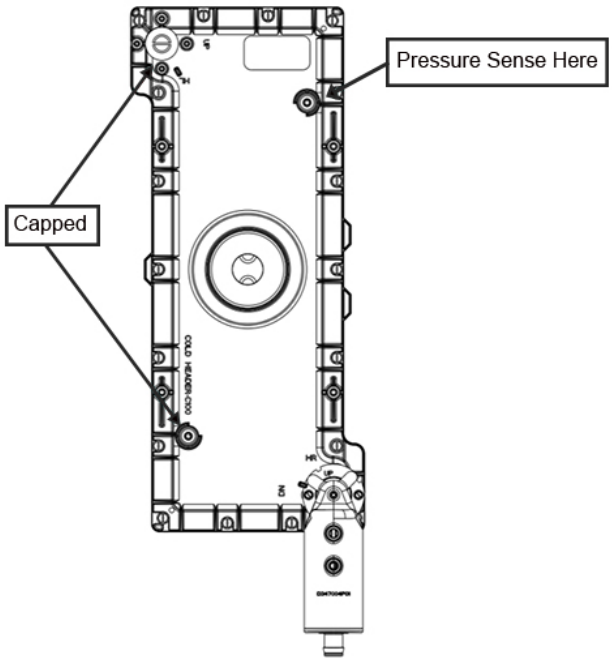
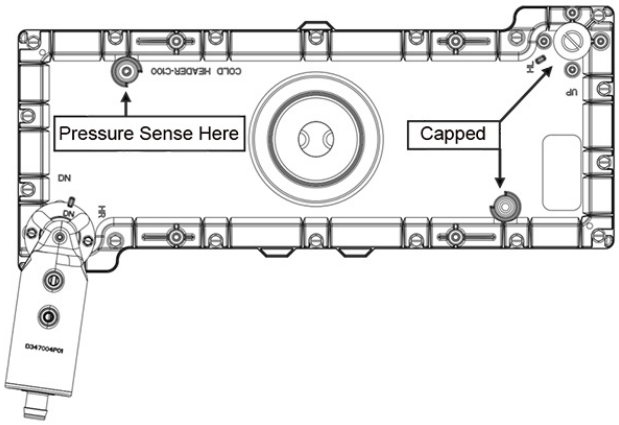


Figure 106. Downflow — pressure sensing tubing and condensate trap connections



Factory Set Up - Upflow and Downflow Orientation

Figure 107. Upflow, horizontal left, and horizontal right orientations

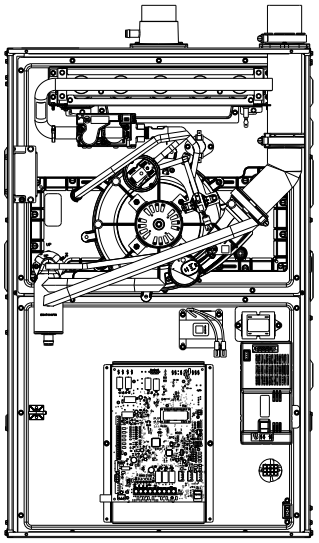


Figure 108. Downflow orientation

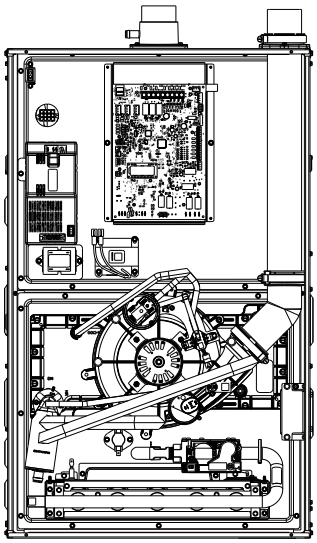
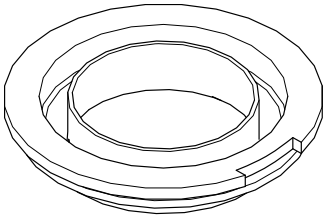


Figure 109. Grommet trap for horizontal left and right application



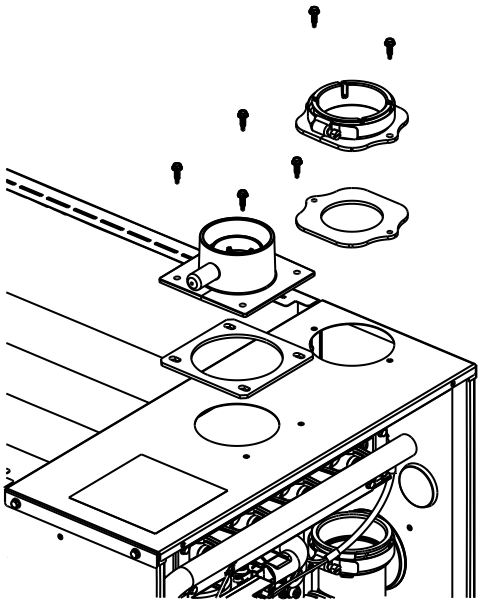
Upflow Furnace in Upflow Position - Top Vented Combustion Air

Important:

- *Trim the condensate pressure switch tubing to length to ensure there is no sag or trap created.*
- *See Figure 107, p. 81 for the factory view of the furnace.*

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

Figure 110. Vent inlet/outlet



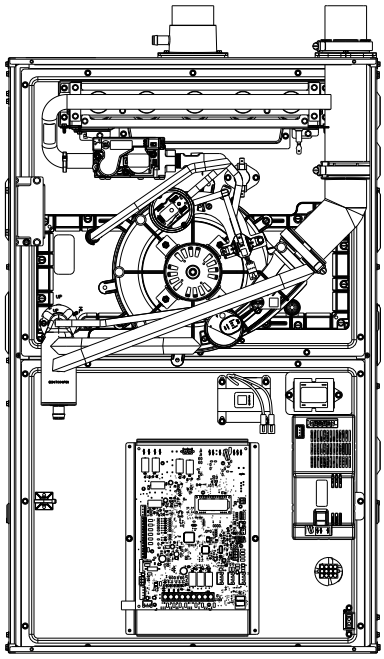
4. Slide PVC pipe through vent outlet adaptor and insert into inducer outlet.
5. Twist to ensure PVC is fully inserted.
6. Tighten the clamp on the end of the 45° elbow.
7. Tighten the clamp on the outlet vent adapter.

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 feet of the cabinet. CPL00938 – 2-inch x 3-inch offset coupling may be used and is factory supplied with 120 KBTUH furnaces. Canadian applications may use BAYREDUCE to meet ULC-S636 requirements.*

Figure 111. Upflow furnace in upflow position



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.

Important:

- *See Figure 107, p. 81 for the factory view of the furnace.*
- *Right side vent outlet is not allowed because condensate will not drain.*

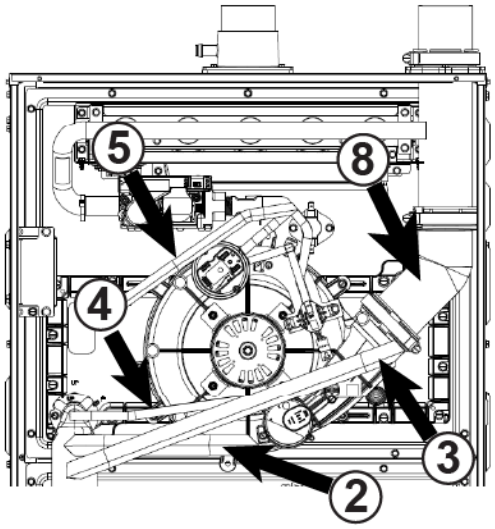
Before proceeding, lay unit on its back to make conversion easier.

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 cold header.

Figure 112. Removing tubing

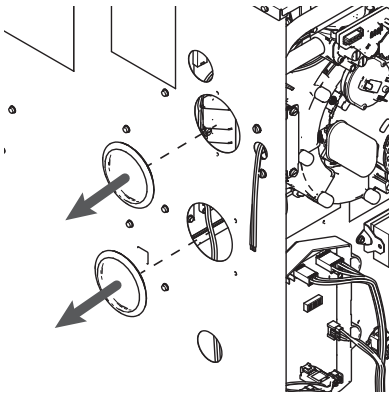


6. Remove two 3-inch plugs on left side of cabinet.

   To be used for combustion air and vent exhaust.

7. Install the two 3-inch plugs into the two 3-inch default openings on the top of the cabinet.

Figure 113. Plug installation



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. Insert and re-tighten screws to 30 in.- lbs. Do not overtighten.
12. Attach the vent outlet gasket to the vent outlet.
13. Install vent outlet to top of cabinet using two screws supplied in the dock pack.
14. Install vent inlet gasket and vent inlet using four screws supplied in the dock pack.
15. Install the grommet for the condensate drain tube. The drain may be located on either side of the cabinet.
16. Slide PVC through vent outlet adaptor and insert into inducer outlet.
17. Twist to ensure PVC is fully inserted.
18. Tighten the two clamps.
19. Install the combustion air inlet pipe.

    Notes:

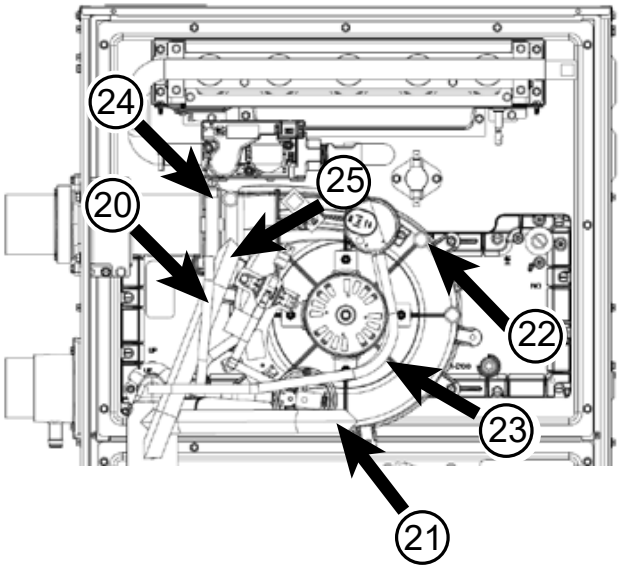
    - *The vent outlet adapter is used for strain relief against the weight of the venting. The clamp should be tightened after the internal connection is made.*
    - *If required, transition to larger venting within 2 feet of the cabinet. An 2-inch x 3-inch offset coupling is required if the transition is made in a horizontal plane. Use coupling CPL00938 (Canadian applications may use BAYREDUCE to meet ULCS636 requirements.) See "3-Inch and Horizontal Venting Requirements," p. 47 section for proper orientation of 2-inch x 3-inch offset coupling.*

20. Connect the black square tubing from the lower port of the pressure transducer back to the cold header.
21. 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.
22. Install previously removed port cap onto open port of the inducer.
23. 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.*

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

Figure 114. Condensate and pressure hose routing



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.

Important: *See Figure 107, p. 81 for the factory view of the furnace.*

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

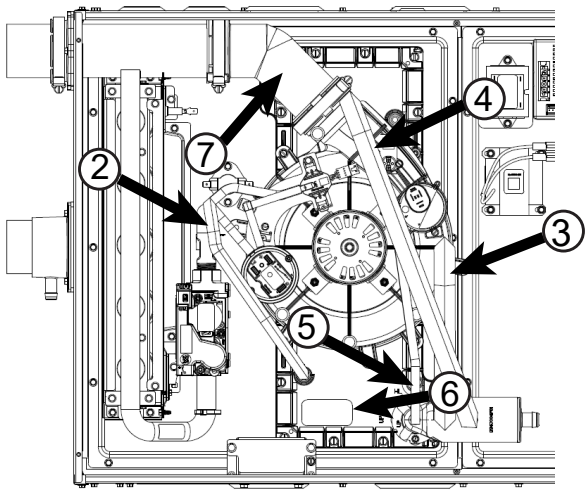
1. Remove all drain hoses from condensate trap. Removing the trap before the hoses is also an option.

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

2. Remove tubing from the lower port of the pressure transducer 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.

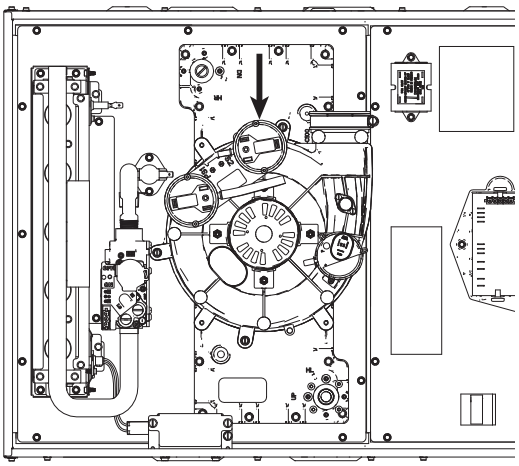
   Note: *There is a yellow EPDM trap adapter located inside the cold header that is held in place by the condensate trap bracket. Do not lose this adapter. This adapter needs to be in place when the condensate trap bracket is reattached.*

Figure 115. Removing tubing



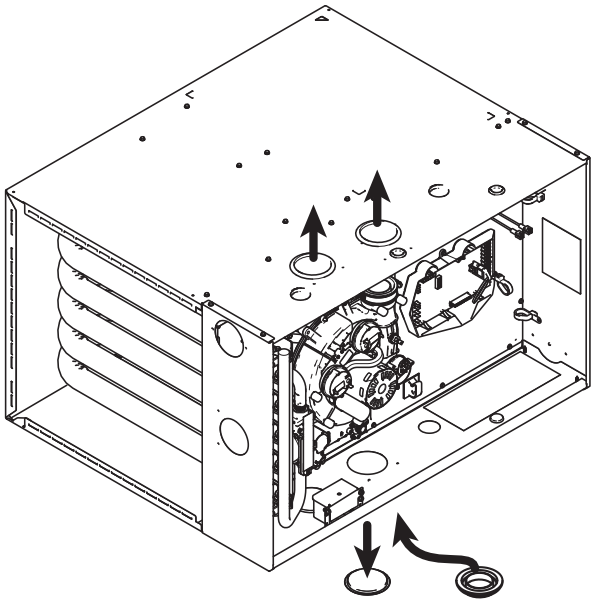
7. Loosen the clamp holding the 45° elbow. Remove the elbow and discard.
8. Remove three inducer screws.
9. Rotate the inducer so that the outlet is pointing vertically.
10. Use the three screws to reattach the inducer to the cold header to 30-in. lbs. Do not overtighten.

Figure 116. Inducer positioning



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

Figure 117. Sealing default openings



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

Notes:

- *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.*
- *If required, transition to larger venting within 2 feet of the cabinet. CPL00938 – 2-inch x 3-inch offset coupling may be used and is factory supplied with 120 MBTUH furnaces. Canadian applications may use BAYREDUCE to meet ULCS636 requirements.*

Condensate Trap Installation

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

Important: *The yellow EPDM trap 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 labelled “HL”.

Important: *When installing a 21.0-inch 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. This allows the rain gutter tubing to fully seat onto the lower condensate port trap.*

21. Hand tighten screws

Figure 118. Tightening screws

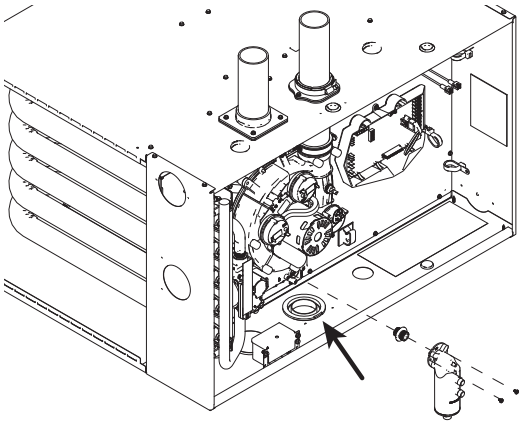
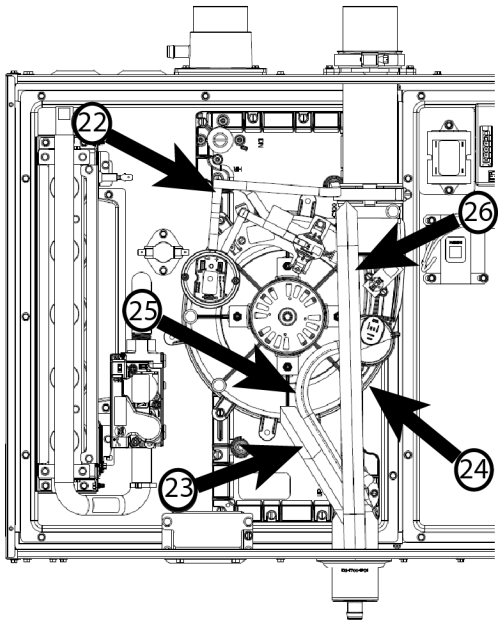


Figure 119. Condensate and pressure hose routing



22. Connect the black square tubing from the lower port of the pressure transducer and new sensing location.
23. 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.

24. Install previously removed port cap onto the open port of the inducer.
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. 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 are needed for hose routing, condensate trap orientation, and inducer port caps only.

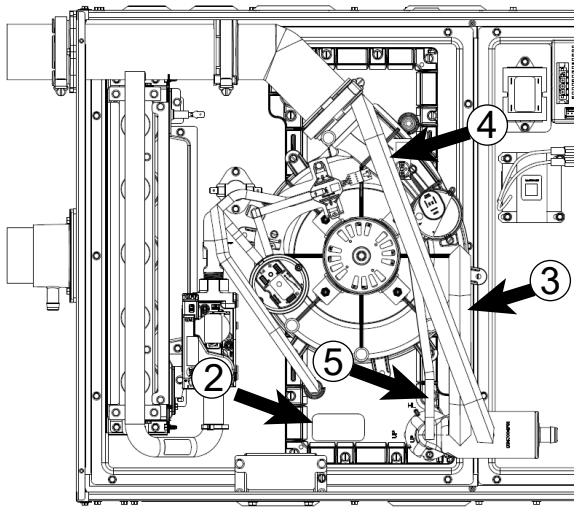
Important: *See Figure 107, p. 81 for the factory view of the furnace.*

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

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 the black square tubing from the lower port of the pressure transducer 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.

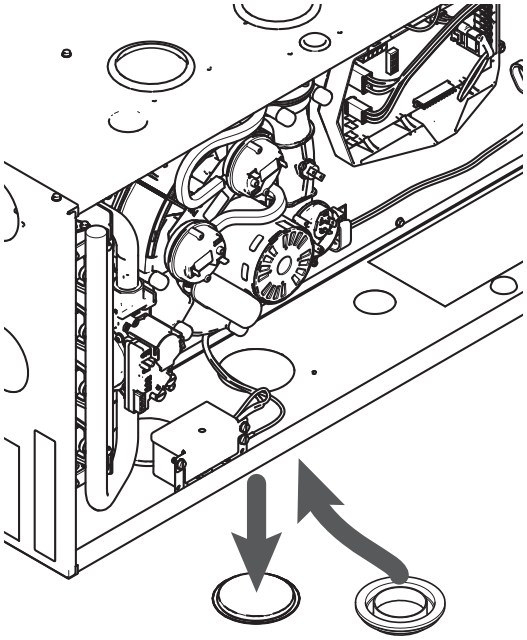
Note: *There is a yellow EPDM trap adapter located inside the cold header that is held in place by the condensate trap bracket. Do not lose this adapter. This adapter needs to be in place when the condensate trap bracket is reattached.*

Figure 120. Removing tubing



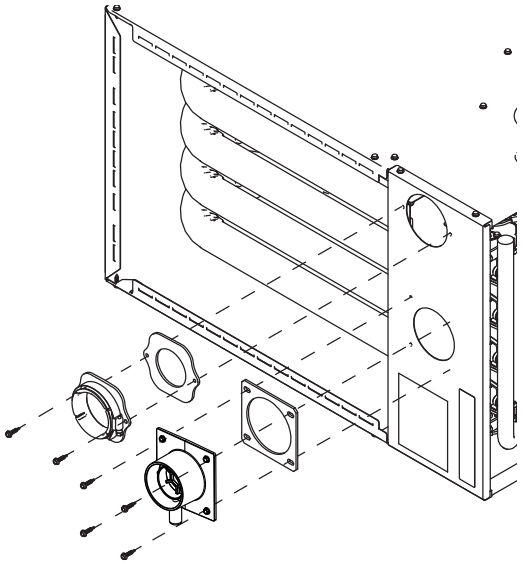
7. Remove plug from 3-inch hole.
8. Install condensate trap grommet.

Figure 121. Condensate trap grommet



9. Attach the vent outlet gasket to the vent outlet.
10. Install vent outlet to top of cabinet using two screws supplied in the doc pack.
11. Install vent inlet gasket and vent inlet using four screws supplied in the doc pack.

Figure 122. Vent inlet/outlet



12. Slide PVC through vent outlet adaptor and insert into inducer outlet.
13. Twist to ensure PVC is fully inserted.
14. Tighten the two clamps.
15. Install the combustion air inlet PVC pipe.

Notes:

- *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.*
- *If required, transition to larger venting within 2 feet of the cabinet. An 2-inch x 3-inch offset coupling is required if the transition is made in a horizontal plane. Use coupling CPL00938 (Canadian applications may use BAYREDUCE to meet ULCS636 requirements.) See "3-Inch and Horizontal Venting Requirements," p. 47 section for proper orientation of 2-inch x 3-inch offset coupling.*

Condensate Trap Installation

16. Reinstall the yellow EPDM trap adapter if it was earlier removed or ensure yellow EPDM trap adapter is still in place.

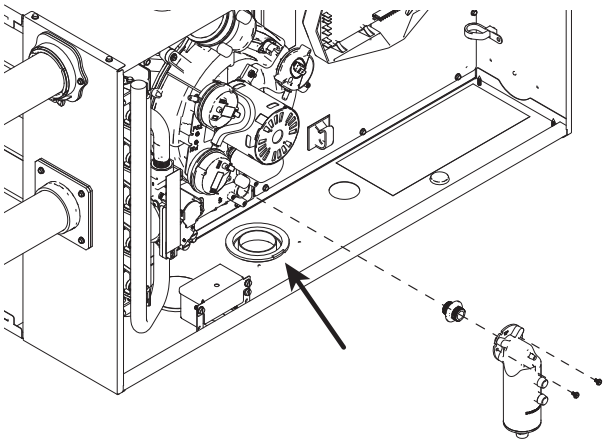
Important: *The yellow EPDM trap adapter must be present for proper condensate drain operation.*

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

Important: *When installing a 21.0-inch 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 . This allows the rain gutter tubing to fully seat onto the lower condensate port trap.*

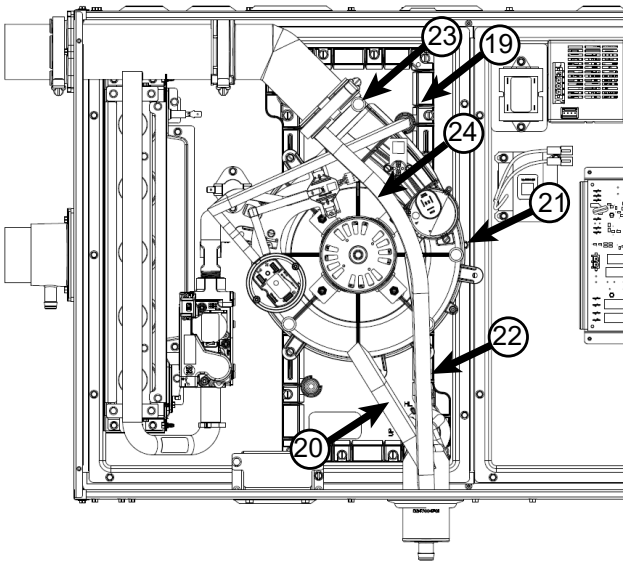
18. Hand tighten screws.

Figure 123. Tightening screws



19. Connect the black square tubing from the lower port of the pressure transducer and new sensing location.
20. 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.
21. Install previously removed port cap onto open port of the inducer.
22. 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.
23. Remove port plug from rain gutter and install in new position on opposite side of the rain gutter.
24. 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.

Figure 124. Condensate and pressure hose routing



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.

Important: *See Figure 107, p. 81 for the factory view of the furnace.*

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

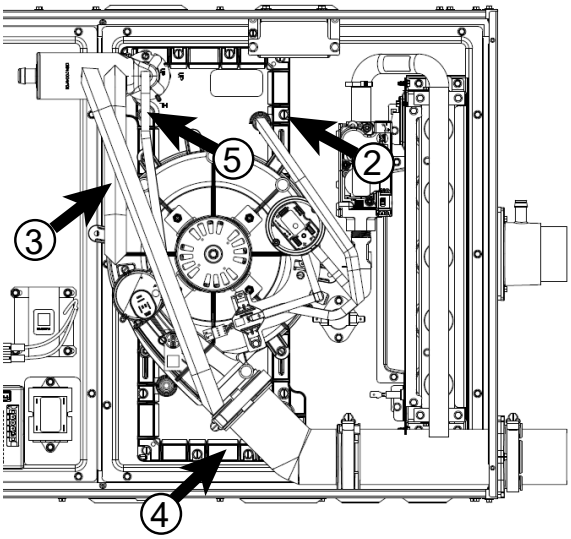
1. Remove all drain hoses from condensate trap.

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 the black square tubing from the lower port of the pressure transducer 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 yellow EPDM trap adapter located inside the condensate trap connection on the cold header and retain for later installation.

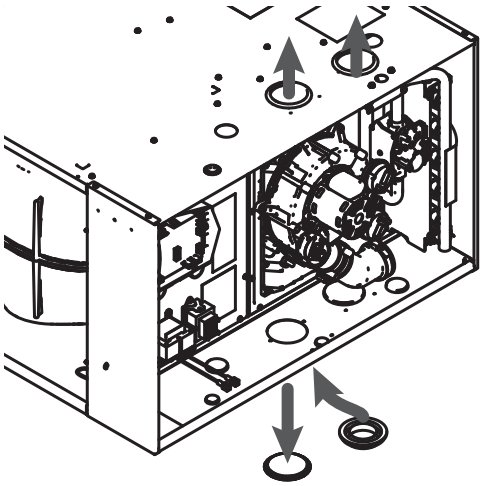
Note: *The yellow EPDM trap adapter located inside the cold header that is held in place by the condensate trap bracket. Do not lose this adapter. This adapter needs to be in place when the condensate trap bracket is reattached.*

Figure 125. Removing tubing



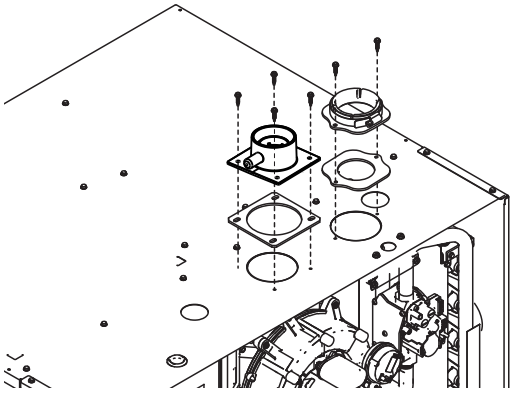
8. Remove 3-inch plug on right side of unit. To be used for condensate trap.
9. Install condensate trap grommet.
10. Remove two 3-inch plugs on left side of cabinet.
11. Reuse the two 3-inch plugs to seal the two 3-inch default openings on the top of the cabinet.

Figure 126. Sealing default openings



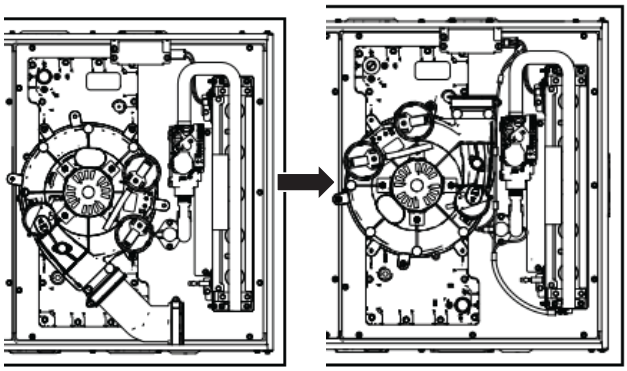
12. Attach the vent outlet gasket to the vent outlet.
13. Install vent outlet to top of cabinet using two screws supplied in the doc pack.
14. Install vent inlet gasket and vent inlet using four screws supplied in the doc pack.

Figure 127. Vent inlet/outlet



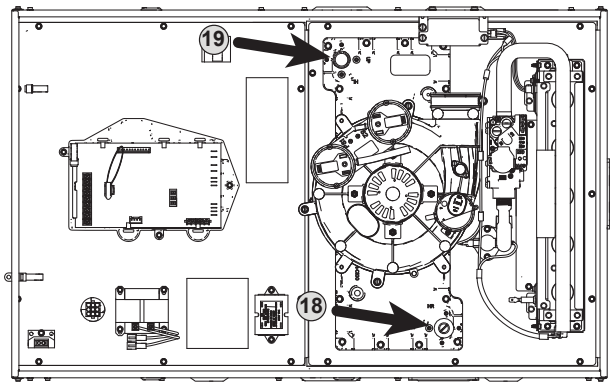
15. Remove three inducer screws.
16. Rotate the inducer so that the outlet is pointing vertically.
17. Use the three inducer screws to reattach the inducer to the cold header. Torque to 30-in. lbs. Do not overtighten.

Figure 128. Inducer positioning



18. Remove condensate drain plug from top right location on cold header.
19. Reinstall the condensate drain plug here.

Figure 129. Condensate drain plug



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

Notes:

- *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.*
- *If required, transition to larger venting within 2 feet of the cabinet. CPL00938 — 2-inch x 3-inch offset coupling may be used and is factory supplied with 120 MBTUH furnaces. Canadian applications may use BAYREDUCE to meet ULCS636 requirements.*

Condensate Trap Installation

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

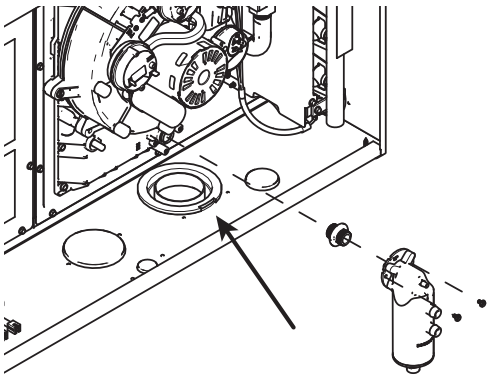
Important: *The yellow EPDM trap adapter must be present for proper condensate drain operation.*

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

Important: *When installing a 21.0-inch 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.

Figure 130. Tightening screws



27. Connect the black square tubing from the lower port of the pressure transducer tubing to the new sensing location.
28. Remove port cap on the bottom of the inducer and connect inducer condensate tubing. Connect other end

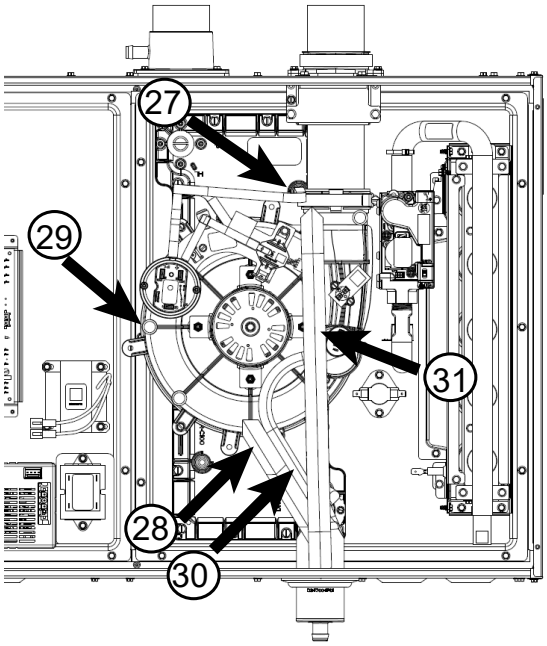
of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.

29. Install previously removed port cap onto open 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.

Figure 131. Condensate and pressure hose routing



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

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.

Important: *See Figure 107, p. 81 for the factory view of the furnace.*

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

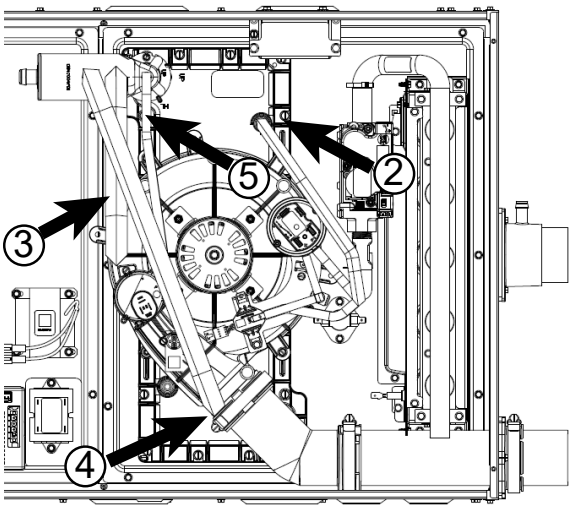
1. Remove all drain hoses from condensate trap.

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 the black square tubing from the lower port of the pressure transducer.
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 yellow EPDM trap adapter located inside the condensate trap connection on the cold header and retain for later installation.

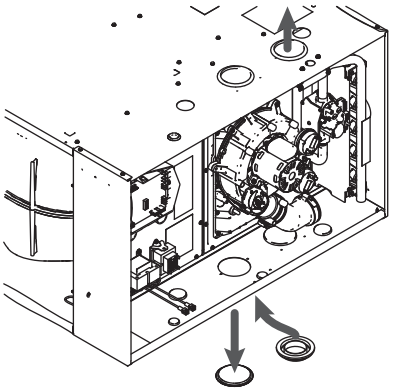
Note: *The yellow EPDM trap adapter located inside the cold header that is held in place by the condensate trap bracket. Do not lose this adapter. The condensate adapter needs to be in place when the condensate trap bracket is reattached.*

Figure 132. Removing tubing



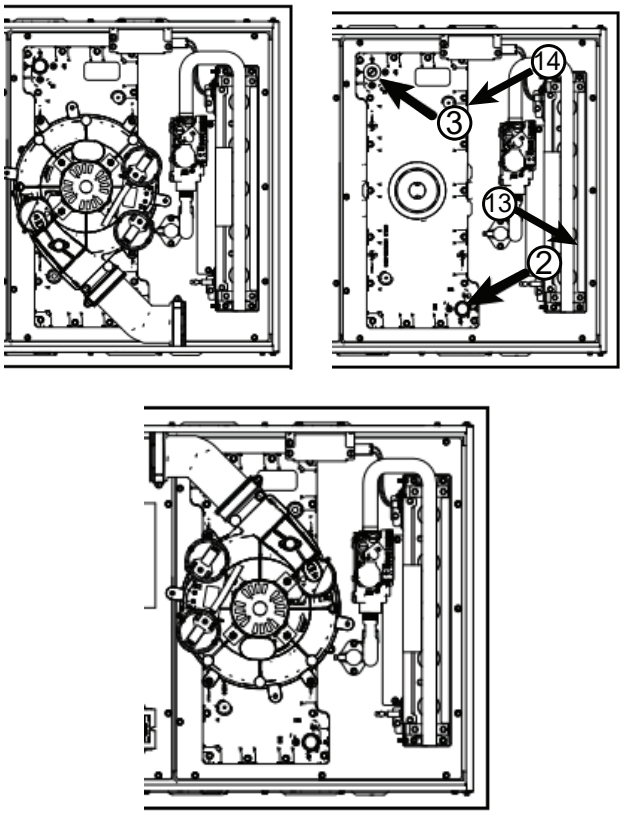
8. Remove 3-inch plug on right side of unit. To be used for condensate trap.
9. Install condensate trap grommet.
10. Remove 3-inch plugs on the left side of the cabinet. To be used for combustion air inlet.
11. Reuse the two 3-inch plugs to seal the two 3-inch default openings on the top of the furnace.

Figure 133. Sealing default openings



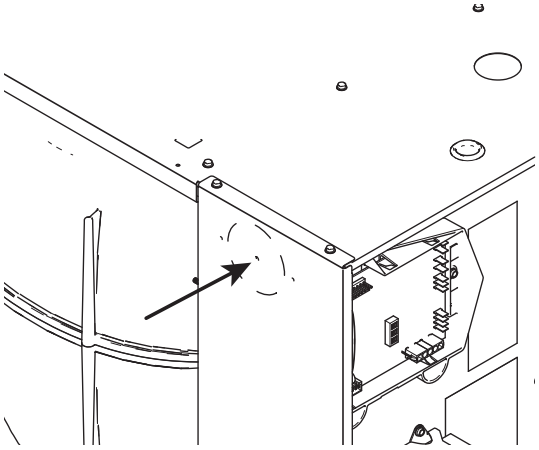
12. Remove three inducer screws.
13. While the inducer is loose, remove condensate drain plug from top right location on cold header.
14. Reinstall the condensate drain plug here.
15. Rotate the inducer 180° to point the elbow towards the left.
16. Use the three inducer screws to reattach the inducer to the cold header. Torque to 30-in. lbs. Do not overtighten.

Figure 134. Inducer positioning



17. Cut 3-inch hole in bottom panel using large dimple as guide.

Figure 135. Bottom panel

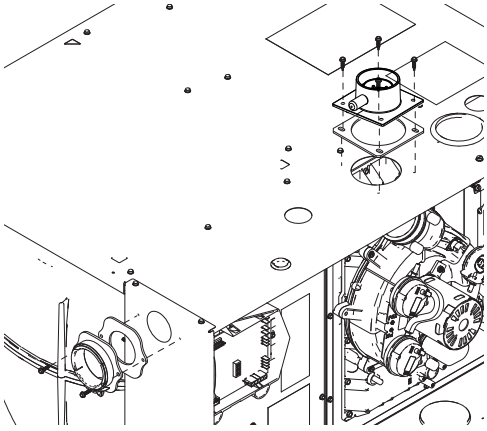


18. Attach the vent outlet gasket to the vent outlet.
19. Install vent outlet to top of cabinet using two screws supplied in the doc pack.
20. Install vent inlet gasket and vent inlet using four screws supplied in the doc pack.

Notes:

- *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.*
- *If required, transition to larger venting within 2 feet of the cabinet. An 2-inch x 3-inch offset coupling is required if the transition is made in a horizontal plane. Use coupling CPL00938 (Canadian applications may use BAYREDUCE to meet ULCS636 requirements.) See "3-Inch and Horizontal Venting Requirements," p. 47 section for proper orientation of 2-inch x 3-inch offset coupling.*

Figure 136. Vent inlet/outlet



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

Condensate Trap Installation

25. Reinstall the yellow EPDM trap adapter if it was earlier removed or ensure adapter is still in place.

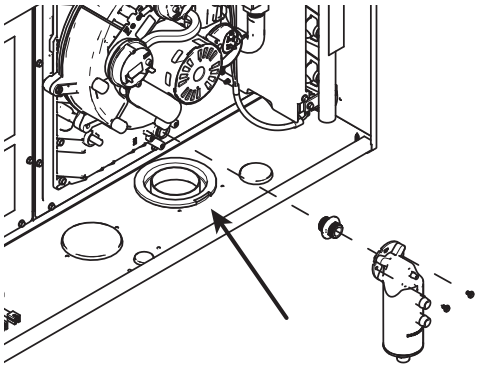
Important: *The yellow EPDM trap adapter must be present for proper condensate drain operation.*

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

Important: *When installing a 21.0-inch 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.*

27. Hand tighten screw.

Figure 137. Tightening screws

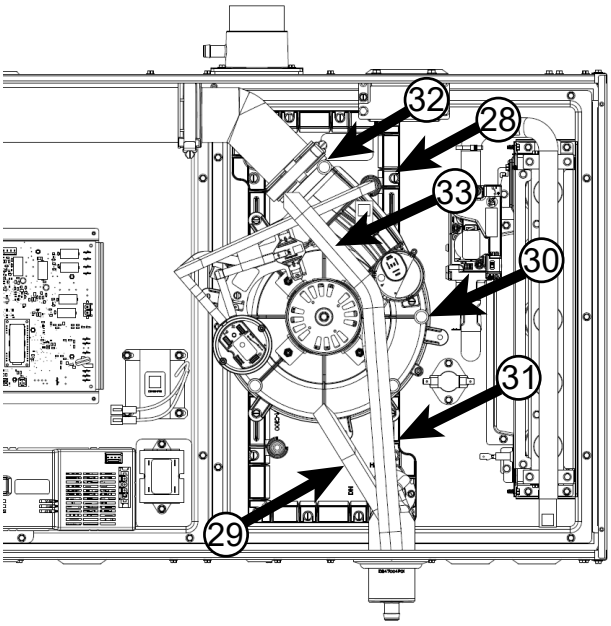


28. Connect the black square tubing from the lower port of the pressure transducer and new sensing location.
29. Remove port cap on the right side of inducer and connect inducer condensate tubing. Connect other end of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.
30. Install previously removed port cap onto open port of the inducer.
31. 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.*

32. Remove port plug from rain gutter and install in new position on opposite side of the rain gutter.
33. 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.

Figure 138. Condensate and pressure hose routing



Downflow Furnace - Top Vented Combustion Air

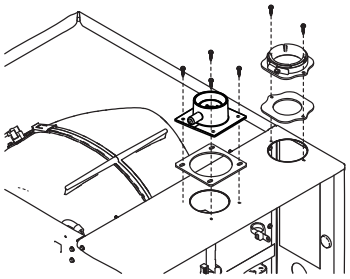
No changes need to be made to the inducer when installing the downflow furnace with the combustion air vented through the top.

Important:

- *See Figure 108, p. 81 for the factory view of the furnace.*
- *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 two screws supplied in the doc pack.
3. Install vent inlet gasket and vent inlet using four screws supplied in the doc pack.

Figure 139. Vent inlet/outlet

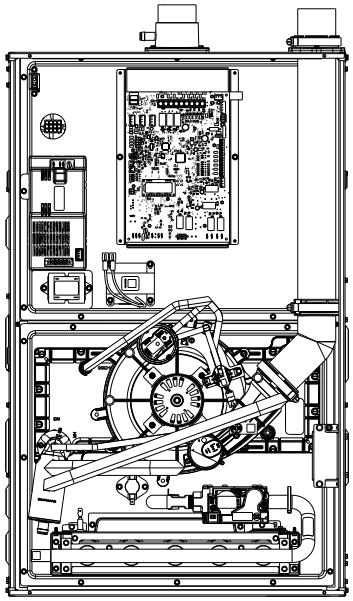


4. Slide PVC pipe through vent outlet adaptor and insert into inducer outlet.
5. Twist to ensure PVC is fully inserted.
6. Tighten the two clamps.
7. Install the combustion air inlet PVC pipe.

Notes:

- *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.*
- *If required, transition to larger venting within 2 feet of the cabinet. CPL00938 – 2-inch x 3-inch offset coupling may be used and is factory supplied with 120 MBTUH furnaces. Canadian applications may use BAYREDUCE to meet ULCS636 requirements.*

Figure 140. PVC pipe installation



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.

Important:

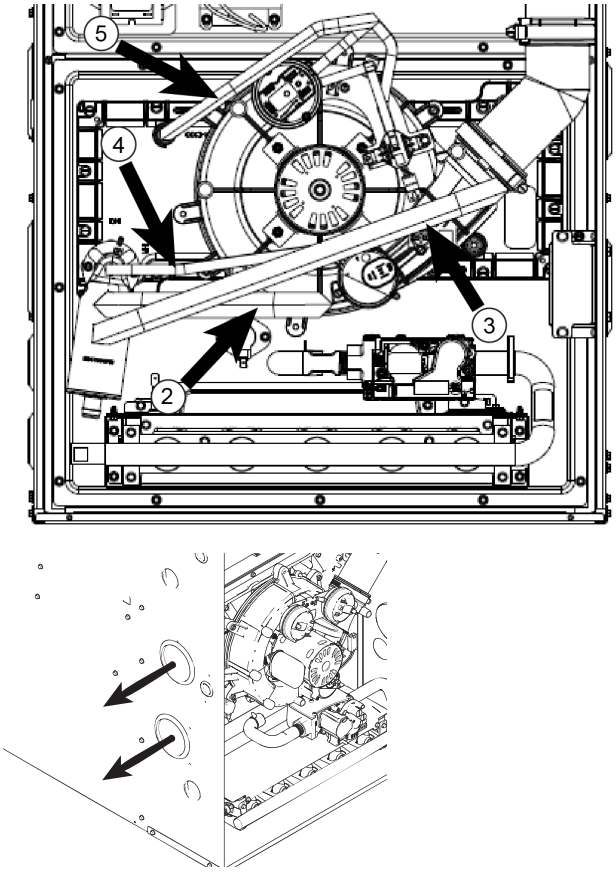
- *See Figure 108, p. 81 for the factory view of the furnace.*
- *Right side vent outlet is not allowed because condensate will not drain.*

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.*

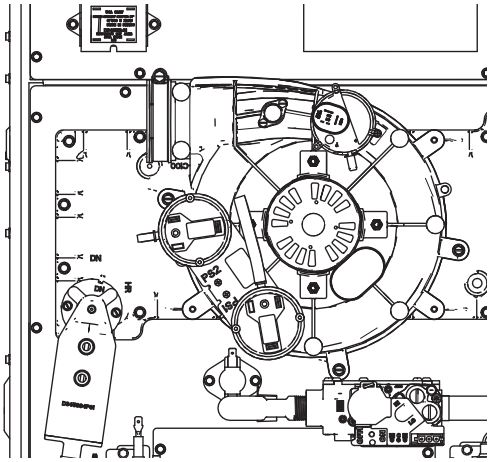
2. Remove drain tubing from bottom of inducer housing.
3. Remove rain gutter tubing from inducer outlet.
4. Remove tubing from condensate pressure switch.
5. Remove the black square tubing from the cold header.
6. Remove two 3-inch plugs on left side of cabinet. To be used for combustion air exhaust and inlet.
7. Reuse the two 3-inch plugs to seal the two 3-inch default openings on the top of the cabinet.

Figure 141. Removing tubing



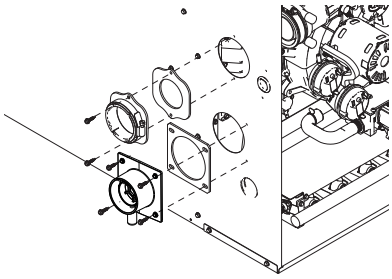
8. Loosen the clamp holding the 45° elbow. Remove the elbow and discard.
9. Remove the three inducer mounting screws.
10. Rotate inducer counterclockwise so that the inducer outlet aligns with the exhaust vent outlet (See Figure 142, p. 94).
11. Reinsert and tighten screws to 30-in. lbs. Do not overtighten.

Figure 142. Inducer rotation



12. Attach the vent outlet gasket to the vent outlet.
13. Install vent outlet to cabinet using two screws supplied in the doc pack.
14. Install vent inlet gasket and vent inlet using four screws supplied in the doc pack.
15. Install the grommet for the condensate drain tube. The drain may be located on either side of the cabinet.

Figure 143. Vent inlet/outlet installation



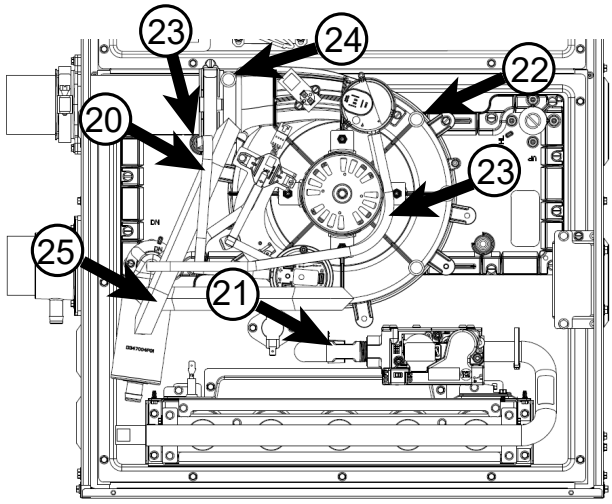
16. Slide PVC through vent outlet adaptor and insert into inducer outlet.
17. Twist to ensure PVC is fully inserted.
18. Tighten the two clamps.
19. Install the combustion air inlet PVC pipe.

Notes:

- *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.*
- *If required, transition to larger venting within 2 feet of the cabinet. An 2-inch x 3-inch offset coupling is required if the transition is made in a horizontal plane. Use coupling CPL00938 (Canadian applications may use BAYREDUCE to meet ULCS636 requirements.) See "3-Inch and Horizontal Venting Requirements," p. 47 section for proper orientation of 2-inch x 3-inch offset coupling.*

20. Connect the black square tubing from the lower port of the pressure transducer back to the cold header.

Figure 144. Condensate and pressure hose routing



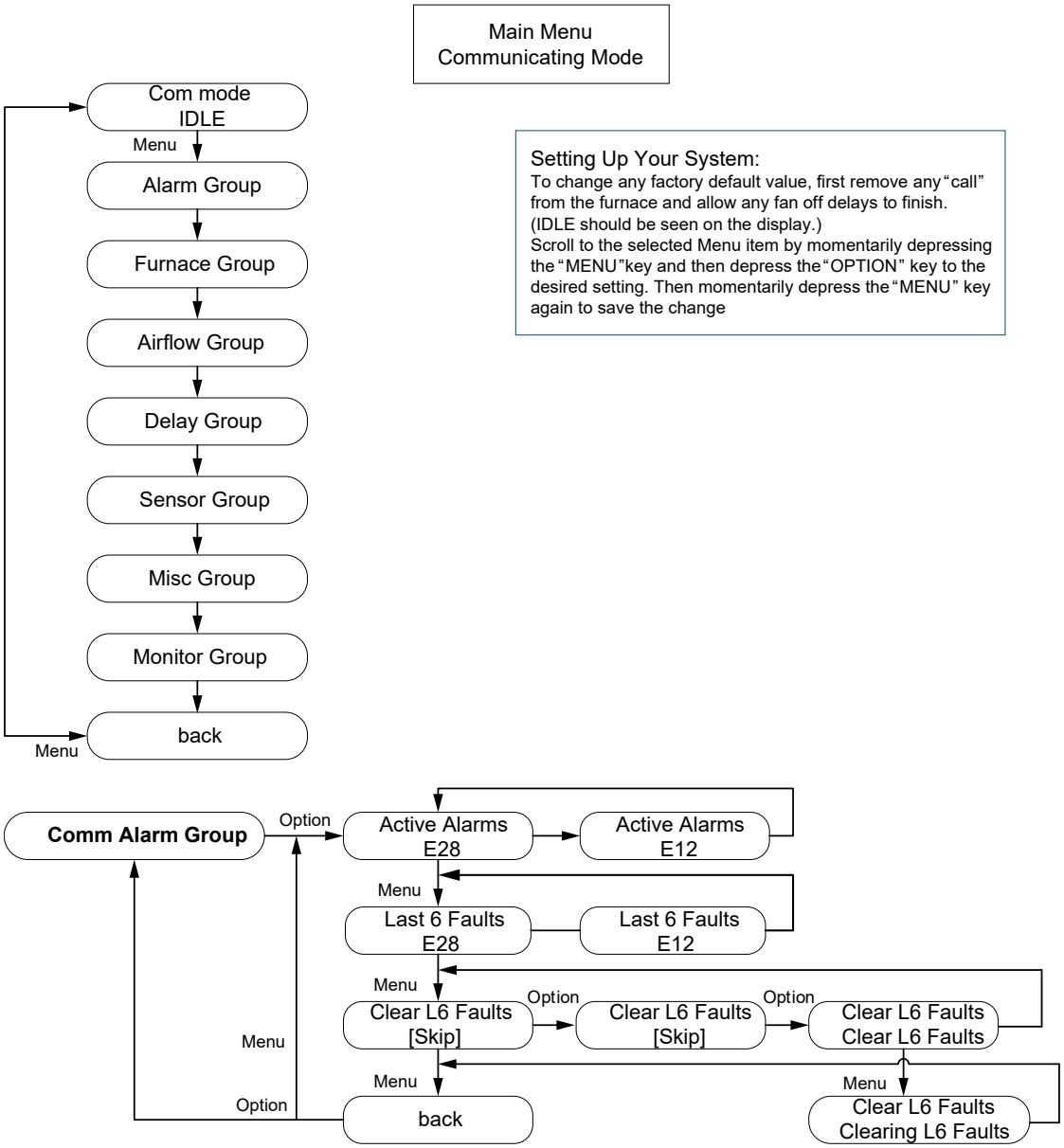
21. Remove port cap at bottom of inducer and connect inducer condensate tubing. Connect other end of inducer condensate tubing to top port on the condensate trap. Cut tubing to length, if necessary.
22. Install previously removed port cap onto open port of the inducer.
23. Connect condensate pressure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

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

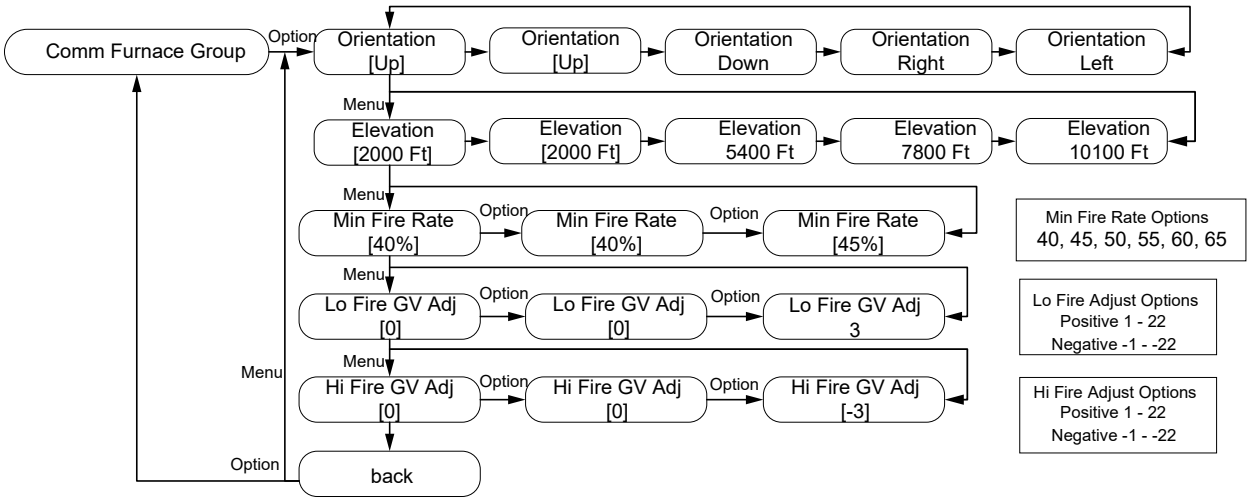
24. Remove port plug from rain gutter and install in new position on opposite side of the rain gutter.
25. Connect rain gutter condensate hose to the rain gutter and the lower port of the condensate trap. Cut to length, as required.

Integrated Furnace Control Menu

Figure 145. Link communicating control system menu



Clearing The Last 6 Faults:
To clear the stored faults,
1. Scroll to the Alarm Group and push the Option button to enter the menu.
2. Push the Menu button to 2 times to get to the "Clear L6 Faults"
3. Push the Option button 2 times to get to the double "Clear L6 Faults".
4. Push the Menu button to clear.
"Clear L6 Faults" will appear 3 times to confirm the faults have been cleared.

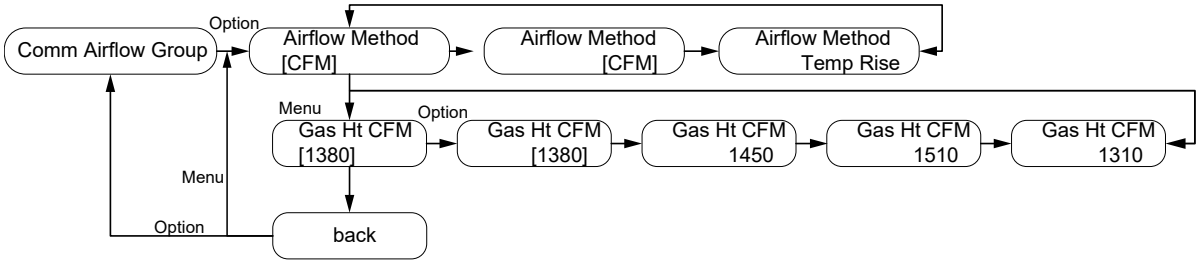


Use the Menu button to scroll down thru the Menu Group.
Use the Option button to scroll to the right within the selected group.
Momentarily press the Menu button to save an option.
[ ] = the saved value

Positive adjustments will raise the manifold pressure.
Negative adjustments will lower the manifold pressure.

When manifold pressure is satisfactory set, momentarily press the Menu button to save the setting.

Gas Valve Set Point	Natural Gas - #45
100%	3.5 IWC
65% Not Adjustable	1.6 IWC
40%	0.7 IWC

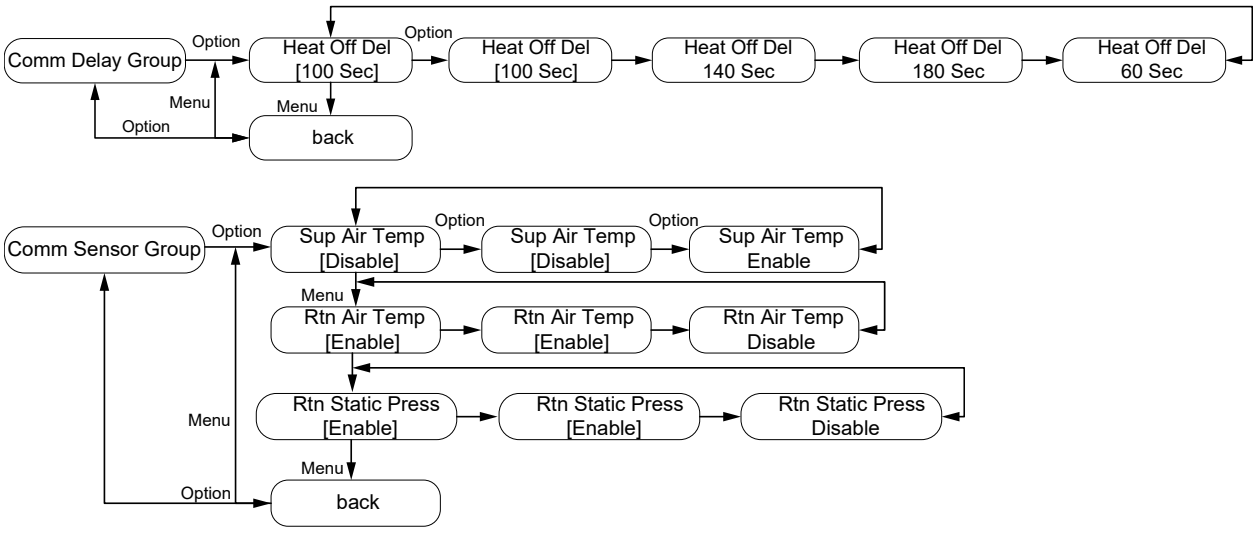


Gas heating airflow can be setup using 2 different methods.
1. The default method, CFM, allows the user to select the base airflow.
2. The Temp Rise method allows the user to select the temp rise across the heat exchanger.

Airflows shown are at 100% firing rate. Airflows will automatically adjust to firing rates less than 100%

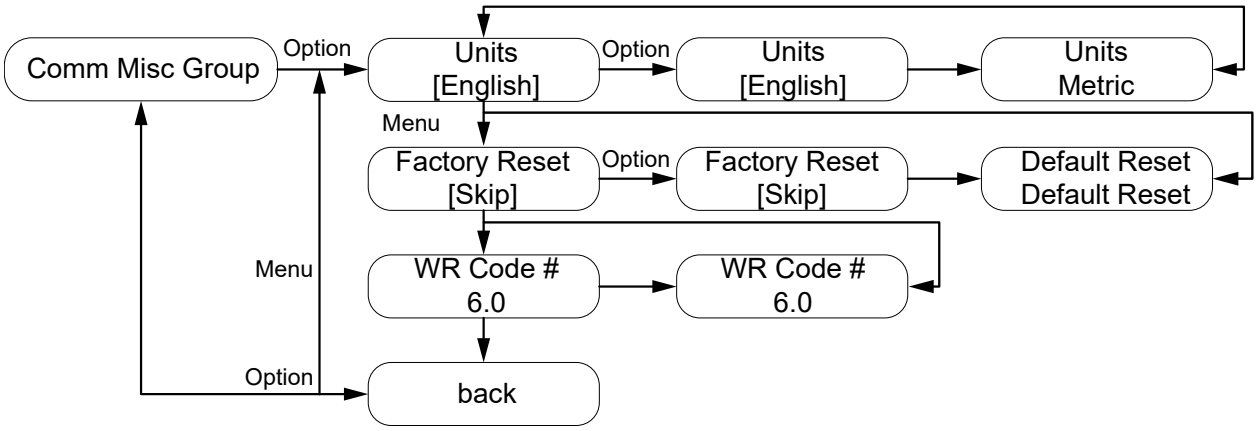
Cooling and heat pump airflow in Link systems is automatically configured, based on the OD unit and type. CFM per ton and tonnage adjustments are not available.

Model	Gas Heating CFM [ ] = Default
Upflow	
S9VMB060U3VC	1100[1100], 1160, 1200, 1270, 880, 1055
S9VMB060U4VC	1100[1100], 1160, 1220, 880, 980, 1055
S9VMB080U4VC	1450[1450], 1510, 1540, 1775, 1260, 1380
S9VMC100U5VC	1910[1910], 1980, 2100, 1620, 1700, 1800
S9VMD120U5VC	1950[1950], 2050, 2150, 2250, 1730, 1850
Downflow	
S9VMB060D3VC	1175[1175], 1240, 1325, 1005, 1056, 1135
S9VMB080D4VC	1455[1455], 1530, 1650, 1730, 1285, 1415
S9VMC100D5VC	1800[1800], 1850, 2000, 1550, 1600, 1700
S9VMD120D5VC	2250[2250], 2350, 1900, 2050, 2100, 2200



The Supply Air temperature sensor is shipped with the A/TLink Thermostat and System Controller. It must be installed in the supply air plenum and enabled using the Technician App, thermostat, or the IFC menu.

The Return Air temperature sensor is included as part of the furnace wiring harness and is enabled by default.



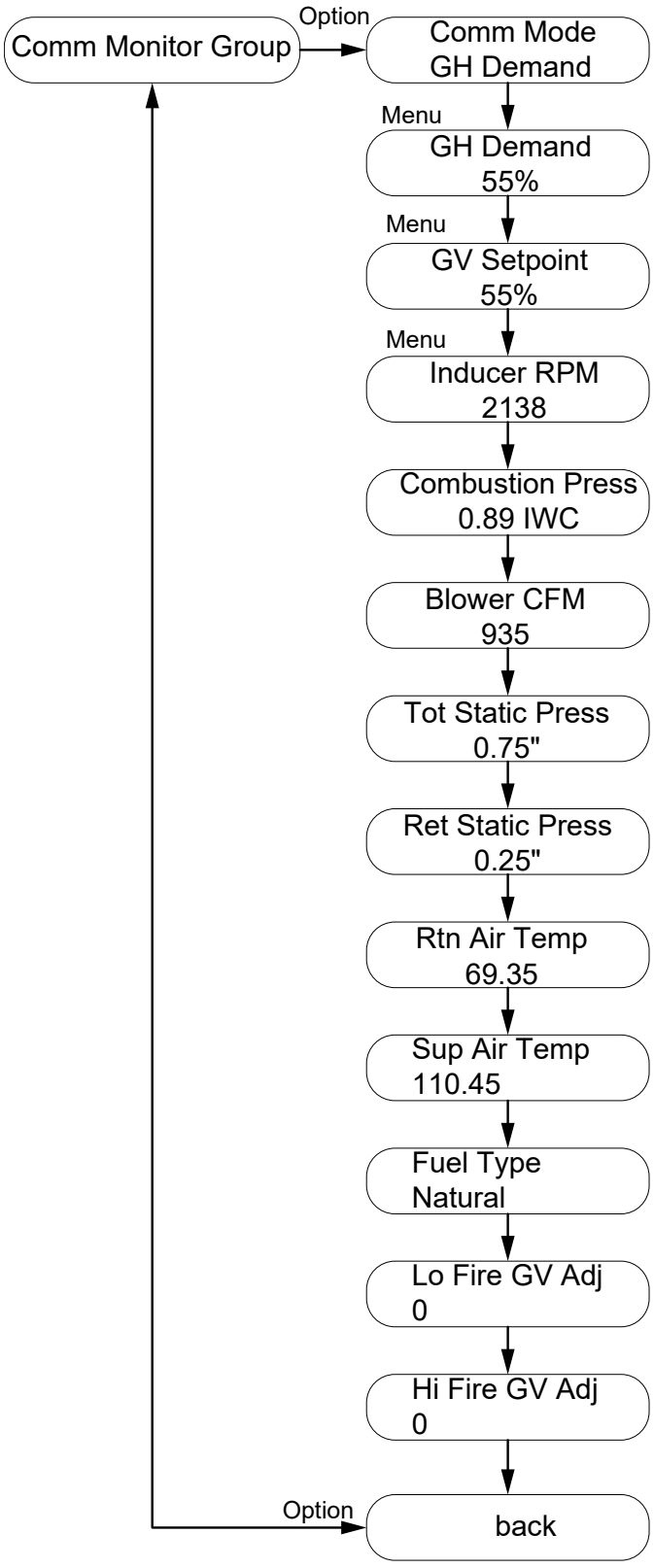
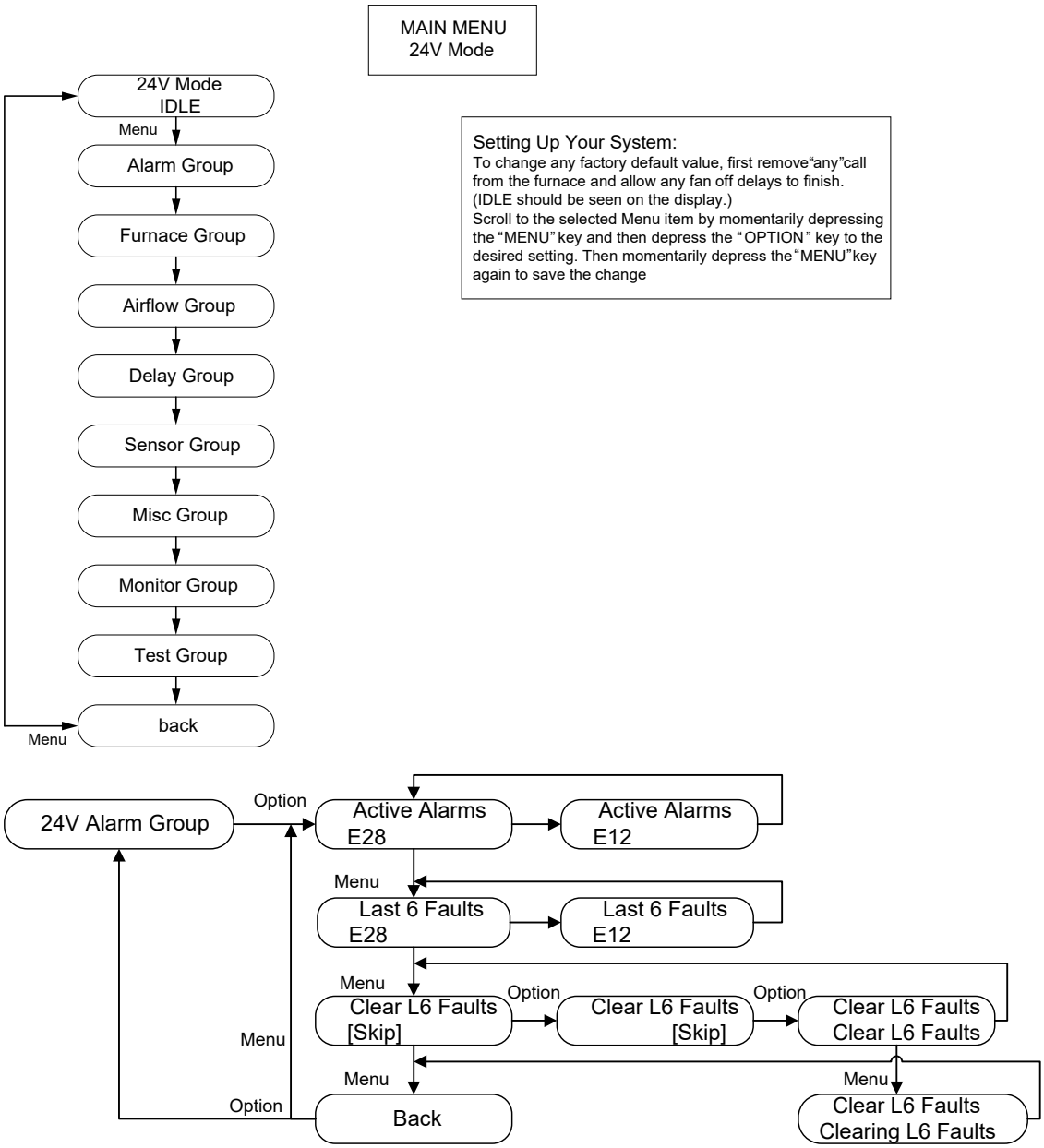
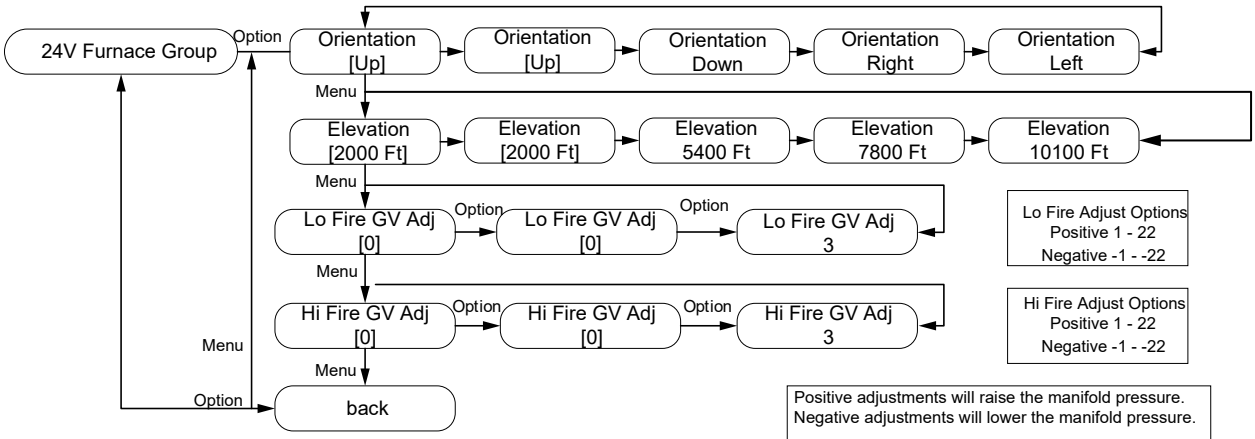

Comm Monitor Group
Option
Comm Mode
GH Demand
Menu
GH Demand
55%
Menu
GV Setpoint
55%
Menu
Inducer RPM
2138
Combustion Press
0.89 IWC
Blower CFM
935
Tot Static Press
0.75"
Ret Static Press
0.25"
Rtn Air Temp
69.35
Sup Air Temp
110.45
Fuel Type
Natural
Lo Fire GV Adj
0
Hi Fire GV Adj
0
Option
back

Figure 146. 24V control system menu



Clearing the Last 6 Faults:
To clear the stored faults,
1. Scroll to the Alarm Group and push the Option button to enter the menu.
2. Push the Menu button to 2 times to get to the “Clear L6 Faults”.
3. Push the Option button 2 times to get to the double “Clear L6 Faults”.
4. Push the Menu button to clear.
“Clear L6 Faults”will appear 3 times to confirm the faults have been cleared.

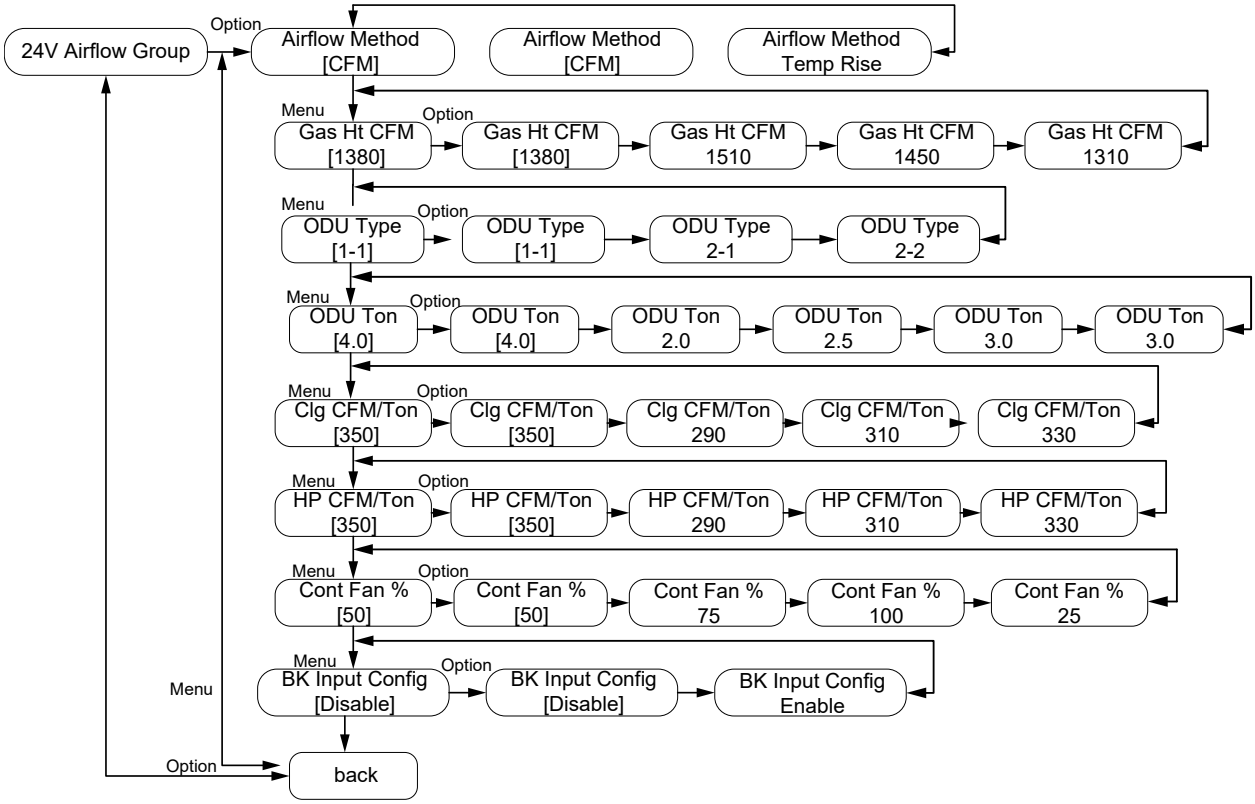


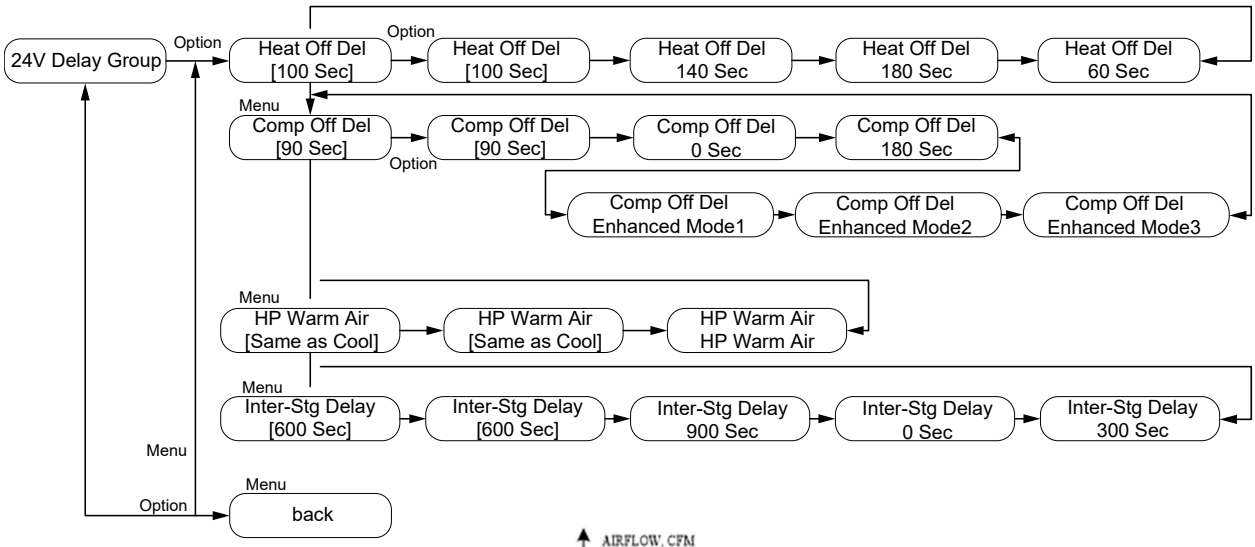
Use the Menu button to scroll down thru the Menu Group. Use the Option button to scroll to the right within the selected group.
Momentarily press the Menu button to save an option.
[ ] = the saved value

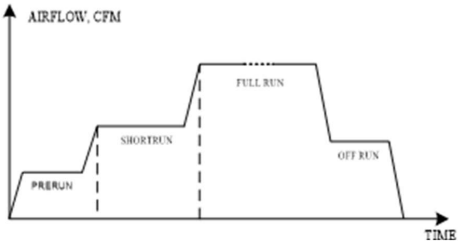
Positive adjustments will raise the manifold pressure. Negative adjustments will lower the manifold pressure.

The menu button must be pressed after adjusting the offset number in order for the gas valve to change the manifold pressure. Repeat as necessary until the manifold pressure meets with table below.

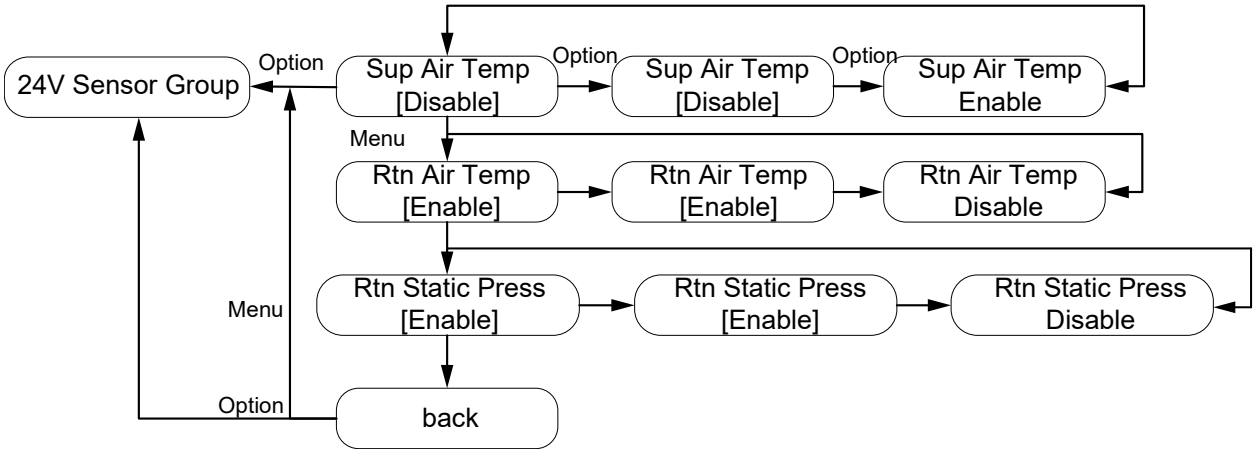
Fuel	100% High Fire	65% Not Adjustable	40% Low Fire
Natural Gas	3.5-inch W. C.	1.6-inch W. C.	0.7-inch W. C.
Propane	10.0-inch W. C.	6.0-inch W. C.	2.1-inch W. C.

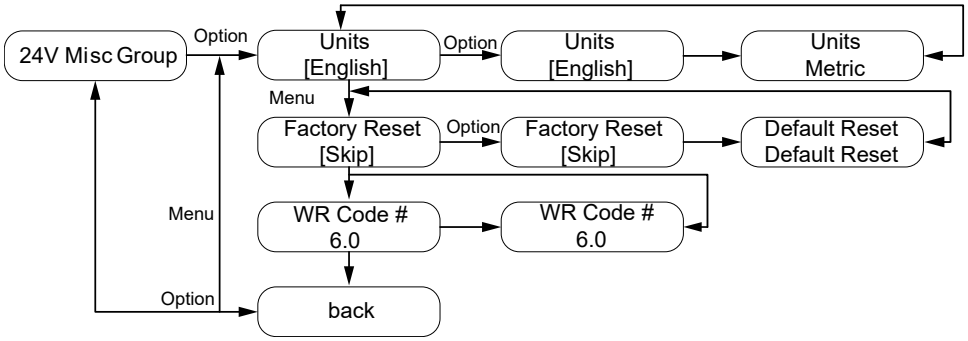


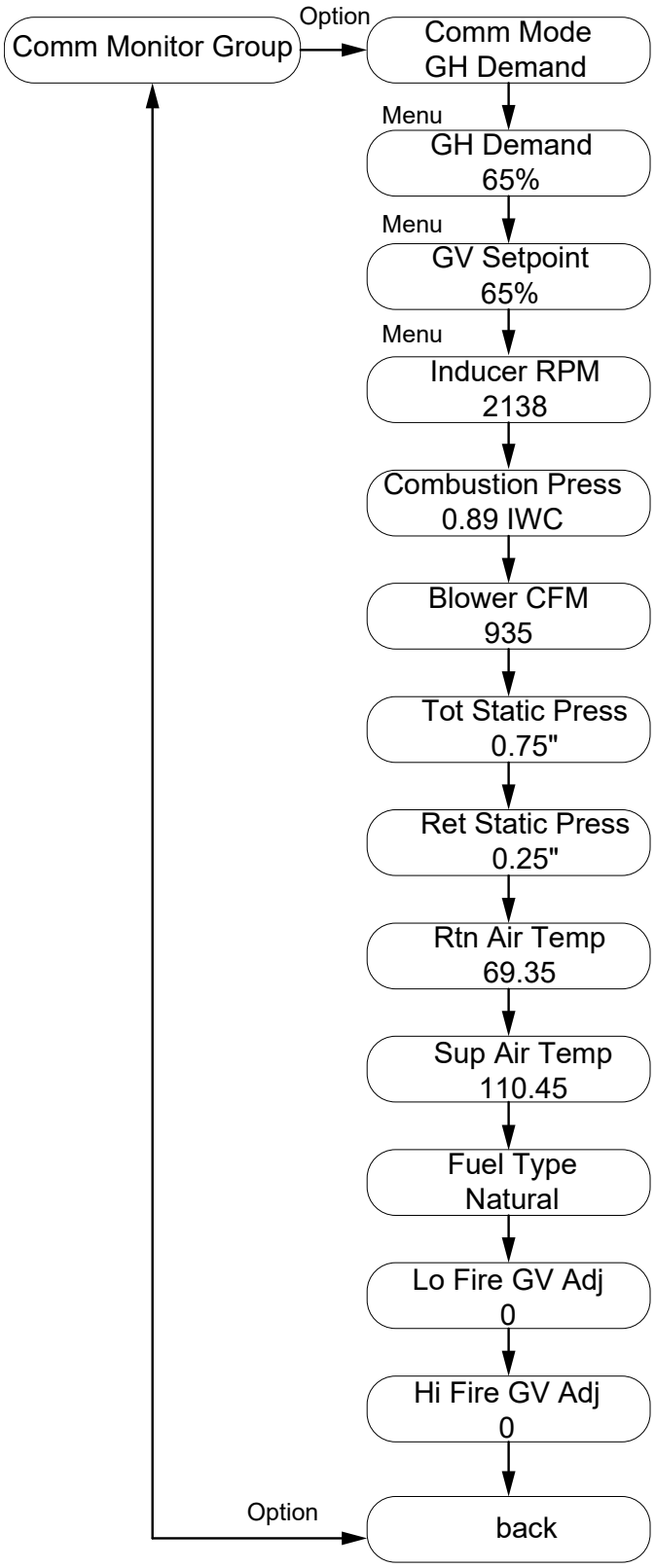




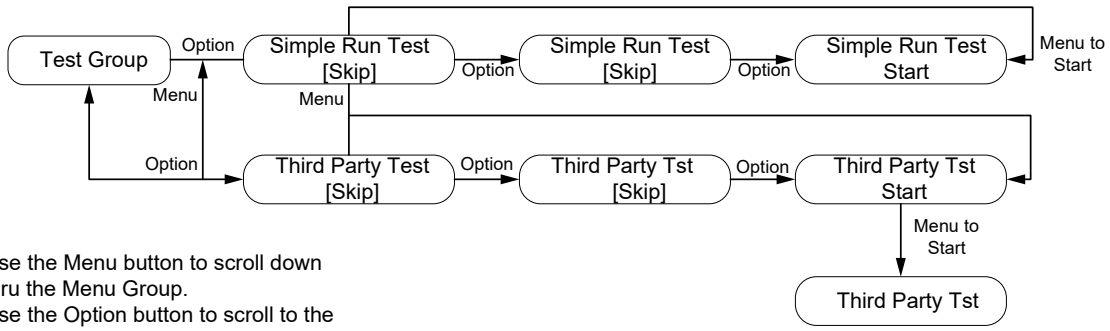
	Pre-Run	Short-Run	Full-Run	Off-Run
Enhanced Mode 1	0	6 minutes @ 80%	100%	0
Enhanced Mode 2	0	7.5 minutes @ 80%	100%	0
Enhanced Mode 3	1 minute @50%	7.5 minutes @ 80%	100	3 minutes @ 50%






Comm Monitor Group
Option
Comm Mode
GH Demand
Menu
GH Demand
65%
Menu
GV Setpoint
65%
Menu
Inducer RPM
2138
Combustion Press
0.89 IWC
Blower CFM
935
Tot Static Press
0.75"
Ret Static Press
0.25"
Rtn Air Temp
69.35
Sup Air Temp
110.45
Fuel Type
Natural
Lo Fire GV Adj
0
Hi Fire GV Adj
0
Option
back

TEST Group Only Available in 24V Mode



Use the Menu button to scroll down thru the Menu Group.
Use the Option button to scroll to the right within the selected group.

3rd party test mode must be used for setting manifold pressure in 24 V mode.

Once in 3rd Part Test mode, the Comm & Status LED's will alternately blink for ~30 seconds. The test can begin anytime after the"WAIT" message goes away.
To begin the test, apply jumpers from R to W1 & W2 on the low voltage terminal strip.
This will start the ignition process.
The firing rate will be set for 100%.
Once manifold pressure is adjusted at 100%, remove the W2 jumper. The firing rate will proceed to 40%. Once the valve position is at 40%, the manifold pressure can be adjusted.
Verify 100% rate by re-applying the W2 jumper.
To end 3rd Party Test mode, cycle power off to the unit.

3rd Party Test Mode Inputs
R-W1 = 40% Rate
R-W1+W2 = 100% Rate
Remove W1 = 65% Rate

After applying the R- W1/W2 jumper(s), scroll to the 24V Furnace Group and follow the instructions to adjust manifold pressure.

Fuel	100% High Fire	65% Not Adjustable	40% Low Fire
Natural Gas	3.5-inch W. C.	1.6-inch W. C.	0.7-inch W. C.
Propane	10.0-inch W. C.	6.0-inch W. C.	2.1-inch W. C.

Troubleshooting

The following pages include troubleshooting flowcharts in reference for the modulating S9VM family of furnaces only. The information 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.

Figure 147. IFC component layout

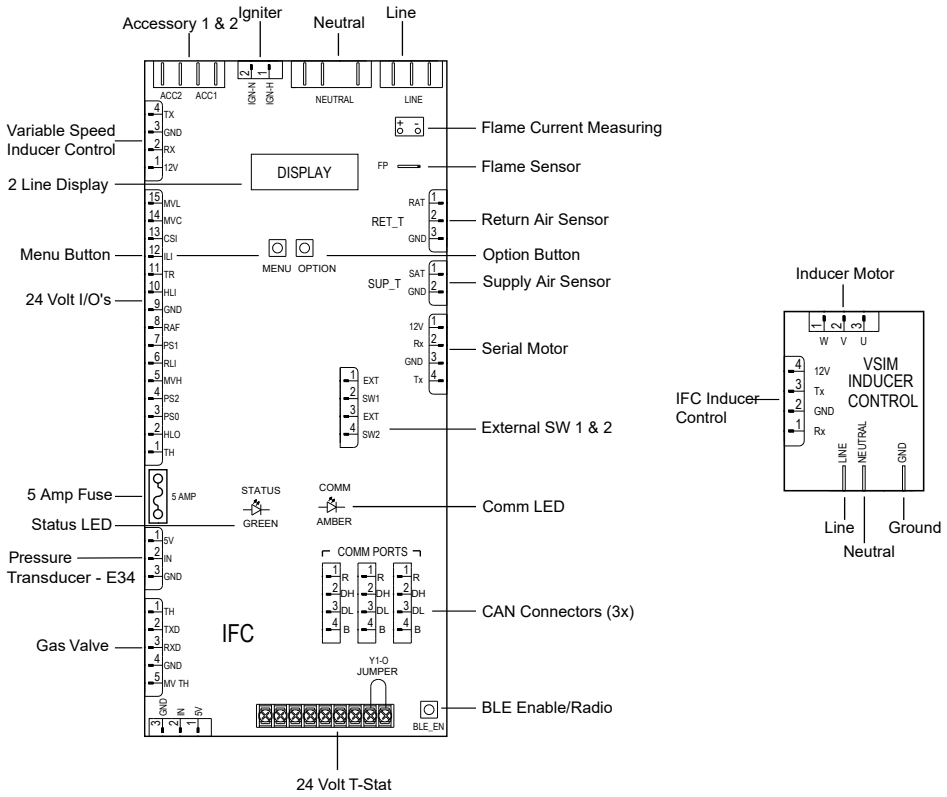


Table 34. Error codes

Alarm	Alarm Explanation	Error Code	Comm Code	P2 Priority	Possible Causes
Internal Failure Error	Loss of the IRQ or other internal failures	E01	ERR.018.00	Critical	Replace indoor control board. Board failure could be caused by line voltage spikes or electrostatic discharge.
External Lockout	Retries Exceeded - 1 hour lockout	E2.1	ERR.022.01	Critical	Flame sensor not sensing flame. Flame current is less than 1 micro amp. Flame sensor not positioned properly in flame. Inlet gas pressure too low. Outlet gas pressure too low. Burner crossovers not aligned properly or restricted.
	Recycles Exceeded - 1 hour lockout	E2.2	ERR.022.00	Critical	Gas valve solenoid failing. Inlet gas pressure dropping too low. Air impingement on burners or flame. Debris in gas valve screen or blockage in supply line. Gas pressure regulator failing.
	1st Stage Gas Valve Not energized When It Should Be (After 10 Times)	E2.3	ERR.022.02	Critical	Verify all wiring is connected, correct and intact. Replace the IFC.
	General Gas Valve Lockout	E2.4	ERR.022.03	Critical	Gas valve may be bad. Cycle furnace power and retry. Replace gas valve, then IFC if problem persists.

Table 34. Error codes (continued)

Alarm	Alarm Explanation	Error Code	Comm Code	P2 Priority	Possible Causes
Pressure Switch Error	Combustion Pressure Alert	E3.0	ERR.001.11	Normal	Vent restriction due to sizing, length, and/or vent termination. Bird or rodent nesting. Excessive wind influencing the pressure that the transducer is measuring. Inducer problem - VSIM board, inducer motor or bearing wear. Minor Pressure Transducer output error. Minor Pressure Switch intermittent error. Pressure tubing leaks, disconnected, or connected incorrectly. Condensate trap not connected or primed. Cold header plug/cap missing.
	Shorted Pressure Switch, 1st Stage	E3.1	ERR.001.05	Normal	Pressure switch contacts stuck closed. Draft inducer motor running with no call for heat. Improper wiring to pressure switch.
	Open Pressure Switch, 1st Stage	E3.2	ERR.001.04	Normal	Pressure switch contacts stuck open. Pressure switch tubing not connected or restricted. Vent piping restricted or improperly sized. Flue gas condensate backing up in secondary heat exchanger.
	Combustion Pressure Low	E3.5	ERR.001.07	Normal	Vent restriction. Excessive wind into flue termination. Vent length, vent size, or vent termination. Transducer null voltage out of range. Inducer not operating. Check pressure hose terminations. Flue termination in positive pressure zone.
	Combustion Pressure High	E3.6	ERR.001.08	Normal	Wind parallel to flue termination causing suction on flue termination. Check pressure hoses. Flue termination in negative pressure zone.
	Combustion Transducer out of bounds too low or no output	E3.7	ERR.001.09	Major	Vent restriction, wind in flue termination, vent length, vent size. Transducer null voltage error, inducer not operating. Check pressure hose terminations, flue in positive pressure zone. Possible bad transducer, source voltage should be ~5Vdc.
	Combustion Transducer out of bounds too high	E3.8	ERR.001.10	Major	Wind parallel to flue, suction on flue termination. Check pressure hose terminations. Possible bad transducer, source voltage should be ~5Vdc.
Open Limit Switch Error	Open High Limit	E4.0	ERR.026.01	Major	Low airflow across heat exchanger. Raise heating CFM. Dirty evaporator coil. Dirty return air filter. Dirty blower wheel. Outlet gas pressure set to high. Return air temperature above 80°F.
	Open Reverse Airflow Limit	E4.1	ERR.026.00	Major	Blower is not operating correctly. Airflow setting too low. Raise heating CFM. Blower off delay not long enough. Increase off delay.
	Open Rollout Limit	E4.2	ERR.087.00	Critical	Cold header plug or inducer cap(s) missing. Flame impingement of burners on flame sharper. Draft inducer is not operating properly. Restricted heat exchanger. Low outlet gas pressure. Gas valve is not fully closing.
Flame Sensed When No Flame Should Be Present (Internal Lockout)	Flame Detected, Should Not Be Present	E5.0	ERR.034.00	Critical	Gas valve not fully closing. Debris in gas valve; no drip led installed. Internal failure of furnace control board. Replace IFC.
Reversed Polarity or Grounding Error	Incoming High Voltage Reversed Polarity	E6.1	ERR.033.00	Normal	Line hot (120V to ground) and line neutral are reversed. Reverse incoming power leads.
	Insufficient / Bad Grounding	E6.2	ERR.088.00	Normal	Furnace ground not connected to earth ground. Chassis grounds not connected or poor connection. Incoming power supply not grounded to main electrical panel.
Igniter Circuit Error	Igniter Relay Failure	E6.3	ERR.010.00	Major	Faulty ignitor. Igniter should read between 35 – 70 ohms (cold). If igniter ohms out good, replace IFC.
	Igniter Open				
External Gas Valve Error (Internal Lockout)	Gas Valve Energized Without Request	E7.1	ERR.093.01	Critical	Shorted wiring in gas valve circuit external to IFC. Incorrect wiring to gas valve. Verify wiring is correct and no shorts exists.
	Redundant Relay (HLO Output) Energized When it Should Be Off	E7.2	ERR.093.04	Critical	Check wiring to MVH for any shorts, replace IFC.

Table 34. Error codes (continued)

Alarm	Alarm Explanation	Error Code	Comm Code	P2 Priority	Possible Causes
Flame Alerts	Flame Current Is Low, But Strong Enough For Operation	E8.0	ERR.004.00	Normal	Verify Vdc on flame sense pads is above 0.75. Flame sensor not properly positioned in flame. Flame sensor wire has high resistance. Low outlet gas pressure causing weak flame. Flame sensor needs to be cleaned or replaced.
	Retry, No Flame Detected	E8.1	ERR.004.01	Normal	Gas valve switch turned off. Air in gas line. Flame sensor not properly positioned in flame. Flame sensor wire has high resistance or bad connection. Low outlet gas pressure. Igniter has failed.
	Recycle, Unexpected Flame Loss	E8.2	ERR.004.02	Normal	Low gas outlet pressure. Flame sensor not properly positioned in flame. Flame sensor needs to be cleaned or replaced. Poor electrical connection to gas valve.
Inducer Limit	Open Inducer Limit Switch	E9.1	ERR.026.02	Major	Excessive temperature rise across heat exchanger. See furnace nameplate for acceptable range. Restricted flue assembly.
Condensate Switch	Open Condensate Switch	E9.2	ERR.026.06	Critical	Common AC / furnace condensate is tripping pressure switch. Relieve static pressure from AC condensate. Condensate line is double trapped. Flue gas condensate backing up into condensate trap.
Condensate Lockout	Condensate Lockout	E9.3	ERR.026.07	Critical	Condensate switch open three (3) times during one call for heat.
VSDI Motor Control Com Err	Communication is lost between the VSDI Motor Control and the furnace control	E10.1	ERR.091.01	Critical	Faulty connection or harness between furnace control board and draft inducer motor control board (VSIM). Verify all wiring is connected, correct and intact. Verify comm voltages (12Vdc on Rx and Tx). Faulty inducer drive board or IFC.
VSDI Max Speed Limit Error	The variable speed inducer has reached its maximum speed limit.	E10.2	ERR.205.00	Normal	Vent restriction, wind into flue, vent length, vent size, vent termination. Transducer voltage fluctuating. Check pressure hose terminations. Flue termination in positive pressure zone.
VSDI Min Speed Limit Error	The variable speed inducer has reached its minimum speed limit.	E10.3	ERR.205.01	Normal	Wind parallel to flue causing suction on flue, flue in negative pressure zone. Check pressure hose connections.
VSDI Control or Motor Failure	The variable speed inducer control board or inducer motor has failed.	E10.4	ERR.091.08	Critical	Confirm all wiring and connections are correct and intact. Check the AC input voltage to the VSIM for proper range (98Vac – 132Vac).
Internal Gas Valve Error	1st Stage Gas Valve Not Energized When It Should Be	E11.1	ERR.093.02	Critical	IFC has failed. Replace IFC.
	Redundant Relay (HLO Output) not Energized when it should be				
	Gas Valve Relay stuck closed	E11.1	ERR.093.04	Critical	Check wiring to MVH for shorts. If none, replace IFC.
	Communication is lost between the gas valve and the furnace control	E11.2	ERR.091.09	Critical	Verify all wiring to between gas valve and IFC is connected, correct and intact. Verify comm voltages (12Vdc on Rx and Tx, 24Vac on TH).
	The gas valve is responding with incorrect position information.	E11.3	ERR.091.10	Critical	Cycle furnace power and retry. Gas valve may be bad. Replace valve, then IFC, if problem persists.
	The gas valve is responding with the incorrect offset information	E11.4	ERR.091.11	Major	Cycle furnace power and retry. Reset the gas valve offsets to zero. Gas valve or IFC may be bad. Replace valve, then IFC, if problem persists.
Open Fuse Error	Open Low Voltage Fuse	E12	ERR.092.00	Critical	Shorted low voltage field wiring. High amp draw in low voltage circuit due to accessories. High resistance in field wiring.
Blower HP / OEM ID Error	HP or OEM ID Does Not Match Furnace Model	E13	ERR.114.02	Critical	Incorrect blower motor horsepower for unit applied. Incorrect model number programmed with IFC replacement. If the blower motor and unit model are correct, replace the blower motor.

Table 34. Error codes (continued)

Alarm	Alarm Explanation	Error Code	Comm Code	P2 Priority	Possible Causes
Configuration Data Error	Configuration File Error	E14	ERR.114.08	Critical	Replacement IFC installed and model number not programmed.
Blower Communication Error	Blower Communication Error on motor, no communication response	E17	ERR.091.00	Critical	IFC not receiving signal from motor on RX. Verify high and low voltage wiring is correct and intact from the IFC to the motor. Replace motor if wiring is correct.
Blower Communication Error	Blower Communication Error on control, communication lost with blower	E18	ERR.171.00	Critical	IFC is not sensing signal on TX of the IFC. Remove 4-pin motor connector from IFC. If error code changes to E17(91.00) replace motor. If error does not change, replace IFC.
Communication Error	Communication Lost Between The ACM and CCM, Modbus Communication Error	E24.1	ERR.091.07	Critical	Replacement IFC installed and model number not programmed. Connect indoor unit to hub and power cycle. If problem still persists, configure indoor control (using technicain app) with correct model number.
Communication Error	CAN Communication Lost	E24.2	ERR.094.00	Critical	ID unit or OD unit is powered down. Check for loose/bad connection between OD / ID unit and System Controller. Cycle power to equipment.
Accelermeter Error	Orientation Sensor Out Of Bounds Or Not Responsive	E25	ERR.161.04	Normal	Sensor failed or damaged. Cycle power and replace IFC if problem persists.
Static Pressure Transducer Error	Static Pressure Transducer Out of Bounds or Not Responsive	E26	ERR.161.03	Normal	Return static pressure transducer enabled but not installed or connected. Verify 5Vdc source voltage with sensor unplugged. Replace transducer if 5Vdc is measured.
Return Air Thermistor Error	Return Air Thermistor Out Of Range Or Configured ON When Not Installed	E27	SOP.004.52	Normal	Sensor is enabled but not installed or connected to IFC. Sensor is open or shorted. 4.99Vdc = Open sensor. 0Vdc = Shorted sensor. Verify 5Vdc source voltage with sensor unplugged. Replace sensor if 5Vdc is measured.
Supply Air Thermistor Error	Supply Air Thermistor Out Of Range Or Configured ON When Not Installed	E28	SOP.004.50	Major	Sensor is enabled but not installed or connected to IFC. Sensor is open or shorted. 4.99Vdc = Open sensor. 0Vdc = Shorted sensor. Verify 5Vdc source voltage with sensor unplugged. Replace sensor if 5Vdc is measured.

Table 35. Pressure transducer voltage - E34 source voltage 5Vdc Pins 1-2 (GR-RD)

E34 Source Voltage 5Vdc Pins 1-2 (GR-RD)	
Cold Header Pressure Inches W. C.	**Transducer Signal Vdc Pins 1-3 (GR-BK @ E18)**
0.00	0.50
0.10	0.60
0.20	0.70
0.30	0.80
0.40	0.90
0.50	1.00
0.60	1.10
0.70	1.20
0.80	1.30
0.90	1.40
1.00	1.50

Table 35. Pressure transducer voltage - E34 source voltage 5Vdc Pins 1-2 (GR-RD) (continued)

E34 Source Voltage 5Vdc Pins 1-2 (GR-RD)	
Cold Header Pressure Inches W. C.	**Transducer Signal Vdc Pins 1-3 (GR-BK @ E18)**
1.10	1.60
1.20	1.70
1.30	1.80
1.40	1.90
1.50	2.00
1.60	2.10
1.70	2.20
1.80	2.30
1.90	2.40
2.00	2.50
2.10	2.60

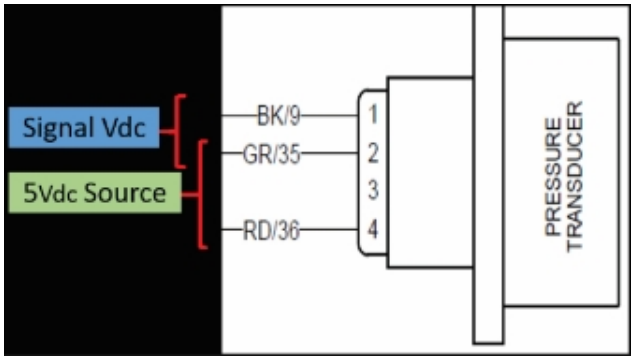
Table 35. Pressure transducer voltage - E34 source voltage 5Vdc Pins 1-2 (GR-RD) (continued)

E34 Source Voltage 5Vdc Pins 1-2 (GR-RD)	
Cold Header Pressure Inches W. C.	**Transducer Signal Vdc Pins 1-3 (GR-BK @ E18)**
2.20	2.70
2.30	2.80
2.40	2.90
2.50	3.00
2.60	3.10
2.70	3.20
2.80	3.30
2.90	3.40
3.00	3.50
3.10	3.60
3.20	3.70
3.30	3.80
3.40	3.90
3.50	4.00
3.60	4.10
3.70	4.20
3.80	4.30
3.90	4.40
4.00	4.50

Notes:

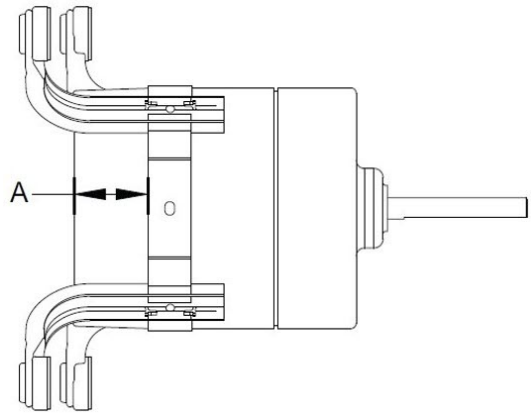
1. OFF = With the inducer off, the pressure transducer voltage should be 0.5Vdc or less
2. Drift Check = During the drift check, the pressure transducer voltage should be ~0.90Vdc when the 0.40 pressure switch closes

Figure 148. Pressure transducer voltage



Belly Band Location

Figure 149. Distance from belly band to the lead end of motor for minimum vibration



Note: *Blower housings and wheel removed from view for clarity.*

Table 36. Regal Rexnord Eon+ motor (D346803P02-P04)

Furnace Cabinet Size	Dimension "A" (inches)
S9VMB060U3 and S9VMB060D3	2.75
S9VMB060U4, S9VMB080U4, and S9VMB080D4	3.54
All C and D	3.79

Table 37. Panasonic V2 motor (D345263P01-P03)

Furnace Cabinet Size	Dimension "A" (inches)
S9VMB060U3 and S9VMB060D3	2.71
S9VMB060U4, S9VMB080U4, and S9VMB080D4	3.42
All C and D	1.79

Sequence of Operation

Accessory terminals 1 and 2 must be configured for electronic air cleaners and humidifiers via the Technician App or the thermostat. Programming through the IFC is an option, however it is not the preferred method.

ACC1 and ACC2 Timing

Note: *When ACC1 or ACC2 has been configured for an Electronic Air Cleaner (EAC) or Humidifier (HUM), the timings below are enforced.*

- EAC relay closes approximately 5 seconds after the blower motor 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 the heating call (HP/Gas) is removed.

Gas Heating – Communicating Mode

1. This furnace is fully modulating between 40% and 100% of capacity in 1% increments. The furnace always lights at ~75% and will modulate up or down; depending on the thermostat control demand. Capacity can be seen in the “Monitor Menu” section of the Technician App and the IFC LED readout.
2. The thermostat signals the furnace IFC for heat.
3. The IFC then checks that all thermal switches are closed.

Note: *On initial power up, power cycle, or 20 gas heating cycles, the IFC will monitor when the pressure switch closes. It then compares the pressure transducer voltage and preforms a “drift check”. Upon a successful drift check, the inducer will momentarily shut down and then begin the heating cycle.*

4. The IFC will ramp the inducer up to speed to light at the 75% firing rate.
5. Once the inducer is up to speed and the combustion pressure is within bounds, the hot surface igniter is turned on.
6. After the 20 second igniter warmup, the communicating gas valve is energized.
7. Trial time for ignition is ~4 seconds.
8. The IFC verifies ignition by the flame current sensing method. If a flame is not detected, the IFC will cycle the furnace three times to try and verify a flame. If no flame is detected, the IFC locks out for one hour.
9. If a flame is detected, the IFC will start the heat exchanger warm-up time delay for the indoor blower.
10. After ~30 seconds, the IFC signals the blower motor to run at the programmed ignition sequence speed.
11. Depending on the capacity requested by the thermostat, the inducer, gas valve, and blower will ramp up or down.
12. The minimum firing rate for all furnaces is 40%.
13. The thermostat will continue to call for the requested capacity demand until the indoor temperature is back at the set point OR,
14. If the thermostat does not detect that the indoor temperature is moving back towards its set point, it will signal the IFC to go to a higher capacity of heat.
15. The thermostat will continue to monitor the indoor temperature and send signals to the IFC to modulate the heating capacity or turn off to maintain the homeowner's set point.
16. Once the thermostat senses that the heating requirements have been satisfied, the gas valve will be de-energized and gas flow will cease. The variable speed inducer will de-energize after a ~5 second post purge. The indoor blower motor will then run the heat off delay that is selected.

24V Mode

1. Operating in 24V mode, the furnace will operate as a two-stage furnace with a standard 24V thermostat.
2. With a W1 call from the thermostat, the IFC checks that all thermal switches are closed.

Note: *On initial power up, power cycle, or 20 every gas heating cycles, the IFC will monitor when the pressure switch closes. It then compares the pressure transducer voltage and preforms a drift check. Upon a successful drift check, the inducer will momentarily shut down and then begin the heating cycle.*

3. The IFC will ramp the inducer up to speed to light at the 75% firing rate.
4. Once the inducer is up to speed and the combustion pressure is within bounds, the hot surface igniter is turned on.
5. After the 20 second igniter warmup, the communicating gas valve is energized.
6. Trial time for ignition is ~4 seconds.
7. The IFC verifies ignition by the flame current sensing method. If a flame is not detected, the IFC will cycle the furnace three times to try and verify a flame. If no flame is detected, the IFC locks out for one hour.
8. If a flame is detected, the IFC starts the heat exchanger warm-up time delay for the indoor blower.
9. After ~30 seconds, the IFC signals the blower motor to run at the programmed ignition sequence speed.

10. The furnace will continue to operate at the 65% firing rate until the temperature setpoint is satisfied at the thermostat.
11. If the indoor temperature continues to fall, the thermostat will call for W2 and the inducer and gas valve will ramp up to the 100% firing rate.
12. Once the indoor temperature warms up, the furnace will either cycle off or drop down to W1 and the 65% firing rate.
13. Once the thermostat senses that the heating requirements have been satisfied, the gas valve will be de-energized and gas flow will cease. The variable speed inducer will de-energize after a ~5 second post purge. The indoor blower motor will then run the heat off delay that is selected.

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.

Notes:

- *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.*
- *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:

Figure 150. Heat exchanger inspection



   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 induced draft Blower connections from recuperative cell and to the flue pipe connection.
   e. Remove burners. (See Step 5.)
   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.

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