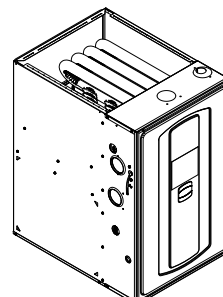
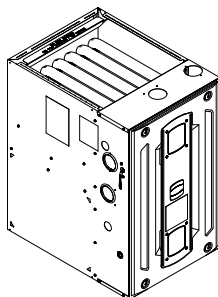


Service Facts

Upflow/Horizontal and Dedicated Downflow Gas-Fired, Direct/Non-Direct Vent, Single Stage / Two Stage Condensing Furnaces with High Efficiency Motor

Upflow, Convertible to
Horizontal Right or Horizontal
Left, and Downflow
S9X1
S9X2
S9B1



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.



S9XB-SF-1E-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.

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 area 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 can 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 Specifications

MODEL	S9X1B040U3PSBA ^(a) S9B1B040U3PSAA	S9X1B060U4PSBA ^(a) S9B1B060U4PSAA	S9X1B080U4PSBA ^(a) S9B1B080U4PSAA	S9X1C080U5PSBA ^(a) S9B1C080U5PSAA
TYPE	Upflow/Horizontal	Upflow/Horizontal	Upflow/Horizontal	Upflow/Horizontal
RATINGS ^(b)				
Input BTUH	40,000	60,000	80,000	80,000
Capacity BTUH (ICS) ^{(c) (d)}	39,000	58,300	77,200	77,800
Temp. Rise (Min.-Max.)	30 - 60	30 - 60	45 - 75	40 - 70
AFUE (%) S9X1 / S9B1 ^(d)	96.0 / 92.1	96.0 / 92.1	96.0 / 92.1	96.0 / 92.1
Return Air Temp. (Min. - Max.)	45°F - 80°F	45°F - 80°F	45°F - 80°F	45°F - 80°F
BLOWER DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
Diameter — Width (In.)	11 X 8	11 X 8	11 X 8	11 X 10
No. Used	1	1	1	1
Speeds (No.) ^(e)	9	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	1/2	3/4	3/4	1
RPM	1075	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	6.4	7.6	7.6	10.6
COMBUSTION FAN — Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Drive — No. Speeds	Direct - 1	Direct - 1	Direct - 1	Direct - 1
Motor HP — RPM	3300	3300	3300	3300
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	2.14	2.14	2.14	0.66
FILTER — Furnished?	No	No	No	No
Type recommended	High Velocity	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 — 16x25 — 1 in.	1 — 16x25 — 1 in.	1 — 16x25 — 1 in.	1 — 20x25 — 1 in.
VENT PIPE DIAMETER — Min (in.) ^{(f) (g)}	2 Round	2 Round	2 Round	2 Round
HEAT EXCHANGER				
Type — Fired	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel
— Unfired	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20	20	20
ORIFICES — Main				
Nat. Gas Qty. — Drill Size	2- 45	3 - 45	4 - 45	4 - 45
LP Gas Qty. — Drill Size	2- 56	3 - 56	4- 56	4- 56
GAS VALVE	Redundant - One Stage	Redundant - One Stage	Redundant - One Stage	Redundant - One Stage
PILOT SAFETY DEVICE				
Type	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS — Type	Multiport Inshot	Multiport Inshot	Multiport Inshot	Multiport Inshot
Number	2	3	4	4
POWER CONN. — V/Ph/Hz ^(h)	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (In Amps)	10.3	11.8	11.8	14.1
Max. Overcurrent Protection (Amps)	15	15	15	15

MODEL	S9X1B040U3PSBA ^(a) S9B1B040U3PSAA	S9X1B060U4PSBA ^(a) S9B1B060U4PSAA	S9X1B080U4PSBA ^(a) S9B1B080U4PSAA	S9X1C080U5PSBA ^(a) S9B1C080U5PSAA
PIPE CONN. SIZE (in.)	1/2	1/2	1/2	1/2
DIMENSIONS	H x W x D	H x W x D	H x W x D	H x W x D
Uncrated (In.)	34 x 17-1/2 x 28-3/4	34 x 17-1/2 x 28-3/4	34 x 17-1/2 x 28-3/4	34 x 21 x 28-3/4
Crated (In.)	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 23 x 30-7/8
WEIGHT				
Shipping (Lbs.)/Net (Lbs.)	122/114	130/122	135/127	149/139

(a) Meets Energy Star

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

(c) Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 — latest edition.

(d) Based on U.S. government standard tests.

(e) 9 Speed constant torque ECM blower motor

(f) Refer to the Vent Length Table in the Installer's Guide.

(g) All furnace models have a vent outlet diameter that equals 2 in.

(h) The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

MODEL	S9X1C100U5PSBA ^(a) S9B1C100U5PSAA	S9X1D120U5PSBA ^(a) S9B1D120U5PSAA	S9X1B040D3PSBA ^(a) S9B1B040D3PSAA	S9X1B060D3PSBA ^(a) S9B1B060D3PSAA
TYPE	Upflow / Horizontal	Upflow/Horizontal	Downflow	Downflow
RATINGS ^(b)				
Input BTUH	100,000	120,000	40,000	60,000
Capacity BTUH (ICS) ^{(c) (d)}	97,400	113,400	38,900	57,600
Temp. Rise (Min.-Max.)	40 - 70	40-70	30 - 60	35 - 65
AFUE (%) S9X1 / S9B1 ^(d)	95.0 / 92.1	95.0 / 92.1	96.0 / 92.1	96.0 / 92.1
Return Air Temp. (Min. - Max.)	45°F - 80°F	45°F - 80°F	45°F - 80°F	45°F - 80°F
BLOWER DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
Diameter — Width (In.)	11 X 10	11 X 10	11 X 8	11 X 8
No. Used	1	1	1	1
Speeds (No.) ^(e)	9	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	1	1	1/2	1/2
RPM	1075	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	10	10.6	6.4	6.4
COMBUSTION FAN — Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Drive — No. Speeds	Direct - 1	Direct - 1	Direct - 1	Direct - 1
Motor HP — RPM	3300	3300	3300	3300
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	0.66	0.66	2.14	2.14
FILTER — Furnished?	No	No	No	No
Type recommended	High Velocity	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 — 20x25 — 1 in.	1 — 24x25 — 1 in.	2 — 14x20 — 1 in.	2 — 14x20 — 1 in.
VENT PIPE DIAMETER — Min (in.) ^{(f) (g)}	2 Round	3 Round	2 Round	2 Round
HEAT EXCHANGER				
Type — Fired	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel
— Unfired	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20	20	20
ORIFICES — Main				

Product Specifications

MODEL	S9X1C100U5PSBA ^(a) S9B1C100U5PSAA	S9X1D120U5PSBA ^(a) S9B1D120U5PSAA	S9X1B040D3PSBA ^(a) S9B1B040D3PSAA	S9X1B060D3PSBA ^(a) S9B1B060D3PSAA
Nat. Gas Qty. — Drill Size	5 - 45	6 - 45	2 - 45	3 - 45
LP Gas Qty. — Drill Size	5 - 56	6 - 56	2 - 56	3 - 56
GAS VALVE	Redundant - One Stage	Redundant - One Stage	Redundant - One Stage	Redundant - One Stage
PILOT SAFETY DEVICE				
Type	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS — Type	Multiport Inshot	Multiport Inshot	Multiport Inshot	Multiport Inshot
Number	5	6	2	3
POWER CONN. — V/Ph/Hz ^(h)	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (In Amps)	13.3	14.1	10.3	10.3
Max. Overcurrent Protection (Amps)	15	15	15	15
PIPE CONN. SIZE (in.)	1/2	1/2	1/2	1/2
DIMENSIONS	H x W x D	H x W x D	H x W x D	H x W x D
Uncrated (In.)	34 x 21 x 28-3/4	34 x 24-1/2 x 28-3/4	34 x 17-1/2 x 28-3/4	34 x 17-1/2 x 28-3/4
Crated (In.)	35-1/2 x 23 x 30-7/8	35-1/2 x 26-1/2 x 30-7/8	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 19-1/2 x 30-7/8
WEIGHT				
Shipping (Lbs.)/Net (Lbs.)	155/145	167/156	122/114	127/119

^(a) Meets Energy Star

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

^(c) Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3.

^(d) Based on U.S. government standard tests.

^(e) 9 Speed constant torque ECM blower motor

^(f) Refer to the Vent Length Table in the Installer's Guide.

^(g) All furnace models have a vent outlet diameter that equals 2 in.

^(h) The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

MODEL	S9X1B080D4PSBA ^(a) S9B1B080D4PSAA	S9X1C100D5PSBA ^(a) S9B1C100D5PSAA	S9X1D120D5PSBA ^(a) S9B1D120D5PSAA
TYPE	Downflow	Downflow	Downflow
RATINGS ^(b)			
Input BTUH	80,000	100,000	120,000
Capacity BTUH (ICS) ^{(c) (d)}	76,900	96,800	115,500
Temp. Rise (Min.-Max.)	45 - 75	40 - 70	45-75
AFUE (%) S9X1 / S9B1 ^(d)	95.0 / 92.1	96.0 / 92.1	95.0 / 92.1
Return Air Temp. (Min. - Max.)	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 10	11 X 10
No. Used	1	1	1
Speeds (No.) ^(e)	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	3/4	1	1
RPM	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	9.3	10.6	10.6
COMBUSTION FAN — Type	Centrifugal	Centrifugal	Centrifugal
Drive — No. Speeds	Direct - 1	Direct - 1	Direct - 1
Motor HP — RPM	3300	3300	3300
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	2.14	0.66	0.66
FILTER — Furnished?	No	No	No

MODEL	S9X1B080D4PSBA ^(a) S9B1B080D4PSAA	S9X1C100D5PSBA ^(a) S9B1C100D5PSAA	S9X1D120D5PSBA ^(a) S9B1D120D5PSAA
Type recommended	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	2 — 14x20 — 1 in.	2 — 16x20 — 1 in.	2 — 16x20 — 1 in.
VENT PIPE DIAMETER — Min (in.) (f) (g)	2 Round	2 Round	3 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	4 - 45	5 - 45	6 - 45
LP Gas Qty. — Drill Size	4- 56	5- 56	6- 56
GAS VALVE	Redundant - One Stage	Redundant - One Stage	Redundant - One Stage
PILOT SAFETY DEVICE			
Type	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS — Type	Multiport Inshot	Multiport Inshot	Multiport Inshot
Number	4	5	6
POWER CONN. — V/Ph/Hz ^(h)	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (In Amps)	13.9	14.1	14.1
Max. Overcurrent Protection (Amps)	15	15	15
PIPE CONN. SIZE (in.)	1/2	1/2	1/2
DIMENSIONS	H x W x D	H x W x D	H x W x D
Uncrated (In.)	34 x 17-1/2 x 28-3/4	34 x 21 x 28-3/4	34 x 24-1/2 x 28-3/4
Crated (In.)	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 23 x 30-7/8	35-1/2 x 26-1/2 x 30-7/8
WEIGHT			
Shipping (Lbs.)/Net (Lbs.)	135/127	155/145	167/156

(a) Meets Energy Star

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

(c) Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3.

(d) Based on U.S. government standard tests.

(e) 9 Speed constant torque ECM blower motor

(f) Refer to the Vent Length Table in the Installer's Guide.

(g) All furnace models have a vent outlet diameter that equals 2 in.

(h) The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

Product Specifications

MODEL	S9X2B040U3PSBA (a)	S9X2B060U4PSBA (a)	S9X2B080U4PSBA (a)	S9X2C080U5PSBA (a)
TYPE	Upflow/Horizontal	Upflow/Horizontal	Upflow/Horizontal	Upflow/Horizontal
RATINGS (b)				
1st Stage Input BTUH (ICS)	26,000	39,000	52,000	52,000
1st Stage Capacity BTUH	25,220	37,830	50,440	50,440
2nd Stage Input BTUH	40,000	60,000	80,000	80,000
2nd Stage Capacity BTUH (ICS) (c) (d)	39,000	58,300	77,200	77,800
1st Stage Temp. Rise (Min.-Max.)	25 - 55	25 - 55	30 - 60	30 - 60
2nd Stage Temp. Rise (Min.-Max.)	30 - 60	30 - 60	45 - 75	40 - 70
AFUE (%)	96.0	96.0	96.0	95.0
Return Air Temp. (Min. - Max.)	45°F - 80°F	45°F - 80°F	45°F - 80°F	45°F - 80°F
BLOWER DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
Diameter — Width (In.)	11 X 8	11 X 8	11 X 8	11 X 10
No. Used	1	1	1	1
Speeds (No.) (e)	9	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	1/2	3/4	3/4	1
RPM	1075	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	6.4	7.6	7.6	10.6
COMBUSTION FAN — Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Drive — No. Speeds	Direct - 2	Direct - 2	Direct - 2	Direct - 2
Motor HP — RPM	3300/2600	3300/2600	3300/2600	3300/2600
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	0.66	0.66	0.66	0.66
FILTER — Furnished?	No	No	No	No
Type recommended	High Velocity	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 — 16x25 — 1 in.	1 — 16x25 — 1 in.	1 — 16x25 — 1 in.	1 — 20x25 — 1 in.
VENT PIPE DIAMETER — Min (in.) (f) (g)	2 Round	2 Round	2 Round	2 Round
HEAT EXCHANGER				
Type — Fired	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel
— Unfired	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20	20	20
ORIFICES — Main				
Nat. Gas Qty. — Drill Size	2- 45	3 - 45	4 - 45	4 - 45
LP Gas Qty. — Drill Size	2- 56	3 - 56	4- 56	4- 56
GAS VALVE	Redundant - Two Stage	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	120 V SiNi Igniter

MODEL	S9X2B040U3PSBA (a)	S9X2B060U4PSBA (a)	S9X2B080U4PSBA (a)	S9X2C080U5PSBA (a)
BURNERS — Type	Multiport Inshot	Multiport Inshot	Multiport Inshot	Multiport Inshot
Number	2	3	4	4
POWER CONN. — V/Ph/Hz (h)	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (In Amps)	8.8	10.3	10.3	14.1
Max. Overcurrent Protection (Amps)	15	15	15	15
PIPE CONN. SIZE (in.)	1/2	1/2	1/2	1/2
DIMENSIONS	H x W x D	H x W x D	H x W x D	H x W x D
Uncrated (In.)	34 x 17-1/2 x 28-3/4	34 x 17-1/2 x 28-3/4	34 x 17-1/2 x 28-3/4	34 x 21 x 28-3/4
Crated (In.)	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 23 x 30-7/8
WEIGHT				
Shipping (Lbs.)/Net (Lbs.)	122/114	130/122	135/127	149/139

(a) Meets Energy Star

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

(c) Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 — latest edition.

(d) Based on U.S. government standard tests.

(e) 9 Speed constant torque ECM blower motor

(f) Refer to the Vent Length Table in the Installer's Guide.

(g) All S9X2 furnace models have a vent outlet diameter that equals 2 in.

(h) The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

MODEL	S9X2C100U5PSBA (a)	S9X2D120U5PSBA (a)	S9X2B040D3PSBA (a)	S9X2B060D3PSBA (a)
TYPE	Upflow / Horizontal	Upflow/Horizontal	Downflow	Downflow
RATINGS (b)				
1st Stage Input BTUH (ICS)	65,000	78,000	26,000	39,000
1st Stage Capacity BTUH	63,050	75,660	25,220	37,830
2nd Stage Input BTUH	100,000	120,000	40,000	60,000
2nd Stage Capacity BTUH (ICS) (c) (d)	97,400	113,400	38,900	57,600
1st Stage Temp. Rise (Min.-Max.)	25 - 55	30 - 60	25 - 55	25 - 55
2nd Stage Temp. Rise (Min.-Max.)	40 - 70	40 - 70	30 - 60	35 - 65
AFUE (%)	96.0	96.0	96.0	95.0
Return Air Temp. (Min. - Max.)	45°F - 80°F	45°F - 80°F	45°F - 80°F	45°F - 80°F
BLOWER DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
Diameter — Width (In.)	11 X 10	11 X 10	11 X 8	11 X 8
No. Used	1	1	1	1
Speeds (No.) (e)	9	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	1	1	1/2	1/2
RPM	1075	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	10	10.6	6.4	6.4
COMBUSTION FAN — Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Drive — No. Speeds	Direct - 2	Direct - 2	Direct - 2	Direct - 2
Motor HP — RPM	3300/2600	3300/2600	3300/2600	3300/2600
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60

Product Specifications

MODEL	S9X2C100U5PSBA (a)	S9X2D120U5PSBA (a)	S9X2B040D3PSBA (a)	S9X2B060D3PSBA (a)
FLA	0.66	0.66	0.66	0.66
FILTER — Furnished?	No	No	No	No
Type recommended	High Velocity	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 — 20x25 — 1 in.	1 — 24x25 — 1 in.	2 — 14x20 — 1 in.	2 — 14x20 — 1 in.
VENT PIPE DIAMETER — Min (in.) (f) (g)	2 Round	3 Round	2 Round	2 Round
HEAT EXCHANGER				
Type — Fired	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel	409 Stainless Steel
— Unfired	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel	29-4C Stainless Steel
Gauge (Fired)	20	20	20	20
ORIFICES — Main				
Nat. Gas Qty. — Drill Size	5 - 45	6 - 45	2 - 45	3 - 45
LP Gas Qty. — Drill Size	5 - 56	6 - 56	2 - 56	3 - 56
GAS VALVE	Redundant - Two Stage	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	120 V SiNi Igniter
BURNERS — Type	Multiport Inshot	Multiport Inshot	Multiport Inshot	Multiport Inshot
Number	5	6	2	3
POWER CONN. — V/Ph/Hz (h)	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (In Amps)	13.3	14.1	8.8	8.8
Max. Overcurrent Protection (Amps)	15	15	15	15
PIPE CONN. SIZE (in.)	1/2	1/2	1/2	1/2
DIMENSIONS	H x W x D	H x W x D	H x W x D	H x W x D
Uncrated (In.)	34 x 21 x 28-3/4	34 x 24-1/2 x 28-3/4	34 x 17-1/2 x 28-3/4	34 x 17-1/2 x 28-3/4
Crated (In.)	35-1/2 x 23 x 30-7/8	35-1/2 x 26-1/2 x 30-7/8	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 19-1/2 x 30-7/8
WEIGHT				
Shipping (Lbs.)/Net (Lbs.)	155/145	167/156	122/114	127/119

(a) Meets Energy Star

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

(c) Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3.

(d) Based on U.S. government standard tests.

(e) 9 Speed constant torque ECM blower motor

(f) Refer to the Vent Length Table in the Installer's Guide.

(g) All S9X2 furnace models have a vent outlet diameter that equals 2 in.

(h) The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

MODEL	S9X2B080D4PSBA (a)	S9X2C100D5PSBA (a)	S9X2D120D5PSBA (a)
TYPE	Downflow	Downflow	Downflow
RATINGS (b)			
1st Stage Input BTUH (ICS)	52,000	65,000	78,000
1st Stage Capacity BTUH	50,440	63,050	75,660
2nd Stage Input BTUH	80,000	100,000	120,000
2nd Stage Capacity BTUH (ICS) (c) (d)	76,900	96,800	115,500
1st Stage Temp. Rise (Min.-Max.)	30 - 60	25 - 55	30-60
2nd Stage Temp. Rise (Min.-Max.)	45 - 75	40 - 70	45-75
AFUE (%)	96.0	95.0	96.0

MODEL	S9X2B080D4PSBA (a)	S9X2C100D5PSBA (a)	S9X2D120D5PSBA (a)
Return Air Temp. (Min. - Max.)	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 10	11 X 10
No. Used	1	1	1
Speeds (No.) (e)	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	3/4	1	1
RPM	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	9.3	10.6	10.6
COMBUSTION FAN — Type	Centrifugal	Centrifugal	Centrifugal
Drive — No. Speeds	Direct - 2	Direct - 2	Direct - 2
Motor HP — RPM	3300/2600	3300/2600	3300/2600
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	0.66	0.66	0.66
FILTER — Furnished?	No	No	No
Type recommended	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	2 — 14x20 — 1 in.	2 — 16x20 — 1 in.	2 — 16x20 — 1 in.
VENT PIPE DIAMETER — Min (in.) (f) (g)	2 Round	2 Round	3 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	4 - 45	5 - 45	6 - 45
LP Gas Qty. — Drill Size	4- 56	5- 56	6- 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	Multiport Inshot	Multiport Inshot	Multiport Inshot
Number	4	5	6
POWER CONN. — V/Ph/Hz (h)	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (In Amps)	12.4	14.1	14.1
Max. Overcurrent Protection (Amps)	15	15	15
PIPE CONN. SIZE (in.)	1/2	1/2	1/2
DIMENSIONS	H x W x D	H x W x D	H x W x D
Uncrated (In.)	34 x 17-1/2 x 28-3/4	34 x 21 x 28-3/4	34 x 24-1/2 x 28-3/4
Crated (In.)	35-1/2 x 19-1/2 x 30-7/8	35-1/2 x 23 x 30-7/8	35-1/2 x 26-1/2 x 30-7/8
WEIGHT			
Shipping (Lbs.)/Net (Lbs.)	135/127	155/145	167/156

(a) Meets Energy Star

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

(c) Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3.

(d) Based on U.S. government standard tests.

(e) 9 Speed constant torque ECM blower motor

(f) Refer to the Vent Length Table in the Installer's Guide.

(g) All S9X2 furnace models have a vent outlet diameter that equals 2 in.

(h) 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 solely on thermostat input.. During a simultaneous call for W1 and W2, the seven-segment will read $H\bar{L}2$, although the IFC will process the call for 1st stage heat first.

1st Stage Gas Heating

1. R – W contacts close on the thermostat sending 24VAC to the W1 low voltage terminal of the IFC. Technician should read 24VAC from W to B/C. The seven-segment LED will read:
 $H\bar{L}1 = 1^{\text{st}}$ Stage gas heat (S9X2)
 $H\bar{L} = \text{Gas Heat (S9X1, S9B1)}$
2. The IFC performs a self-check routine and then confirms that the:
 - a. Condensate pressure switch and Inducer limit switch are closed by sending 24VAC out the HLO terminal and monitoring the ILL 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.
 - c. Pressure switch 1 (PS1) and pressure switch 2 (PS2 – S9X2 only) are open by sending 24VAC out the HLO terminal, through the limit switches, and monitoring the PS1 and PS2 inputs.

Note: If a thermal limit is open, 24VAC will not be present at the pressure switch.

3. After steps a, b, and c are confirmed, the inducer relay is closed energizing the inducer motor.
4. As the inducer ramps up, PS1 will close.
5. When PS1 closes, the ignitor relay on the IFC will close. The ignitor is energized. The ignitor warm up is approximately 17 seconds.
6. After the ignitor warm up, the gas valve relay is closed on the IFC, which energizes the gas valve solenoid to allow ignition.
7. The first burner will ignite, and flame will crossover to the remaining burners, establishing current to the flame sensor. Proof of flame must be established within 4 seconds.

Note: There are two flame sense pads located on the IFC marked as “FP”. To measure the flame current, use a VOM set to DC volts. 1VDC = 1 micro-amp. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3 VDC).

8. Once flame sense has been established, a timer on the IFC starts, and the indoor blower will energize at 1st stage speed after the blower “Heat On Delay” has completed.. The seven-segment LED for example will alternately read:

$H\bar{L} = \text{Gas heating} = \text{S9X1} / \text{S9B1}$

$H\bar{L}1 = \text{Gas heating, Stage 1} = \text{S9X2}$

$L\bar{P}2 = \text{Speed Tap 2}$

9. When the temperature raises enough to satisfy the thermostat setting, contacts R-W will open.
10. The gas valve relay will open, closing the gas valve. The inducer will continue to run for approximately 5 seconds to remove any combustion by-products from inside the furnace.
11. The indoor blower continues to run to remove heat from the heat exchangers. The blower off time is field adjustable through the IFC menu setup option. The seven segment LED will read $I\bar{D}L = \text{Idle, no thermostat demand.}$

2nd Stage Gas Heating (S9X2 Only)

1. See sequence of operation for 1st stage gas heating operation above (steps 1-8)

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

2. 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 $H\bar{L}2$
3. The IFC checks to ensure that PS2 is open, and then energizes the 2nd stage inducer relay. The inducer is energized on high speed, and the second stage gas valve relay on the IFC closes, energizing second stage gas valve. The indoor blower motor will ramp up to the 2nd stage gas heating speed. The seven-segment LED for example will alternately read:

$H\bar{L}2 = \text{Gas heating, Stage 2}$

$L\bar{P}5 = \text{Tap 5}$

4. The IFC monitors PS2 for closure and if PS2 does not close within 45 seconds, a PS2 open error will be declared and the furnace will operate in 1st stage. If PS2 closes, 2nd stage gas heating will continue until the thermostat R-W2 contacts open.

Note: If PS2 does not close within the 45 second time, the IFC will wait 10 minutes and repeat steps 3 & 4. If on the third attempt during the same heating call, PS2 does not close within the 45 second proving time, the unit will run in 1st stage until the thermostat contacts R-W2 open.

5. When the temperature raises enough to satisfy the thermostat setting, contacts R-W2 will open, the 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.
6. When the temperature raises enough to satisfy the thermostat setting, contacts R-W1 will open.

7. 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.
8. 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 $I dL$ = 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: For S9X2 units, the factory supplied Y1-O jumper must remain in place for proper seven-segment LED readout. If removed, the seven-segment LED will read $HP I$

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:
 $CL I$ = Cooling, Stage 1 (S9X2)
 $CP I$ = Cooling, Stage 1 (S9X1 / S9B1)
 $EP I$ = Speed Tap 7
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 "Cool Off Delay" has been enabled in the IFC setup menu options. The seven-segment LED will read $I dL$ = Idle, no thermostat demand.

Two Stage Cooling

1. See sequence of operation for Single Stage Cooling above (Steps 1–3).
2. R-Y2 contact on the thermostat closes sending 24VAC to the Y2 low voltage terminal on the IFC. Technician should read 24VAC between Y2-B/C.
3. 24VAC is sent to the OD unit via thermostat wiring.
4. The indoor blower ramps to 2nd stage airflow. The seven-segment LED for example will alternately read:
 $CL 2$ = Cooling, Stage 2 (S9X2)
 $CP 2$ = Cooling, Stage 2 (S9X1)
 $EP I$ = Speed Tap 7
5. When the temperature is lowered enough to satisfy the thermostat setting, contacts R-Y1-Y2-G will open.

6. The OD unit shuts off and the indoor blower shuts off, unless a blower "Cool Off Delay" has been enabled in the IFC setup menu options. The seven-segment LED will read $I dL$ = Idle, no thermostat demand.

Single Stage Heat Pump

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: For S9X2 units, the factory supplied Y1-O jumper must be removed for proper seven-segment LED readout. If left in place, the seven-segment LED will read $CL I$

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:
 $HP I$ = Cooling, Stage 1 (S9X2)
 $CP I$ = Cooling, Stage 1 (S9X1 / S9B1)
 $EP I$ = Speed Tap 7
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 "Cool Off Delay" has been enabled in the IFC setup menu options. The seven-segment LED will read $I dL$ = Idle, no thermostat demand.

Two Stage Heat Pump

1. See sequence of operation for Single Stage heat pump above (Steps 1–3).
2. R-Y2 contact on the thermostat closes sending 24VAC to the Y2 low voltage terminal on the IFC. Technician should read 24VAC between Y2-B/C.
3. 24VAC is sent to the OD unit via thermostat wiring.
4. The indoor blower ramps to 2nd stage airflow. The seven-segment LED for example will alternately read:
 $HP 2$ = Cooling, Stage 2 (S9X2)
 $CP 2$ = Cooling, Stage 2 (S9X1)
 $EP I$ = Speed Tap 7
5. When the temperature is lowered enough to satisfy the thermostat setting, contacts R-Y1-Y2-G will open.
6. The OD unit shuts off and the indoor blower shuts off, unless a blower "Cool Off Delay" has been enabled in the IFC setup menu options. The seven-segment LED will read $I dL$ = Idle, no thermostat demand.

Periodic Servicing Requirements

1. GENERAL INSPECTION – *Examine the furnace installation annually for the following items:*

- a. All flue product carrying areas external to the Furnace (i.e. chimney, vent connector) are clear and free of obstruction. A vent screen in the end of the Vent (flue) Pipe must be inspected for blockage annually, if applicable.
- b. The vent connector is in place, slopes upward and is physically sound without holes or excessive corrosion.
- c. The return air duct connection(s) is physically sound, is sealed to the Furnace and terminates outside the space containing the Furnace.
- d. The physical support of the Furnace should be sound without sagging, cracks, gaps, etc., around the base so as to provide a seal between the support and the base.

2. FILTERS – Filters should be cleaned or replaced (with high velocity filters only), monthly and more frequently during high use times of the year such as midsummer or midwinter.

3. BLOWERS – The Blower size and speed determine the air volume delivered by the Furnace. The Blower motor bearings are factory lubricated and under normal operating conditions do not require servicing. Annual cleaning of the Blower wheel and housing is recommended for maximum air output, and this must be performed only by a qualified servicer or service agency.

4. IGNITER – This unit has a special hot surface direct ignition device that automatically lights the burners. Please note that it is very fragile and should be handled with care. ! CAUTION Do NOT touch igniter. It is extremely hot.

5. BURNER – Gas burners do not normally require scheduled servicing, however, accumulation of foreign material may cause a yellowing flame or delayed ignition. Either condition indicates that a service call is required. For best operation, burners must be cleaned annually using brushes and vacuum cleaner. Turn off gas and electric power supply. To clean burners, remove burner bottom plate (2 screws) and bottom burner bracket (2 screws). Twist burner towards slot, lift, and push forward away from orifice. Remove burners.

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

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

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

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

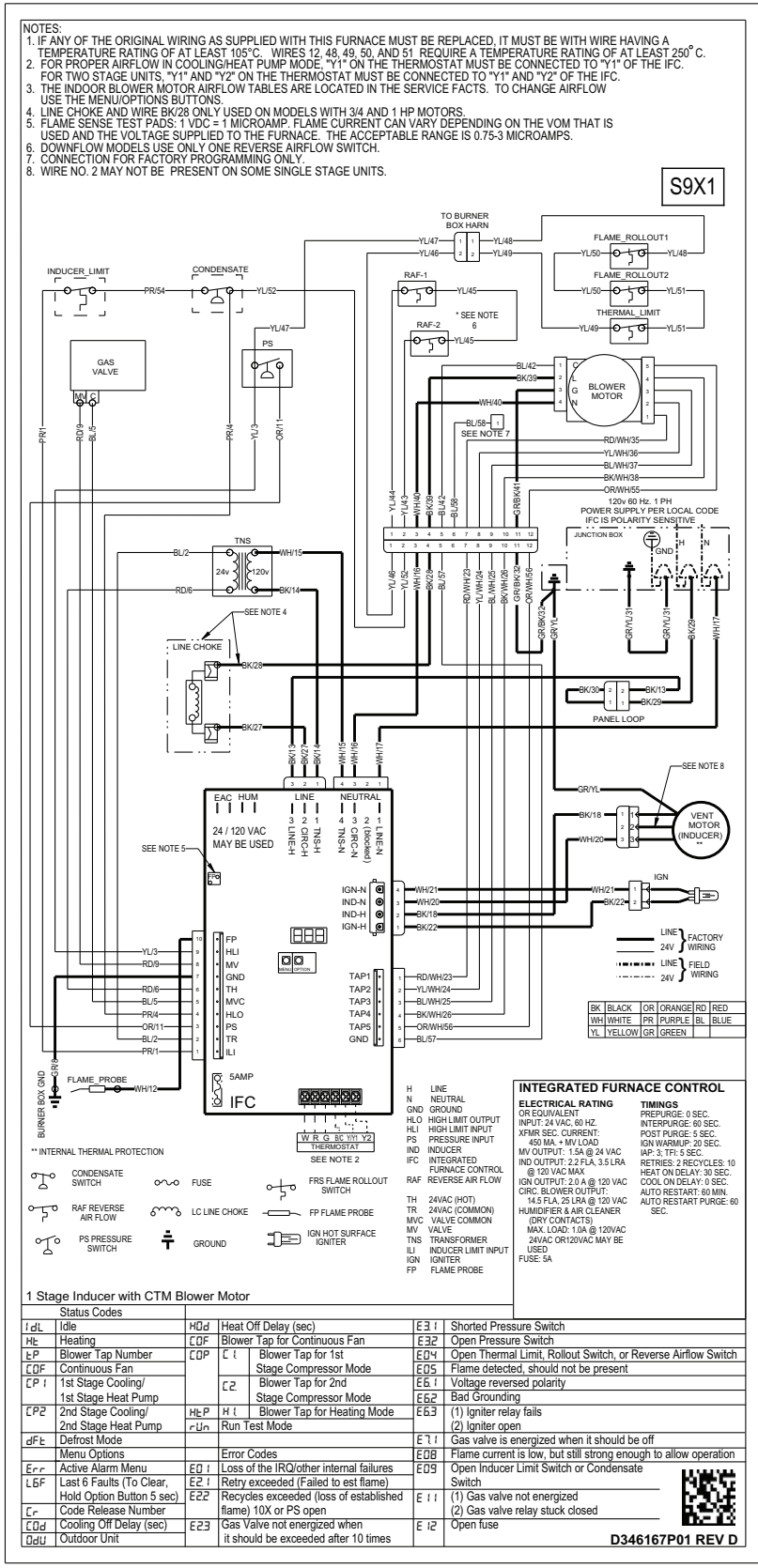
Note: On Propane units, due to variations in BTU content and altitude, servicing may be required at shorter intervals.

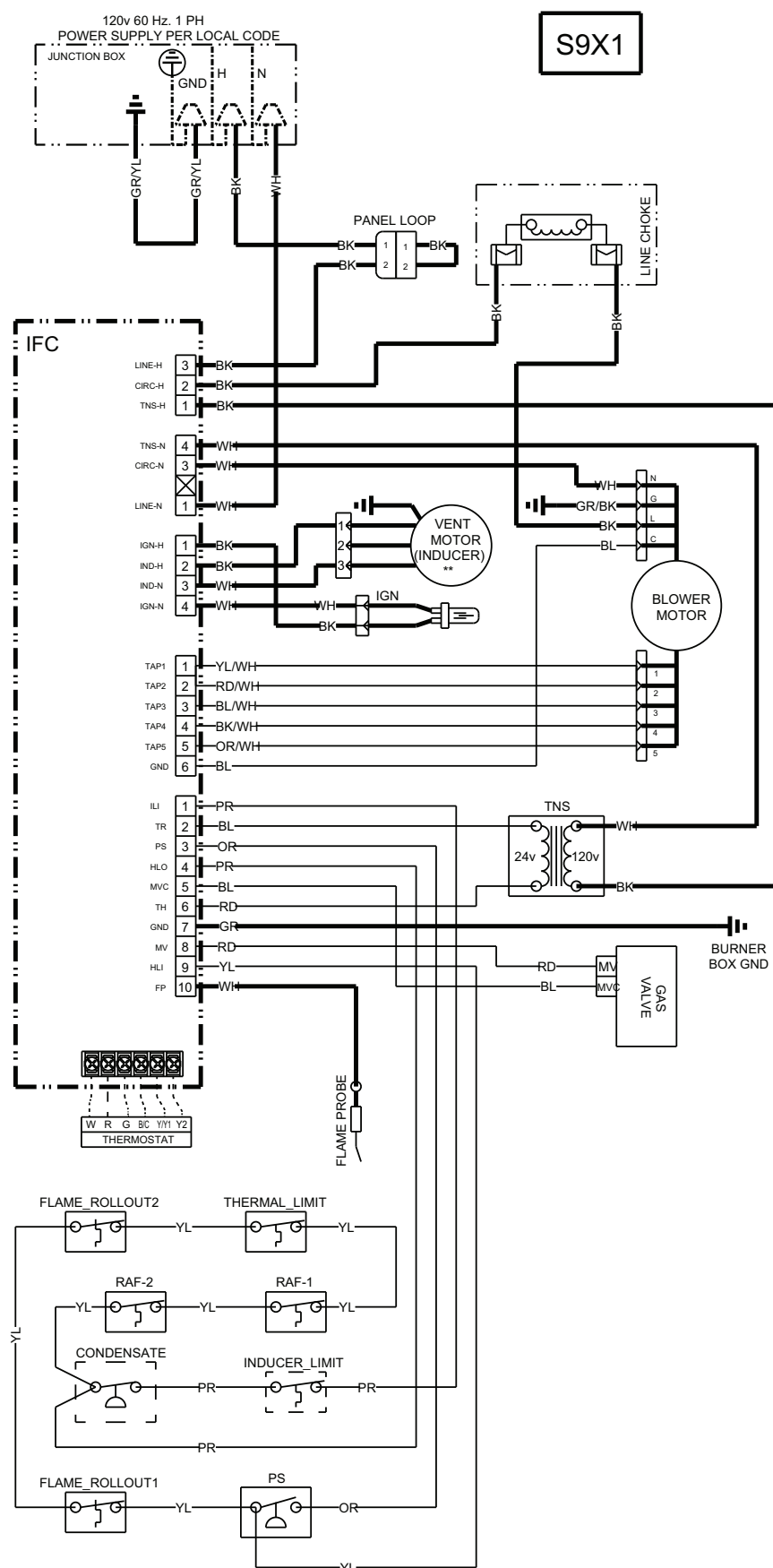
6. HEAT EXCHANGER/ FLUE PIPE – These items must be inspected for signs of corrosion, and/ or deterioration at the beginning of each heating season by a qualified service technician and cleaned annually for best operation. To clean flue gas passages, follow recommendations below:

- a. Turn off gas and electric power supply.
- b. Inspect flue pipe exterior for cracks, leaks, holes or leaky joints. Some discoloration of PVC pipe is normal.
- c. Remove door from Furnace.
- d. Inspect around insulation covering flue collector box. Inspect induced draft Blower connections from recuperative cell and to the flue pipe connection.
- e. Remove burners. (See 5. Burner)
- f. Use a mirror and flashlight to inspect interior of Heat Exchanger, be careful not to damage the Igniter, Flame Sensor or other components.
- g. If any corrosion is present, the Heat Exchanger should be cleaned by a qualified service technician.
- h. After inspection is complete replace burners and Furnace door.
- i. Restore gas supply. Check for leaks using a soap solution. Restore electrical supply. Check unit for normal operation.

7. COOLING COIL CONDENSATE DRAIN - If a cooling coil is installed with the Furnace, condensate drains should be checked and cleaned periodically to assure that condensate can drain freely from coil to drain. If condensate cannot drain freely water damage could occur. (See Condensate Drain in Installer's Guide.)

Wiring Diagrams

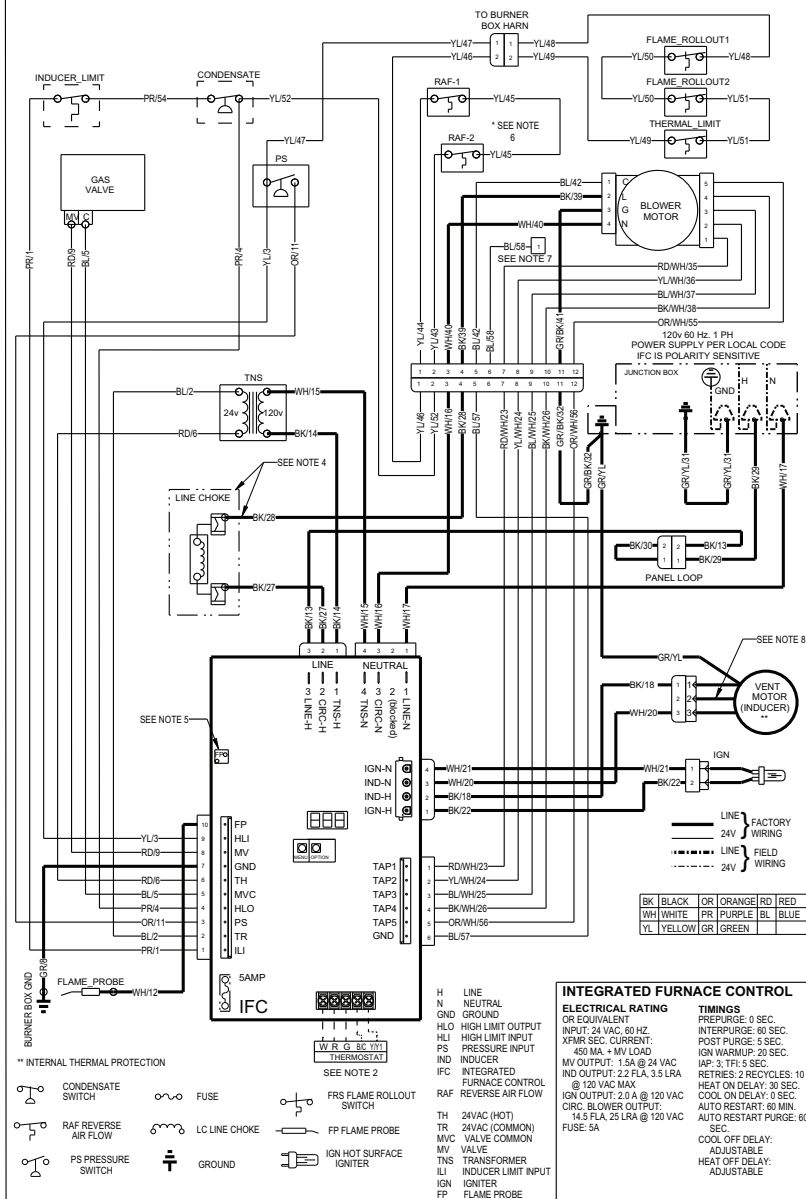




NOTES:

1. IF ANY OF THE ORIGINAL WIRING AS SUPPLIED WITH THIS FURNACE MUST BE REPLACED, IT MUST BE WITH WIRE HAVING A TEMPERATURE RATING OF AT LEAST 105°C. WIRES 12, 48, 49, 50, AND 51 REQUIRE A TEMPERATURE RATING OF AT LEAST 250°C.
2. FOR PROPER AIRFLOW IN COOLING/HEAT PUMP MODE, "Y1" ON THE THERMOSTAT MUST BE CONNECTED TO "Y1" OF THE IFC.
3. THE INDOOR BLOWER MOTOR AIRFLOW TABLES ARE LOCATED IN THE SERVICE FACTS. TO CHANGE AIRFLOW USE THE MENU/OPTIONS BUTTONS.
4. LINE CHOKE AND WIRE BK/28 ONLY USED ON MODELS WITH 3/4 AND 1 HP MOTORS.
5. FLAME SENSE TEST PADS: 1 VDC = 1 MICROAMP. FLAME CURRENT CAN VARY DEPENDING ON THE VOM THAT IS USED AND THE VOLTAGE SUPPLIED TO THE FURNACE. THE ACCEPTABLE RANGE IS 0.75-3 MICROAMPS.
6. DOWNFLOW MODELS USE ONLY ONE REVERSE AIRFLOW SWITCH.
7. CONNECTION FOR FACTORY PROGRAMMING ONLY.
8. WIRE NO. 2 MAY NOT BE PRESENT ON SOME SINGLE STAGE UNITS.

S9B1



INTEGRATED FURNACE CONTROL

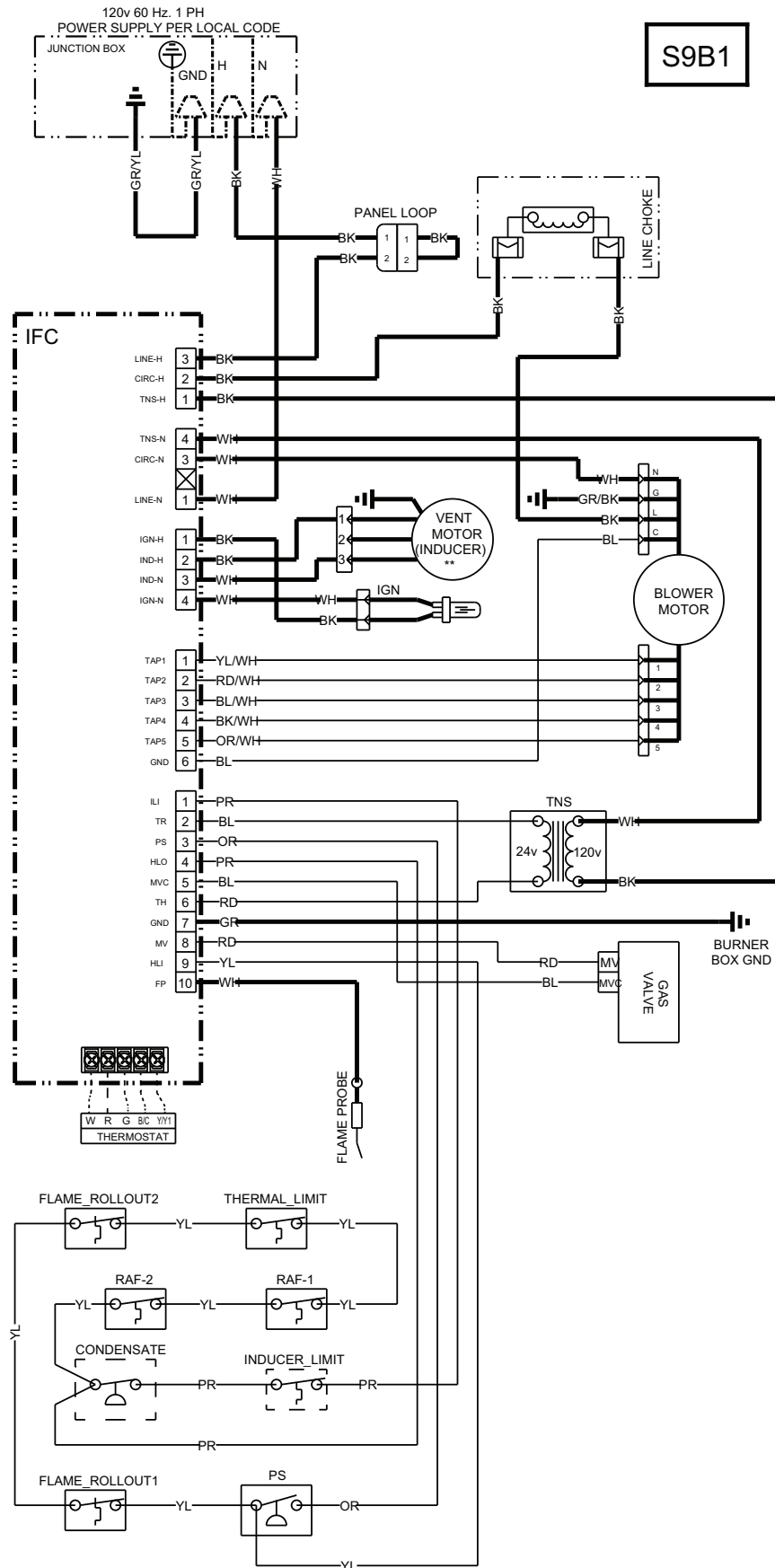
ELECTRICAL RATING
OR EQUIVALENT
INPUT: 24 VAC, 60 HZ.
XPR SEC. CURRENT:
450 MA + MV LOAD
MV OUTPUT: 1.5A @ 24 VAC
IND OUTPUT: 2.2 FLA, 3.5 LRA
@ 120 VAC MAX
IGN OUTPUT: 2.0 A @ 120 VAC
CIRC. BLOWER OUTPUT:
14.5 FLA, 25 LRA @ 120 VAC
FUSE: 5A

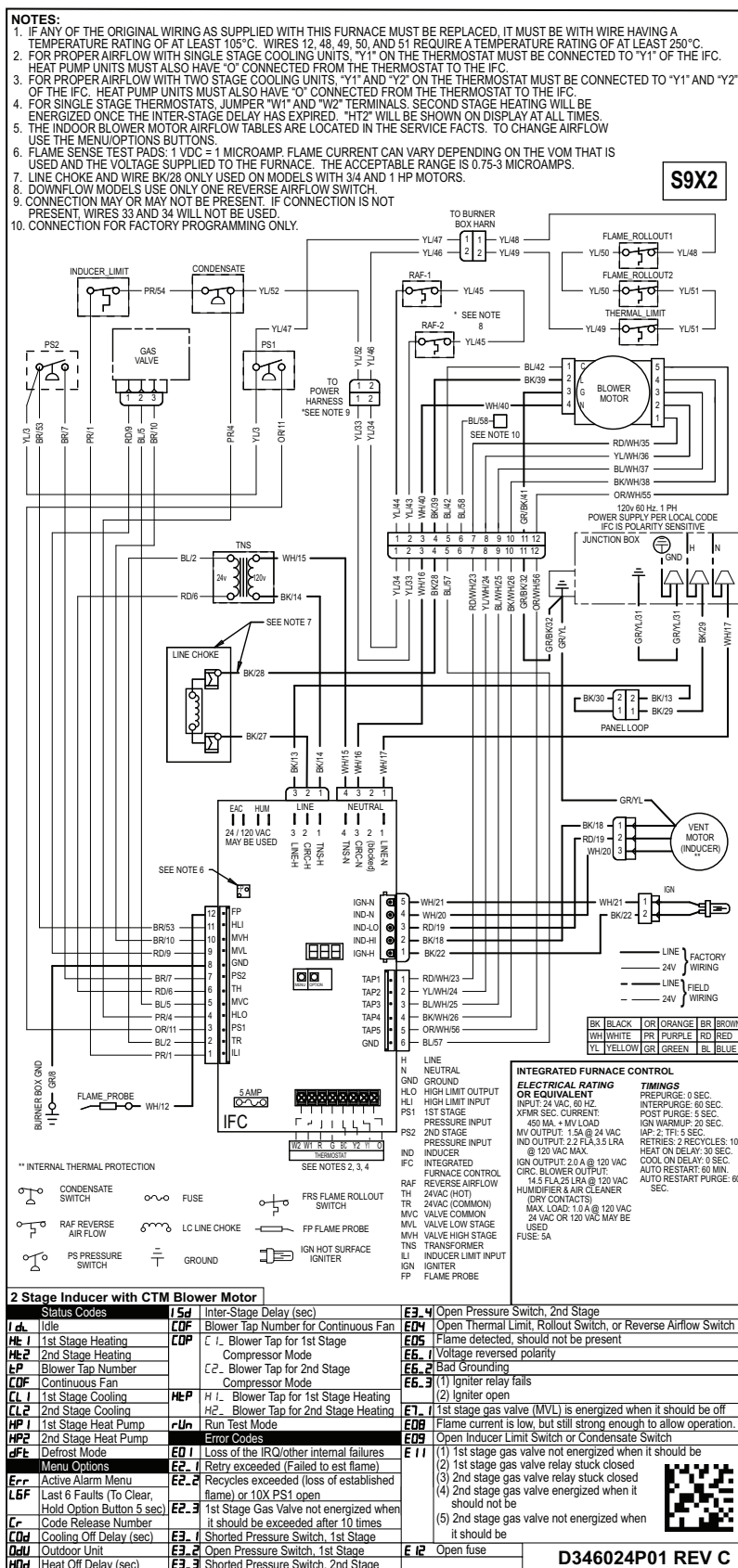
TIMINGS
PREPURGE: 0 SEC.
INTERPURGE: 60 SEC.
POST PURGE: 5 SEC.
IGN WARMUP: 20 SEC.
IAP: 3, TFI: 5 SEC.
RETRIES: 2 RECYCLES: 10
HEAT ON DELAY: 30 SEC.
COOL ON DELAY: 0 SEC.
AUTO RESTART: 60 MIN.
AUTO RESTART PURGE: 60
SEC.
COOL OFF DELAY:
ADJUSTABLE
HEAT OFF DELAY:
ADJUSTABLE

1 Stage Inducer with CTM Blower Motor

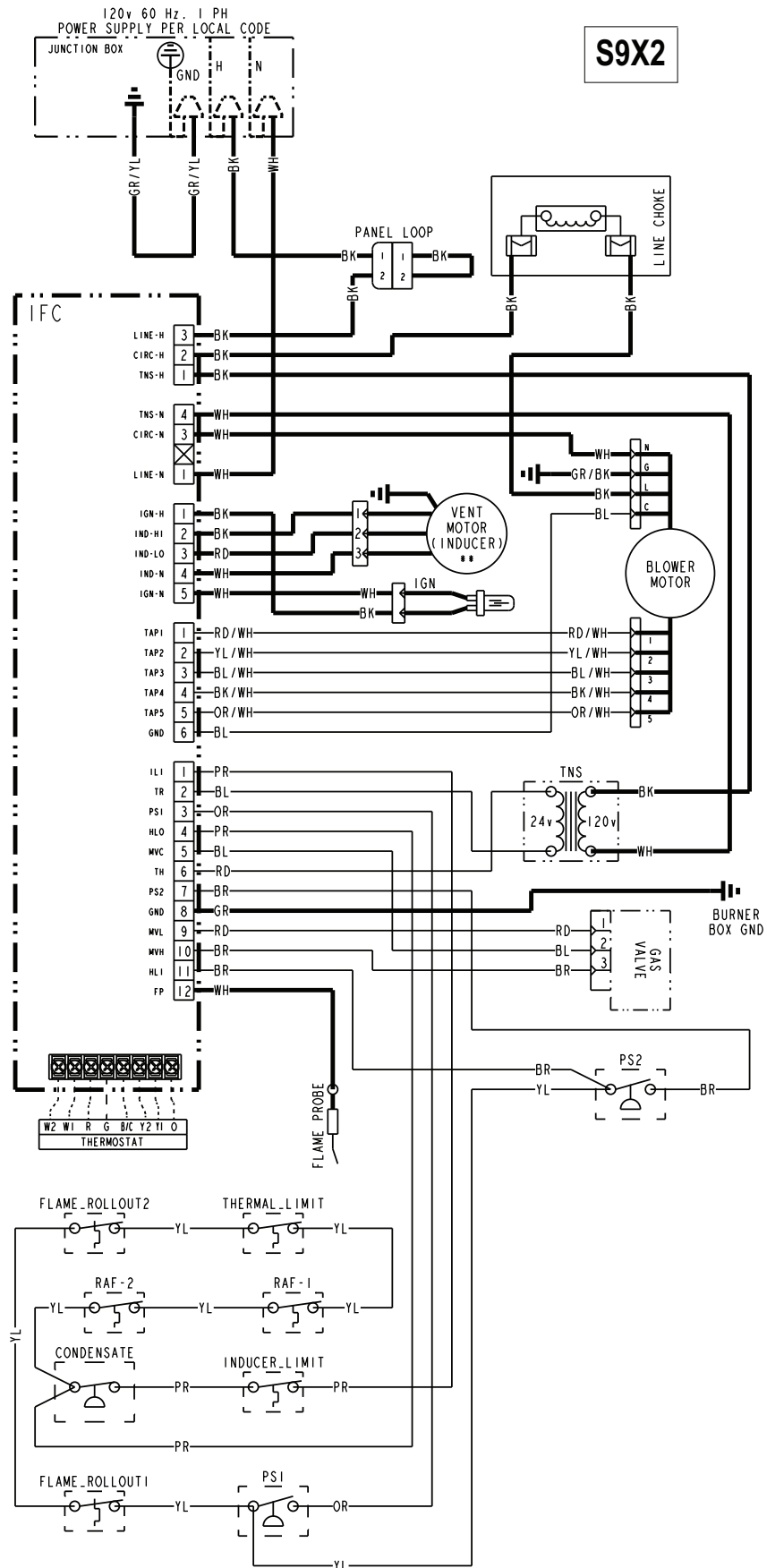
Status Codes			
Id	Idle	Hd	Heat Off Delay (sec)
Ht	Heating	Cf	Blower Tap for Continuous Fan
EP	Blower Tap Number	Cf	Blower Tap for 1st Stage Compressor Mode
Cf	Continuous Fan		
CP	1st Stage Cooling/1st Stage Heat Pump		
		Ht	Blower Tap for Heating Mode
		Run	Run Test Mode
dFt	Defrost Mode		
	Menu Options		Error Codes
Erf	Active Alarm Menu	E0	Loss of the IRQ/other internal failures
L6F	Last 6 Faults (To Clear, Hold Option Button 5 sec)	E1	Retry exceeded (Failed to est flame)
Er	Code Release Number	E2	Recycles exceeded (loss of established flame) 10X or PS open
Cof	Cooling Off Delay (sec)	E3	Gas Valve not energized when it should be exceeded after 10 times
OdU	Outdoor Unit		
		E3	Shorted Pressure Switch
		E3	Open Pressure Switch
		E4	Open Thermal Limit, Rollout Switch, or Reverse Airflow Switch
		E5	Flame detected, should not be present
		E6	Voltage reversed polarity
		E6	Bad Grounding
		E6	(1) Igniter relay fails
		E6	(2) Igniter open
		E7	Gas valve is energized when it should be off
		E8	Flame current is low, but still strong enough to allow operation
		E9	Open Inducer Limit Switch or Condensate Switch
		E1	(1) Gas valve not energized
		E1	(2) Gas valve relay stuck closed
		E1	Open fuse

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Wiring Diagrams



Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1B040U3PSBA S9B1B040U3PSAA S9X2B040U3PSBA	1	SCFM	510	314	118	-	-
		Watts	34	43	52	-	-
	2	SCFM	532	341	150	-	-
		Watts	36	45	54	-	-
	3	SCFM	877	748	620	491	362
		Watts	91	104	118	131	144
	4	SCFM	933	813	693	573	452
		Watts	106	120	133	147	161
	5	SCFM	1056	950	843	737	631
		Watts	140	156	172	188	204
	6	SCFM	1111	1009	908	806	705
		Watts	157	174	190	207	223
	7	SCFM	1174	1078	983	887	791
		Watts	182	199	216	233	251
	8	SCFM	1376	1297	1218	1140	1061
		Watts	285	305	325	344	364
	9	SCFM	1512	1445	1378	1312	1245
		Watts	382	403	424	445	466

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1B060U4PSBA S9B1B060U4PSAA S9X2B060U4PSBA	1	SCFM	840	702	565	427	290
		Watts	91	101	111	121	130
	2	SCFM	1001	893	786	678	571
		Watts	137	149	162	174	186
	3	SCFM	1140	1051	963	875	786
		Watts	193	207	221	235	249
	4	SCFM	1208	1128	1048	969	889
		Watts	223	238	253	268	283
	5	SCFM	1299	1224	1148	1073	998
		Watts	270	284	298	312	327
	6	SCFM	1413	1348	1283	1217	1152
		Watts	343	359	375	391	406
	7	SCFM	1444	1380	1315	1251	1186
		Watts	354	370	386	403	419
	8	SCFM	1727	1674	1622	1570	1518
		Watts	612	631	650	668	687
	9	SCFM	1790	1741	1691	1642	1593
		Watts	694	712	729	747	765

Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1B080U4PSBA S9B1B080U4PSAA S9X2B080U4PSBA	1	SCFM	911	766	622	477	332
		Watts	94	104	115	125	136
	2	SCFM	1075	963	851	740	628
		Watts	139	153	168	182	197
	3	SCFM	1215	1121	1028	934	840
		Watts	185	202	219	236	253
	4	SCFM	1250	1164	1077	990	903
		Watts	203	221	239	257	274
	5	SCFM	1349	1272	1194	1116	1039
		Watts	251	271	291	310	330
	6	SCFM	1453	1387	1321	1254	1188
		Watts	313	335	356	378	400
	7	SCFM	1505	1438	1372	1305	1239
		Watts	340	362	384	406	427
	8	SCFM	1657	1597	1538	1479	1419
		Watts	453	477	500	524	547
	9	SCFM	1878	1815	1752	1690	1627
		Watts	669	686	702	718	735

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1C080U5PSBA S9B1C080U5PSAA S9X2C080U5PSBA	1	SCFM	643	384	125		
		Watts	45	53	62	-	-
	2	SCFM	1125	982	838	694	551
		Watts	126	142	158	174	190
	3	SCFM	1192	1038	884	730	576
		Watts	140	157	174	191	208
	4	SCFM	1509	1377	1246	1115	983
		Watts	245	268	291	314	337
	5	SCFM	1548	1428	1308	1187	1067
		Watts	257	281	304	328	352
	6	SCFM	1602	1467	1331	1196	1061
		Watts	320	345	371	396	421
	7	SCFM	1640	1512	1383	1255	1127
		Watts	352	379	406	433	459
	8	SCFM	1831	1778	1726	1673	1621
		Watts	521	550	579	608	637
	9	SCFM	2351	2278	2204	2131	2058
		Watts	886	918	950	982	1014

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1C100U5PSBA S9B1C100U5PSAA S9X2C100U5PSBA	1	SCFM	1013	847	680	514	348
		Watts	104	116	129	142	155
	2	SCFM	1261	1126	990	854	718
		Watts	168	185	202	219	236
	3	SCFM	1519	1407	1296	1184	1072
		Watts	267	290	313	336	358
	4	SCFM	1554	1446	1337	1229	1120
		Watts	283	307	330	353	377
	5	SCFM	1749	1651	1554	1457	1359
		Watts	385	411	436	462	488
	6	SCFM	1868	1778	1688	1599	1509
		Watts	464	491	519	546	574
	7	SCFM	2018	1936	1853	1770	1688
		Watts	573	602	631	660	689
	8	SCFM	2191	2112	2033	1954	1875
		Watts	718	750	782	815	847
	9	SCFM	2395	2303	2212	2120	2028
		Watts	966	981	996	1012	1027

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1D120U5PSBA S9B1D120U5PSAA S9X2D120U5PSBA	1	SCFM	707	443	179	-	-
		Watts	46	55	64	-	-
	2	SCFM	1344	1218	1092	966	840
		Watts	163	183	202	222	241
	3	SCFM	1532	1419	1307	1195	1083
		Watts	225	247	268	290	312
	4	SCFM	1584	1477	1370	1263	1156
		Watts	247	270	292	315	338
	5	SCFM	1915	1818	1722	1625	1529
		Watts	401	428	454	480	506
	6	SCFM	2104	2016	1927	1839	1750
		Watts	525	553	582	610	639
	7	SCFM	2132	2045	1958	1870	1783
		Watts	546	575	604	633	662
	8	SCFM	2410	2328	2247	2165	2084
		Watts	833	868	903	937	972
	9	SCFM	2472	2401	2329	2257	2186
		Watts	909	944	979	1013	1048

Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1B040D3PSBA S9B1B040D3PSAA S9X2B040D3PSBA	1	SCFM	378	153	-	-	-
		Watts	28	32	-	-	-
	2	SCFM	514	330	145	-	-
		Watts	35	45	55	64	74
	3	SCFM	765	618	471	324	178
		Watts	69	81	93	105	116
	4	SCFM	827	691	554	418	281
		Watts	81	94	106	119	132
	5	SCFM	988	879	770	661	553
		Watts	124	140	156	171	187
	6	SCFM	1085	986	887	787	688
		Watts	156	173	190	207	224
	7	SCFM	1125	1030	934	839	743
		Watts	170	188	205	222	239
	8	SCFM	1129	1035	941	847	753
		Watts	170	187	204	221	239
	9	SCFM	1492	1419	1346	1273	1200
		Watts	369	390	411	431	452

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1B060D3PSBA S9B1B060D3PSAA S9X2B060D3PSBA	1	SCFM	624	451	277	104	-
		Watts	47	57	68	79	-
	2	SCFM	866	734	602	470	338
		Watts	89	102	116	129	142
	3	SCFM	949	833	718	602	486
		Watts	113	128	142	156	171
	4	SCFM	1122	1025	928	831	733
		Watts	165	182	200	217	235
	5	SCFM	1178	1087	996	905	814
		Watts	191	209	227	246	264
	6	SCFM	1260	1180	1100	1021	941
		Watts	233	252	271	290	309
	7	SCFM	1370	1299	1228	1158	1087
		Watts	296	316	336	355	375
	8	SCFM	1480	1416	1352	1287	1223
		Watts	365	387	408	429	450
	9	SCFM	1504	1440	1376	1312	1249
		Watts	384	406	427	449	470

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1B080D4PSBA S9B1B080D4PSAA S9X2B080D4PSBA	1	SCFM	499	306	113	-	-
		Watts	36	43	49	-	-
	2	SCFM	1017	922	828	734	640
		Watts	143	158	173	188	203
	3	SCFM	1119	1029	940	850	761
		Watts	176	192	207	223	239
	4	SCFM	1205	1125	1044	964	883
		Watts	215	233	250	268	285
	5	SCFM	1237	1160	1083	1006	928
		Watts	231	250	268	286	305
	6	SCFM	1378	1309	1240	1172	1103
		Watts	315	334	354	373	393
	7	SCFM	1453	1389	1324	1260	1195
		Watts	360	380	399	419	439
	8	SCFM	1618	1562	1505	1449	1392
		Watts	496	518	540	561	583
	9	SCFM	1794	1742	1691	1639	1587
		Watts	682	704	726	748	770

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1C100D5PSBA S9B1C100D5PSAA S9X2C100D5PSBA	1	SCFM	1002	823	644	465	285
		Watts	103	117	130	144	157
	2	SCFM	1385	1276	1167	1057	948
		Watts	223	243	264	284	304
	3	SCFM	1527	1430	1333	1236	1139
		Watts	286	310	333	357	380
	4	SCFM	1610	1516	1421	1326	1231
		Watts	328	352	377	401	425
	5	SCFM	1761	1677	1593	1509	1425
		Watts	433	459	486	512	538
	6	SCFM	1861	1783	1706	1628	1551
		Watts	492	520	549	577	605
	7	SCFM	1984	1902	1820	1738	1656
		Watts	548	577	606	635	663
	8	SCFM	2173	2097	2020	1944	1867
		Watts	728	760	792	824	856
	9	SCFM	2342	2269	2196	2123	2050
		Watts	945	973	1002	1031	1060

Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	Tap		0.1	0.3	0.5	0.7	0.9
S9X1D120D5PSBA S9B1D120D5PSAA S9X2D120D5PSBA	1	SCFM	680	419	159	-	-
		Watts	47	56	66	-	-
	2	SCFM	1481	1372	1264	1155	1046
		Watts	236	259	282	304	327
	3	SCFM	1566	1461	1357	1253	1149
		Watts	268	292	316	340	363
	4	SCFM	1803	1711	1619	1527	1435
		Watts	393	420	446	472	498
	5	SCFM	1891	1801	1711	1621	1532
		Watts	445	472	500	527	555
	6	SCFM	2132	2025	1919	1812	1705
		Watts	568	601	633	666	698
	7	SCFM	2154	2068	1982	1896	1810
		Watts	644	675	705	736	766
	8	SCFM	2344	2267	2190	2113	2035
		Watts	837	870	902	934	967
	9	SCFM	2414	2333	2251	2170	2088
		Watts	896	928	961	993	1026

CFM Versus Temperature Rise

S9X1 and S9B1 furnaces have one stage heating.

S9X2 Furnaces have two stage heating. First Stage is Low heating and Second Stage is High heating.

Table 1. Heating Table – Upflow

CFM VS. TEMPERATURE RISE																	
MODEL	CFM (CUBIC FEET PER MINUTE)																
	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
S9X1B040U3PSBA S9B1B040U3PSAA	55	48	44	39	36	33	30										
S9X1B060U4PSBA S9B1B060U4PSAA			63	58	52	49	46	43	41	40							
S9X1B080U4PSBA S9B1B080U4PSAA					64	61	57	54	51	48	44	39	35				
S9X1C080U5PSBA S9B1C080U5PSAA					65	59	56	54	49	46	44	42	40	38	36		
S9X1C100U5PSBA S9B1C100U5PSAA									65	61	57	55	53	49	46	44	43
S9X1D120U5PSBA S9B1D120U5PSAA									67	65	60	55	54	51	48	44	41

Table 2. Heating Table – Downflow

CFM VS. TEMPERATURE RISE																			
MODEL	CFM (CUBIC FEET PER MINUTE)																		
	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
S9X1B040D3PSBA S9B1B040D3PSAA		53	46	45	37	34	31												
S9X1B060D3PSBA S9B1B060D3PSAA					63	58	52	48	44	41	37								
S9X1B080D4PSBA S9B1B080D4PSAA								62	57	53	49	48	46						
S9X1C100D5PSBA S9B1C100D5PSAA									65	62	58	55	53	50	48	44			
S9X1D120D5PSBA S9B1D120D5PSAA												66	64	58	56	53	52	49	44

Table 3. 2nd Stage Heating Table – Upflow

CFM VS. 2ND STAGE TEMPERATURE RISE																			
MODEL	CFM (CUBIC FEET PER MINUTE)																		
	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
S9X2B040U3PSBA	60	51	45	40	36	33													
S9X2B060U4PSBA				60	54	49	45	41	38	36	34	32							
S9X2B080U4PSBA					72	65	60	55	51	48									
S9X2C080U5PSBA						65	60	55	51	48	45	42							
S9X2C100U5PSBA								69	64	60	56	53	50	47	45	43	41		
S9X2D120U5PSBA											67	63	60	57	54	51	49	47	

CFM Versus Temperature Rise

Table 4. 1st Stage Heating Table — Upflow

CFM VS. 1ST STAGE TEMPERATURE RISE																	
MODEL																	
	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
S9X2B040U3PSBA	47	39	33	29	26												
S9X2B060U4PSBA			50	44	39	35	32	29	27	25							
S9X2B080U4PSBA				58	52	47	42	39	36	33	31						
S9X2C080U5PSBA				58	52	47	42	39	36	33	31						
S9X2C100U5PSBA							53	49	45	42	39	36	34	32	31	29	28
S9X2D120U5PSBA								58	54	50	47	44	41	39	37	35	33

Table 5. 2nd Stage Heating Table — Downflow

CFM VS. 2ND STAGE TEMPERATURE RISE																		
MODEL	CFM (CUBIC FEET PER MINUTE)																	
	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
S9X2B040D3PSBA	60	51	45	40	36	33												
S9X2B060D3PSBA				60	54	49	45	41	38	36								
S9X2B080D4PSBA					72	65	60	55	51	48								
S9X2C100D5PSBA								69	64	60	56	53	50	47	45	43	41	
S9X2D120D5PSBA										72	67	63	60	57	54	51	49	47

Table 6. 1st Stage Heating Table — Downflow

CFM VS. 1ST STAGE TEMPERATURE RISE																	
MODEL																	
	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
S9X2B040D3PSBA	47	39	33	29	26												
S9X2B060D3PSBA			50	44	39	35	32	29	27	25							
S9X2B080D4PSBA				58	52	47	42	39	36	33	31						
S9X2C100D5PSBA							53	49	45	42	39	36	34	32	31	29	28
S9X2D120D5PSBA								58	54	50	47	44	41	39	37	35	33

Integrated Furnace Control Display Codes

Menu Options	
<i>I dL</i>	Idle
<i>Err</i>	Active Alarm Errors
<i>L6F</i>	Last 6 Faults (To clear — Hold Option button down for 5 seconds after entering the <i>L6F</i> menu)
<i>Cr</i>	Code Release Number
<i>COd</i>	Cooling Off Delay (Seconds)
<i>OdU</i>	Outdoor Unit Type
<i>COF</i>	Blower Constant Fan Airflow
<i>HOd</i>	Heat Off Delay (Seconds)
<i>I5d</i>	Inter-Stage Delay (Seconds)
<i>gHC</i>	Gas Heating CFM (1st and 2nd stage airflow are selectable)
<i>rUn</i>	Test Mode

Error Codes	
Alarm Error Code	Alarm Explanation
<i>E0I</i>	Loss of the IRQ or other internal failures (Internal IFC error)
<i>E2.1</i>	Retry Exceeded (Flame never sensed, one hour lockout after 3 times)
<i>E2.2</i>	Recycles Exceeded (Flame sensed then lost, one hour lockout after 10 times)
<i>E2.3</i>	1st Stage Gas Valve Not Energized When It Should Be exceeded after 10 times
<i>E3.1</i>	Shorted Pressure Switch, 1st Stage
<i>E3.2</i>	Open Pressure Switch, 1st Stage
<i>E3.3</i>	Shorted Pressure Switch, 2nd Stage (Not applicable for S9X1/S9B1)
<i>E3.4</i>	Open Pressure Switch, 2nd Stage (Not applicable for S9X1/S9B1)
<i>E04</i>	Open Limit (Main Thermal, Rollout Switch, or Reverse Airflow Switch)
<i>E05</i>	Flame detected, should not be present
<i>E6.1</i>	Voltage reversed polarity
<i>E6.2</i>	Bad grounding
<i>E6.3</i>	(1) Igniter relay fails
	(2) Igniter open
<i>E7.1</i>	1st Gas valve (MVL) is energized when it should be off
<i>E08</i>	Flame current is low, but still strong enough to allow operation
<i>E09</i>	Open Inducer Limit Switch or Condensate Pressure Switch
<i>E11</i>	(1) 1st stage gas valve not energized when it should be
	(2) 1st stage gas valve relay stuck closed
	(3) 2nd stage gas valve relay stuck closed (Not applicable for S9X1/S9B1)
	(4) 2nd stage gas valve energized when it should not be (Not applicable for S9X1/S9B1)
	(5) 2nd stage gas valve not energized when it should be (Not applicable for S9X1/S9B1)
<i>E12</i>	Open fuse

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.

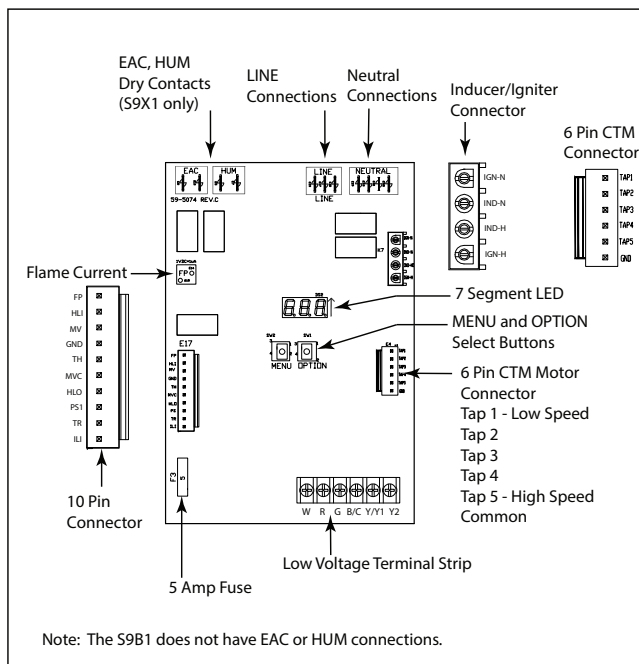
Clearing the Last 6 Faults

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.

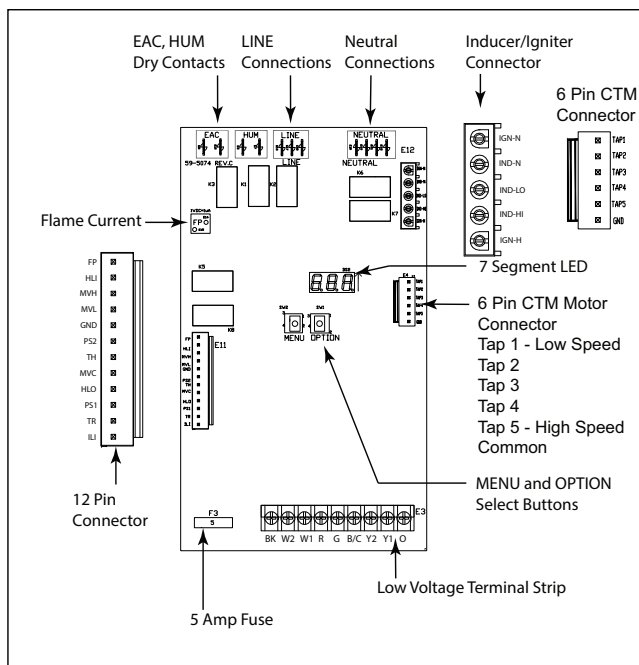
Resetting Factory Defaults

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.

S9X1 S9B1 IFC Component Layout

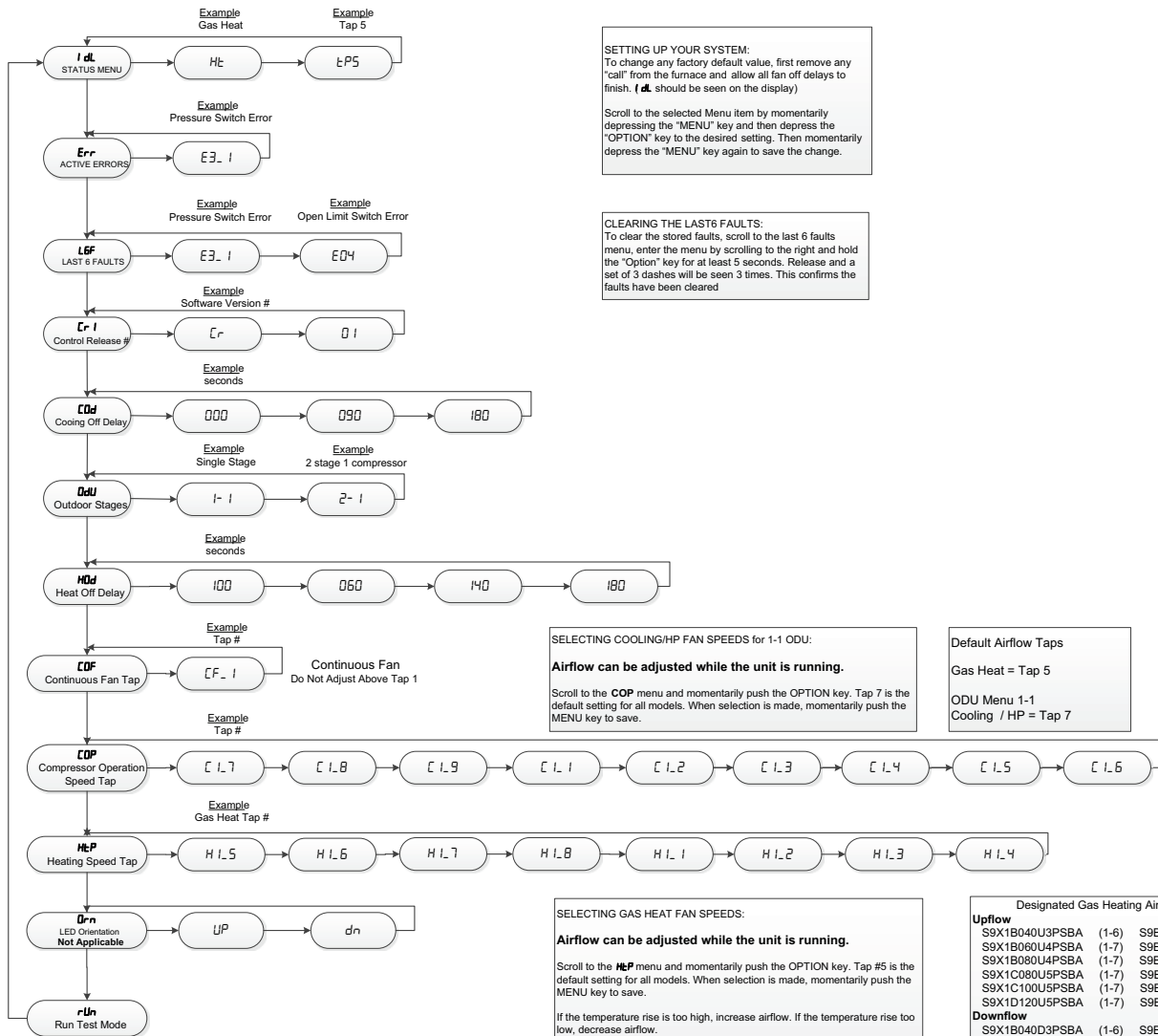


S9X2 IFC Component Layout



Integrated Furnace Control Menu

S9X1 / S9B1 Control System Menu Single Stage OD



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

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

CLEARING THE LAST 6 FAULTS:
To clear the stored faults, scroll to the last 6 faults menu, 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

SELECTING COOLING/HP FAN SPEEDS for 1-1 ODU:

Airflow can be adjusted while the unit is running.

Scroll to the **COP** menu and momentarily push the OPTION key. Tap 7 is the default setting for all models. When selection is made, momentarily push the MENU key to save.

Default Airflow Taps

Gas Heat = Tap 5

ODU Menu 1-1
Cooling / HP = Tap 7

SELECTING GAS HEAT FAN SPEEDS:

Airflow can be adjusted while the unit is running.

Scroll to the **HtP** menu and momentarily push the OPTION key. Tap #5 is the default setting for all models. When selection is made, momentarily push the MENU key to save.

If the temperature rise is too high, increase airflow. If the temperature rise too low, decrease airflow.

NOTE: Tap 9 is not available for gas heating

Designated Gas Heating Airflow Taps

Upflow

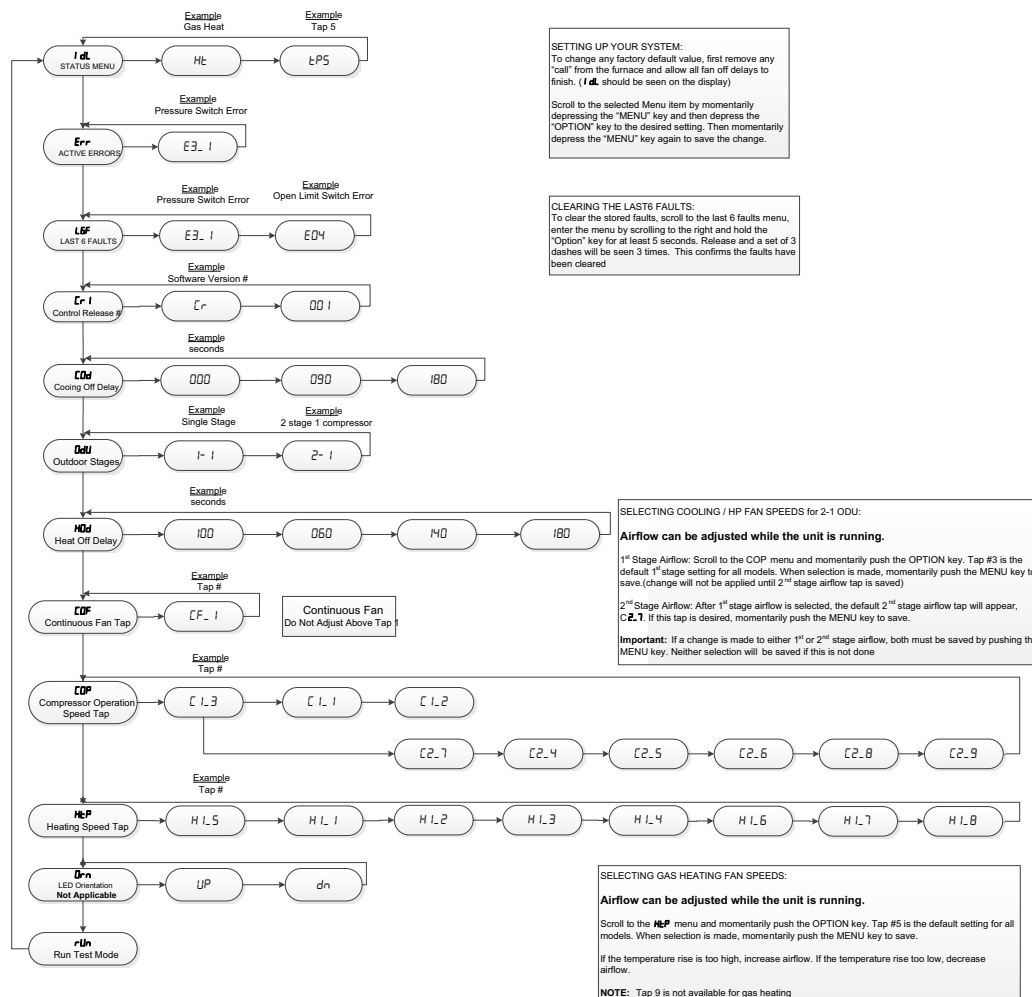
S9X1B040U3PSBA	(1-6)	S9B1B040U3PSAA
S9X1B060U4PSBA	(1-7)	S9B1B060U4PSAA
S9X1B080U4PSBA	(1-7)	S9B1B080U4PSAA
S9X1C080U5PSBA	(1-7)	S9B1C080U5PSAA
S9X1C100U5PSBA	(1-7)	S9B1C100U5PSAA
S9X1D120U5PSBA	(1-7)	S9B1D120U5PSAA

Downflow

S9X1B040D3PSBA	(1-6)	S9B1B040D3PSAA
S9X1B060D3PSBA	(1-7)	S9B1B060D3PSAA
S9X1B080D4PSBA	(1-6)	S9B1B080D4PSAA
S9X1C100D5PSBA	(1-7)	S9B1C100D5PSAA
S9X1D120D5PSBA	(1-7)	S9B1D120D5PSAA

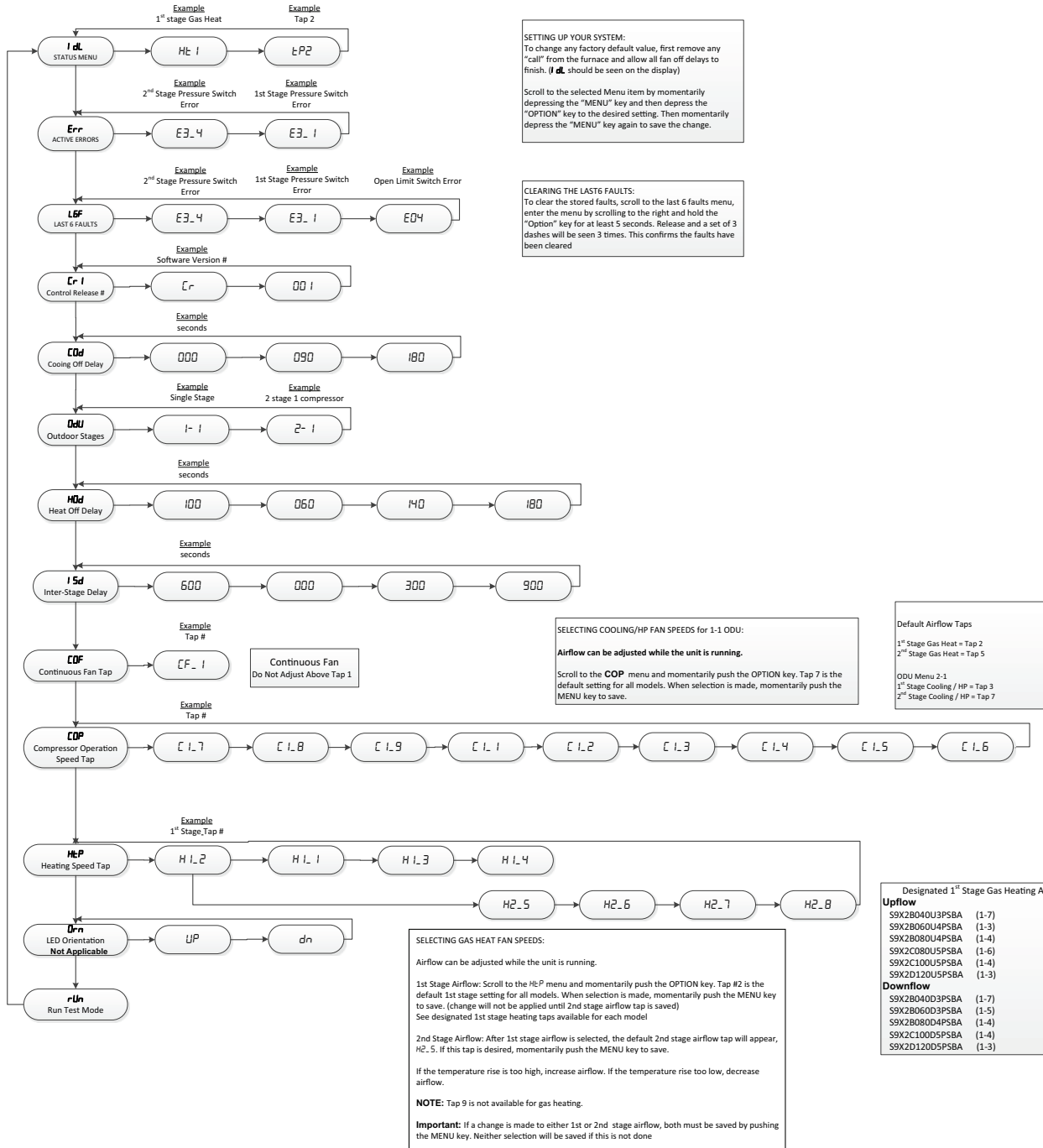
Integrated Furnace Control Menu

S9X1 Control System Menu Two Stage OD



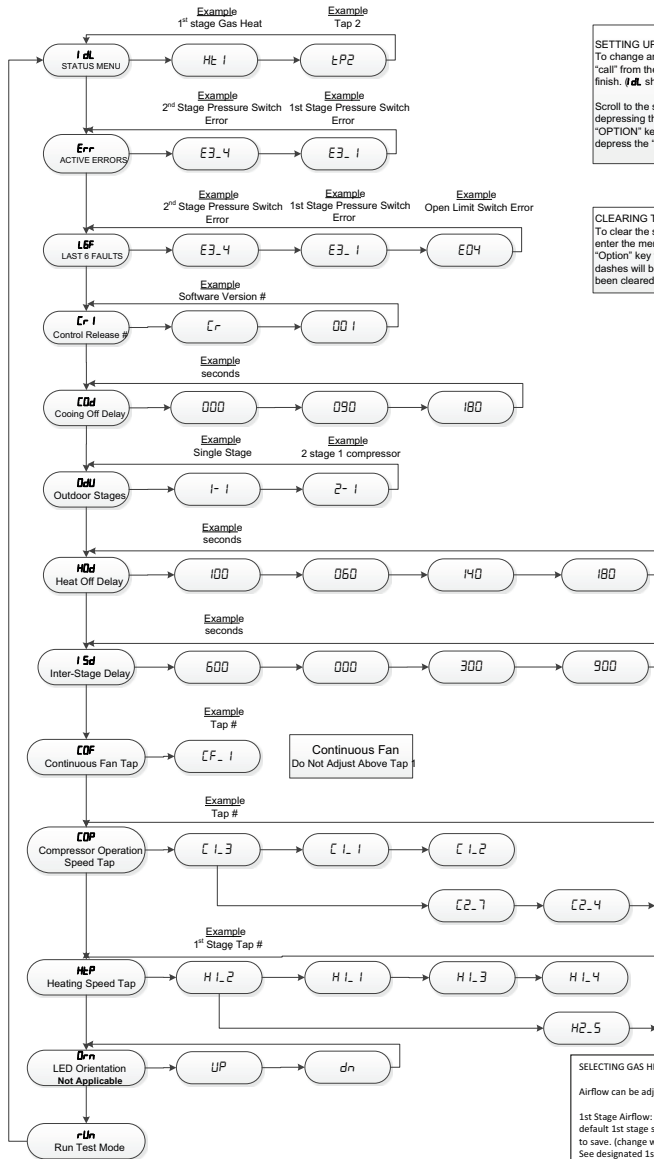
Designated Gas Heating Airflow Taps		
Upflow		
S9X1B040U3PSBA	(1-6)	S9B1B040U3PSAA
S9X1B060U4PSBA	(1-7)	S9B1B060U4PSAA
S9X1B080U4PSBA	(1-7)	S9B1B080U4PSAA
S9X1C080U5PSBA	(1-7)	S9B1C080U5PSAA
S9X1C100U5PSBA	(1-7)	S9B1C100U5PSAA
S9X1D120U5PSBA	(1-7)	S9B1D120U5PSAA
Downflow		
S9X1B040D3PSBA	(1-6)	S9B1B040D3PSAA
S9X1B060D3PSBA	(1-7)	S9B1B060D3PSAA
S9X1B080D4PSBA	(1-6)	S9B1B080D4PSAA
S9X1C100D5PSBA	(1-7)	S9B1C100D5PSAA
S9X1D120D5PSBA	(1-7)	S9B1D120D5PSAA

S9X2 Control System Single Stage OD



Integrated Furnace Control Menu

S9X2 Control System Menu Two Stage OD



SETTING UP YOUR SYSTEM:
To change any factory default value, first remove any "call" from the furnace and allow all fan off delays to finish. **St** should be seen on the display)
Scroll to the selected Menu item by momentarily depressing the "MENU" key and then depress the "OPTION" key to the desired setting. Then momentarily depress the "MENU" key again to save the change.

CLEARING THE LAST 6 FAULTS:
To clear the stored faults, scroll to the last 6 faults menu, 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

SELECTING COOLING / HP FAN SPEEDS for 2-1 ODU:
Airflow can be adjusted while the unit is running.
1st Stage Airflow: Scroll to the **COP** menu and momentarily push the OPTION key. Tap #3 is the default 1st stage setting for all models. When selection is made, momentarily push the MENU key to save. (change will not be applied until 2nd stage airflow tap is saved)
2nd Stage Airflow: After 1st stage airflow is selected, the default 2nd stage airflow tap will appear, C2.7. If this tap is desired, momentarily push the MENU key to save.
Important: If a change is made to either 1st or 2nd stage airflow, both must be saved by pushing the MENU key. Neither selection will be saved if this is not done

Default Airflow Taps
1st Stage Gas Heat = Tap 2
2nd Stage Gas Heat = Tap 5

ODU Menu 2-1
1st Stage Cooling / HP = Tap 3
2nd Stage Cooling / HP = Tap 7

SELECTING GAS HEAT FAN SPEEDS:
Airflow can be adjusted while the unit is running.
1st Stage Airflow: Scroll to the **HtP** menu and momentarily push the OPTION key. Tap #2 is the default 1st stage setting for all models. When selection is made, momentarily push the MENU key to save. (change will not be applied until 2nd stage airflow tap is saved)
See designated 1st stage heating taps available for each model
2nd Stage Airflow: After 1st stage airflow is selected, the default 2nd stage airflow tap will appear, H2.5. If this tap is desired, momentarily push the MENU key to save.
If the temperature rise is too high, increase airflow. If the temperature rise too low, decrease airflow.
NOTE: Tap 9 is not available for gas heating.
Important: If a change is made to either 1st or 2nd stage airflow, both must be saved by pushing the MENU key. Neither selection will be saved if this is not done

Designated 1st Stage Gas Heating Airflow Taps	
Upflow	
S9X2B040U3PSBA	(1-7)
S9X2B060U4PSBA	(1-3)
S9X2B080U4PSBA	(1-4)
S9X2C080U5PSBA	(1-6)
S9X2C100U5PSBA	(1-4)
S9X2D120U5PSBA	(1-3)
Downflow	
S9X2B040D3PSBA	(1-7)
S9X2B060D3PSBA	(1-5)
S9X2B080D4PSBA	(1-4)
S9X2C100D5PSBA	(1-4)
S9X2D120D5PSBA	(1-3)

S9X1 – S9X2 – S9B1 Run Test Mode

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

Run 1 – Turns the inducer on in 1st stage for 30 seconds

Run 2 – Turns on the inducer on 2nd stage for 30 seconds (N/A for S9B1/S9X1)

Run 3 – Turns the igniter on for 10 seconds

Run 4 – Turns the circulating blower on 1st stage compressor speed for 10 seconds

Run 5 – Turns the circulating blower on 2nd stage compressor speed for 10 seconds (N/A for S9B1)

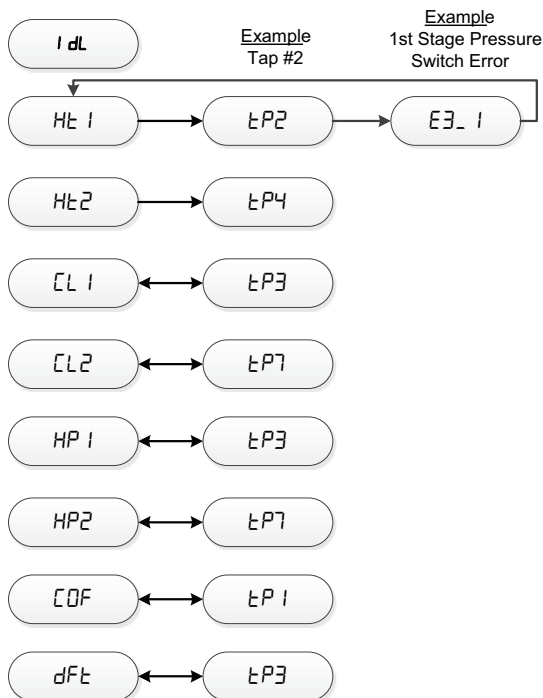
Run 6 – Turns the circulating blower on 1st stage gas heat speed for 10 seconds

Run 7 – Turns on the circulating blower on 2nd stage gas heat speed for 10 seconds (N/A for S9B1, S9X1)

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.

S9X1 – S9X2 – S9B1 System Status Menu



I dL = Idle, no demand for cooling, heating, or fan

Ht 1 = Demand for 1st stage gas heat (**Ht** = S9X1 & S9B1)

Ht 2 = Demand for 2nd stage gas heat

CL 1 = Demand for 1st stage cooling (**CP 1** = S9X1 & S9B1)

CL 2 = Demand for 2nd stage cooling (**CP 2** = S9X1)

HP 1 = Demand for 1st stage heat pump (**CP 1** = S9X1 & S9B1)

HP 2 = Demand for 2nd stage heat pump (**CP 2** = S9X1)

CDF = Demand for continuous fan

dFt = Demand for outdoor unit defrost, furnace running in gas heat mode

tP 1-9 = Tap selected for airflow

NOTE:

(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

Setting Airflow

With all ductwork connected and a clean filter in place, measure the External Static Pressure (ESP) of the unit in locations below. Use the appropriate airflow table for the furnace and outdoor unit installed.

Measurements must be made prior to the evaporator coil, if equipped, and after the filter.

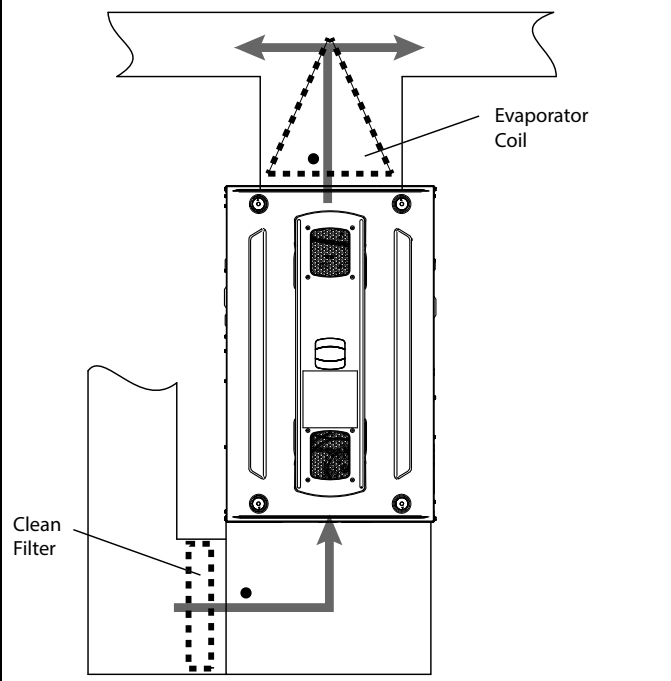
Note: Check out fieldtechhelp.com to watch a short video.



Setting Air Flow on the 9-Tap Motor

Date: Sessions: Availability:

Location: Cost: USD 0.00



S9X1/S9B1/S9X2 B080U4 Furnace Airflow (CFM) at. External Static Pressure (in. W.C.) versus Tap							
Tap	Torque (%)		Static				
			0.1	0.3	0.5	0.7	0.9
1	20	SCFM	911	766	622	477	332
		Watts	94	104	115	125	136
2	31	SCFM	1075	963	851	740	628
		Watts	139	153	168	182	197
3	40	SCFM	1215	1121	1028	934	840
		Watts	185	202	219	236	253
4	43	SCFM	1250	1164	1077 ^(a)	990	903
		Watts	203	221	239	257	274
5	51	SCFM	1349	1272	1194	1116 ^(b)	1039
		Watts	251	271	291	310	330
6	61	SCFM	1453	1387	1321	1254	1188
		Watts	313	335	356	378	400
7	64	SCFM	1505	1438	1372	1305	1239
		Watts	340	362	384	406	427
8	78	SCFM	1657	1597	1538	1479	1419 ^(a)
		Watts	453	477	500	524	547
9	100	SCFM	1878	1815	1752	1690	1627
		Watts	669	686	702	718	735

^(a) Example 2

^(b) Example 1

Example 1: S9X2B080U4PSBAA (Default Tap 7)

Cooling / HP

- 3 Ton Single Stage Outdoor
- Total ESP = 0.7" W.C.
- Required Airflow = 1050 cfm (3T x 350 cfm/ton)
- New Tap Number = Tap 5 (Re-check static pressure and adjust airflow as necessary)

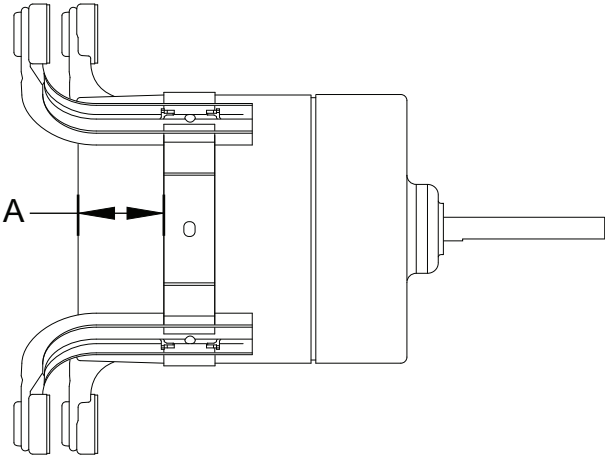
Example 2: S9X2B080U4PSBAA (Default Tap 3 & 7)

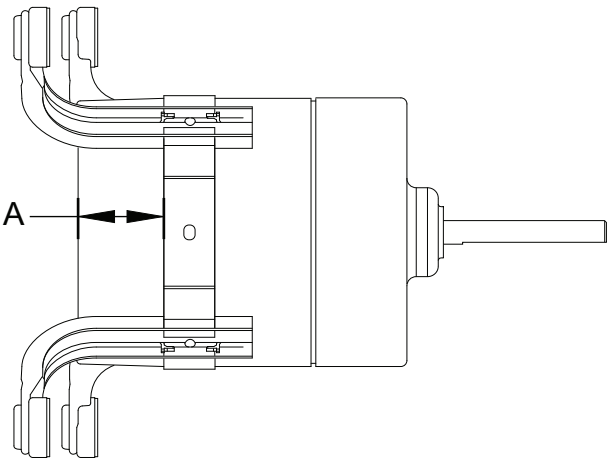
- 4 Ton Two Stage Outdoor

- Total 2nd Stage ESP = 0.9" W.C.
- Total 1st Stage ESP = 0.6" W.C.
- Required 2nd Stage Airflow = 1400 cfm (4T x 350 cfm/ton)
- Required 1st Stage Airflow = 1050 cfm (2nd stage airflow x .75)
- New 2nd Stage Tap Number = Tap 8 (Re-check static pressure and adjust as necessary)
- New 1st Stage Tap Number = Tap 4 (Re-check static pressure and adjust as necessary)

Belly Band Location

Distance from belly band to the back side off motor for minimum vibration

 Blower housings and wheel removed from view for clarity.	Furnace Model Number	Dimension "A" (inches)
	S9X1B060U4PSBA S9B1B060U4PSAA S9X2B060U4PSBA S9X1B080U4PSBA S9B1B080U4PSAA S9X2B080U4PSBA	3.05
	S9X1B080D4PSBA S9B1B080D4PSAA S9X2B080D4PSBA	3.29
	S9X1B040U3PSBA S9B1B040U3PSAA S9X2B040U3PSBA S9X1B040D3PSBA S9B1B040D3PSAA S9X2B040D3PSBA S9X1B060D3PSBA S9B1B060D3PSAA S9X2B060D3PSBA	3.54
	S9X1C080U5PSBA S9B1C080U5PSAA S9X2C080U5PSBA S9X1D120U5PSBA S9B1D120U5PSAA S9X2D120U5PSBA S9X1C100D5PSBA S9B1C100D5PSAA S9X2C100D5PSBA S9X1D120D5PSBA S9B1D120D5PSAA S9X2D120D5PSBA	3.79
	S9X1C100U5PSBA S9B1C100U5PSAA S9X2C100U5PSBA	3.81

 Blower housings and wheel removed from view for clarity.	Furnace Model Number	Dimension "A" (inches)
	S9X1B040D3PSBA S9B1B040D3PSAA S9X2B040D3PSBA	3.025
	S9X1B040U3PSBA S9B1B040U3PSAA S9X2B040U3PSBA S9X1B060D3PSBA S9B1B060D3PSAA S9X2B060D3PSBA S9X1B060U4PSBA S9B1B060U4PSAA S9X2B060U4PSBA S9X1B080U4PSBA S9B1B080U4PSAA S9X2B080U4PSBA S9X1B080D4PSBA S9B1B080D4PSAA S9X2B080D4PSBA	3.525
	S9X1C080U5PSBA S9B1C080U5PSAA S9X2C080U5PSBA S9X1C100U5PSBA S9B1C100U5PSAA S9X2C100U5PSBA S9X1C100D5PSBA S9B1C100D5PSAA S9X2C100D5PSBA S9X1D120U5PSBA S9B1D120U5PSAA S9X2D120U5PSBA S9X1D120D5PSBA S9B1D120D5PSAA S9X2D120D5PSBA	3.780

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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Troubleshooting

The following pages include troubleshooting flowcharts in reference to the S9X1 and S9B1 single stage furnaces and the S9X2 two stage furnace only

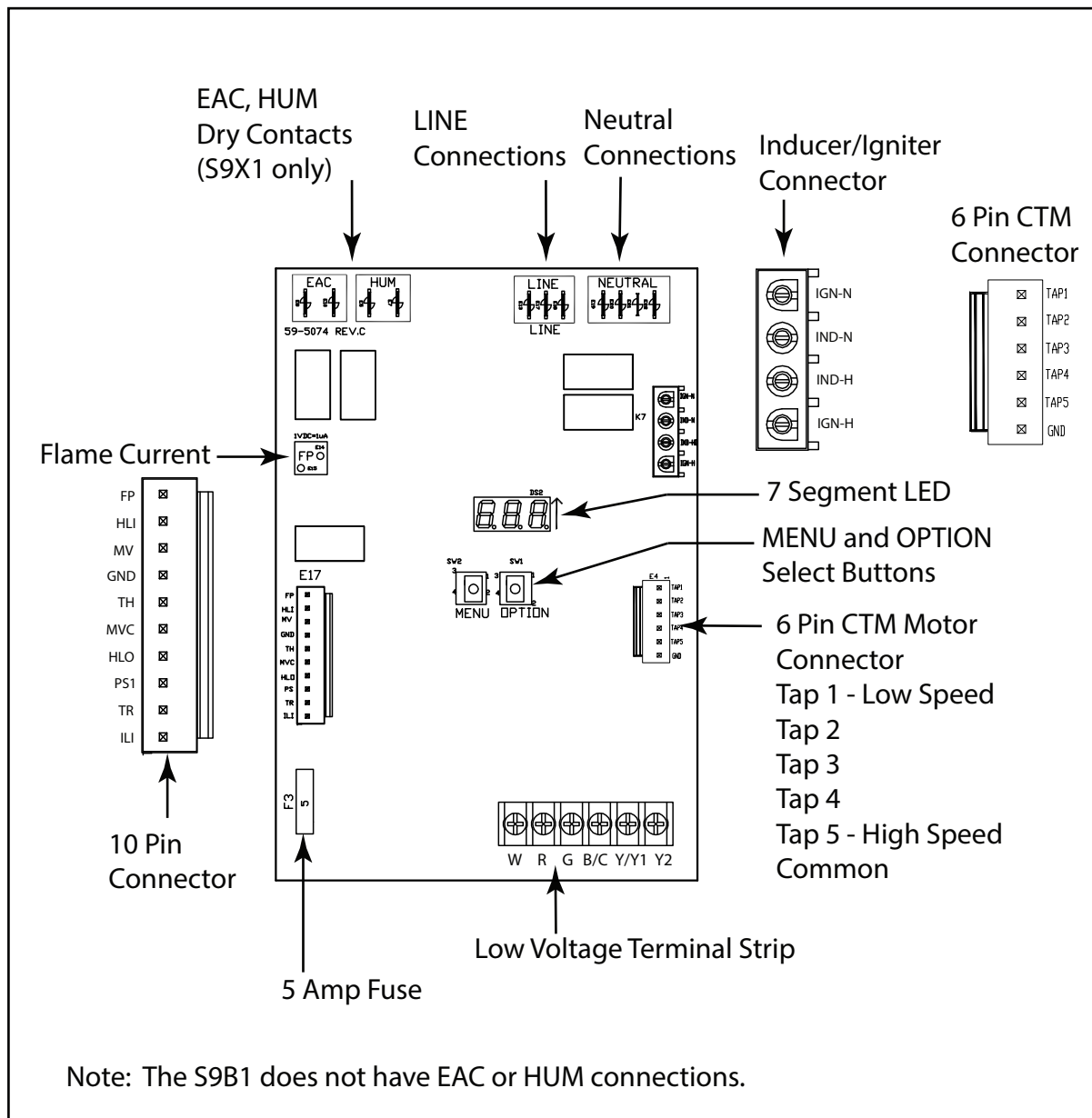
The information contained is for reference only and does not cover all scenarios or problems that may be encountered.

ONLY qualified technicians should attempt to install, troubleshoot, or repair this appliance.

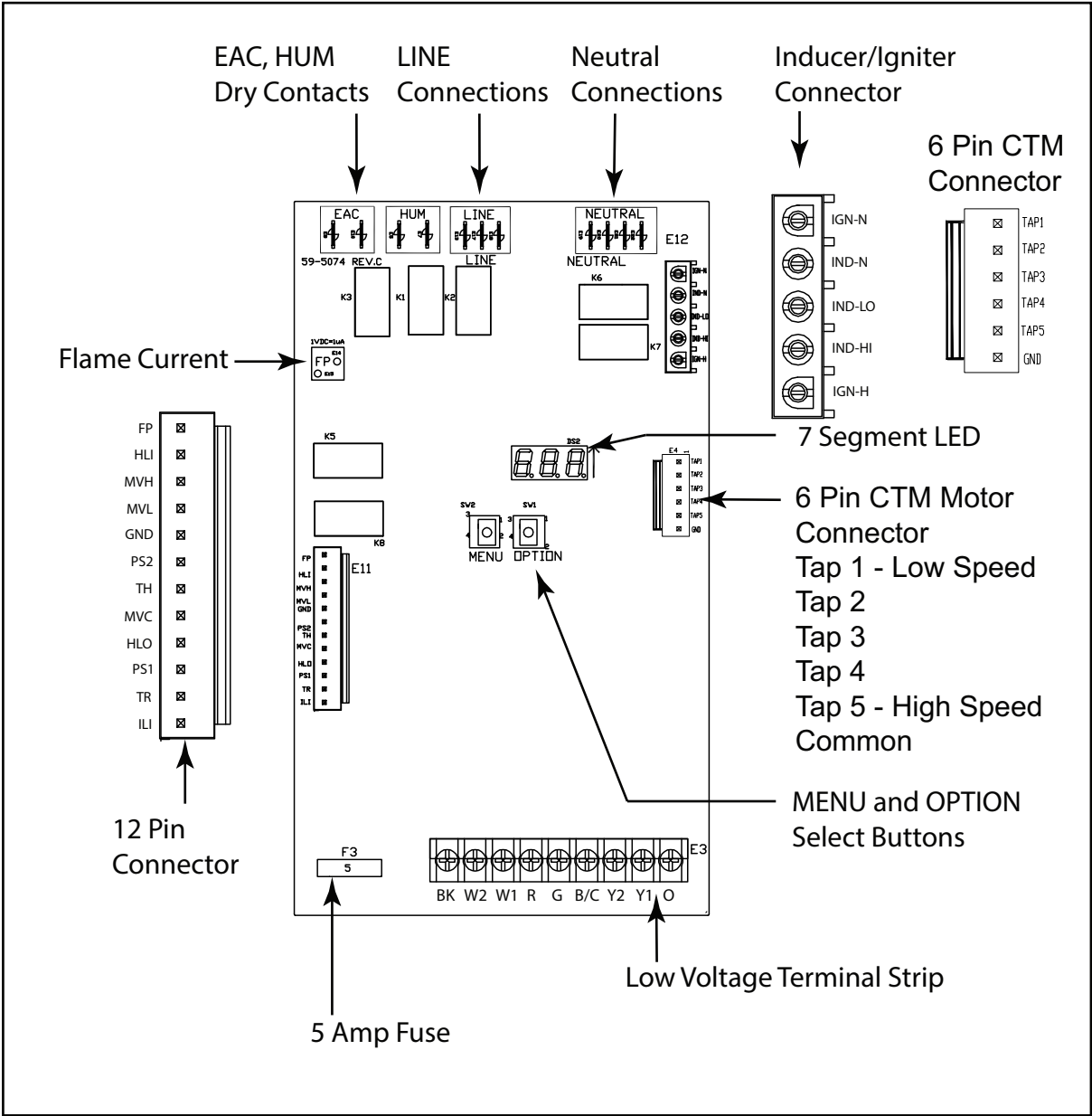
Failure to follow all cautions and/or warnings could result in personal or property damage, including death.

Error Codes	
Alarm Error Code	Alarm Explanation
E01	Loss of the IRQ or other internal failures (Internal IFC error)
E2.1	Retry Exceeded (Flame never sensed, one hour lockout after 3 times)
E2.2	Recycles Exceeded (Flame sensed then lost, one hour lockout after 10 times)
E2.3	1st Stage Gas Valve Not Energized When It Should Be exceeded after 10 times
E3.1	Shorted Pressure Switch, 1st Stage
E3.2	Open Pressure Switch, 1st Stage
E3.3	Shorted Pressure Switch, 2nd Stage (Not applicable for S9X1/S9B1)
E3.4	Open Pressure Switch, 2nd Stage (Not applicable for S9X1/S9B1)
E04	Open Limit (Main Thermal, Rollout Switch, or Reverse Airflow Switch)
E05	Flame detected, should not be present
E6.1	Voltage reversed polarity
E6.2	Bad grounding
E6.3	(1) Igniter relay fails
	(2) Igniter open
E7.1	1st stage gas valve (MVL) is energized when it should be off
E08	Flame current is low, but still strong enough to allow operation
E09	Open Inducer Limit Switch or Condensate Pressure Switch
E11	(1) 1st stage gas valve not energized when it should be
	(2) 1st stage gas valve relay stuck closed
	(3) 2nd stage gas valve relay stuck closed (Not applicable for S9X1/S9B1)
	(4) 2nd stage gas valve energized when it should not be (Not applicable for S9X1/S9B1)
	(5) 2nd stage gas valve not energized when it should be (Not applicable for S9X1/S9B1)
E12	Open fuse

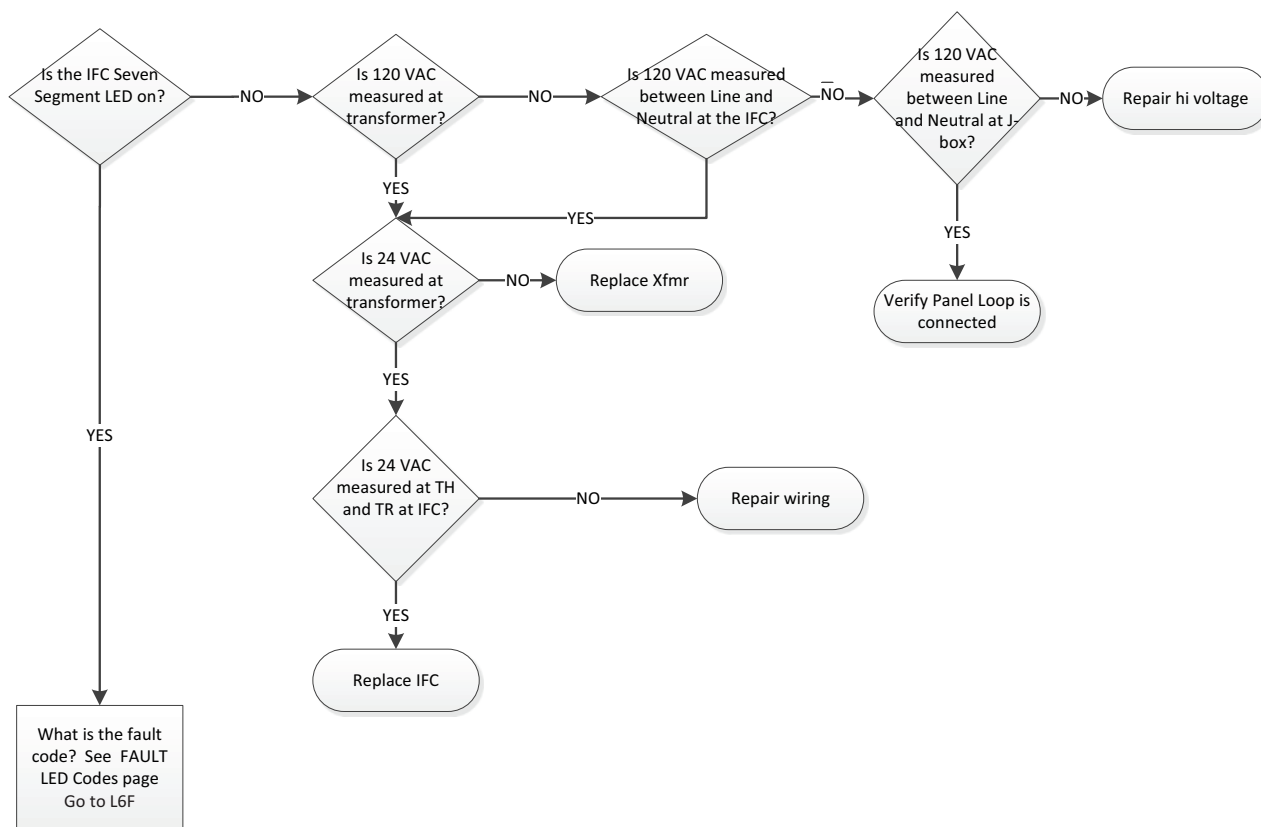
S9X1 S9B1 IFC Component Layout



S9X2 IFC Component Layout



GETTING STARTED



Refer to Gas Furnace Silicon Nitride Ignitor Models
Service Manual to supplement this information.
Publication Number 34-3405-08

DEFINITION :

Internal Failure of the Control Board

E01 Fault Code

Replace IFC

Troubleshooting

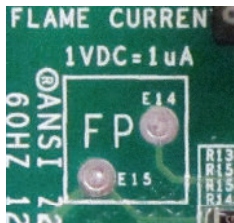
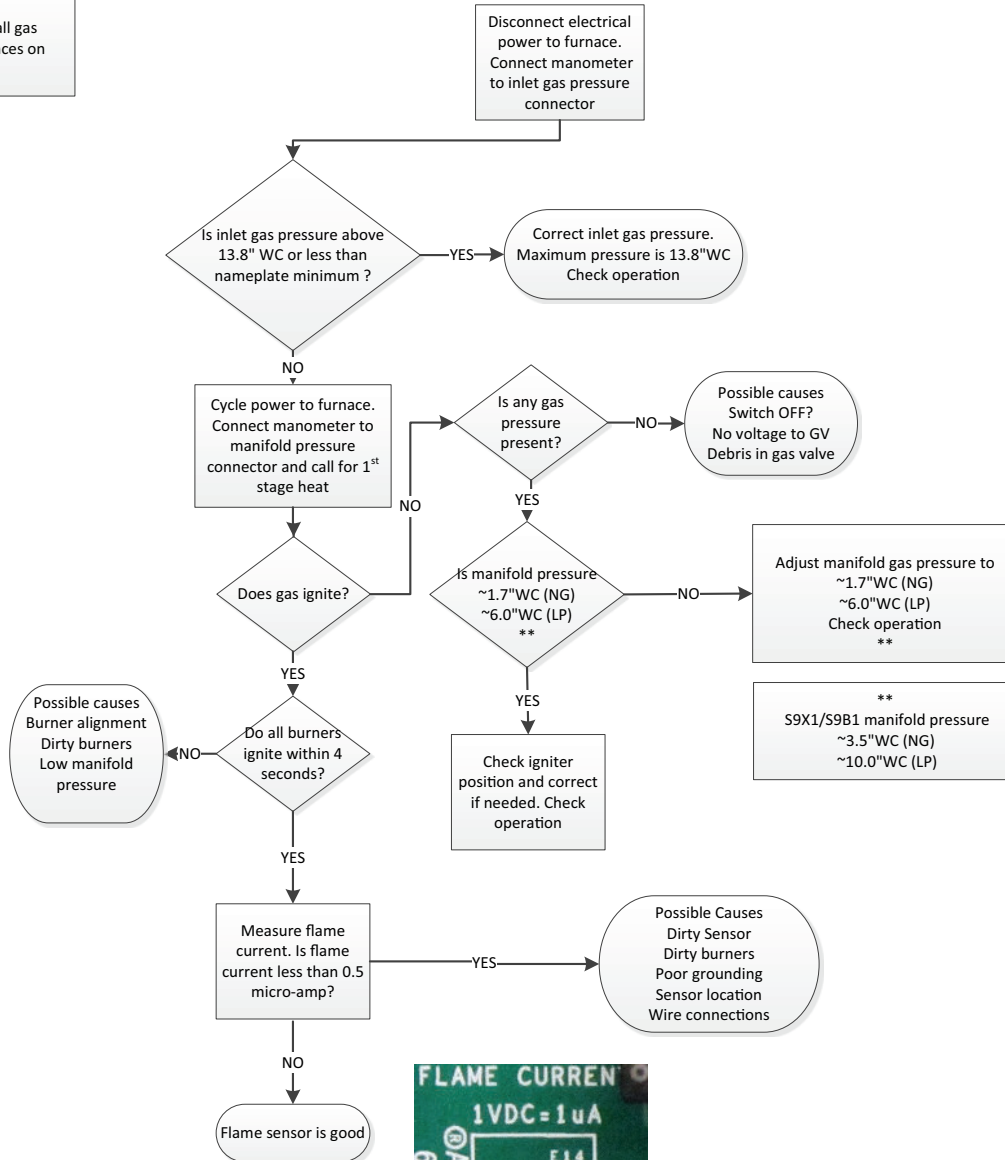
DEFINITION

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

Turn all gas appliances on

2.1 Fault Code



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

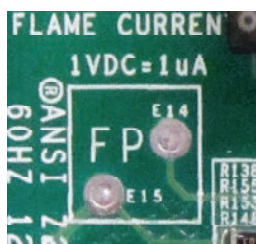
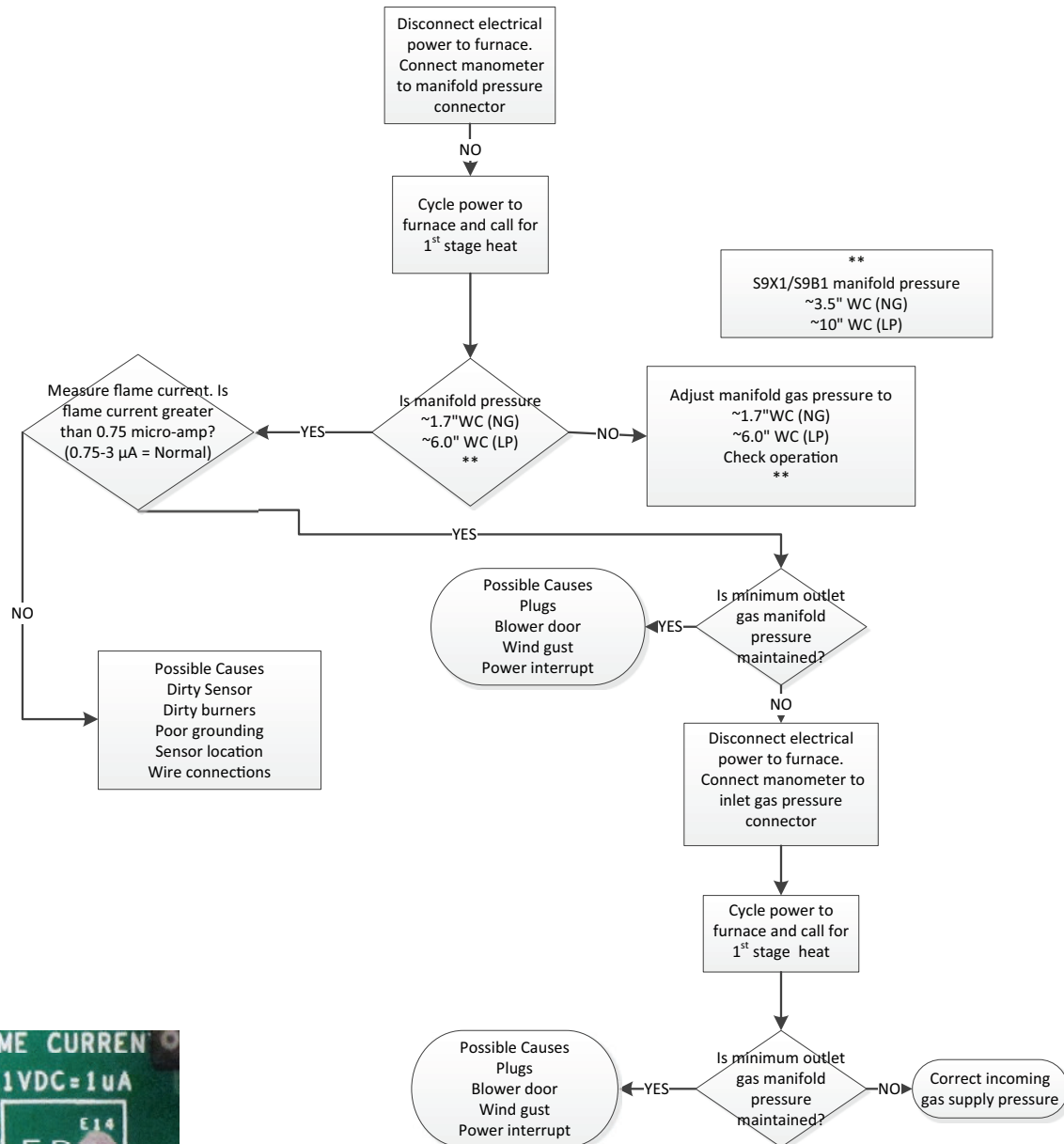
DEFINITION

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

Flame is sensed & then lost

Turn all gas appliances on

2.2 Fault Code



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

DEFINITION

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

24VAC not sensed on MVL 10 times

2.3 Fault Code

Replace IFC

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.

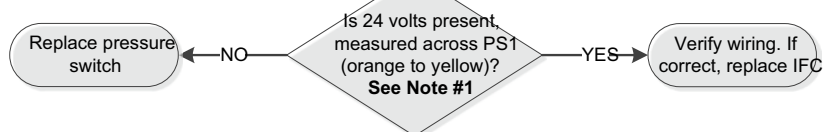
NOTE: Verify pressure switch wiring and tube routing are correct.

Note #1

24 volts = Open Switch
0 volts = Closed Switch

3.1 Fault Code

Cycle power to the furnace and call for 1st stage heat.



DEFINITION

An error has occurred with the PS1 indicating that the pressure switch is either 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 happen when wind gusts occur.

S9X2 Only

The IFC will attempt to close both PS1 and PS2 and operate on 2nd stage during such an event.

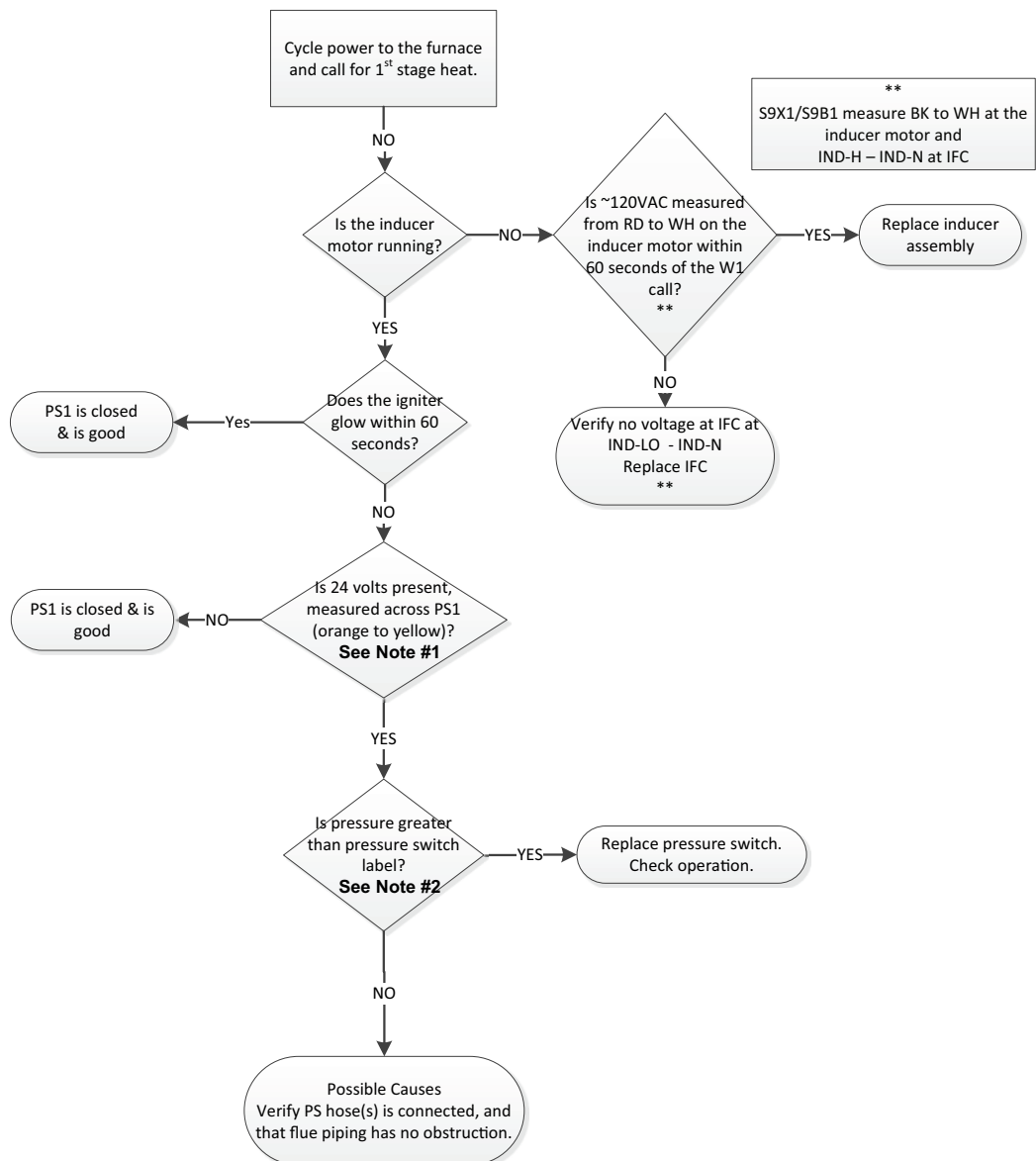
3.2 Fault Code

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.

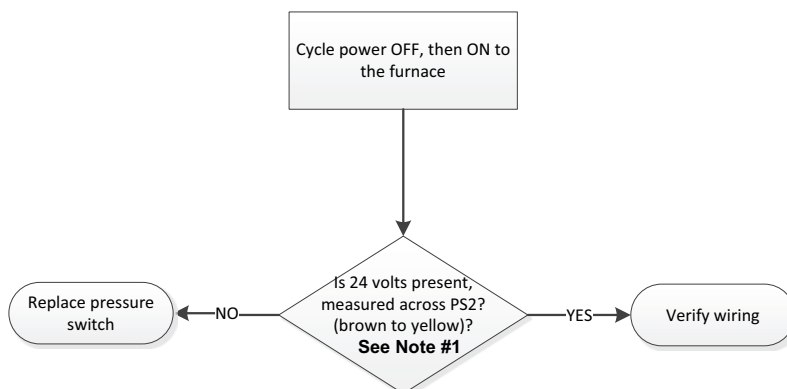
In most cases, the pressure switch is not the problem.

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 PS1 indicating that the pressure switch is either 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.

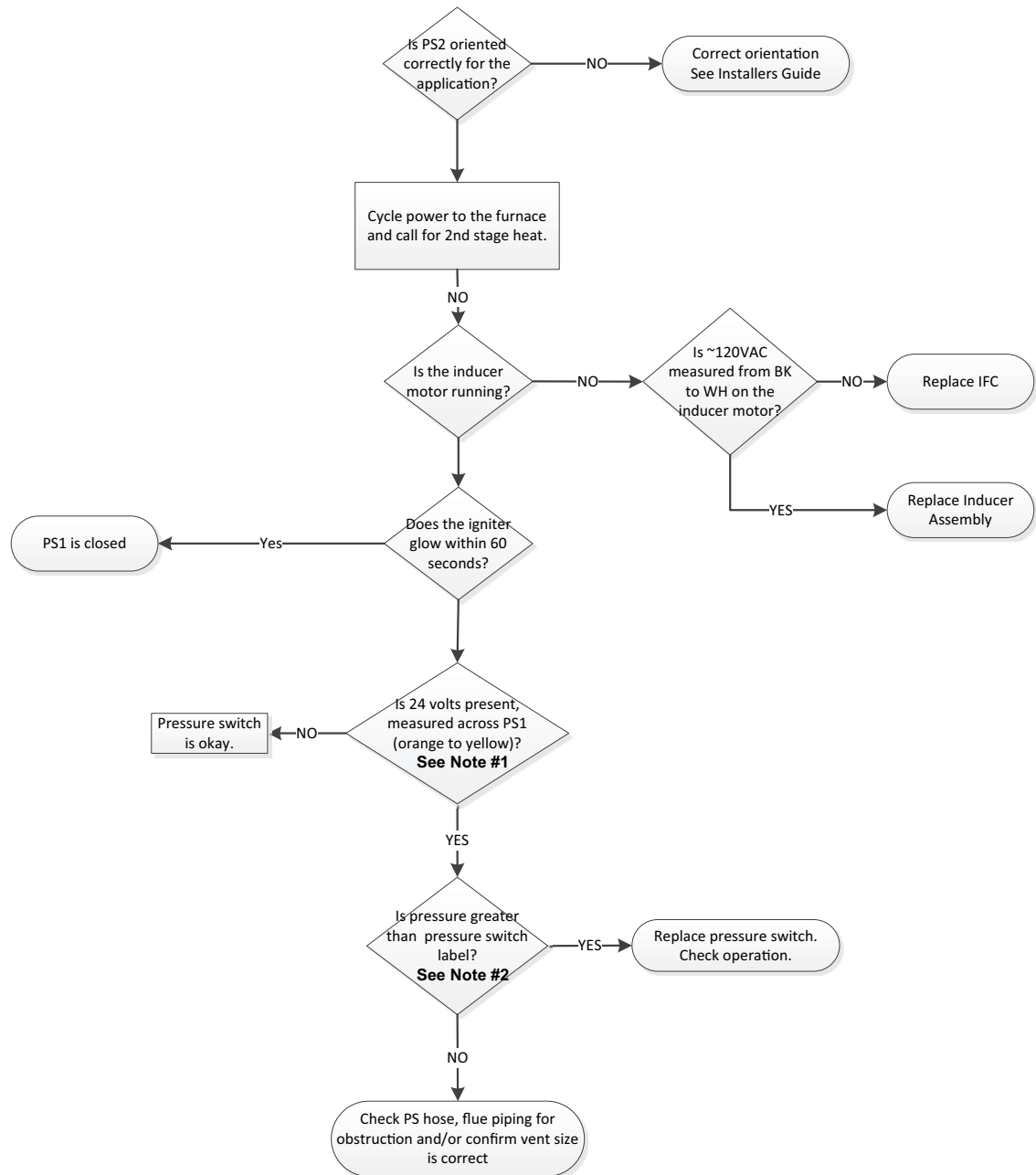
3.4 Fault Code

Note #1

24 volts = Open Switch
0 volts = Closed Switch

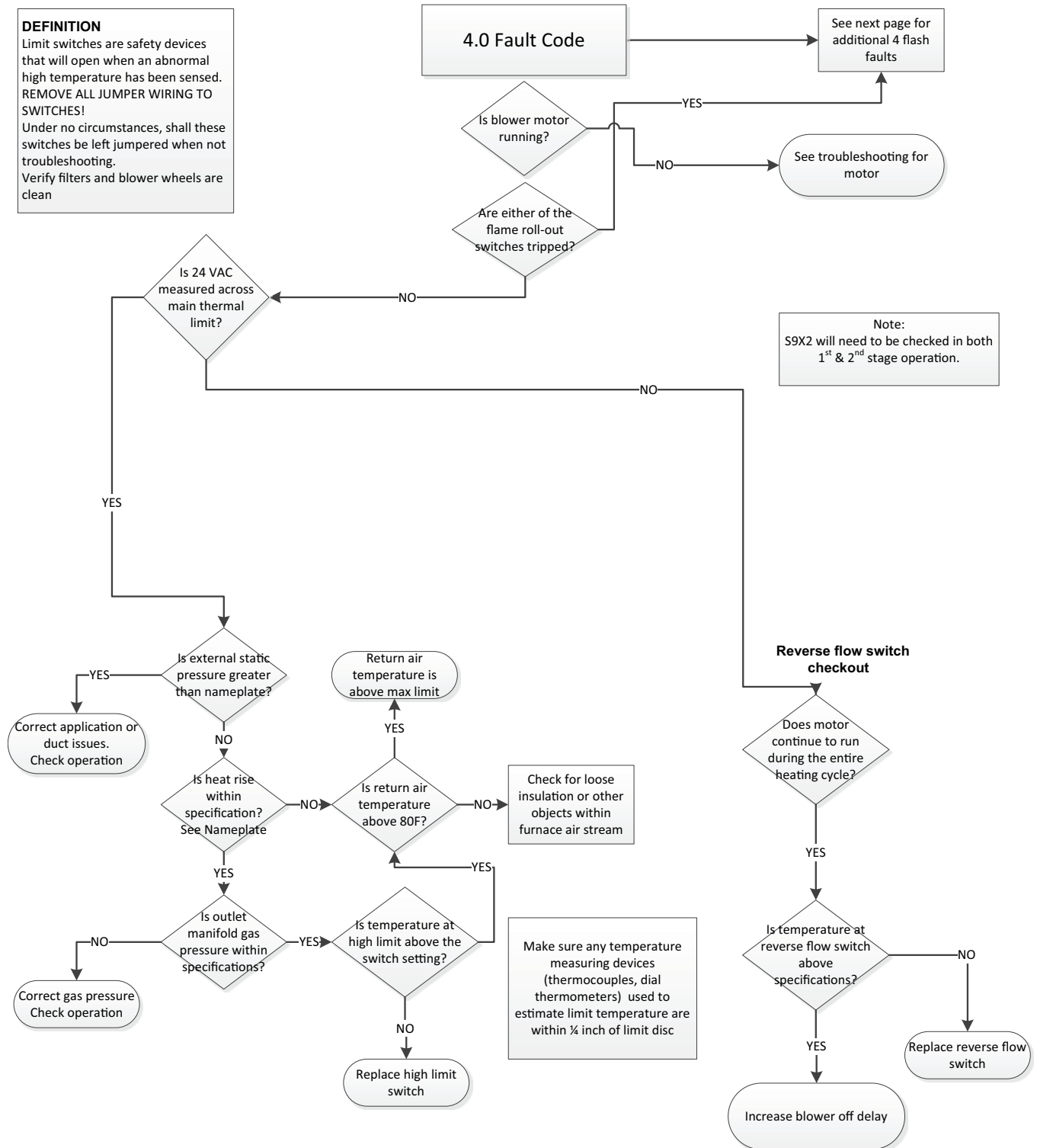
Note #2

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



DEFINITION

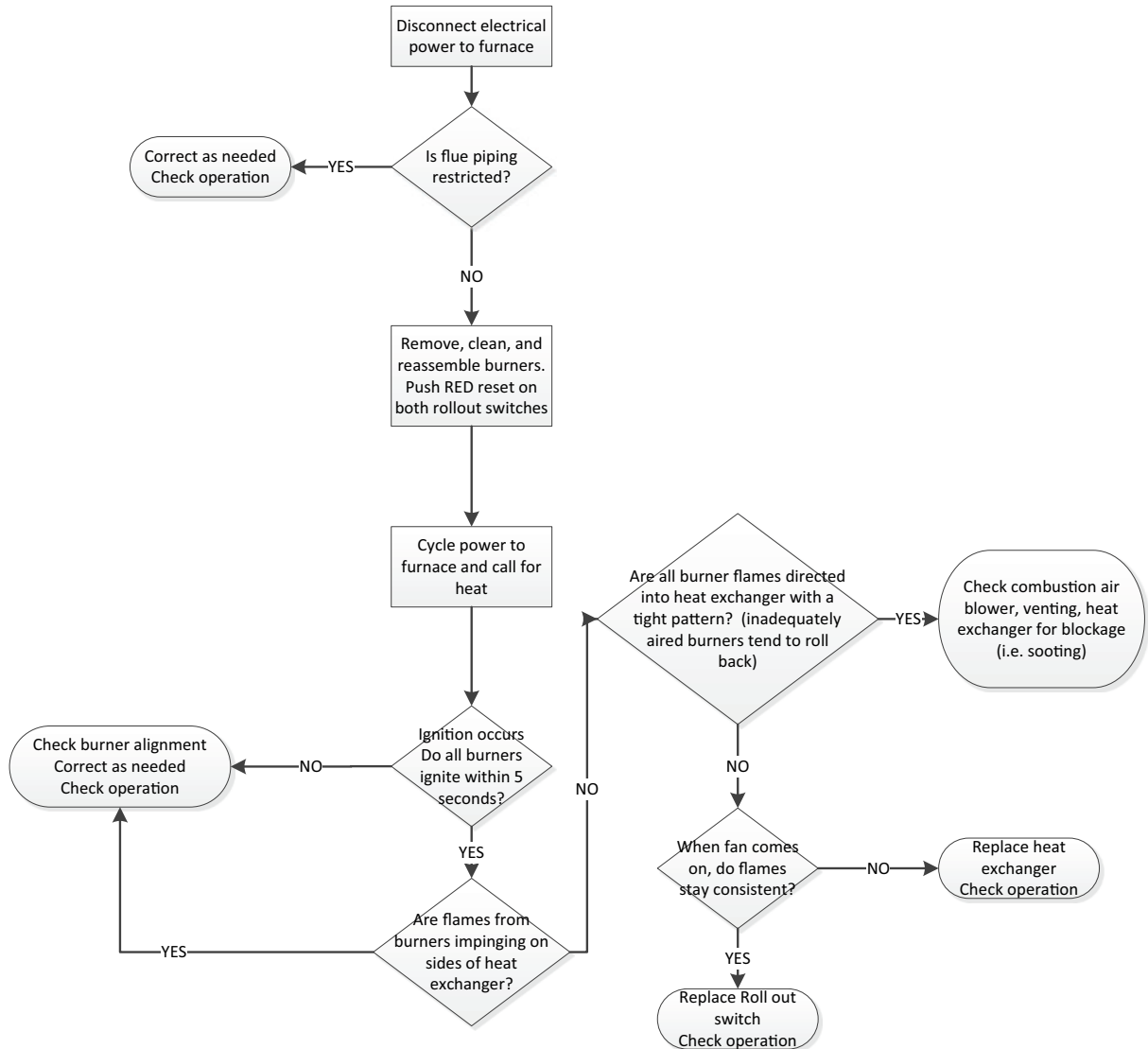
Limit switches are safety devices that will open when an abnormal high temperature has been sensed. REMOVE ALL JUMPER WIRING TO SWITCHES! Under no circumstances, shall these switches be left jumpered when not troubleshooting. Verify filters and blower wheels are clean



DEFINITION:

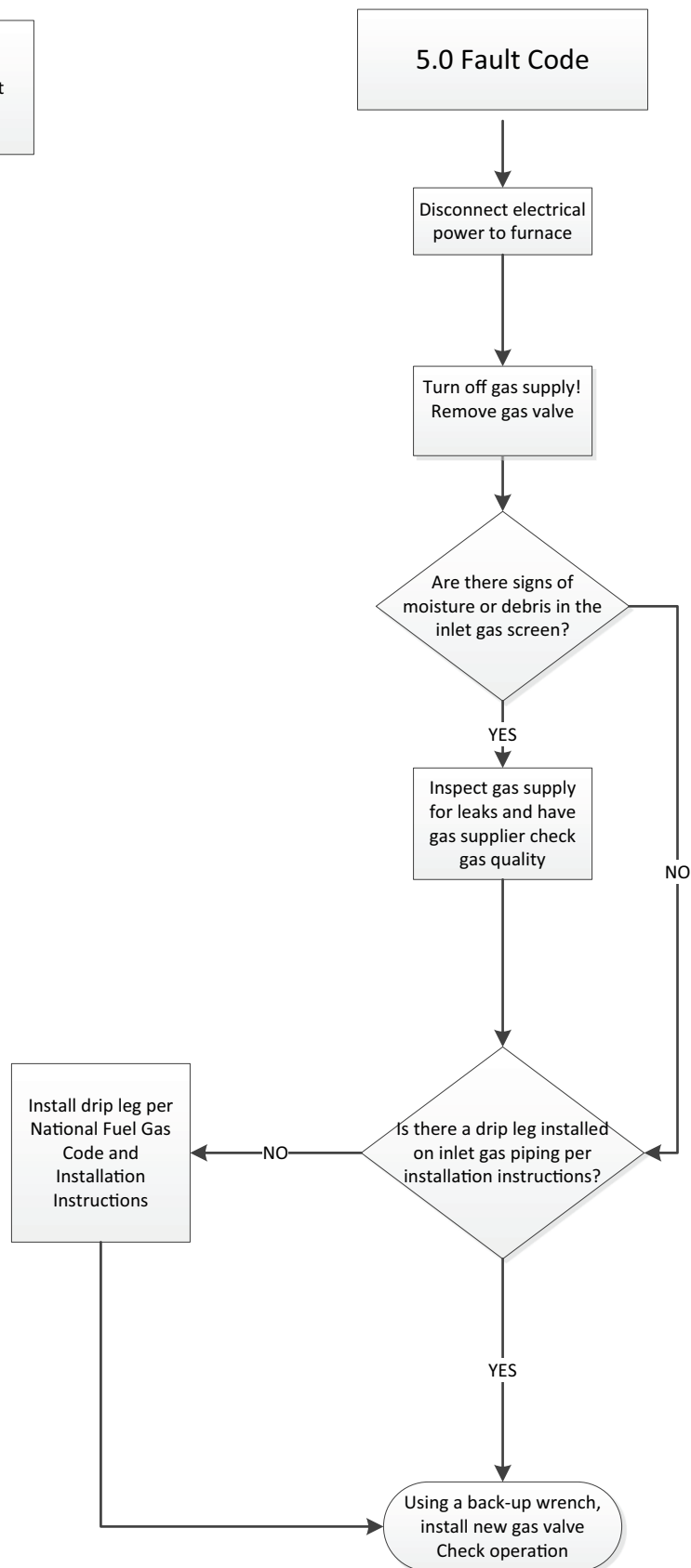
Limit switches are safety devices that will open when an abnormal high temperature has been sensed.
REMOVE ALL JUMPER WIRING TO SWITCHES!
 Under no circumstances, shall these switches be left jumpered when not troubleshooting.

4.0 Fault Code Flame Rollout



DEFINITION:

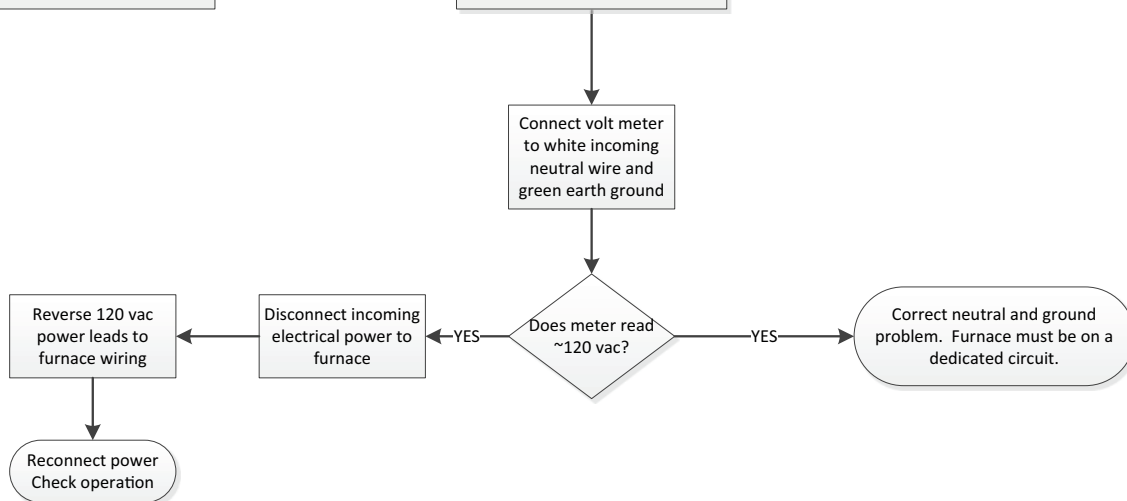
Flame is sensed when it should not be sensed.



DEFINITION

Polarity Fault – Incoming high voltage wiring is reversed

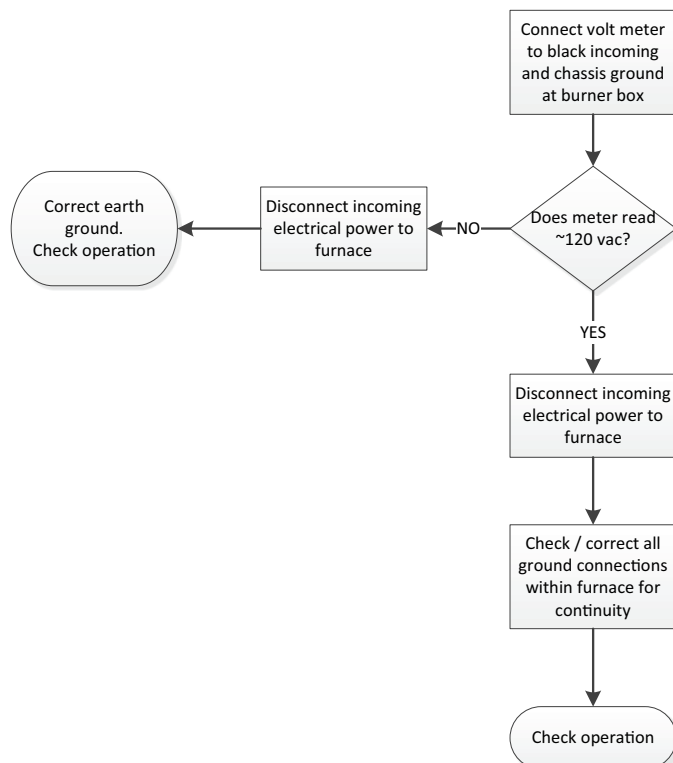
6.1 Fault Code



DEFINITION

Ground Fault - Incoming or chassis ground connection is not sensed

6.2 Fault Code

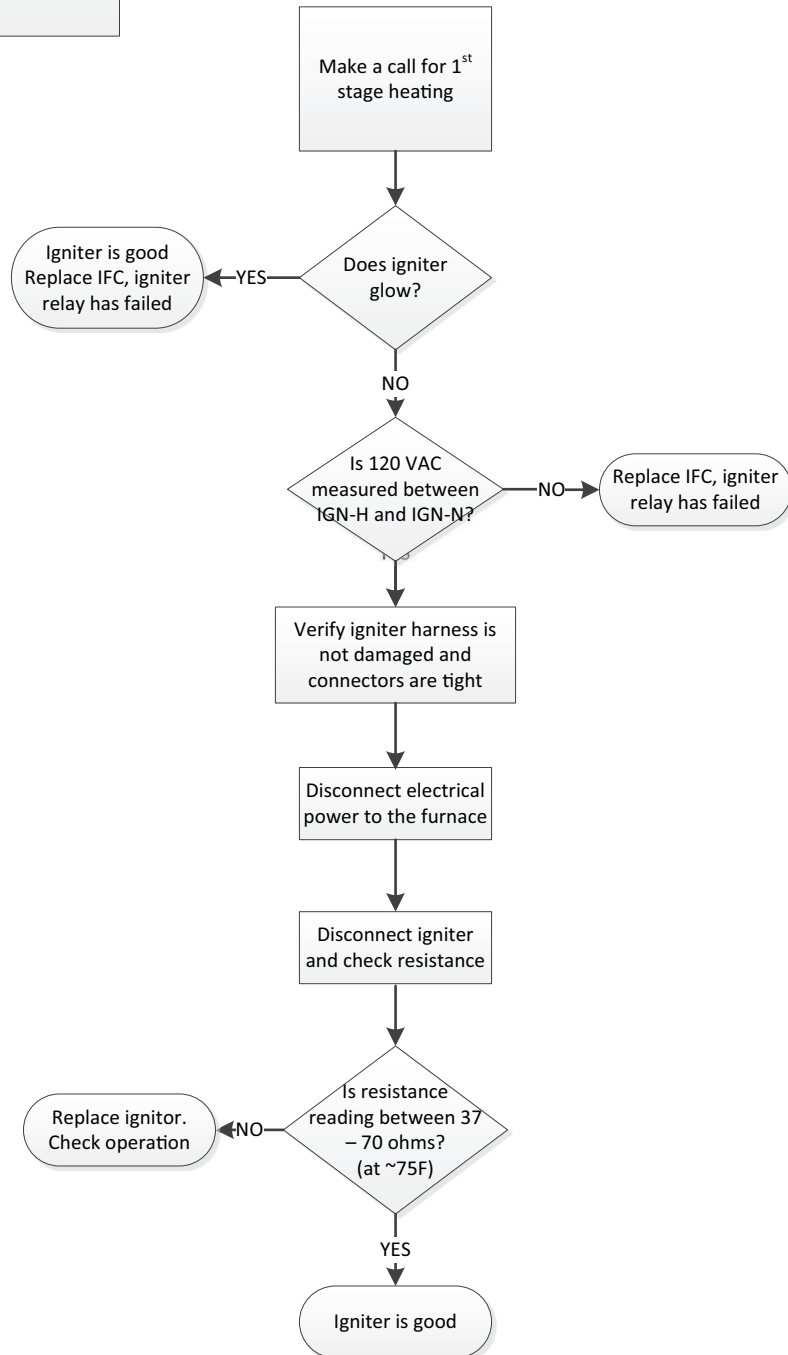


DEFINITION

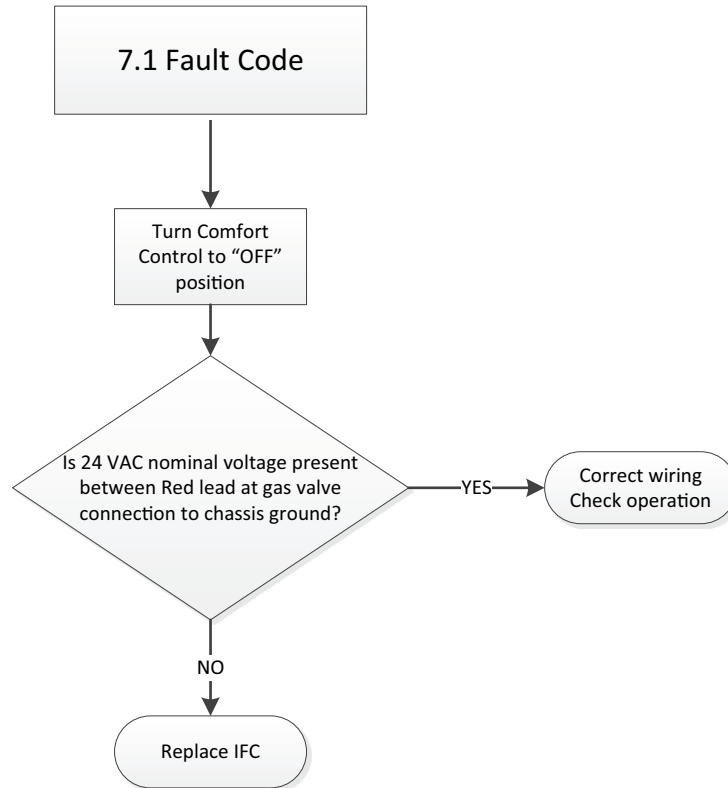
Igniter Relay Fault – The control board has sensed that the igniter relay has stuck closed

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

6.3 Fault Code

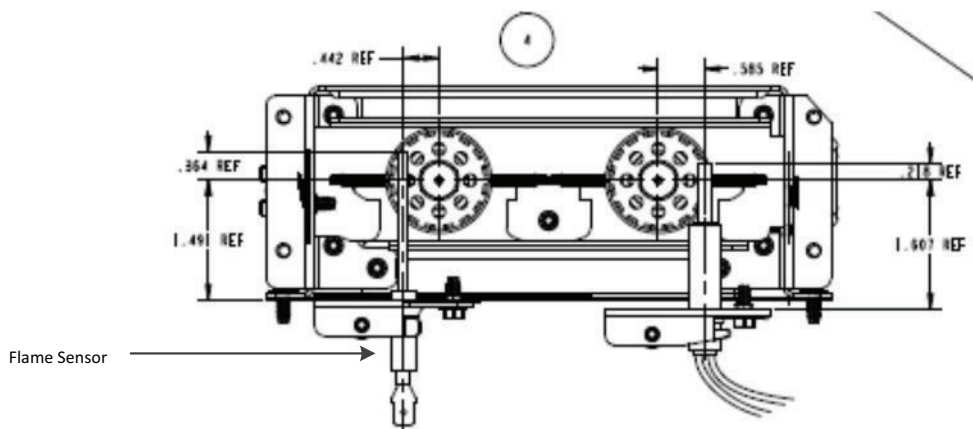
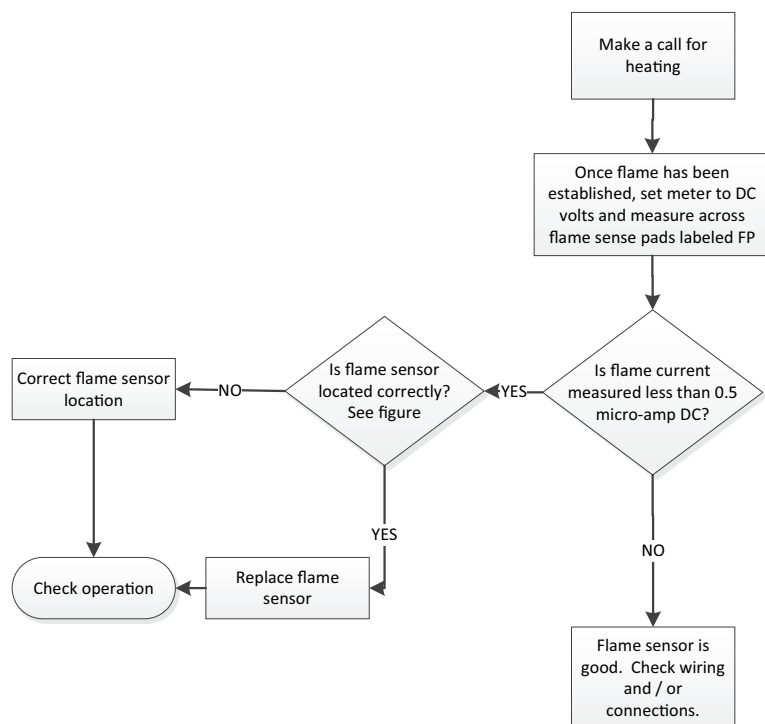


DEFINITION: External Gas Valve
Circuit Error (24 volts is present
when it should not be present)

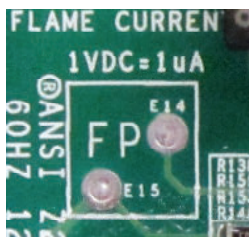


DEFINITION:
The flame sense current is less than 0.5 micro-amp DC

08 Fault Code



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

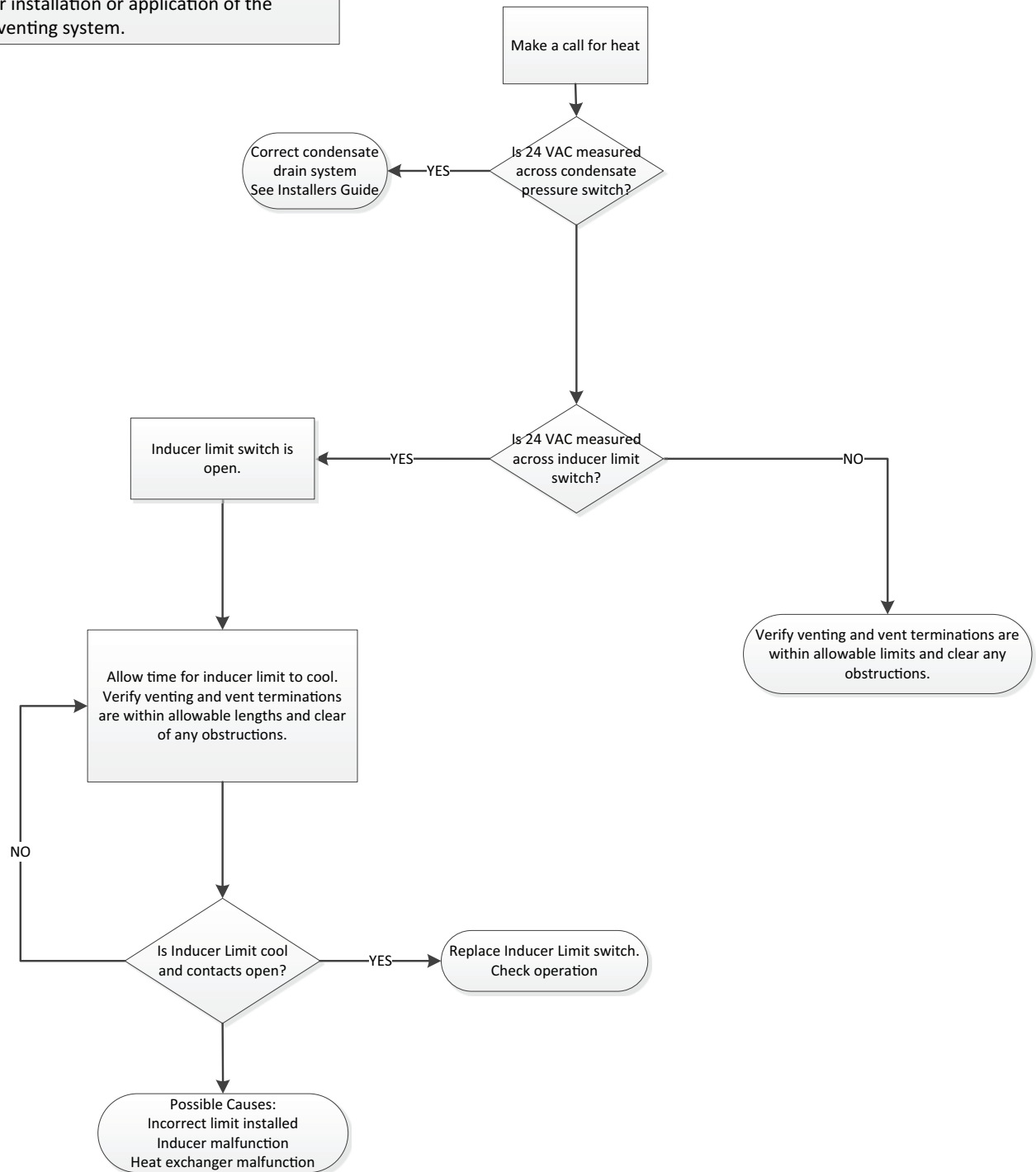


Definition:

Condensate Pressure Switch Open: The condensate system is 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:

The IFC has detected that internal gas valve relays have failed.

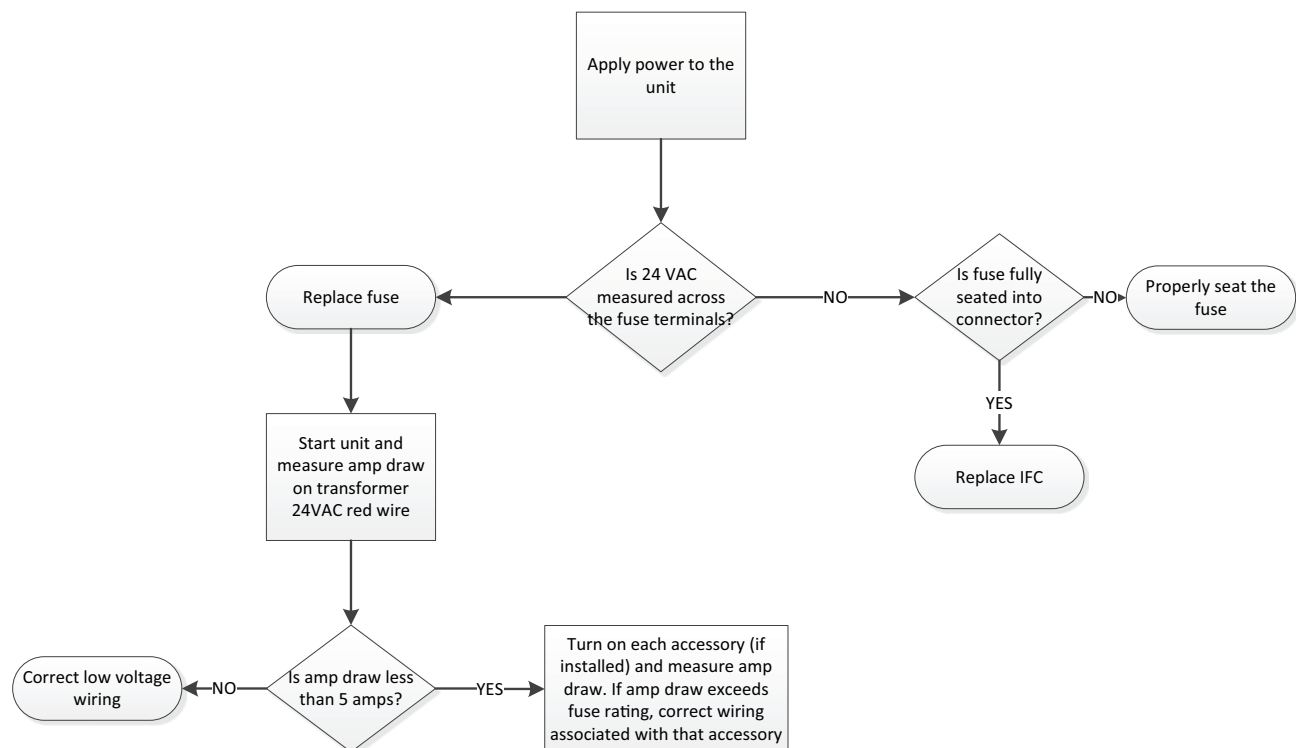
11 Fault Code

Verify all wiring
Replace IFC

Definition:

The onboard 5 amp fuse is open or missing.

12 Fault Code



Continuous FAN on this unit is limited to TAP 1 only. No field adjustment can be made. If troubleshooting other speed taps, use the method as outlined below using the voltages listed for the tap number being used

Constant Torque Motor Troubleshooting

Ensure power is applied to the unit and Seven Segment LED's are ON with no active error codes

Turn fan to ON at thermostat and verify that COF and TP1 alternately appear on the seven segment display

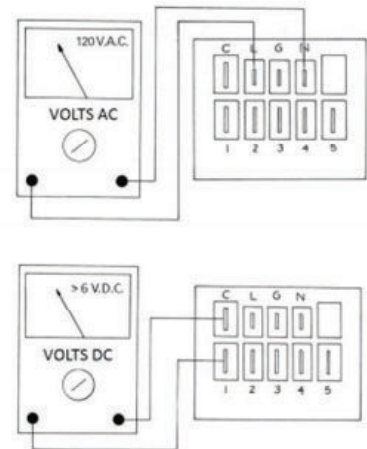
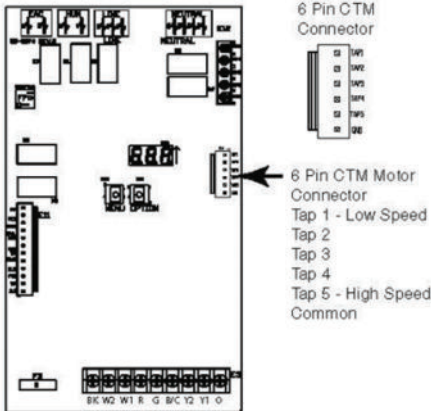
Does motor run?

Motor & IFC are good

NO

Verify voltage(s) listed

If voltage is not present, remove 6 pin connector from IFC and re-check. If voltage is present, verify voltage at panel connectors and at motor. If voltage is present at the motor, replace motor

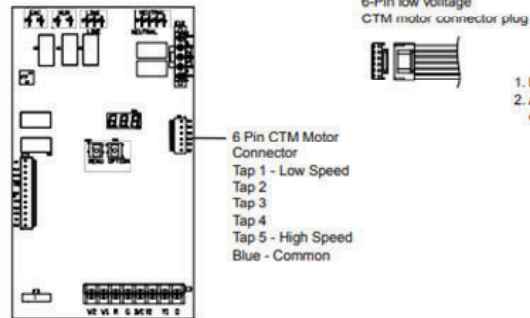


S9X1 / S9B1 / S9X2 Output Voltage

RD/W	Tap 1
YL/W	Tap 2
BL/W	Tap 3
BK/W	Tap 4
OR/W	Tap 5
BLUE	24v C

Tap 1	~ 8vdc	
Tap 2	~ 8vdc	
Tap 3	~ 18vdc	
Tap 4	~ 8vdc	
Tap 5	~ 18vdc	
Tap 6 (1+2)	~ 8vdc	~ 8vdc
Tap 7 (1+3)	~ 8vdc	~ 18vdc
Tap 8 (1+4)	~ 8vdc	~ 8vdc
Tap 9 (1+5)	~ 8vdc	~ 18vdc

All Voltages Reference Ground



1. Remove the 6-pin low voltage connector from the IFC
2. Apply 24 VAC to Common tap (Blue) and any speed tap on the CTM motor 6-pin plug. The motor should run.

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