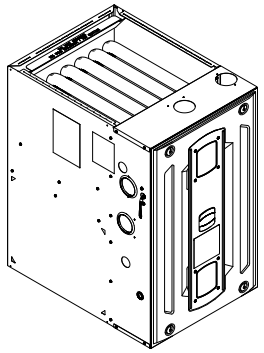
Service Facts

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

Upflow, Convertible to Horizontal Right or Horizontal Left
S9V2B040U3VSAC/D
S9V2B060U3VSAC/D
S9V2B080U4VSAC/D
S9V2C100U4VSAC/D
S9V2D120U5VSAC/D

Downflow Only
S9V2B080D4VSAC/D
S9V2C100D4VSAC/D



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

⚠ CAUTION

COIL REQUIREMENT!

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

S9V2-VS-SF-2B-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.

February 2022 **S9V2-VS-SF-2B-EN**

SAFETY SECTION — FURNACES

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

⚠ WARNING

FIRE OR EXPLOSION HAZARD!

Failure to follow safety warnings exactly could result in a fire or explosion causing property damage, personal injury or loss of life.

— Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. — WHAT TO DO IF YOU SMELL GAS

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

— Installation and service must be performed by a qualified installer, service agency, or the gas supplier.

⚠ WARNING

EXPLOSION HAZARD!

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

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

⚠ WARNING

FIRE OR EXPLOSION HAZARD!

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

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

⚠ WARNING

ELECTRICAL SHOCK, FIRE, OR EXPLOSION HAZARD!

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

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

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

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

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

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

⚠ WARNING

CARBON MONOXIDE HAZARD!

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

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

⚠ WARNING

FIRE HAZARD!

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

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

⚠ WARNING

WARNING!

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

⚠ WARNING

EXPLOSION HAZARD!

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

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

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

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

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

⚠ WARNING

FIRE OR EXPLOSION HAZARD!

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

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

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

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

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

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

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

⚠ WARNING

SAFETY HAZARD!

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

⚠ WARNING

EXPLOSION HAZARD!

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

⚠ WARNING

EXPLOSION HAZARD!

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

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

⚠ WARNING

SAFETY HAZARD!

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

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

⚠ WARNING

INSTALLATION WARNING — HIGH VOLTAGE MOVING PARTS!

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

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

⚠ WARNING

SAFETY HAZARD!

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

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

⚠ WARNING

SAFETY HAZARD!

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

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

⚠ WARNING

CARBON MONOXIDE HAZARD!

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

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

⚠ WARNING

CARBON MONOXIDE HAZARD!

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

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

⚠ WARNING

SHOCK HAZARD!

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

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

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

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

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

⚠ WARNING

OVERHEATING AND EXPLOSION HAZARD!

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

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

⚠ CAUTION

IMPROPER VOLTAGE CONNECTION!

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

⚠ CAUTION

CORROSION WARNING!

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

⚠ CAUTION

SAFETY HAZARD!

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

⚠ CAUTION

SHARP EDGE HAZARD!

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

⚠ CAUTION

BACKUP WRENCH REQUIRED!

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

⚠ CAUTION

FREEZE CAUTION!

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

⚠ CAUTION

FREEZE CAUTION!

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

⚠ CAUTION

FREEZE CAUTION!

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

⚠ CAUTION

FREEZE CAUTION!

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

⚠ CAUTION

IGNITION FUNCTION!

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

⚠ CAUTION

WATER DAMAGE!

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

⚠ CAUTION

HOT SURFACE!

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

⚠ CAUTION

FURNACE SERVICE CAUTION!

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

⚠ CAUTION

DO NOT USE AS CONSTRUCTION HEATER!

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

⚠ CAUTION

WIRING INFORMATION!

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

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

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

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

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

⚠ CAUTION

VENTING REQUIREMENT!

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

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

IMPORTANT – The single wall flue pipe joints must be sealed. The 90° elbow connection to vertical pipe must be sealed to prevent condensate leakage to base of masonry chimney.

⚠ CAUTION

VENTING REQUIREMENT!

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

Condensing furnaces may be vented through UNUSED chimneys. Do NOT run vent through chimney for wood burning or oil Furnaces or incinerators or any other gas appliance.

IMPORTANT – The single wall flue pipe joints must be sealed. The 90° elbow connection to vertical pipe must be sealed to prevent condensate leakage to base of masonry chimney.

⚠ CAUTION

EQUIPMENT DAMAGE!

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

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

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

Coil Caution

⚠ CAUTION

COIL REQUIREMENT!!

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

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

Product Specification

Model	S9V2B040U3VSAC/D [a], [b]	S9V2B060U3VSAC/D [a], [b]	S9V2B080U4VSAC/D [a], [b]
Type	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal
RATINGS [c]			
1st Stage Input BTUH	26,000	39,000	52,000
1st Stage Capacity BTUH (ICS)	25,700	38,450	51,050
2nd Stage Input BTUH	40,000	60,000	80,000
2nd Stage Capacity BTUH (ICS) [d]	39,350	57,700	76,700
1st Stage Temp. Rise (Min. - Max.) °F	25 - 55	25 - 55	30 - 60
2nd Stage Temp. Rise (Min. - Max.) °F	30 - 60	35 - 65	35 - 65
AFUE (%) [d]	97.0	97.0	97.0
Return Air Temp. (Min. - Max.) °F	45°F - 80°F	45°F - 80°F	45°F - 80°F
BLOWER DRIVE	DIRECT	DIRECT	DIRECT
Diameter - Width (in.)	11 X 8	11 X 8	11 X 8
No. Used	1	1	1
Speeds (No.)	Variable	Variable	Variable
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	1/2	1/2	3/4
R.P.M.	Variable	Variable	Variable
Volts / Ph / Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	5.7 / 6.4	5.7 / 6.4	8 / 9.6
COMBUSTION FAN - Type	Variable Speed	Variable Speed	Variable Speed
Drive - No. Speeds	Direct - Variable	Direct - Variable	Direct - Variable
Motor RPM	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
FLA	0.77	0.77	0.77
Inducer Orifice	0.61	0.79	0.96
FILTER - Furnished?	No	No	No
Type Recommended	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.
VENT OUTLET DIAMETER - MIN. (in.) [e]	2 Round	2 Round	2 Round
INLET AIR DIAMETER -MIN. (in.) [e]	2 Round	2 Round	2 Round
HEAT EXCHANGER – Type			
Fired	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel
Unfired	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20	20
ORIFICES - Main			
Nat. Gas (Qty. - Drill Size)	2 - 45	3 - 45	4 - 45

Model	S9V2B040U3VSAC/D [a], [b]	S9V2B060U3VSAC/D [a], [b]	S9V2B080U4VSAC/D [a], [b]
Propane Gas (Qty. - Drill Size)	2 - 56	3 - 56	4 - 56
GAS VALVE	Redundant - Two Stage	Redundant - Two Stage	Redundant - Two Stage
PILOT SAFETY DEVICE – TYPE	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS - TYPE - QTY	Inshot - 2	Inshot - 3	Inshot - 4
POWER CONN. - V/Ph/HZ [f]	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (Amps)	8.1 / 8.9	8.1 / 8.9	10.9 / 12.9
Max. Overcurrent Protection (Amps)	15	15	15
PIPE CONN. SIZE (IN.)	1/2	1/2	1/2

[a] Meets Energy Star
[b] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 - latest edition.
[c] For U.S. Applications, above input ratings (BTUH) are up to 2,000 feet, derate 4% per 1,000 feet for elevations above 2,000 feet above sea level. For Canadian applications, above input ratings (BTUH) are up to 4,500 feet, derate 4% per 1,000 feet for elevations above 4,500 feet above sea level.
[d] Based on U.S. government standard tests.
[e] Refer to Vent Length Table in the Installer's Guide.
[f] The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

Model	S9V2C100U4VSAC/D [a], [b]	S9V2D120U5VSAC/D [a], [b]
Type	Upflow / Horizontal	Upflow / Horizontal
RATINGS [c]		
1st Stage Input BTUH	65,000	78,000
1st Stage Capacity BTUH (ICS)	64,200	77,050
2nd Stage Input BTUH	100,000	120,000
2nd Stage Capacity BTUH (ICS) [d]	97,150	116,250
1st Stage Temp. Rise (Min. - Max.) °F	25 - 55	35 - 65
2nd Stage Temp. Rise (Min. - Max.) °F	35 - 65	40 - 70
AFUE (%) [d]	97.0	97.0
Return Air Temp. (Min. - Max.) °F	45°F - 80°F	45°F - 80°F
BLOWER DRIVE	DIRECT	DIRECT
Diameter - Width (in.)	11 X 10	11 X 10
No. Used	1	1
Speeds (No.)	Variable	Variable
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table
Motor HP	3/4	1
R.P.M.	Variable	Variable
Volts / Ph / Hz	120 / 1 / 60	120 / 1 / 60
FLA	8 / 9.6	10.5 / 10
COMBUSTION FAN - Type	Variable Speed	Variable Speed
Drive - No. Speeds	Direct - Variable	Direct - Variable
Motor RPM	1/50 - 5000	1/50 - 5000
Volts/Ph/Hz	33 - 110 / 3 / 60 - 180	33 - 110 / 3 / 60 - 180
FLA	0.77	0.77

Model	S9V2C100U4VSAC/D [a], [b]	S9V2D120U5VSAC/D [a], [b]
Inducer Orifice	1.05	1.19
FILTER - Furnished?	No	No
Type Recommended	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 - 20 X 25 - 1 in.	1 - 24 X 25 - 1 in.
VENT OUTLET DIAMETER - MIN. (in.) [e]	2 Round	3 Round
INLET AIR DIAMETER -MIN. (in.) [e]	2 Round	3 Round
HEAT EXCHANGER – Type		
Fired	409 Stainless Steel	409 Stainless Steel
Unfired	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20
ORIFICES - Main		
Nat. Gas (Qty. - Drill Size)	5 - 45	6 - 45
Propane Gas (Qty. - Drill Size)	5 - 56	6 - 56
GAS VALVE	Redundant - Two Stage	Redundant - Two Stage
PILOT SAFETY DEVICE – TYPE	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS - TYPE - QTY	Inshot - 5	Inshot - 6
POWER CONN. - V/Ph/HZ [f]	120 / 1 / 60	120 / 1 / 60
Ampacity (Amps)	10.9 / 12.9	14.1 / 13.4
Max. Overcurrent Protection (Amps)	15	15
PIPE CONN. SIZE (IN.)	1/2	1/2

[a] Meets Energy Star
[b] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 - latest edition.
[c] For U.S. Applications, above input ratings (BTUH) are up to 2,000 feet, derate 4% per 1,000 feet for elevations above 2,000 feet above sea level. For Canadian applications, above input ratings (BTUH) are up to 4,500 feet, derate 4% per 1,000 feet for elevations above 4,500 feet above sea level.
[d] Based on U.S. government standard tests.
[e] Refer to Vent Length Table in the Installer's Guide.
[f] The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

Model	S9V2B080D4VSAC/D [a], [b]	S9V2C100D4VSAC/D [a], [b]
Type	Downflow	Downflow
RATINGS [c]		
1st Stage Input BTUH	52,000	65,000
1st Stage Capacity BTUH (ICS)	51,150	64,300
2nd Stage Input BTUH	80,000	100,000
2nd Stage Capacity BTUH (ICS) [d]	76,900	97,071
1st Stage Temp. Rise (Min. - Max.) °F	30 - 60	30 - 60
2nd Stage Temp. Rise (Min. - Max.) °F	35 - 65	35 - 65
AFUE (%) [d]	97.0	97.0
Return Air Temp. (Min. - Max.) °F	45°F - 80°F	45°F - 80°F
BLOWER DRIVE	DIRECT	DIRECT
Diameter - Width (in.)	11 X 8	11 X 10

Model	S9V2B080D4VSAC/D [a], [b]	S9V2C100D4VSAC/D [a], [b]
No. Used	1	1
Speeds (No.)	Variable	Variable
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table
Motor HP	3/4	3/4
R.P.M.	Variable	Variable
Volts / Ph / Hz	120 / 1 / 60	120 / 1 / 60
FLA	8 / 9.6	8 / 9.6
COMBUSTION FAN - Type	Variable Speed	Variable Speed
Drive - No. Speeds	Direct - Variable	Direct - Variable
Motor RPM	1/50 - 5000	1/50 - 5000
Volts/Ph/Hz	33 - 110 / 3 / 60 - 180	33 - 110 / 3 / 60 - 180
FLA	0.77	0.77
Inducer Orifice	0.96	1.05
FILTER - Furnished?	No	No
Type Recommended	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 - 16 X 25 - 1 in.	1 - 20 X 25 - 1 in.
VENT OUTLET DIAMETER - MIN. (in.) [e]	2 Round	2 Round
INLET AIR DIAMETER -MIN. (in.) [e]	2 Round	2 Round
HEAT EXCHANGER – Type		
Fired	409 Stainless Steel	409 Stainless Steel
Unfired	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20
ORIFICES - Main		
Nat. Gas (Qty. - Drill Size)	4 - 45	5 - 45
Propane Gas (Qty. - Drill Size)	4 - 56	5 - 56
GAS VALVE	Redundant - Two Stage	Redundant - Two Stage
PILOT SAFETY DEVICE – TYPE	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS - TYPE - QTY	Inshot - 4	Inshot - 5
POWER CONN. - V/Ph/HZ [f]	120 / 1 / 60	120 / 1 / 60
Ampacity (Amps)	10.9 / 12.9	10.9 / 12.9
Max. Overcurrent Protection (Amps)	15	15
PIPE CONN. SIZE (IN.)	1/2	1/2

[a] Meets Energy Star
[b] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 - latest edition.
[c] For U.S. Applications, above input ratings (BTUH) are up to 2,000 feet, derate 4% per 1,000 feet for elevations above 2,000 feet above sea level. For Canadian applications, above input ratings (BTUH) are up to 4,500 feet, derate 4% per 1,000 feet for elevations above 4,500 feet above sea level.
[d] Based on U.S. government standard tests.
[e] Refer to Vent Length Table in the Installer's Guide.
[f] The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

Sequence of Operation

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

1st Stage Gas Heating

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

      Note: *Downflow units will have one reverse air flow switch (RAF).*
      Upflow units will have two reverse air flow switches (RAF).

   c. Pressure switch 1 (PS1) and pressure switch 2 (PS2) are opened by sending 24VAC out the HLO terminal, through the limit switches, and monitoring the PS1 and PS2 inputs.

      Note: *If a thermal limit is open, 24VAC <u>will not</u> be present at either pressure switch.*
3. After steps 2a, b, and c are confirmed, the variable speed inducer is energized and will run at the predetermined factory default 1st stage inducer speed. As the inducer ramps up, PS1 will close.
4. When PS1 closes, the ignitor relay on the IFC will close. The ignitor is energized and warm up is approximately 20 seconds.
5. After the ignitor warm up, the 1st stage gas valve relay is closed, energizing the 1st stage gas valve solenoid to allow ignition.
6. The first burner will ignite and flame will crossover to the remaining burners, establishing current to the flame sensor. Flame sensing must take place within 4 seconds.
7. Once flame sense has been achieved, a timer on the IFC starts and after the "Blower On" delay has completed, the indoor blower will energize and run at the 1st stage gas heating speed.
   - During this time, the variable speed inducer will start its 1st stage learning routine, seen as Lr 1 on the seven segment LED display. HE 1 and Lr 1 will alternately be displayed until the learning routine has been successfully completed. See <u>Learning Routine</u> section below for specifics.
8. Once the 1st stage learning routine has successfully been achieved, the seven segment LED will alternately read:

   HE1 = Gas heating, Stage 1

   ArF = Airflow

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

2nd Stage Gas Heating

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

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

      Note: *Downflow units will have one reverse air flow switch (RAF).*
      Upflow units will have two reverse air flow switches (RAF).

   c. Pressure switch 1 (PS1) and pressure switch 2 (PS2) are opened by sending 24VAC out the HLO terminal, through the limit switches, and monitoring the PS1 and PS2 inputs.

      Note: *If a thermal limit is open, 24VAC <u>will not</u> be present at either pressure switch.*
3. After steps 2a, b, and c are confirmed, the variable speed inducer is energized and will run at the predetermined factory default 1st stage inducer speed. As the inducer ramps up, PS1 will close.
4. When PS1 closes, the ignitor relay on the IFC will close. The ignitor is energized and warm up is approximately 20 seconds.

5. After the ignitor warm up, the 1st stage gas valve relay is closed, energizing the 1st stage gas valve solenoid to allow ignition.
6. The first burner will ignite and flame will crossover to the remaining burners, establishing current to the flame sensor. Flame sensing must take place within 4 seconds.
7. Once flame sense has been achieved, a timer on the IFC starts and after the "Blower On" delay has completed, the indoor blower will energize and run at the 1st stage gas heating speed.
   - During this time, the variable speed inducer will start its 1st stage learning routine, seen as Lr 1 on the seven segment LED display. Ht 1 and Lr 1 will alternately be displayed until the learning routine has been successfully completed. See Learning Routine section below for specifics.
8. Once the 1st stage learning routine has successfully been achieved, the seven segment LED will alternately read:

   Ht1 = Gas heating, Stage 1

   ArF = Airflow

   060 = 600 calculated cfm (value shown x 10)
9. R-W2 contacts close on the thermostat sending 24VAC to the W2 low voltage terminal of the IFC. Technician should read 24VAC from W2 to B/C. The seven segment LED will read "Ht2".
10. The IFC checks to insure that PS2 is open and the inducer is ramped up to the predetermined factory default 2nd stage speed, closing PS2 pressure switch. The second stage gas valve relay on the IFC closes, energizing second stage gas valve. The indoor blower motor will ramp up to the 2nd stage gas heating speed.
    - During this time, the variable speed inducer will start its 2nd stage learning routine, seen as Lr2 on the seven segment LED display. Ht2 and Lr2 will alternately be displayed until the learning routine has been successfully completed. See Learning Routine section below for specifics
11. Once the the 2nd stage learning routine has successfully been completed, the seven segment LED will alternately read:

    Ht2 = Gas heating, Stage 2

    ArF = Airflow

    123 = 1230 calculated cfm (value shown x 10)
12. When the temperature raises enough to satisfy the thermostat setting, contacts R-W2 will open, 2nd stage gas valve will close, the indoor blower motor will ramp down to 1st stage, and the unit will continue to run until R-W1 contacts open.
13. When the temperature raises enough to satisfy the thermostat setting, contacts R-W1 will open.
14. The gas valve relay will open, closing the gas valve. The inducer will continue to run for approximately 5 seconds to remove any combustion byproducts from inside the furnace.
15. The indoor blower continues to run to remove heat from the heat exchangers. This blower off time is field adjustable through the IFC menu setup option. The seven segment LED will read "Idl" = Idle, no thermostat demand.

Single Stage Cooling

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

   Note: *Factory supplied Y1-O jumper must remain in place for proper seven segment LED readout. If removed, seven segment LED will read "HP 1".*
2. 24VAC is sent to the OD unit via thermostat wiring.
3. The indoor blower ramps to the cooling airflow. The seven segment LED for example will alternately read:

   CL 1 = Cooling, Stage 1

   ArF = Airflow

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

Two Stage Cooling

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

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

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

   CL 1 = Cooling, Stage 1

   ArF = Airflow

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

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

   CL2 = Cooling, Stage 2

   ArF = Airflow

   160 = 1600 calculated cfm (value shown x 10)

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

Variable Speed Inducer Learning Routine

The purpose of the learning routine is to determine the most efficient inducer operating speed for the furnace in a given heat stage. On a call for gas heat, or transition to a given gas heat stage, the inducer is commanded to a speed in order to close the pressure switch for that stage.

Note: *NOTE: Gas manifold measurements or adjustments must not be made until the learning routine for each stage has been successfully completed.*

There are two learning routines, one for 1st stage gas heat and another for 2nd stage gas heat. Each learning routine is separate and will occur:

1. Upon initial commissioning of the furnace
2. When power to the furnace has been interrupted
3. After the below number of heating cycles has been reached
   a. 150 1st stage cycles
   b. 100 2nd stage cycles

1st Stage Heat

1. When 1st stage gas heat is requested, the variable speed inducer is energized and will run at the predetermined factory default 1st stage inducer speed. Once the ignition process and the blower on delay have successfully completed the IFC will begin the Inducer Learning Routine as outlined below

   PS1 closes at default speed

   a. The inducer speed is reduced every 2 seconds until PS1 opens
   b. At the time PS1 opens, the IFC stores the inducer RPM
   c. The inducer RPM is then raised every 3 seconds to re-close PS1. Upon PS1 closing, the IFC has now learned the most efficient inducer speed for 1st stage gas heat operation.

   PS1 does not close at default speed

   The IFC will increase the speed of the inducer until:

   a. The maximum RPM for 1st stage gas heat is reached
   b. Or PS1 closes

      Once PS1 closes, the learning routine will begin as stated above.

2nd Stage Heat

1. When 2nd stage gas heat is requested, the variable speed inducer will run at the predetermined factory default 2nd stage inducer speed.

   PS2 closes at default speed

   a. The inducer speed is reduced every 2 seconds until PS2 opens
   b. At the time PS2 opens, the IFC stores the inducer RPM
   c. The inducer RPM is then raised every 3 seconds to re-close PS2. Upon PS2 closing, the IFC has now learned the most efficient inducer speed for 2nd stage gas heat operation.

   PS2 does not close at default speed

   The IFC will increase the speed of the inducer until:

   a. The maximum RPM for 2nd stage gas heat is reached
   b. Or PS2 closes

      Once PS2 closes, the learning routine will begin as stated above. If PS2 does not close after reaching the maximum RPM, a PS2 open error will be reported and the furnace will continue to run in 1st stage for 10 minutes and retry 2nd stage. This process will repeat until the request for 2nd stage heat is removed.

Periodic Servicing Requirements

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

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

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

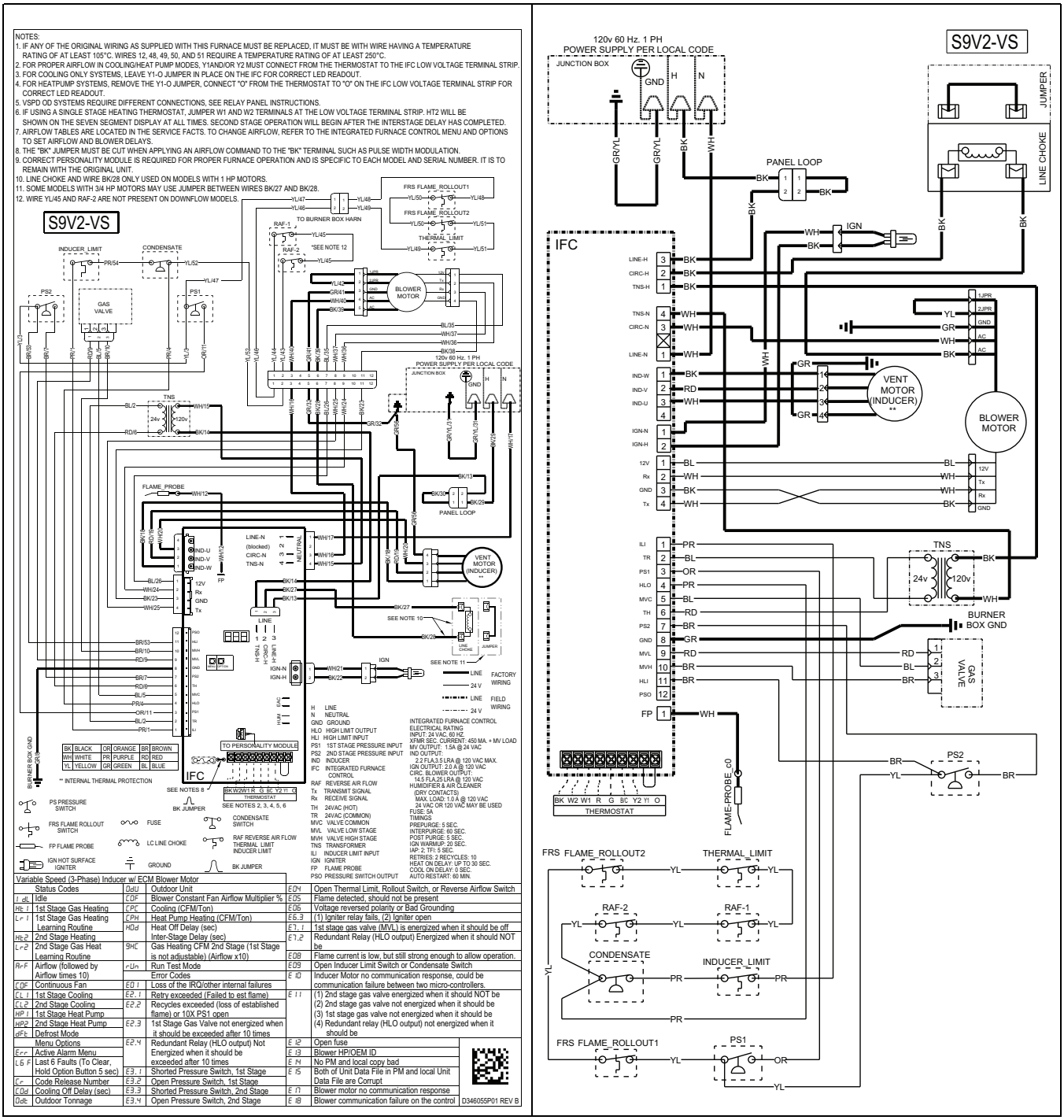
Clean burners with brush and/ or vacuum cleaner. Reassemble parts by reversal of the above procedure.

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

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

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

S9V2–VS Wiring Diagram



Heating and Cooling Airflow Tables

Table 1. S9V2B040U3VSAC Heating Airflow

S9V2B040U3VSAC Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 25,700 2nd Stage Capacity = 39,350				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	468	CFM	468	452	437	421	406
			Temp. Rise	49	51	54	56	58
			Watts	27	58	90	121	152
	Medium Low	598	CFM	552	600	647	694	741
			Temp. Rise	43	39	36	32	28
			Watts	41	76	112	147	183
	Medium [a]	634	CFM	583	635	687	739	791
			Temp. Rise	39	36	33	30	27
			Watts	48	83	118	153	189
	High	1008	CFM	930	905	879	853	828
			Temp. Rise	25	25	26	27	27
			Watts	125	178	232	285	339
Heating 2nd Stage	Low	650	CFM	633	636	639	643	646
			Temp. Rise	57	57	57	56	56
			Watts	48	92	135	179	223
	Medium Low	830	CFM	760	786	813	840	866
			Temp. Rise	48	46	45	43	41
			Watts	82	132	182	232	282
	Medium [a]	880	CFM	792	817	842	867	892
			Temp. Rise	44	44	43	43	42
			Watts	94	142	189	237	284
	High	1400	CFM	1337	1269	1200	1132	1063
			Temp. Rise	27	29	31	32	34
			Watts	335	376	417	458	499

[a] Factory Setting.

Table 2. S9V2B040U3VSAD Heating Airflow

S9V2B040U3VSAD Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 25,700 2nd Stage Capacity = 39,350				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	468	CFM	468	452	437	421	406
			Temp. Rise	49	51	54	56	58
			Watts	27	58	90	121	152
	Medium Low	598	CFM	552	600	647	694	741
			Temp. Rise	43	39	36	32	28
			Watts	41	76	112	147	183
	Medium [a]	634	CFM	583	635	687	739	791
			Temp. Rise	39	36	33	30	27
			Watts	48	83	118	153	189
	High	864	CFM	753	786	818	850	883
			Temp. Rise	30	29	28	27	26
			Watts	87	129	171	214	256
Heating 2nd Stage	Low	650	CFM	633	636	639	643	646
			Temp. Rise	57	57	57	56	56
			Watts	48	92	135	179	223
	Medium Low	830	CFM	760	786	813	840	866
			Temp. Rise	48	46	45	43	41
			Watts	82	132	182	232	282
	Medium [a]	880	CFM	792	817	842	867	892
			Temp. Rise	44	44	43	43	42
			Watts	94	142	189	237	284
	High	1200	CFM	1023	1044	1066	1088	1109
			Temp. Rise	34	34	33	33	32
			Watts	192	251	310	369	428

[a] Factory Setting.

Table 3. S9V2B040U3VSAC/D Cooling Airflow

S9V2B040U3VSAC/D Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	1.5 Ton	Cooling 450 CFM/Ton	CFM	675	675	675	675	675
			Watts	47	81	121	166	215
		Cooling 420 CFM/Ton	CFM	630	630	630	630	630
			Watts	40	72	111	154	202
		Cooling 400 CFM/Ton	CFM	600	600	600	600	600
			Watts	36	67	105	147	193
		Cooling 370 CFM/Ton	CFM	555	555	555	555	555
			Watts	30	60	96	136	181
		Cooling 350 CFM/Ton	CFM	525	525	525	525	525
			Watts	27	56	90	130	174
		Cooling 330 CFM/Ton	CFM	495	495	495	495	495
			Watts	24	51	85	124	167
		Cooling 310 CFM/Ton	CFM	465	465	465	465	465
			Watts	21	48	80	118	161
		Cooling 290 CFM/Ton	CFM	435	435	435	435	435
			Watts	19	44	76	113	155
Cooling	2.0 Ton	Cooling 450 CFM/Ton	CFM	900	900	900	900	900
			Watts	94	137	186	240	298
		Cooling 420 CFM/Ton	CFM	840	840	840	840	840
			Watts	79	120	166	218	273
		Cooling 400 CFM/Ton	CFM	800	800	800	800	800
			Watts	70	109	154	204	258
		Cooling 370 CFM/Ton	CFM	740	740	740	740	740
			Watts	58	95	138	185	236
		Cooling 350 CFM/Ton	CFM	700	700	700	700	700
			Watts	51	86	127	173	223
		Cooling 330 CFM/Ton	CFM	660	660	660	660	660
			Watts	44	78	118	162	211
		Cooling 310 CFM/Ton	CFM	620	620	620	620	620
			Watts	38	71	109	152	199
		Cooling 290 CFM/Ton	CFM	580	580	580	580	580
			Watts	33	64	101	142	188
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1125	1125	1125	1125	1125
			Watts	167	219	278	341	408
		Cooling 420 CFM/Ton	CFM	1050	1050	1050	1050	1050
			Watts	139	188	244	304	368
		Cooling 400 CFM/Ton	CFM	1000	1000	1000	1000	1000
			Watts	123	170	223	281	343
		Cooling 370 CFM/Ton	CFM	925	925	925	925	925
			Watts	100	145	195	250	308
		Cooling 350 CFM/Ton	CFM	875	875	875	875	875
			Watts	87	129	178	230	287
		Cooling 330 CFM/Ton	CFM	825	825	825	825	825
			Watts	121	160	205	254	308
		Cooling 310 CFM/Ton	CFM	775	775	775	775	775
			Watts	101	139	182	229	281
		Cooling 290 CFM/Ton	CFM	725	725	725	725	725
			Watts	88	123	164	210	260
Cooling	3.0 Ton [a]	Cooling 450 CFM/Ton	CFM	1350	1350	1350	1298	1198
			Watts	272	334	402	440	450
		Cooling 420 CFM/Ton	CFM	1260	1260	1260	1260	1198
			Watts	226	284	348	417	450
		Cooling 400 CFM/Ton	CFM	1200	1200	1200	1200	1198
			Watts	198	254	315	381	450
		Cooling 370 CFM/Ton	CFM	1110	1110	1110	1110	1110
			Watts	161	213	271	333	399
		Cooling 350 CFM/Ton [a]	CFM	1050	1050	1050	1050	1050
			Watts	139	188	244	304	368
		Cooling 330 CFM/Ton	CFM	990	990	990	990	990
			Watts	119	166	219	277	338
		Cooling 310 CFM/Ton	CFM	930	930	930	930	930
			Watts	102	146	197	252	311
		Cooling 290 CFM/Ton	CFM	870	870	870	870	870
			Watts	86	128	176	229	285

[a] Factory Setting.

Table 4. S9V2B060U3VSAC/D Heating Airflow

S9V2B060U3VSAC/D Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 38,450 2nd Stage Capacity = 57,700				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	632	CFM	660	658	656	654	652
			Temp. Rise	53	53	53	53	54
			Watts	48	85	121	157	193
	Medium Low [a]	814	CFM	860	856	852	848	844
			Temp. Rise	41	41	42	42	43
			Watts	91	128	164	200	236
	Medium	893	CFM	900	899	898	897	896
			Temp. Rise	39	39	39	39	39
			Watts	110	147	183	219	255
	High	1027	CFM	1068	1061	1054	1047	1041
			Temp. Rise	33	33	33	33	33
			Watts	165	202	239	276	313
Heating 2nd Stage	Low	800	CFM	851	843	835	826	818
			Temp. Rise	64	64	64	64	64
			Watts	81	127	172	218	264
	Medium Low [a]	1030	CFM	1092	1075	1057	1039	1022
			Temp. Rise	49	50	50	51	52
			Watts	157	209	262	314	366
	Medium	1130	CFM	1132	1128	1124	1119	1115
			Temp. Rise	47	47	48	48	48
			Watts	201	255	308	362	416
	High	1300	CFM	1280	1281	1282	1283	1283
			Temp. Rise	42	42	42	42	42
			Watts	319	365	410	456	502

[a] Factory Setting.

Table 5. S9V2B060U3VSAC/D Cooling Airflow

S9V2B060U3VSAC/D Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	1.5 Ton	Cooling 450 CFM/Ton	CFM	663	673	666	641	596
			Watts	47	83	119	155	192
		Cooling 420 CFM/Ton	CFM	621	630	621	595	549
			Watts	41	75	109	144	180
		Cooling 400 CFM/Ton	CFM	582	580	566	528	507
			Watts	36	67	99	130	170
		Cooling 370 CFM/Ton	CFM	549	556	546	517	469
			Watts	32	63	95	128	162
		Cooling 350 CFM/Ton	CFM	521	527	516	486	437
			Watts	29	59	90	122	156
		Cooling 330 CFM/Ton	CFM	492	497	486	455	405
			Watts	26	55	85	117	150
		Cooling 310 CFM/Ton	CFM	463	468	455	423	372
			Watts	23	51	81	112	145
		Cooling 290 CFM/Ton	CFM	435	438	424	391	339
			Watts	21	48	77	107	141
Cooling	2.0 Ton	Cooling 450 CFM/Ton	CFM	878	893	890	869	829
			Watts	90	135	179	223	266
		Cooling 420 CFM/Ton	CFM	821	834	830	808	767
			Watts	76	119	161	202	244
		Cooling 400 CFM/Ton	CFM	770	778	770	742	725
			Watts	66	105	144	182	230
		Cooling 370 CFM/Ton	CFM	725	737	731	707	664
			Watts	57	96	134	172	211
		Cooling 350 CFM/Ton	CFM	687	698	691	666	622
			Watts	51	88	124	161	199
		Cooling 330 CFM/Ton	CFM	649	659	651	625	580
			Watts	45	80	115	151	188
		Cooling 310 CFM/Ton	CFM	611	620	611	584	538
			Watts	39	73	107	142	177
		Cooling 290 CFM/Ton	CFM	573	581	571	543	496
			Watts	34	67	99	133	168

Table 5. S9V2B060U3VSAC/D Cooling Airflow (continued)

S9V2B060U3VSAC/D Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1097	1114	1114	1097	1061
			Watts	159	212	265	317	368
		Cooling 420 CFM/Ton	CFM	1023	1040	1039	1020	984
			Watts	133	184	233	282	331
		Cooling 400 CFM/Ton	CFM	976	989	990	970	932
			Watts	117	166	214	261	308
		Cooling 370 CFM/Ton	CFM	902	917	915	894	855
			Watts	97	142	187	232	276
		Cooling 350 CFM/Ton	CFM	854	868	865	843	803
			Watts	84	128	171	214	257
		Cooling 330 CFM/Ton	CFM	806	819	815	793	752
			Watts	73	115	157	198	239
		Cooling 310 CFM/Ton	CFM	759	771	766	742	700
			Watts	63	103	143	182	222
		Cooling 290 CFM/Ton	CFM	711	722	716	692	648
			Watts	55	93	130	168	206
Cooling	3.0 Ton [a]	Cooling 450 CFM/Ton	CFM	1319	1340	1343	1328	1295
			Watts	260	321	382	441	501
		Cooling 420 CFM/Ton	CFM	1229	1249	1251	1235	1201
			Watts	215	274	331	387	443
		Cooling 400 CFM/Ton	CFM	1170	1189	1190	1173	1139
			Watts	189	245	300	354	408
		Cooling 370 CFM/Ton	CFM	1082	1100	1099	1081	1046
			Watts	154	206	258	309	360
		Cooling 350 CFM/Ton [a]	CFM	1023	1040	1039	1020	984
			Watts	133	184	233	282	331
		Cooling 330 CFM/Ton	CFM	965	981	979	960	922
			Watts	114	163	210	257	304
		Cooling 310 CFM/Ton	CFM	907	922	919	899	860
			Watts	98	144	189	234	278
		Cooling 290 CFM/Ton	CFM	850	863	860	838	798
			Watts	83	127	170	212	255

[a] Factory Setting.

Table 6. S9V2B080U4VSAC/D Heating Airflow

S9V2B080U4VSAC/D Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 51,050 2nd Stage Capacity = 76,700				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	864	CFM	860	849	838	827	816
			Temp. Rise	54	55	56	57	58
			Watts	87	125	163	200	238
	Medium Low [a]	907	CFM	907	893	879	865	852
			Temp. Rise	51	52	53	54	54
			Watts	97	135	174	212	251
	Medium	958	CFM	957	930	903	876	849
			Temp. Rise	49	50	51	52	53
			Watts	112	153	194	234	275
	High	1051	CFM	1042	1015	989	962	936
			Temp. Rise	45	46	47	47	48
			Watts	140	182	225	267	310
Heating 2nd Stage	Low	1200	CFM	1211	1206	1201	1197	1192
			Temp. Rise	60	60	60	60	60
			Watts	196	248	300	352	404
	Medium Low [a]	1260	CFM	1258	1261	1263	1265	1268
			Temp. Rise	58	57	57	57	57
			Watts	215	271	326	381	436
	Medium	1330	CFM	1307	1303	1299	1296	1292
			Temp. Rise	55	55	55	55	55
			Watts	260	312	364	416	468
	High	1460	CFM	1431	1412	1393	1374	1355
			Temp. Rise	50	51	52	52	53
			Watts	334	390	445	501	557

[a] Factory Setting.

Table 7. S9V2B080D4VSAC/D Heating Airflow

S9V2B080D4VSAC/D Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 51,150 2nd Stage Capacity = 76,900				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	864	CFM	780	776	772	768	764
			Temp. Rise	60	60	61	61	61
			Watts	94	135	176	216	257
	Medium Low	907	CFM	807	811	814	818	822
			Temp. Rise	57	57	58	58	58
			Watts	101	151	201	252	302
	Medium [a]	958	CFM	862	862	862	861	861
			Temp. Rise	54	54	54	54	54
			Watts	117	168	219	271	322
	High	1066	CFM	977	963	949	934	920
			Temp. Rise	48	49	50	51	52
			Watts	128	179	230	281	332
Heating 2nd Stage	Low	1200	CFM	1111	1104	1096	1088	1081
			Temp. Rise	66	66	66	66	66
			Watts	204	260	317	373	429
	Medium Low	1260	CFM	1193	1201	1209	1217	1225
			Temp. Rise	59	59	59	59	59
			Watts	232	296	360	424	488
	Medium [a]	1330	CFM	1217	1217	1216	1215	1215
			Temp. Rise	58	58	58	58	59
			Watts	273	335	396	457	518
	High	1480	CFM	1342	1328	1313	1299	1284
			Temp. Rise	53	54	55	56	56
			Watts	329	389	448	508	567

[a] Factory Setting.

Table 8. S9V2B080U4VSAC/D / S9V2B080D4VSAC/D Cooling Airflow

S9V2B080U4VSAC/D / S9V2B080D4VSAC/D Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2.0 Ton	Cooling 450 CFM/Ton	CFM	892	899	893	872	838
			Watts	91	136	180	222	265
		Cooling 420 CFM/Ton	CFM	834	841	834	813	777
			Watts	77	120	161	202	243
		Cooling 400 CFM/Ton	CFM	785	785	781	754	737
			Watts	67	106	146	183	229
		Cooling 370 CFM/Ton	CFM	738	744	736	714	677
			Watts	58	97	134	172	210
		Cooling 350 CFM/Ton	CFM	700	705	697	675	638
			Watts	52	89	125	161	198
		Cooling 330 CFM/Ton	CFM	662	666	658	635	598
			Watts	46	81	116	151	187
		Cooling 310 CFM/Ton	CFM	624	627	619	596	558
			Watts	40	74	107	142	177
		Cooling 290 CFM/Ton	CFM	585	588	580	557	518
			Watts	35	67	100	133	168
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1108	1120	1116	1098	1065
			Watts	159	213	265	315	365
		Cooling 420 CFM/Ton	CFM	1035	1046	1041	1022	989
			Watts	133	184	233	281	328
		Cooling 400 CFM/Ton	CFM	988	997	992	972	938
			Watts	118	167	214	260	306
		Cooling 370 CFM/Ton	CFM	916	924	918	897	863
			Watts	97	143	188	231	275
		Cooling 350 CFM/Ton	CFM	868	875	868	848	813
			Watts	85	129	172	213	255
		Cooling 330 CFM/Ton	CFM	820	826	819	798	762
			Watts	74	116	157	197	237
		Cooling 310 CFM/Ton	CFM	772	778	770	749	712
			Watts	64	104	143	182	221
		Cooling 290 CFM/Ton	CFM	724	729	721	699	663
			Watts	56	94	131	168	205
Cooling	3.0 Ton	Cooling 450 CFM/Ton	CFM	1326	1341	1341	1325	1296
			Watts	257	320	380	439	497
		Cooling 420 CFM/Ton	CFM	1239	1252	1250	1234	1203
			Watts	214	273	330	385	440
		Cooling 400 CFM/Ton	CFM	1181	1193	1191	1173	1142
			Watts	188	245	299	353	405
		Cooling 370 CFM/Ton	CFM	1094	1105	1101	1083	1050
			Watts	153	207	258	308	358
		Cooling 350 CFM/Ton	CFM	1036	1046	1041	1022	989
			Watts	133	184	233	281	329
		Cooling 330 CFM/Ton	CFM	978	987	982	962	928
			Watts	115	164	210	256	302
		Cooling 310 CFM/Ton	CFM	920	929	923	902	868
			Watts	99	145	189	233	277
		Cooling 290 CFM/Ton	CFM	863	870	863	843	807
			Watts	84	128	170	212	253
Cooling	4.0 Ton [a]	Cooling 450 CFM/Ton	CFM	1769	1791	1797	1789	1766
			Watts	570	648	725	799	873
		Cooling 420 CFM/Ton	CFM	1650	1670	1675	1664	1639
			Watts	469	544	616	686	756
		Cooling 400 CFM/Ton	CFM	1571	1590	1593	1582	1555
			Watts	410	481	550	618	685
		Cooling 370 CFM/Ton	CFM	1453	1470	1472	1458	1430
			Watts	330	397	462	526	588
		Cooling 350 CFM/Ton [a]	CFM	1375	1391	1391	1376	1347
			Watts	284	348	410	471	530
		Cooling 330 CFM/Ton	CFM	1297	1312	1311	1295	1265
			Watts	242	303	363	420	477
		Cooling 310 CFM/Ton	CFM	1219	1233	1230	1214	1183
			Watts	205	263	319	374	428
		Cooling 290 CFM/Ton	CFM	1142	1154	1151	1133	1101
			Watts	172	227	280	332	384

[a] Factory Setting.

Table 9. S9V2C100U4VSAC/D Heating Airflow

S9V2C100U4VSAC/D Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 64,200 2nd Stage Capacity = 97,150				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	1146	CFM	1132	1120	1108	1097	1085
			Temp. Rise	52	52	52	52	53
			Watts	139	192	246	299	352
	Medium Low	1280	CFM	1265	1251	1237	1223	1209
			Temp. Rise	46	47	47	48	48
			Watts	187	239	291	343	395
	Medium	1359	CFM	1291	1269	1248	1226	1205
			Temp. Rise	45	46	46	47	47
			Watts	211	272	332	393	454
	High [a]	1446	CFM	1401	1404	1408	1412	1415
			Temp. Rise	41	41	41	41	41
			Watts	255	311	367	423	479
Heating 2nd Stage	Low	1450	CFM	1421	1416	1412	1408	1404
			Temp. Rise	63	63	63	63	63
			Watts	272	336	401	466	531
	Medium Low	1620	CFM	1620	1611	1602	1593	1584
			Temp. Rise	55	55	55	56	56
			Watts	354	424	493	562	631
	Medium	1720	CFM	1646	1643	1640	1638	1635
			Temp. Rise	53	54	54	54	54
			Watts	408	484	559	635	711
	High [a]	1830	CFM	1805	1787	1768	1749	1731
			Temp. Rise	49	50	50	51	51
			Watts	525	579	633	687	741

[a] Factory Setting.

Table 10. S9V2C100D4VSAC/D Heating Airflow

S9V2C100D4VSAC/D Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 64,300 2nd Stage Capacity = 97,071				
Heating	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Heating 1st Stage	Low	1080	CFM	1068	1048	1029	1009	989
			Temp. Rise	55	57	60	63	66
			Watts	101	151	201	251	301
	Medium Low	1166	CFM	1158	1113	1068	1023	978
			Temp. Rise	51	53	55	57	59
			Watts	115	172	229	285	342
	Medium [a]	1318	CFM	1326	1272	1218	1164	1111
			Temp. Rise	46	48	50	51	53
			Watts	153	206	259	312	365
	High	1361	CFM	1312	1270	1229	1188	1147
			Temp. Rise	46	47	47	48	49
			Watts	166	221	276	331	387
Heating 2nd Stage	Low	1500	CFM	1514	1478	1441	1404	1367
			Temp. Rise	58	60	61	63	64
			Watts	223	297	370	443	516
	Medium Low	1620	CFM	1620	1588	1556	1523	1491
			Temp. Rise	55	56	57	58	59
			Watts	276	345	415	484	553
	Medium [a]	1830	CFM	1768	1746	1724	1702	1620
			Temp. Rise	50	51	52	53	53
			Watts	372	446	520	594	668
	High	1890	CFM	1810	1783	1756	1729	1702
			Temp. Rise	49	50	51	52	52
			Watts	405	476	548	677	695

[a] Factory Setting.

Table 11. S9V2C100U4VSAC/D / S9V2C100D4VSAC/D Cooling Airflow

S9V2C100U4VSAC/D / S9V2C100D4VSAC/D Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter (iwc)								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2.5 Ton	Cooling 450 CFM/Ton	CFM	1153	1149	1147	1145	1141
			Watts	111	159	208	260	314
		Cooling 420 CFM/Ton	CFM	1077	1073	1071	1068	1064
			Watts	94	138	185	235	287
		Cooling 400 CFM/Ton	CFM	1061	1057	1054	1044	1021
			Watts	90	134	180	227	273
		Cooling 370 CFM/Ton	CFM	950	945	942	939	935
			Watts	69	109	151	197	246
		Cooling 350 CFM/Ton	CFM	899	893	890	887	882
			Watts	60	98	140	184	232
		Cooling 330 CFM/Ton	CFM	848	841	838	835	830
			Watts	53	89	129	172	219
		Cooling 310 CFM/Ton	CFM	796	789	786	782	777
			Watts	46	80	119	161	208
		Cooling 290 CFM/Ton	CFM	745	737	733	729	724
			Watts	39	72	110	151	198
Cooling	3.0 Ton	Cooling 450 CFM/Ton	CFM	1378	1376	1374	1372	1368
			Watts	178	234	292	352	413
		Cooling 420 CFM/Ton	CFM	1289	1286	1284	1282	1277
			Watts	149	201	256	312	371
		Cooling 400 CFM/Ton	CFM	1228	1225	1223	1221	1217
			Watts	131	181	234	288	345
		Cooling 370 CFM/Ton	CFM	1138	1134	1132	1130	1125
			Watts	108	154	203	255	309
		Cooling 350 CFM/Ton	CFM	1077	1073	1071	1068	1064
			Watts	94	138	185	235	287
		Cooling 330 CFM/Ton	CFM	1016	1011	1009	1006	1002
			Watts	81	123	168	216	266
		Cooling 310 CFM/Ton	CFM	955	950	947	944	940
			Watts	70	110	153	199	248
		Cooling 290 CFM/Ton	CFM	894	888	885	882	877
			Watts	59	97	138	183	231
Cooling	3.5 Ton	Cooling 450 CFM/Ton	CFM	1601	1599	1597	1594	1590
			Watts	269	334	401	469	539
		Cooling 420 CFM/Ton	CFM	1498	1496	1494	1491	1487
			Watts	224	284	347	411	477
		Cooling 400 CFM/Ton	CFM	1428	1426	1424	1422	1417
			Watts	196	254	314	376	439
		Cooling 370 CFM/Ton	CFM	1324	1321	1319	1317	1313
			Watts	160	214	270	327	387
		Cooling 350 CFM/Ton	CFM	1253	1251	1249	1246	1242
			Watts	138	190	243	298	355
		Cooling 330 CFM/Ton	CFM	1183	1180	1178	1175	1171
			Watts	119	167	218	271	326
		Cooling 310 CFM/Ton	CFM	1112	1109	1107	1104	1100
			Watts	102	147	196	246	299
		Cooling 290 CFM/Ton	CFM	1041	1037	1035	1032	1028
			Watts	86	129	175	223	275
Cooling	4.0 Ton [a]	Cooling 450 CFM/Ton	CFM	1820	1819	1816	1812	1807
			Watts	388	462	538	615	693
		Cooling 420 CFM/Ton	CFM	1704	1702	1700	1697	1692
			Watts	321	390	461	533	607
		Cooling 400 CFM/Ton	CFM	1626	1624	1622	1619	1614
			Watts	281	347	415	484	554
		Cooling 370 CFM/Ton	CFM	1507	1505	1504	1501	1497
			Watts	228	289	352	417	482
		Cooling 350 CFM/Ton [a]	CFM	1428	1426	1424	1422	1417
			Watts	196	254	314	376	439
		Cooling 330 CFM/Ton	CFM	1348	1346	1344	1342	1338
			Watts	168	223	280	338	399
		Cooling 310 CFM/Ton	CFM	1268	1266	1264	1261	1257
			Watts	143	195	248	304	362
		Cooling 290 CFM/Ton	CFM	1188	1185	1183	1180	1176
			Watts	120	169	220	273	328

[a] Factory Setting.

Table 12. S9V2D120U5VSAC/D Heating Airflow

S9V2D120U5VSAC/D Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure with Filter (iwc)								
				1st Stage Capacity = 77,050 2nd Stage Capacity = 116,250				
Heating	**Airflow Setting**	**Target Airflow**		**External Static Pressure**				
				0.1	**0.3**	**0.5**	**0.7**	**0.9**
Heating 1st Stage	Low	1123	CFM	1138	1158	1178	1198	1218
			Temp. Rise	61	60	59	58	57
			Watts	115	176	236	297	358
	Medium Low	1332	CFM	1371	1383	1394	1406	1417
			Temp. Rise	51	50	50	49	49
			Watts	182	251	320	389	457
	Medium [a]	1404	CFM	1440	1450	1461	1471	1482
			Temp. Rise	48	48	48	47	47
			Watts	208	283	357	431	505
	High	1620	CFM	1669	1674	1680	1685	1691
			Temp. Rise	42	42	41	41	41
			Watts	315	388	460	533	605
Heating 2nd Stage	Low	1560	CFM	1654	1637	1621	1604	1587
			Temp. Rise	65	66	67	67	68
			Watts	291	360	430	499	568
	Medium Low	1850	CFM	1980	1951	1922	1893	1864
			Temp. Rise	55	56	57	58	58
			Watts	456	539	621	704	787
	Medium [a]	1950	CFM	2075	2037	1999	1961	1923
			Temp. Rise	52	53	54	55	56
			Watts	527	611	696	781	865
	High	2250	CFM	2280	2197	2114	2032	1949
			Temp. Rise	48	50	52	54	56
			Watts	795	819	842	865	888

[a] Factory Setting.

Table 13. S9V2D120U5VSAC/D Cooling Airflow

S9V2D120U5VSAC/D Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter								
Cooling	Unit Outdoor	Airflow Setting (CFM/ton)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	3.0 Ton	Cooling 450 CFM/Ton	CFM	1336	1346	1354	1360	1363
			Watts	163	221	281	341	402
		Cooling 420 CFM/Ton	CFM	1248	1258	1265	1271	1274
			Watts	137	191	247	304	361
		Cooling 400 CFM/Ton	CFM	1189	1199	1206	1211	1214
			Watts	121	173	227	281	336
		Cooling 370 CFM/Ton	CFM	1102	1110	1116	1121	1123
			Watts	100	148	198	249	301
		Cooling 350 CFM/Ton	CFM	1043	1051	1057	1060	1062
			Watts	87	133	181	230	279
		Cooling 330 CFM/Ton	CFM	985	991	996	999	1000
			Watts	76	119	165	211	259
		Cooling 310 CFM/Ton	CFM	927	932	936	937	938
			Watts	65	107	150	195	241
		Cooling 290 CFM/Ton	CFM	869	872	874	875	875
			Watts	56	95	136	179	223
Cooling	3.5 Ton	Cooling 450 CFM/Ton	CFM	1559	1567	1574	1579	1583
			Watts	244	312	381	450	519
		Cooling 420 CFM/Ton	CFM	1455	1464	1472	1477	1481
			Watts	204	267	331	396	462
		Cooling 400 CFM/Ton	CFM	1386	1395	1403	1409	1413
			Watts	179	240	301	363	426
		Cooling 370 CFM/Ton	CFM	1282	1292	1300	1305	1309
			Watts	147	203	260	318	376
		Cooling 350 CFM/Ton	CFM	1214	1223	1231	1236	1239
			Watts	127	181	235	290	346
		Cooling 330 CFM/Ton	CFM	1145	1154	1161	1166	1169
			Watts	110	160	212	265	318
		Cooling 310 CFM/Ton	CFM	1077	1085	1092	1096	1098
			Watts	94	142	191	241	292
		Cooling 290 CFM/Ton	CFM	1009	1016	1021	1025	1026
			Watts	80	125	171	219	267
Cooling	4.0 Ton	Cooling 450 CFM/Ton	CFM	1783	1789	1793	1796	1798
			Watts	350	427	505	584	663
		Cooling 420 CFM/Ton	CFM	1663	1671	1677	1681	1683
			Watts	290	362	436	509	583
		Cooling 400 CFM/Ton	CFM	1584	1592	1599	1603	1607
			Watts	255	324	393	464	534
		Cooling 370 CFM/Ton	CFM	1465	1474	1481	1487	1491
			Watts	207	271	336	401	467
		Cooling 350 CFM/Ton	CFM	1386	1395	1403	1409	1413
			Watts	179	240	301	363	426
		Cooling 330 CFM/Ton	CFM	1307	1317	1324	1330	1334
			Watts	154	211	269	328	388
		Cooling 310 CFM/Ton	CFM	1228	1238	1246	1251	1254
			Watts	131	185	240	296	352
		Cooling 290 CFM/Ton	CFM	1150	1159	1166	1171	1174
			Watts	111	162	214	266	320
Cooling	5.0 Ton [a]	Cooling 450 CFM/Ton	CFM	2238	2235	2230	2226	2220
			Watts	646	742	840	938	1036
		Cooling 420 CFM/Ton	CFM	2086	2086	2085	2083	2080
			Watts	533	623	714	806	897
		Cooling 400 CFM/Ton	CFM	1985	1987	1988	1988	1986
			Watts	466	552	639	726	813
		Cooling 370 CFM/Ton	CFM	1834	1838	1842	1844	1845
			Watts	377	456	536	617	698
		Cooling 350 CFM/Ton [a]	CFM	1733	1740	1745	1748	1750
			Watts	324	399	475	552	628
		Cooling 330 CFM/Ton	CFM	1633	1641	1647	1652	1655
			Watts	277	347	419	492	564
		Cooling 310 CFM/Ton	CFM	1534	1543	1550	1555	1558
			Watts	234	301	369	437	505
		Cooling 290 CFM/Ton	CFM	1435	1444	1452	1458	1461
			Watts	196	259	322	387	451

[a] Factory Setting.

Integrated Furnace Control Display Codes

2 Stage Inducer with ECM Blower Motor	
IdL	Idle
Ht1	First Stage Gas Heating
Lr1	First Stage Gas Heat Learning Routine
Ht2	Second Stage Heating
Lr2	Second Stage Gas Heat Learning Routine
ArF	Calculated Airflow (Followed by Airflow times 10)
COF	Continuous Fan
CL1	First Stage Cooling
CL2	Second Stage Cooling
HP1	First Stage Heat Pump
HP2	Second Stage Heat Pump
dFt	Defrost Mode
Menu Options	
Err	Active Alarm Menu
L6F	Last 6 Faults (To clear — Hold Option button down for 5 seconds)
Cr	Code Release Number
COd	Cooling Off Delay (Seconds)
Odt	Outdoor Tonnage
OdU	Outdoor Unit
COF	Blower Constant Fan Airflow Multiplier (Percentage)
CPC	Cooling (CFM/Ton)
CPH	Heat Pump Heating (CFM/Ton)
Hod	Heat Off Delay (Seconds)
I Sd	Inter-Stage Delay (Seconds)
9HC	Gas Heating CFM 2nd Stage (1st Stage is not adjustable) (Airflow times 10)
rUn	Run Test Mode

Table 14. Fault Code Recovery

Fault Code Recovery

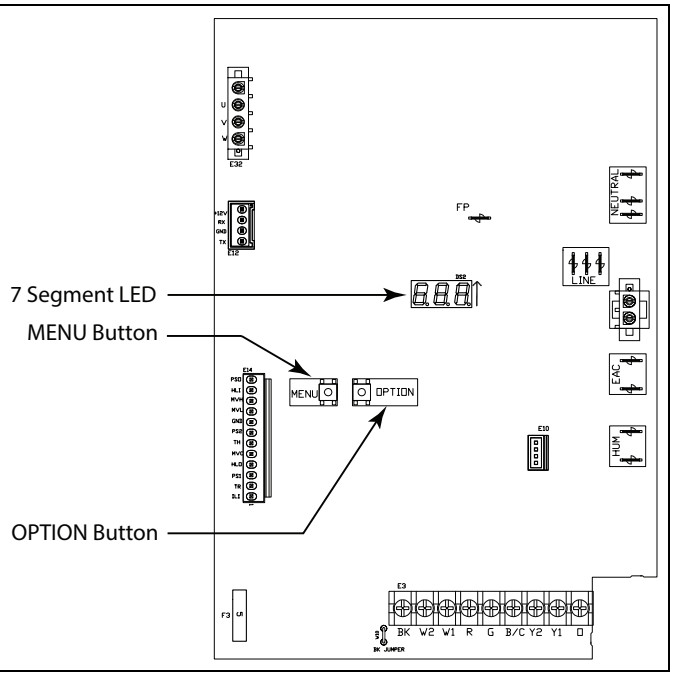
1. To view the last 6 faults, press the "Menu" key until the "Last 6 Faults" (L6F) menu appears.
2. Enter the menu by pressing the "Option" key.
3. The last 6 faults can be viewed.

Clearing the Last 6 Faults

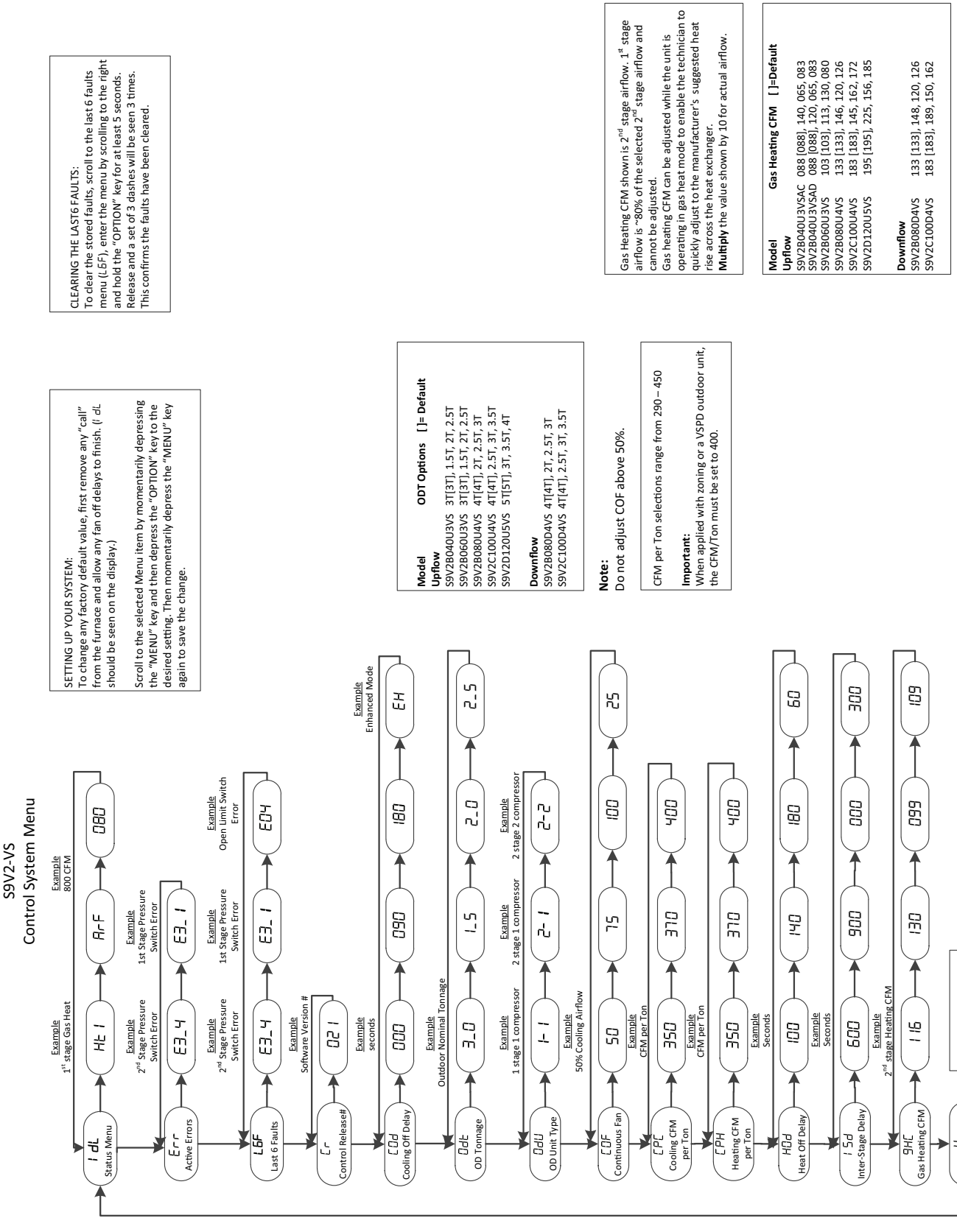
1. To clear the last 6 faults, press the "Menu" key until the "Last 6 Faults" (L6F) menu appears.
2. Enter the menu by pressing the "Option" key.
3. Hold the "Option" key for at least 5 seconds.
4. Release and a set of 3 dashes with be seen 3 times. This confirms the faults have been cleared.

Resetting Factory Defaults

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



Integrated Furnace Control Menu



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

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

CLEARING THE LAST6 FAULTS:
To clear the stored faults, scroll to the last 6 faults menu (*LbF*), enter the menu by scrolling to the right and hold the "OPTION" key for at least 5 seconds. Release and a set of 3 dashes will be seen 3 times. This confirms the faults have been cleared.

Model	ODT Options [ ]= Default
Upflow	
S9V2B040U3VS	3T[3T], 1.5T, 2T, 2.5T
S9V2B060U3VS	3T[3T], 1.5T, 2T, 2.5T
S9V2B080U4VS	4T[4T], 2T, 2.5T, 3T
S9V2C100U4VS	4T[4T], 2.5T, 3T, 3.5T
S9V2D120U5VS	5T[5T], 3T, 3.5T, 4T
Downflow	
S9V2B080D4VS	4T[4T], 2T, 2.5T, 3T
S9V2C100D4VS	4T[4T], 2.5T, 3T, 3.5T

Note:
Do not adjust COF above 50%.

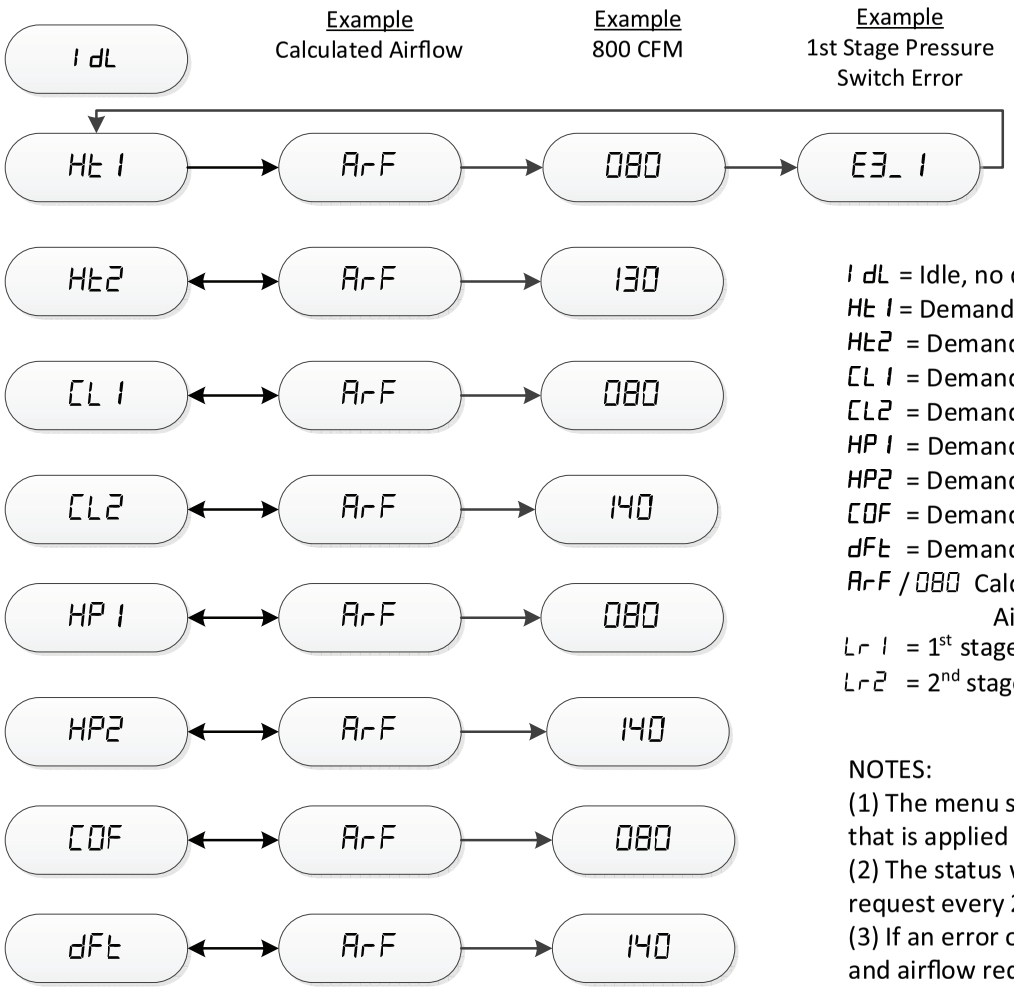
CFM per Ton selections range from 290 – 450

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

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

Model	Gas Heating CFM [ ]=Default
Upflow	
S9V2B040U3VSAC	088 [088], 140, 065, 083
S9V2B040U3VSAD	088 [088], 120, 065, 083
S9V2B060U3VS	103 [103], 113, 130, 080
S9V2B080U4VS	133 [133], 146, 120, 126
S9V2C100U4VS	183 [183], 145, 162, 172
S9V2D120U5VS	195 [195], 225, 156, 185
Downflow	
S9V2B080D4VS	133 [133], 148, 120, 126
S9V2C100D4VS	183 [183], 189, 150, 162

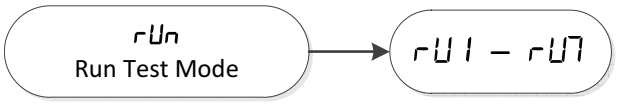
S9V2-VS
Examples of System Status



I dL = Idle, no demand for cooling, heating, or fan
Ht 1 = Demand for 1st stage gas heat
Ht2 = Demand for 2nd stage gas heat
CL 1 = Demand for 1st stage cooling
CL2 = Demand for 2nd stage cooling
HP 1 = Demand for 1st stage heat pump
HP2 = Demand for 2nd stage heat pump
COF = Demand for continuous fan
dFt = Demand for outdoor unit defrost, furnace running in gas heat mode
ArF / 080 Calculated airflow is 800 CFM.
Airflow display is rounded down to the nearest 10 cfm
Lr 1 = 1st stage gas heat learning routine
Lr2 = 2nd stage gas heat learning routine

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

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



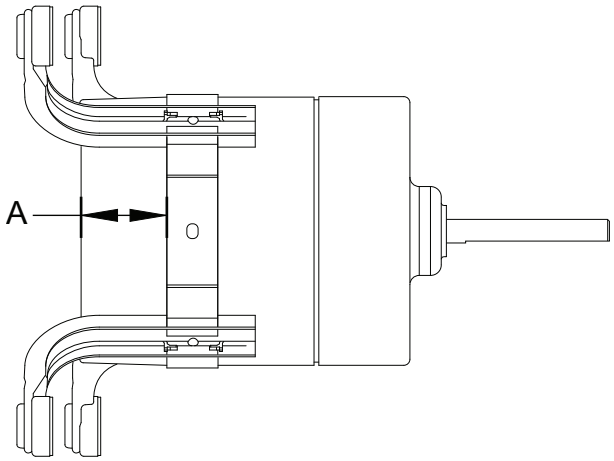
Run Test Mode:
To enter Run Test Mode, scroll to rUn using the Menu key, then push the option key. The LED will flash rUn three times, then begin the test.
To exit the test mode, momentarily push the Menu key, cycle power to the furnace, or make a valid thermostat call for capacity or fan.

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

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

Belly Band Location

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



Blower housings and wheel removed from view for clarity.

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

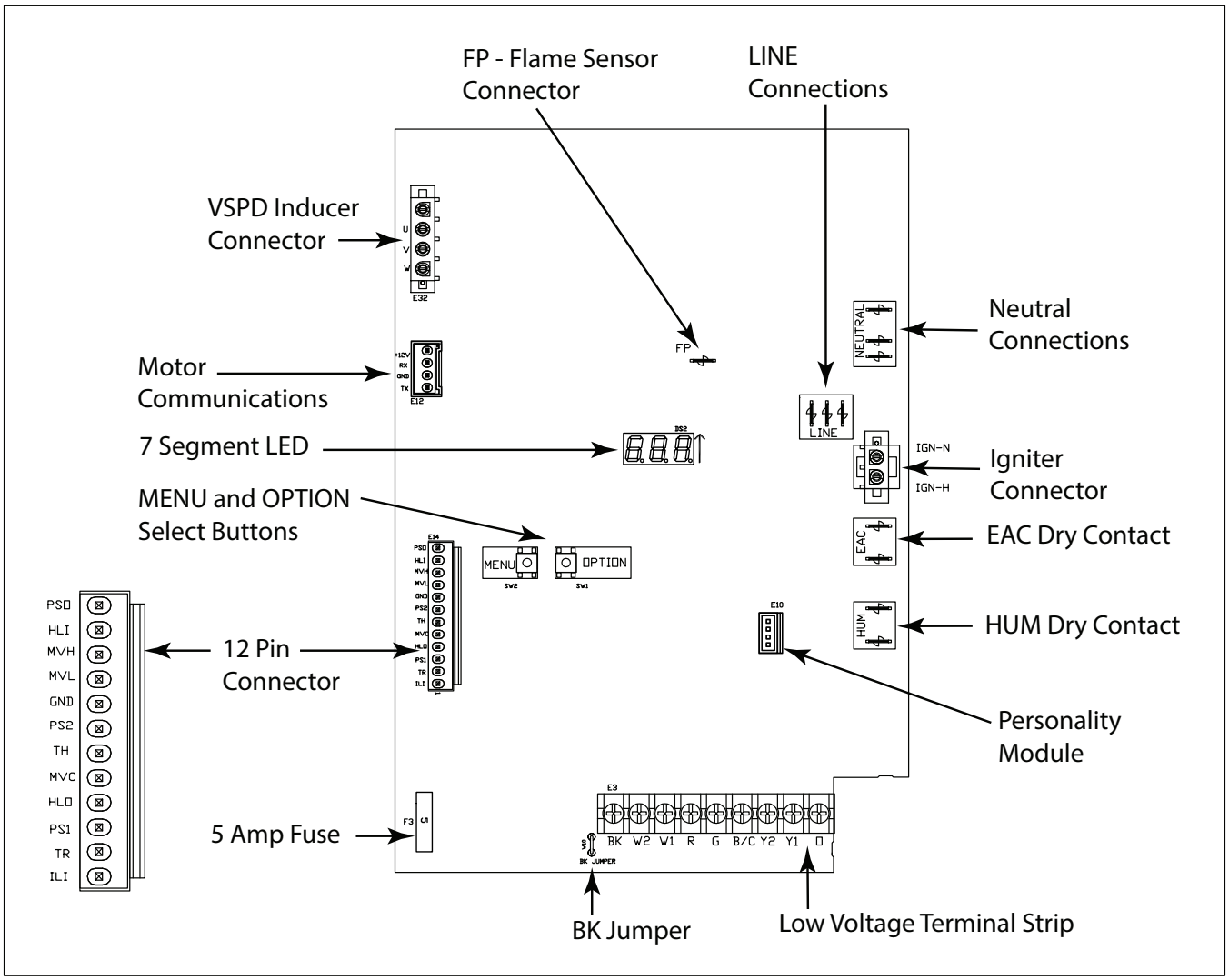
For D Models only	
Furnace Cabinet Size	**Dimension "A" (inches)**
B	2.75
C	3.54
D	3.79

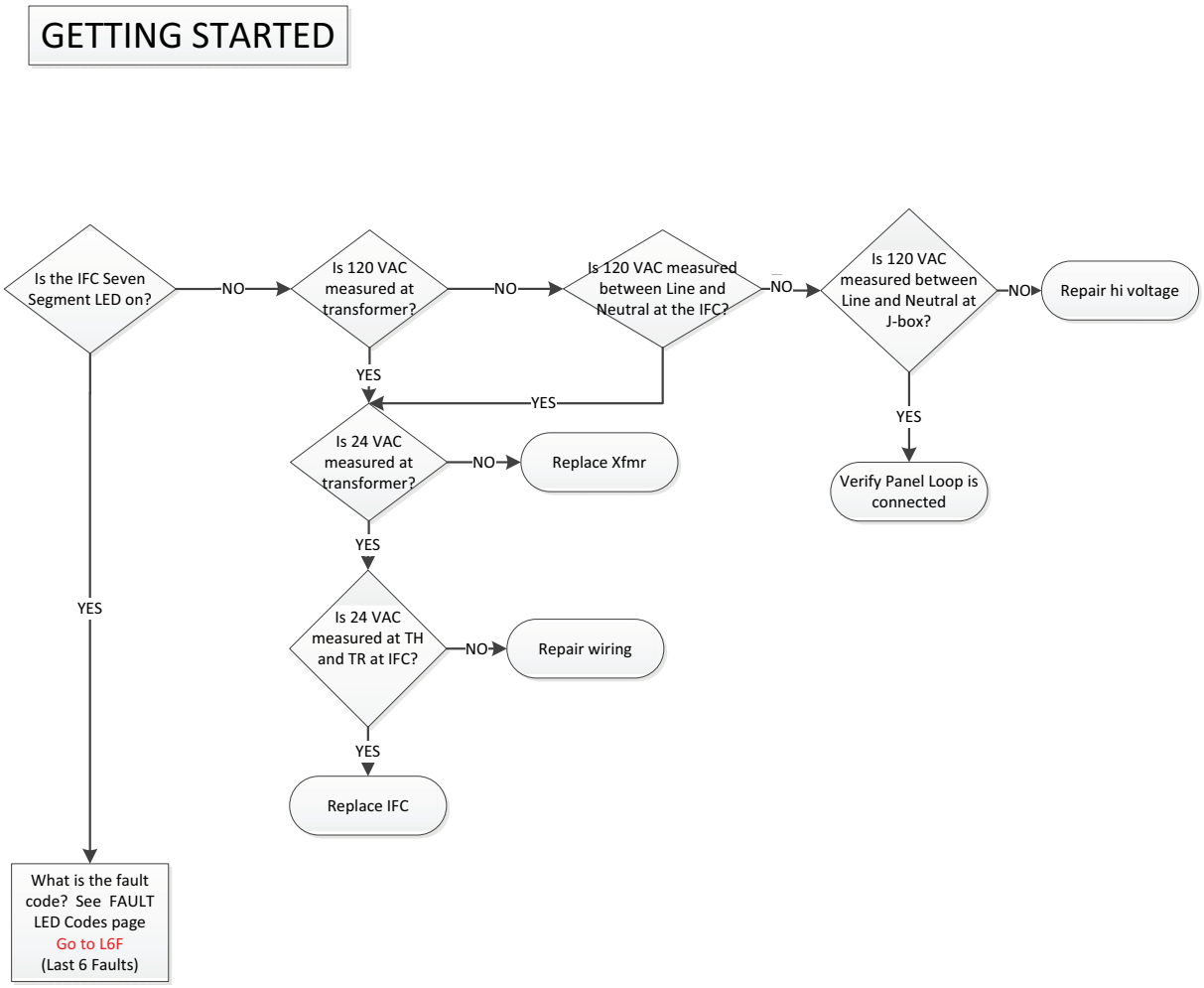
Troubleshooting

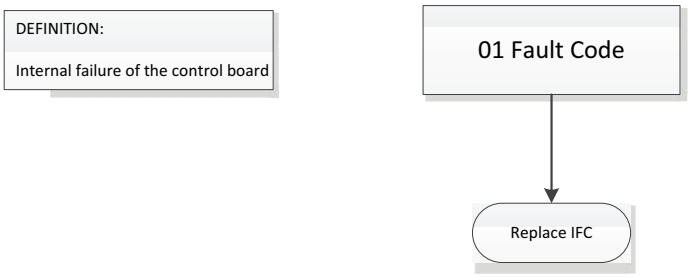
The following pages include troubleshooting flowcharts in reference for the 2 Stage S9V2* family of furnaces only.
The information contained is for reference only and does not cover all scenarios or problems that may be encountered.
ONLY qualified technicians should attempt to install, troubleshoot, or repair this appliance.
Failure to follow all cautions and /or warnings could result in personal or property damage, including death.

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

IFC Component Layout




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


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

DEFINITION

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

Flame has never been sensed

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

2.1 Fault Code

Disconnect electrical power to furnace. Connect manometer to inlet gas pressure connector

Is inlet gas pressure above 13.8" WC or less than nameplate minimum ?

YES → Correct inlet gas pressure. Maximum pressure is 13.8"WC Check operation

NO

Cycle power to furnace. Connect manometer to manifold pressure connector and call for 1st stage heat

Is any gas pressure present?

NO → Possible causes Switch OFF? No voltage to GV Debris in gas valve

YES

NO

Does gas ignite?

Is manifold pressure ~1.7"WC (NG) ~6.0"WC (LP)

NO → Adjust manifold gas pressure to ~1.7"WC (NG) ~6.0"WC (LP) Check operation

YES

YES

Possible causes: Burner alignment Dirty burners Low manifold pressure

NO ← Do all burners ignite within 4 seconds?

Check igniter position and correct if needed. Check operation

YES

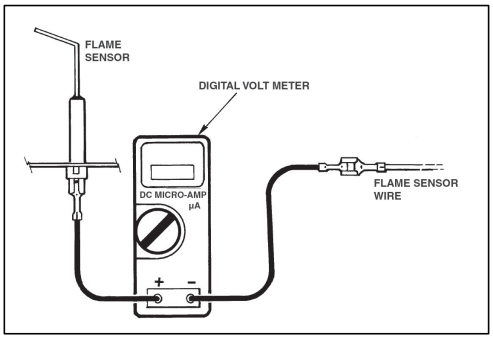
Measure flame current. Is flame current less than 0.5 micro-amp?

YES → Possible Causes Dirty Sensor Dirty burners Poor grounding Sensor location Wire connections

NO

Flame sensor is good

To measure flame current, use a VOM set to DC micro-amps. Connect voltmeter leads in series with flame sensor circuit, see illustration



DEFINITION

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

Flame is sensed & then lost

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

2.2 Fault Code

Disconnect electrical power to furnace. Connect manometer to manifold pressure connector

NO

Cycle power to furnace and call for 1st stage heat

Is manifold pressure ~1.7"WC (NG) ~6.0"WC (LP)

YES

Measure flame current. Is flame current greater than 0.75 micro-amp? (0.75-3 µA = Normal)

NO

Adjust manifold gas pressure to ~1.7"WC (NG) ~6.0"WC (LP) Check operation

NO

Possible Causes: Dirty Sensor Dirty burners Poor grounding Sensor location Wire connections

YES

Is minimum outlet gas manifold pressure maintained?

YES

Posible Causes Plugs Blower door Wind gust Condensate Power interrupt

NO

Disconnect electrical power to furnace. Connect manometer to inlet gas pressure connector

Cycle power to furnace and call for 1st stage heat

Is minimum outlet gas manifold pressure maintained?

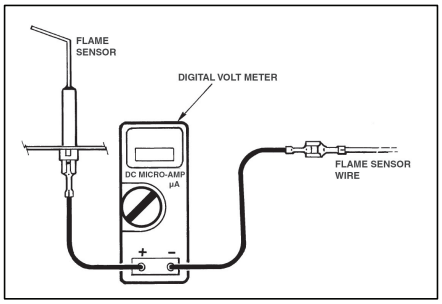
YES

Repeat steps with 2nd stage heating

NO

Correct incoming gas supply pressure

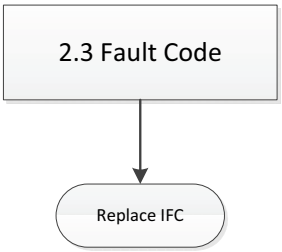
To measure flame current, use a VOM set to DC micro-amps. Connect voltmeter leads in series with flame sensor circuit, see illustration



DEFINITION

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

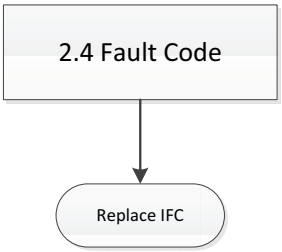
24VAC not sensed on MVL 10 times



DEFINITION

High limit output relay is not closed when it should be

24VAC not sensed on HLO 10 times

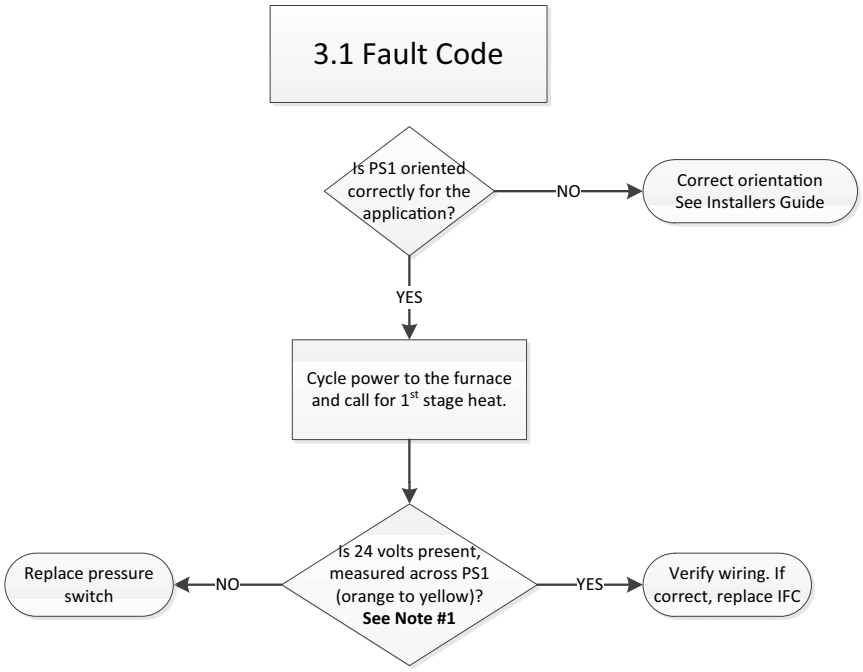


DEFINITION
An error has occurred with the PS1, indicating that the pressure switch is closed when it should be open.

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

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

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



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

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

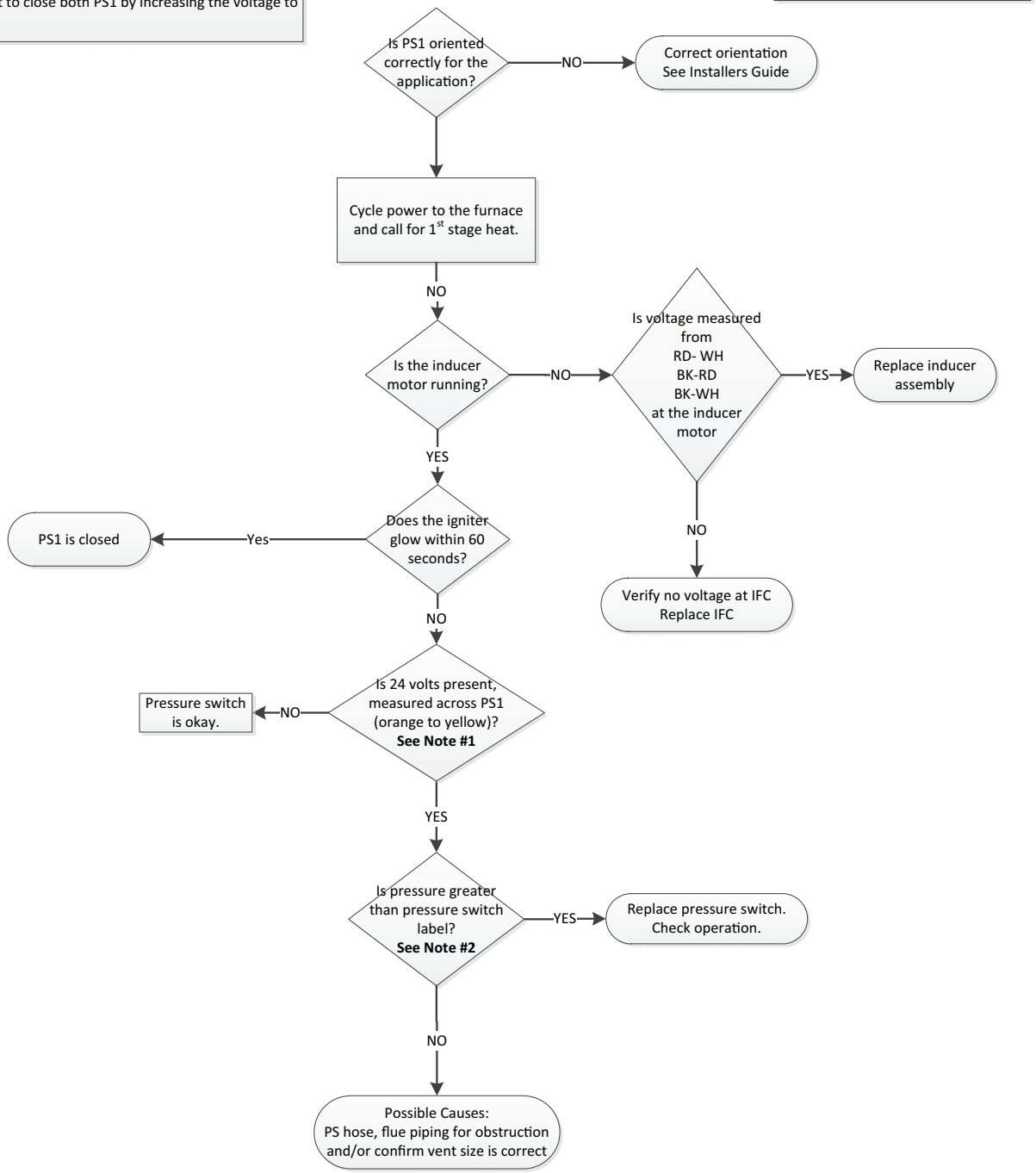
NOTE: Verify pressure switch wiring and tube routing are correct.

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

3.2 Fault Code

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

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



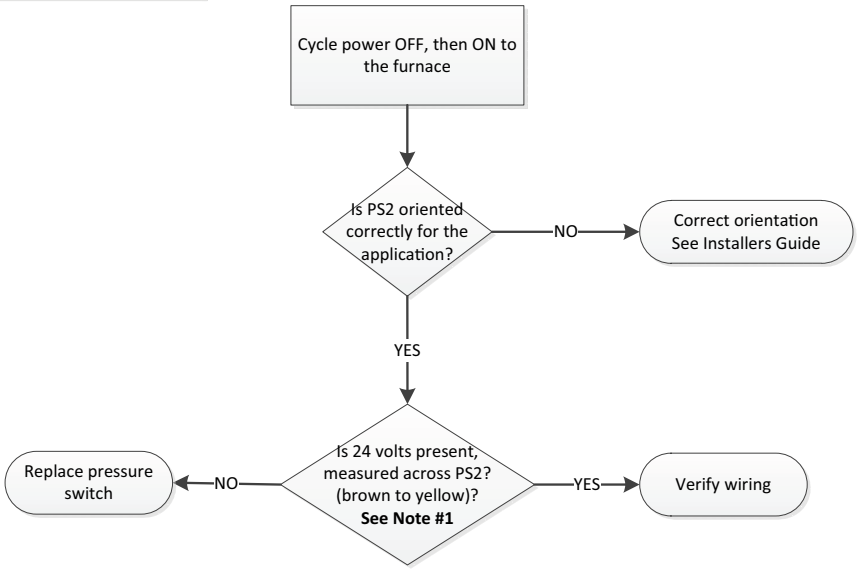
DEFINITION
An error has occurred with the PS2, indicating that the pressure switch is closed when it should be open.

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

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

3.3 Fault Code

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



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

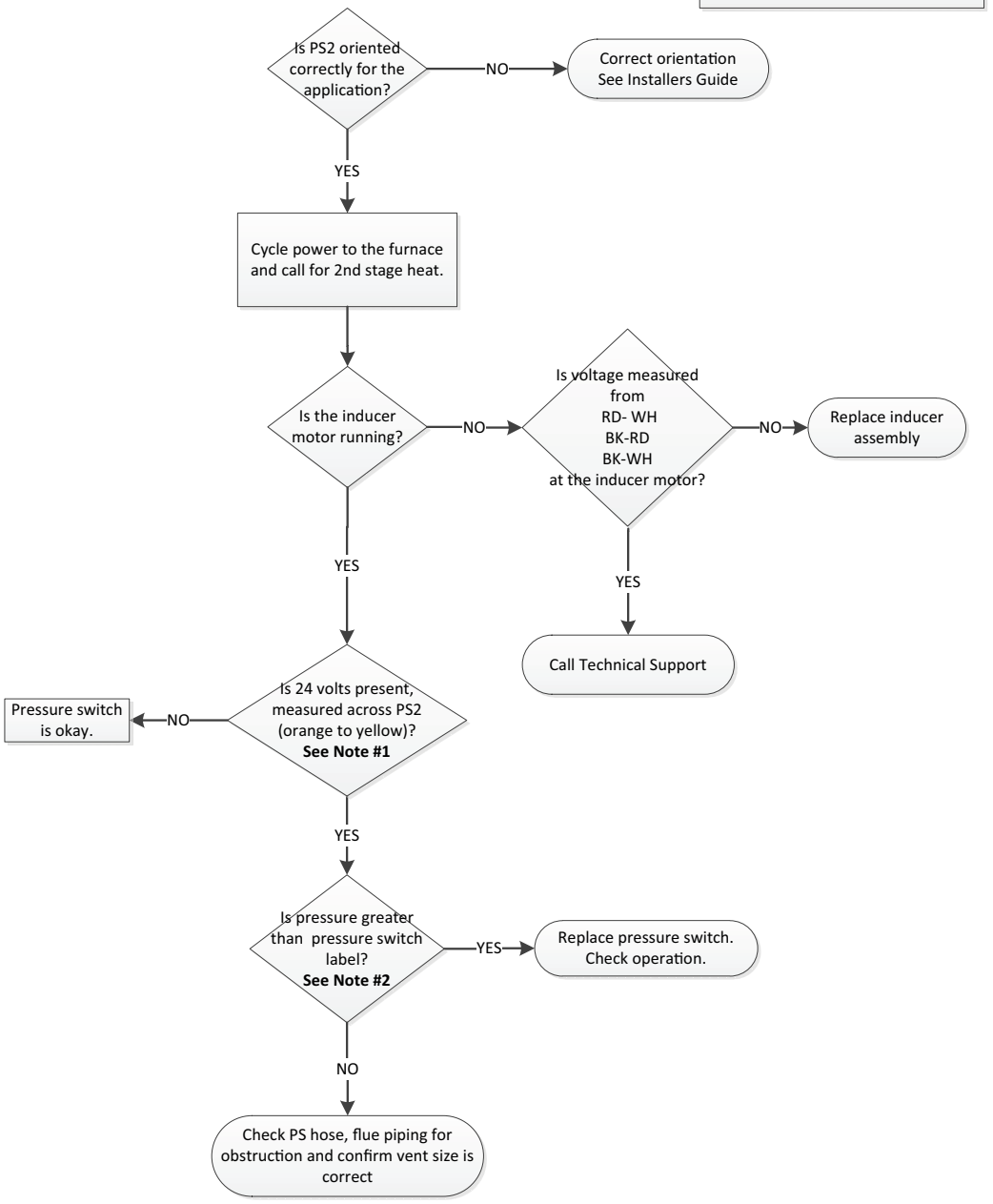
In most cases, the pressure switch is not the problem.

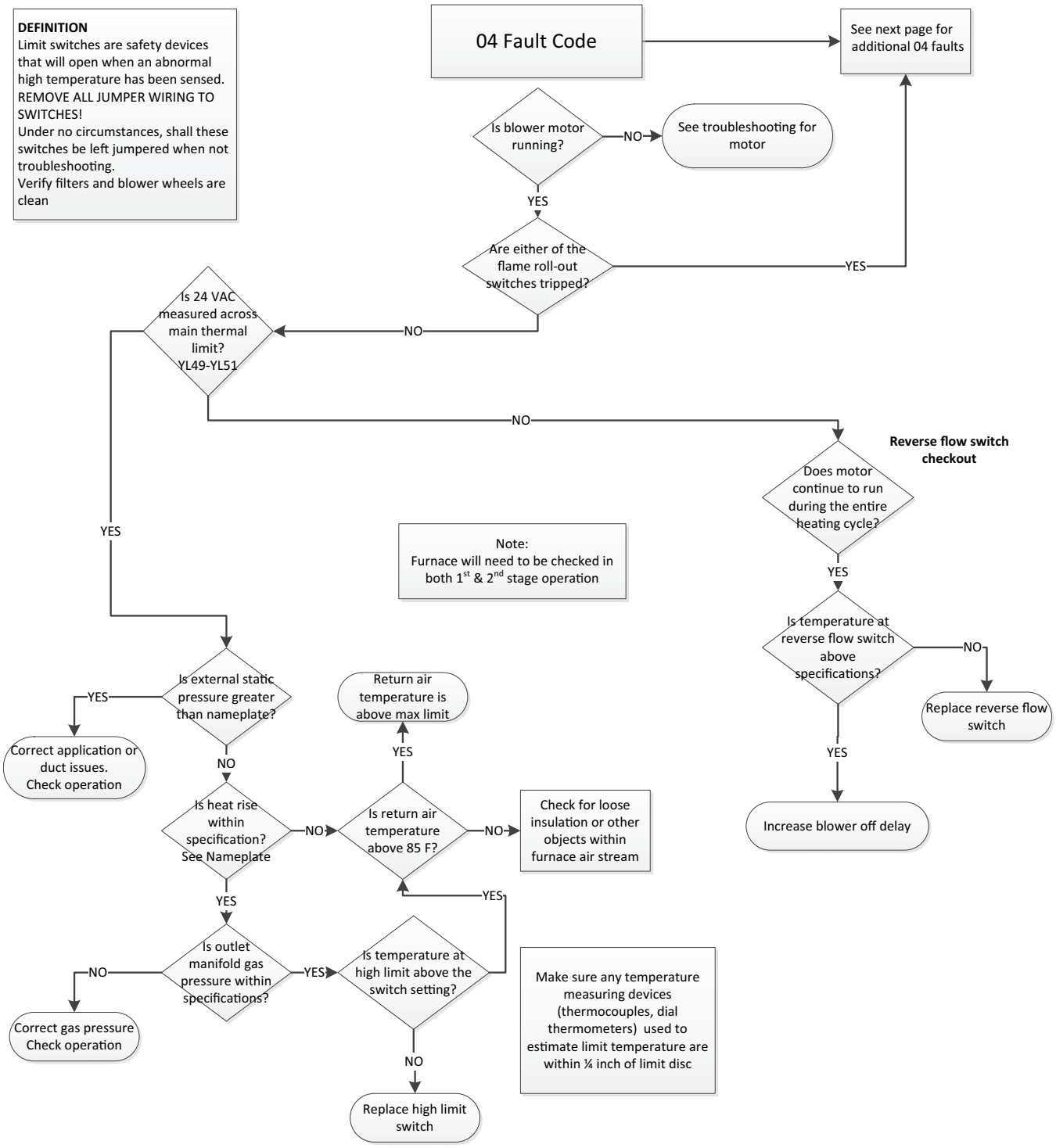
NOTE: Verify pressure switch wiring and tube routing are correct.

3.4 Fault Code

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

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

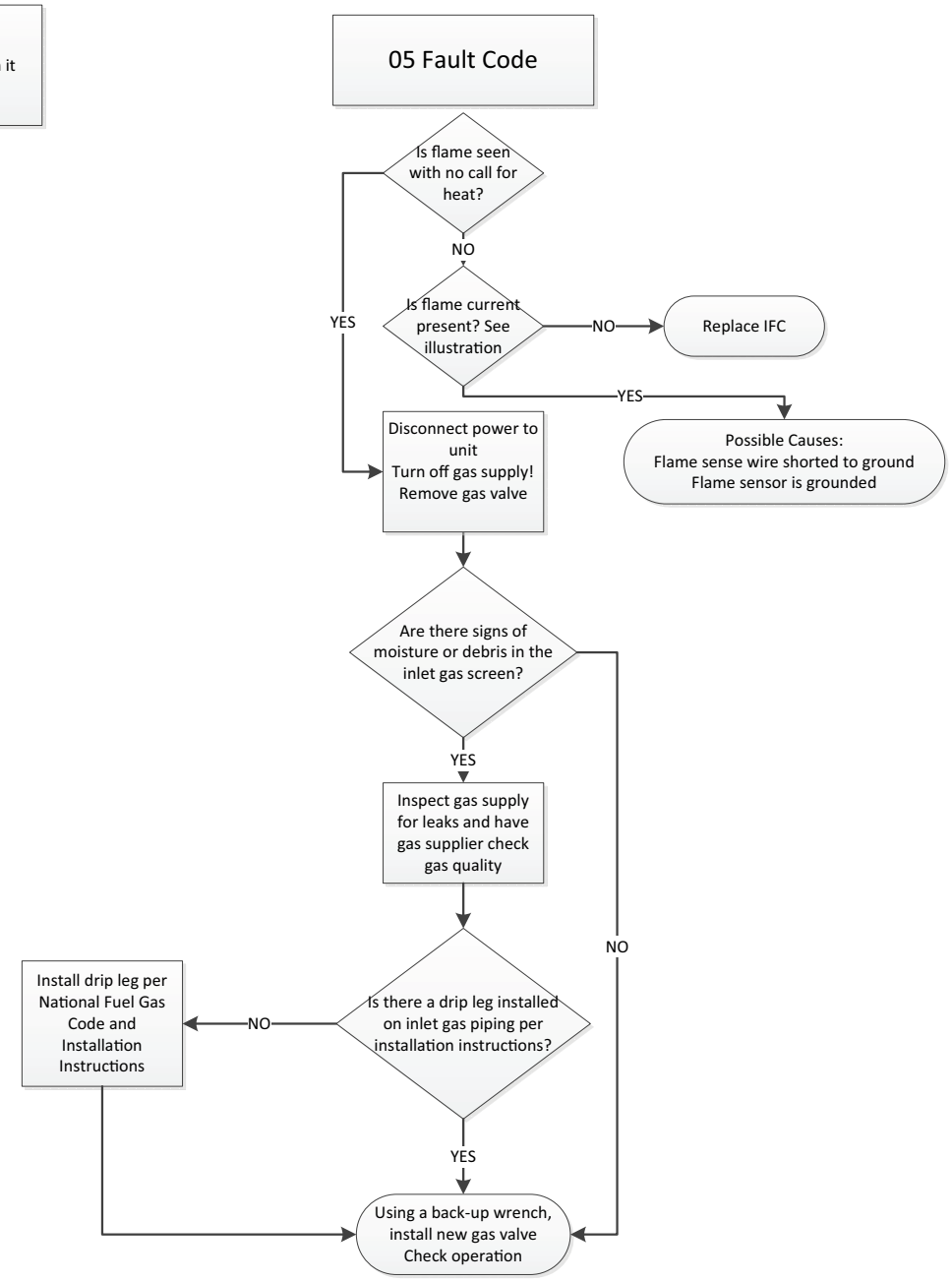



DEFINITION
Limit switches are safety devices that will open when an abnormal high temperature has been sensed.
REMOVE ALL JUMPER WIRING TO SWITCHES!
Under no circumstances, shall these switches be left jumpered when not troubleshooting.
Verify filters and blower wheels are clean
04 Fault Code
See next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

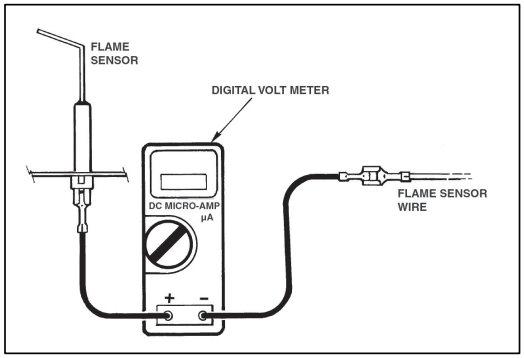
DEFINITION
Limit switches are safety devices that will open when an abnormal high temperature has been sensed.
REMOVE ALL JUMPER WIRING TO SWITCHES!
Under no circumstances, shall these switches be left jumpered when not troubleshooting.

DEFINITION:

Flame is sensed when it should not be.

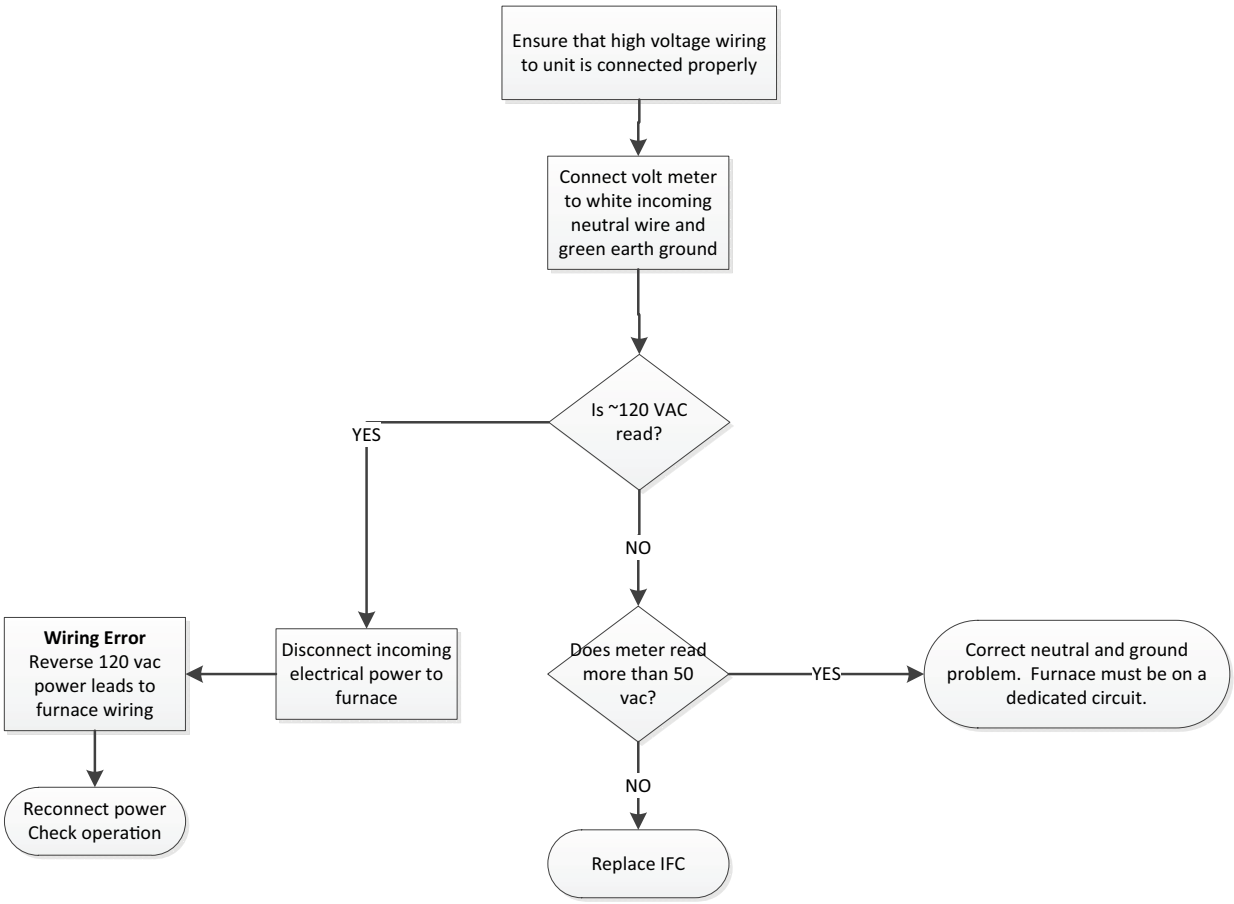


To measure flame current, use a VOM set to DC micro-amps. Connect voltmeter leads in series with flame sensor circuit, see illustration



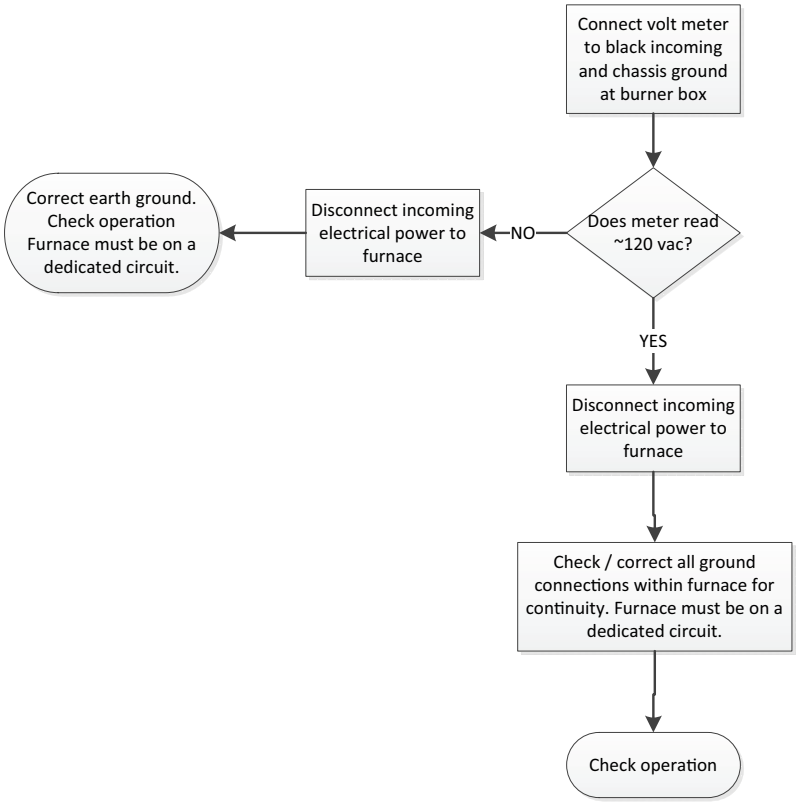
DEFINITION:
Polarity Fault – Incoming high voltage wiring is reversed

06 Fault Code Reversed Polarity



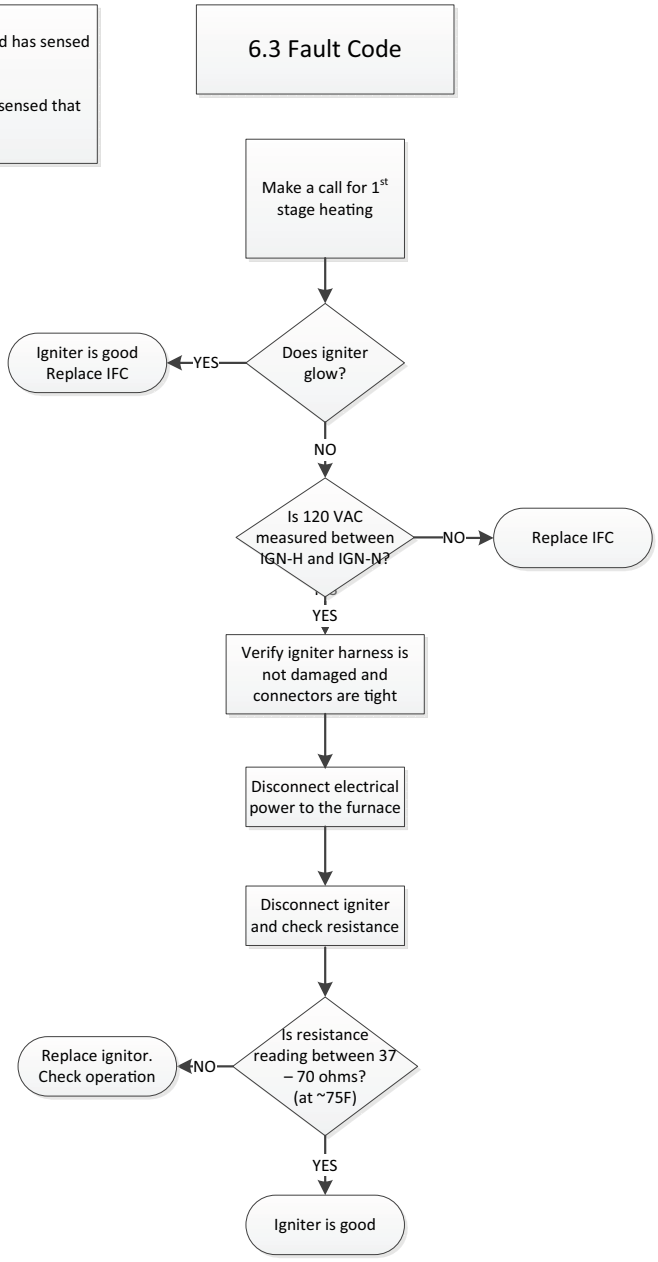
DEFINITION:
Ground Fault - Incoming or chassis ground connection is not sensed

06 Fault Code
Faulty Ground



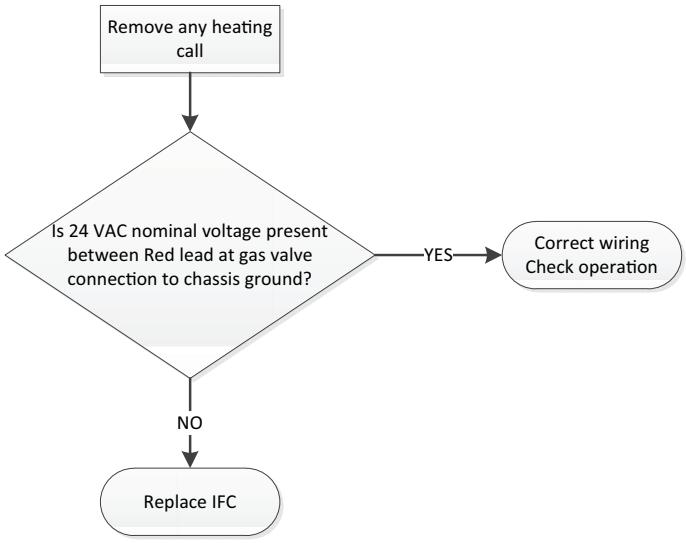
DEFINITION:
Igniter Relay Fault – The control board has sensed that the igniter relay has stuck closed

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



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

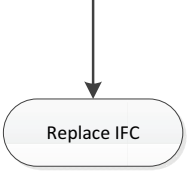
7.1 Fault Code



DEFINITION:

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

7.2 Fault Code



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

08 Fault Code

Make a call for 1st stage heating

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

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

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

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

YES

Is flame sensor located correctly? See figure

NO

Correct flame sensor location

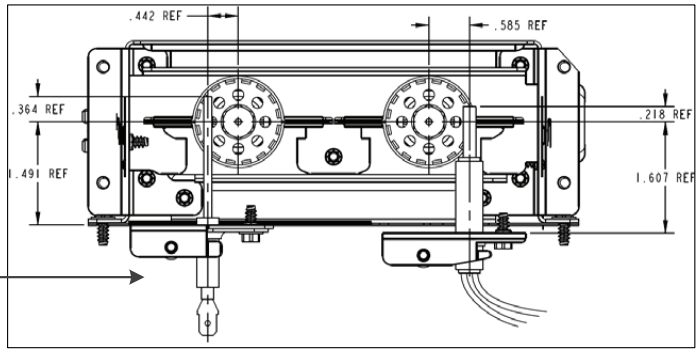
YES

Replace flame sensor

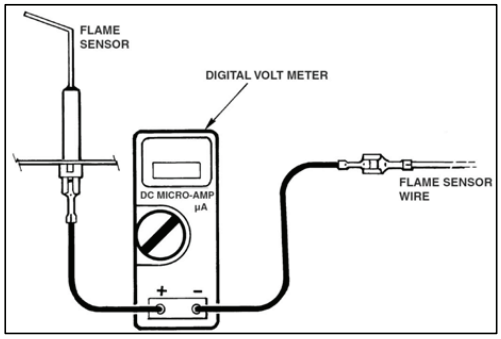
Check operation

NO

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



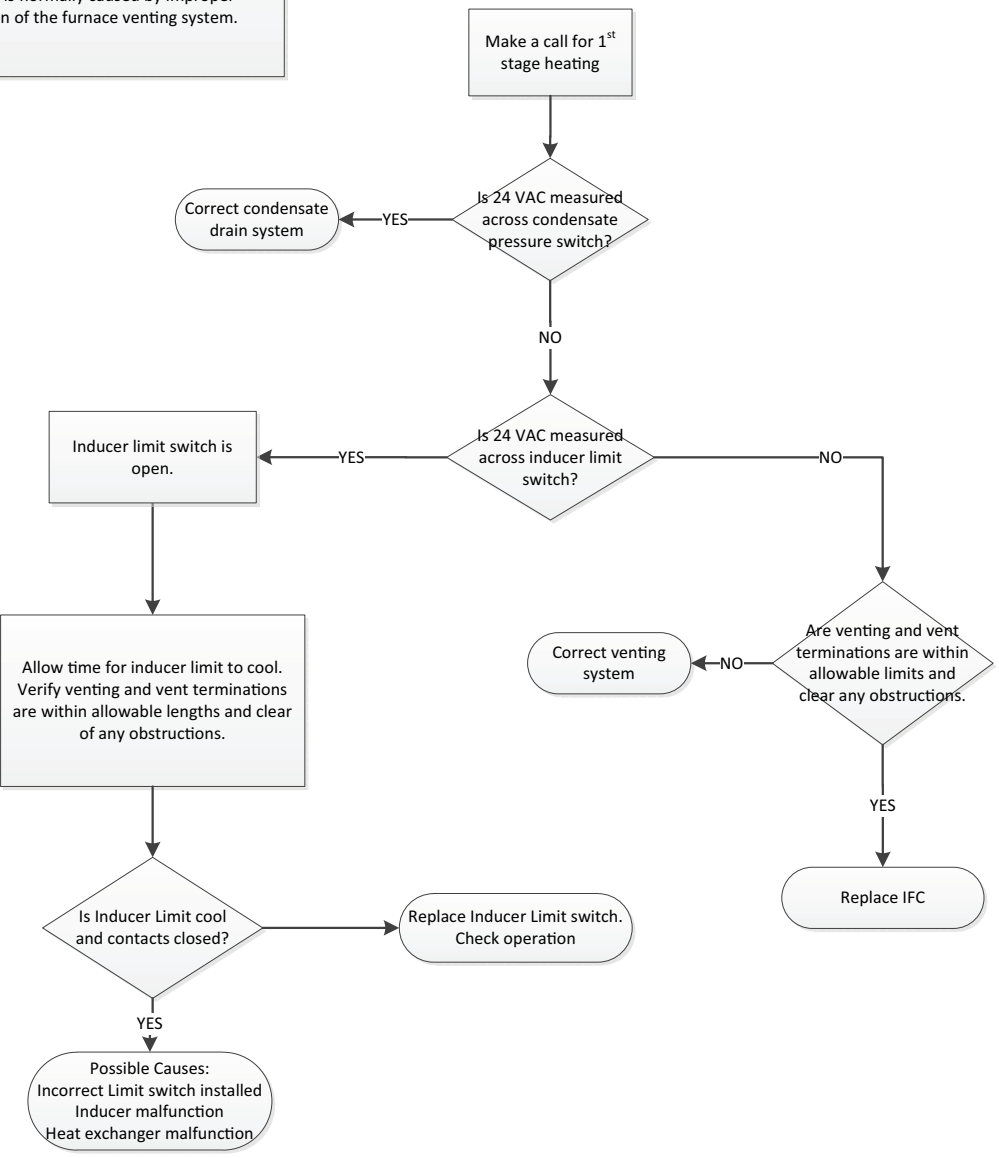
To measure flame current, use a VOM set to DC micro-amps. Connect voltmeter leads in series with flame sensor circuit, see illustration



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

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

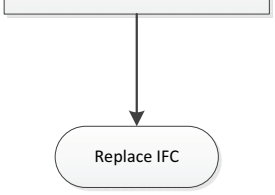
09 Fault Code



DEFINITION:

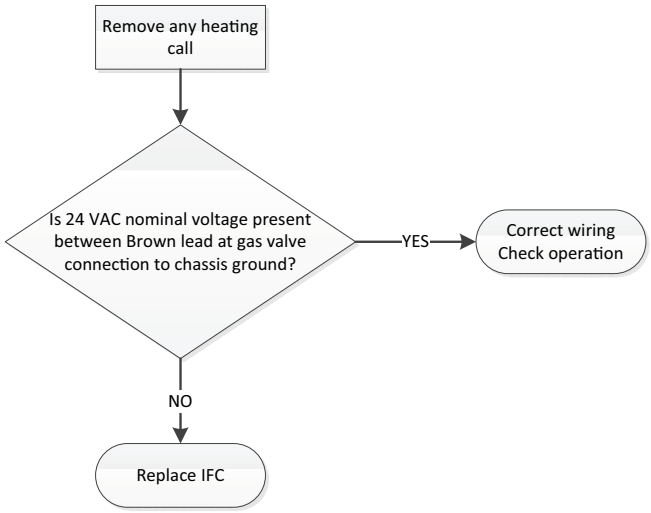
Internal control board error. Communication error between the inducer and blower motor micro-processors

10 Fault Code



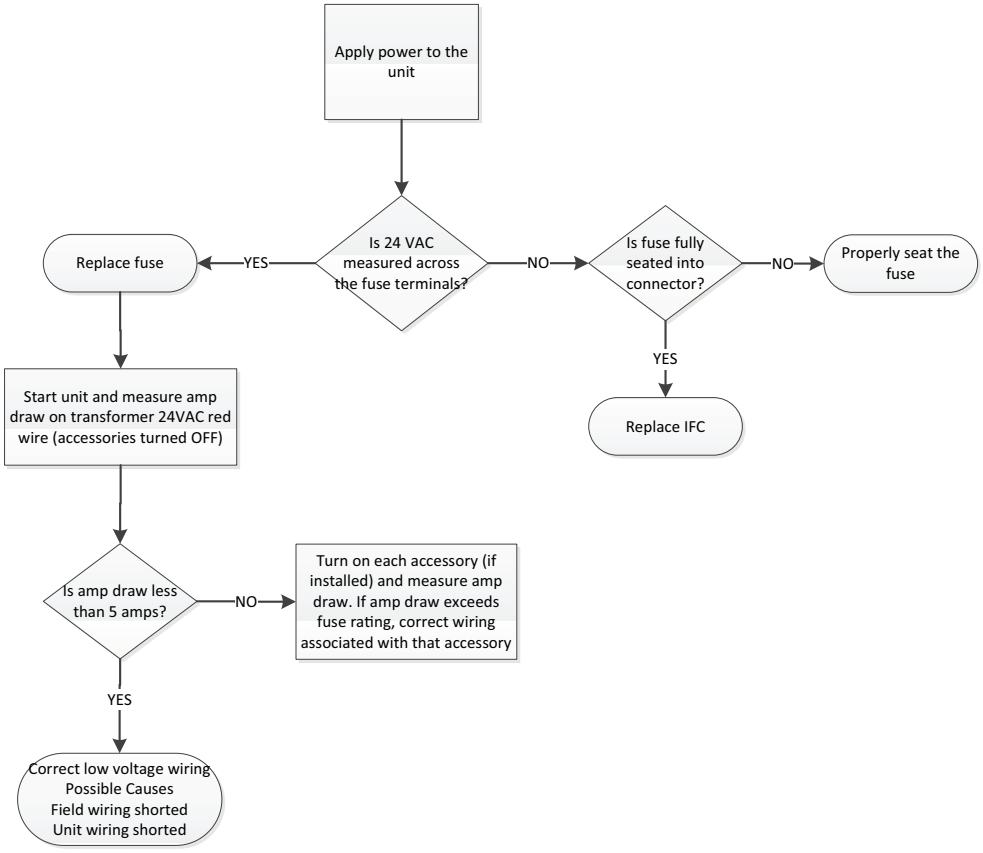
Definition
The IFC has detected that internal gas valve relays have failed OR 24 VAC is being sensed at 2nd stage gas valve

11 Fault Code

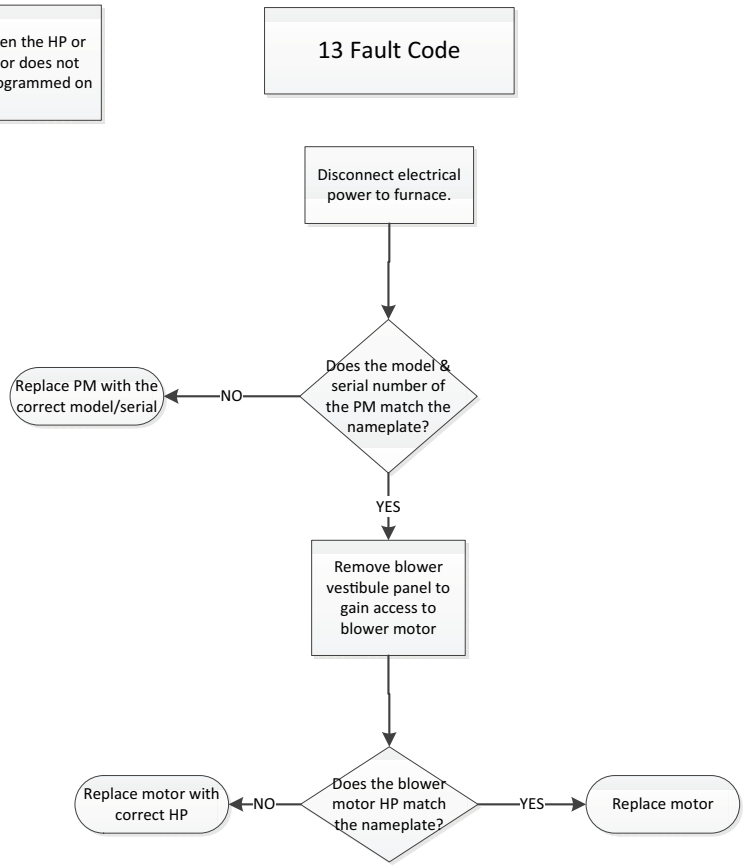


Definition:
The onboard 5 amp fuse is open or missing.

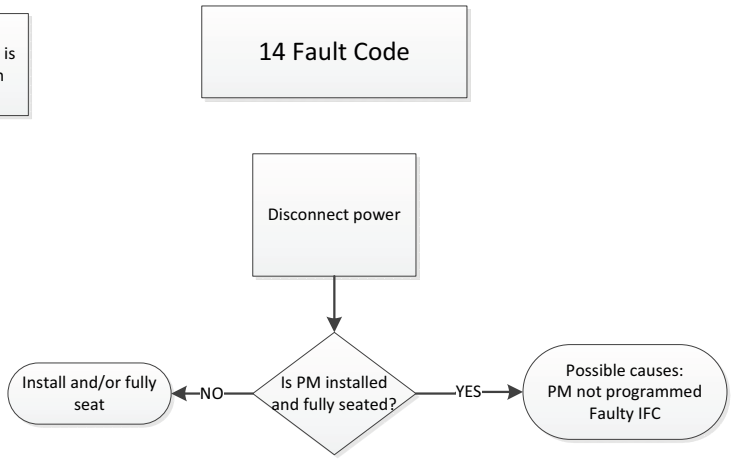
12 Fault Code



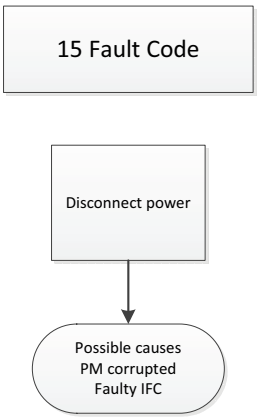
DEFINITION:
This fault is generated when the HP or OEM ID of the blower motor does not match the value that is programmed on the Personality Module



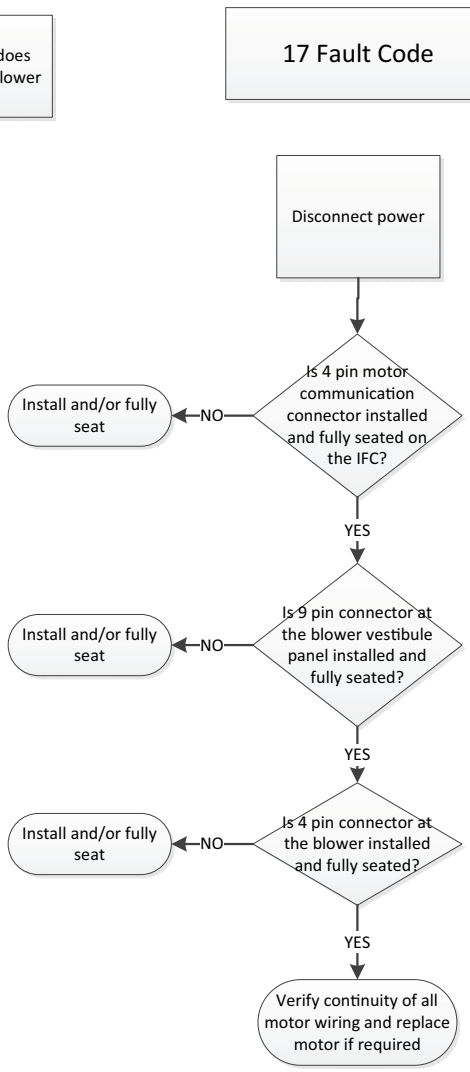
DEFINITION:
This fault is generated when the PM is missing and the onboard information cannot be read



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

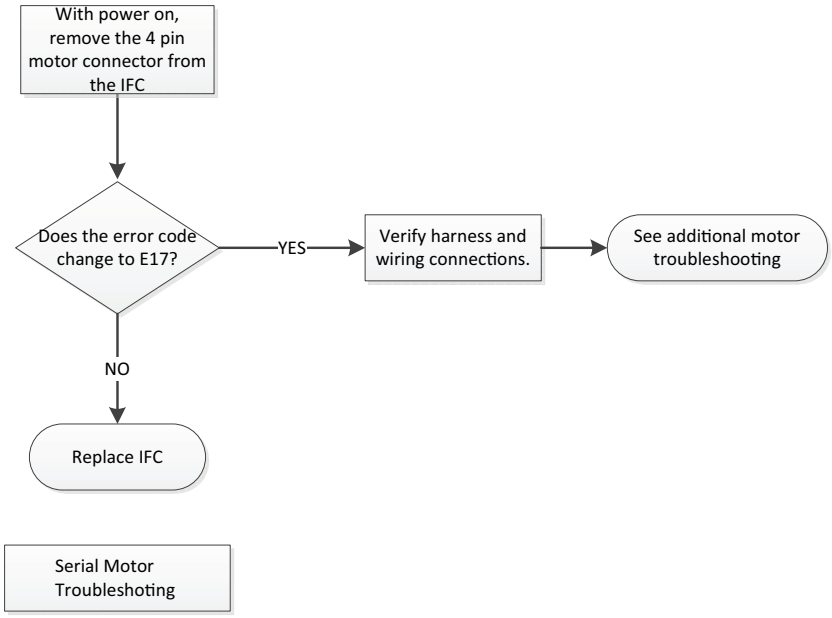


DEFINITION:
This fault is generated when IFC does not see a return signal from the blower motor



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

18 Fault Code



Serial Motor Troubleshoting

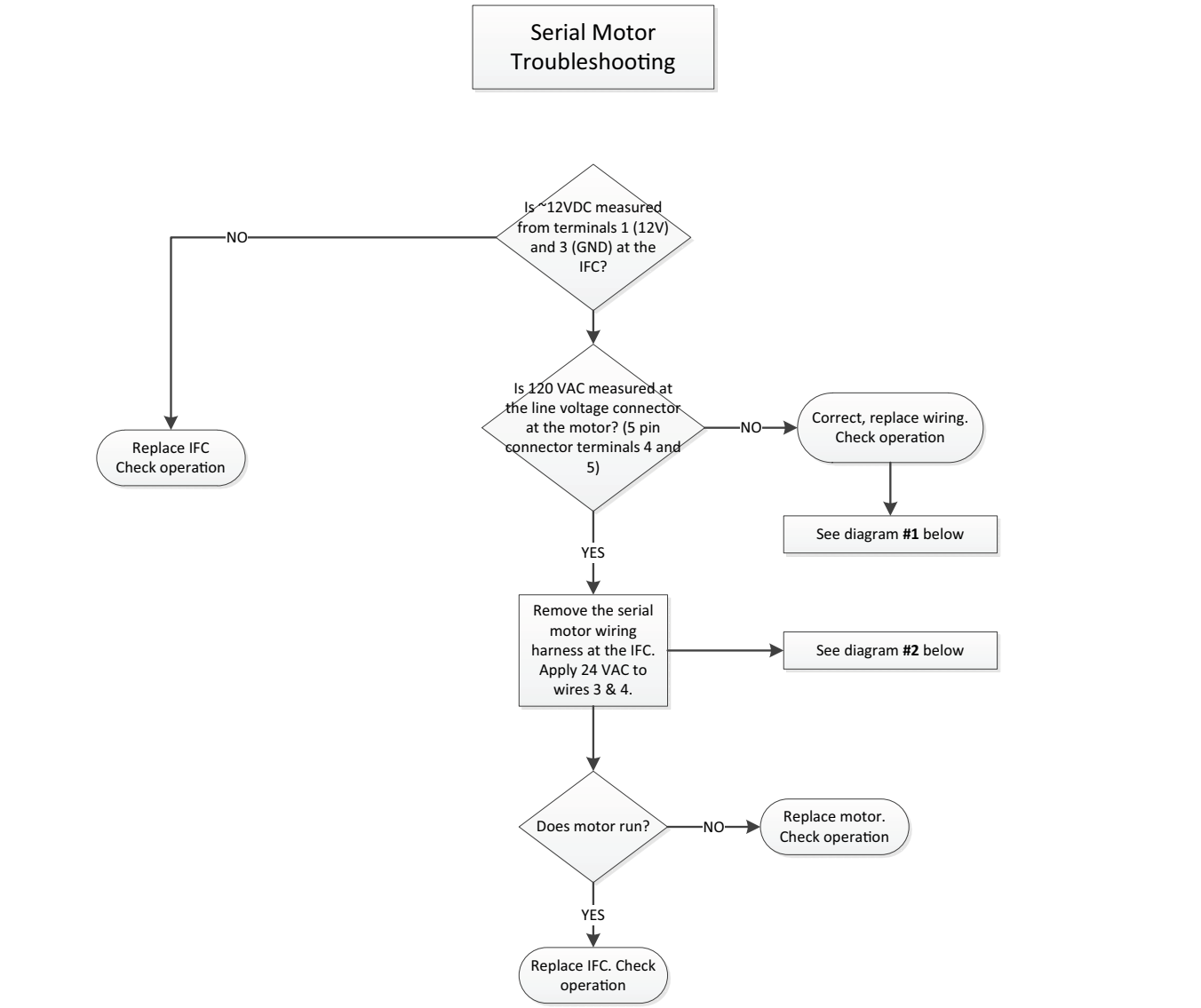


DIAGRAM #1

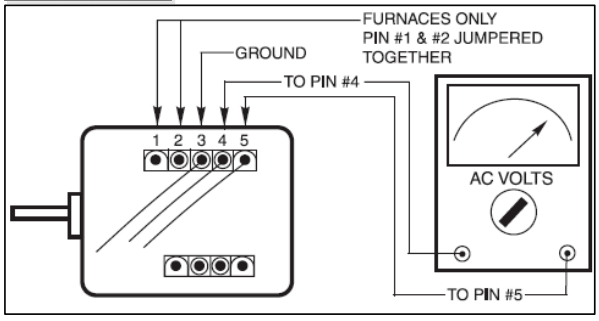
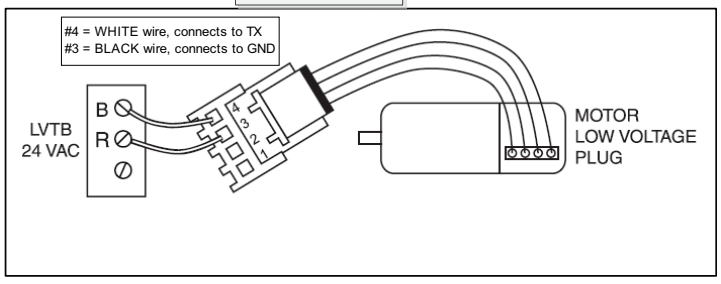


DIAGRAM #2



Part List

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

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

S9V2-VS-SF-2B-EN 04 Feb 2022
Supersedes S9V2-VS-SF-2A-EN (March 2021)