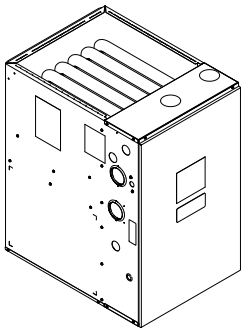
Service Facts

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

Upflow, Convertible to Horizontal Right or Horizontal Left	Downflow Only
A951X040BU3SAA	A951X040BD3SAA
A951X060BU4SAA	A951X060BD3SAA
A951X080BU4SAA	A951X080BD4SAA
A951X080CU5SAA	A951X100CD5SAA
A951X100CU5SAA	A951X120DD5SAA
A951X120DU5SAA	



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.

⚠ 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.

August 2019

A951X-SF-1B-EN

Ingersoll Rand

SAFETY SECTION— FURNACES

Ingersoll Rand has a policy of continuous product and product data improvement and it reserves the right to change design and specifications without notice.

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.

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⚠ WARNING

FIRE HAZARD!

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

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

⚠ WARNING

WARNING!

This product can expose you to chemicals including lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov.

⚠ WARNING

EXPLOSION HAZARD!

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

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

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

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

Do not bypass the door switch or panel loop by any permanent means.

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

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

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

⚠ WARNING

FIRE OR EXPLOSION HAZARD!

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

Do NOT attempt to manually light the furnace.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

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

Follow the service and/or periodic maintenance instructions for the Furnace and venting system.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

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

Make sure that the blower door is in place and not ajar. Dangerous fumes could escape an improperly secured door.

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

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

Disconnect power to the unit before removing the blower door. Allow a minimum of 10 seconds for IFC power supply to discharge to 0 volts.

⚠ WARNING

SAFETY HAZARD!

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

These furnaces are not approved or intended for installation in trailers or recreational vehicles. Installation in manufactured (mobile) housing is only approved with BAYMFGH Kit.

⚠ WARNING

EXPLOSION HAZARD!

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

In the event that electrical, fuel, or mechanical failures occur, shut gas supply off at the manual gas valve located on the supply gas piping coming into the furnace before turning off the electrical power to the furnace. Contact the service agency designated by your dealer.

⚠ WARNING

EXPLOSION HAZARD!

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

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

⚠ WARNING

SAFETY HAZARD!

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

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

⚠ WARNING

INSTALLATION WARNING — HIGH VOLTAGE MOVING PARTS!

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

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

⚠ WARNING

SAFETY HAZARD!

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

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

⚠ WARNING

SAFETY HAZARD!

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

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

⚠ WARNING

CARBON MONOXIDE HAZARD!

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

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

⚠ WARNING

CARBON MONOXIDE HAZARD!

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

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

⚠ WARNING

SHOCK HAZARD!

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

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

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

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

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

⚠ WARNING

OVERHEATING AND EXPLOSION HAZARD!

Failure to follow this Warning could result in property damage, personal injury or death.
Should overheating occur, or the gas supply fail to shut off, shut off the gas valve to the unit before shutting off the electrical supply.

⚠ CAUTION

IMPROPER VOLTAGE CONNECTION!

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

⚠ CAUTION

CORROSION WARNING!

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

⚠ CAUTION

SAFETY HAZARD!

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

⚠ CAUTION

SHARP EDGE HAZARD!

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

⚠ CAUTION

BACKUP WRENCH REQUIRED!

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

⚠ CAUTION

FREEZE CAUTION!

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

⚠ CAUTION

FREEZE CAUTION!

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

⚠ CAUTION

FREEZE CAUTION!

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

⚠ CAUTION

FREEZE CAUTION!

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

⚠ CAUTION

IGNITION FUNCTION!

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

⚠ CAUTION

WATER DAMAGE!

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

⚠ CAUTION

HOT SURFACE!

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

⚠ CAUTION

FURNACE SERVICE CAUTION!

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

⚠ CAUTION

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.IRCO.com or contact your installing dealer.
Ingersoll Rand
800 Beaty St.
Davidson, NC 28036

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	**A951X040BU3SAA** [a]	**A951X060BU4SAA** [a]	**A951X080BU4SAA** [a]	**A951X080CU5SAA** [a]
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]	38,800	58,200	77,600	77,600
Temp. Rise (Min.-Max.)	30 - 60	35 - 65	45 - 75	45 - 75
AFUE (%) [d]	96.0	96.0	96.0	96.0
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	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 - 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)	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

MODEL	A951X040BU3SAA [a]	A951X060BU4SAA [a]	A951X080BU4SAA [a]	A951X080CU5SAA [a]
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	A951X100CU5SAA [a]	A951X120DU5SAA [a]	A951X040BD3SAA [a]	A951X060BD3SAA [a]
TYPE	Upflow / Horizontal	Upflow/Horizontal	Downflow	Downflow
RATINGS [b]				
Input BTUH	100,000	120,000	40,000	60,000
Capacity BTUH (ICS) [c] [d]	97,000	116,400	38,800	58,200
Temp. Rise (Min.-Max.)	40 - 70	40-70	30 - 60	35 - 65
AFUE (%) [d]	96.0	95.0	96.0	95.0
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	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

MODEL	A951X100CU5SAA [a]	A951X120DU5SAA [a]	A951X040BD3SAA [a]	A951X060BD3SAA [a]
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	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 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	A951X080BD4SAA [a]	A951X100CD5SAA [a]	A951X120DD5SAA [a]
TYPE	Downflow	Downflow	Downflow
RATINGS [b]			
Input BTUH	80,000	100,000	120,000
Capacity BTUH (ICS) [c] [d]	77,600	97,000	116,400
Temp. Rise (Min.-Max.)	45 - 75	40 - 70	45-75
AFUE (%) [d]	95.0	95.0	95.0
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	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

MODEL	A951X080BD4SAA [a]	A951X100CD5SAA [a]	A951X120DD5SAA [a]
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)	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 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

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 W1 to B/C. The seven-segment LED will read:

   HE = Gas Heating
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 ILI input.
   b. Flame roll-out switches (FRS) 1 & 2, main thermal limit (TCO), and any reverse air flow (RAF) switches are closed by sending 24VAC out the HLO terminal and monitoring the HLI input.
   c. Pressure switch 1 (PS1) is opened by sending 24VAC out the HLO terminal, through the limit switches, and monitoring the PS1 (3) input.

   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, PS will close.
5. When PS 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, 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 after the blower "Heat On Delay" has completed.. The seven-segment LED for example will alternately read:

   HE = Gas heating

   tP5 = Speed Tap 5
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 IdL = Idle, no thermostat demand.

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

   CPI = Cooling / Heat Pump

   tP7 = Speed Tap 7
4. When the temperature is lowered / raised (PH mode) enough to satisfy the thermostat setting, contacts R-Y-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 IdL = Idle, no thermostat demand.

Periodic Servicing Requirements

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

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

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

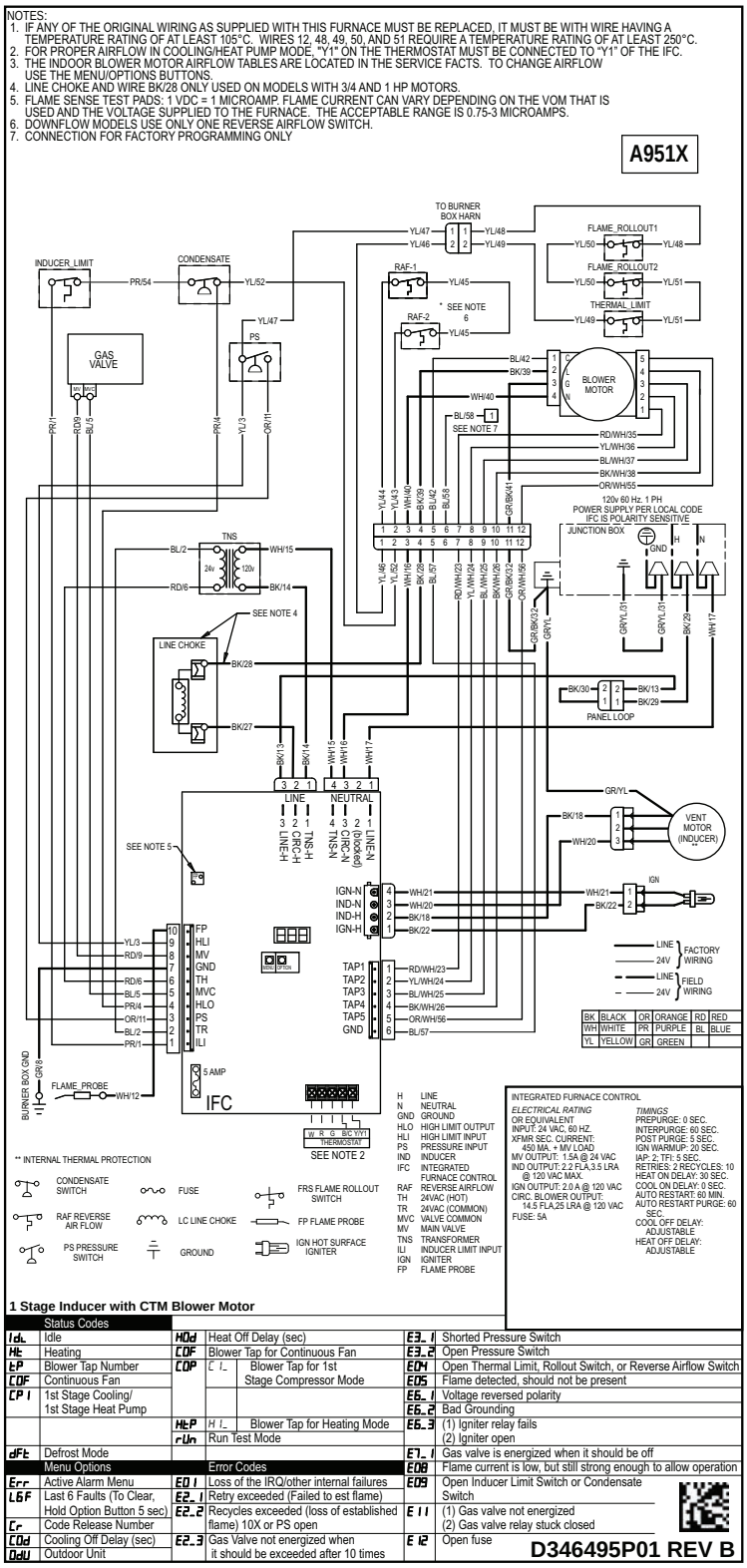
Clean burners with brush and/ or vacuum cleaner. Reassemble parts by reversal of the above procedure.

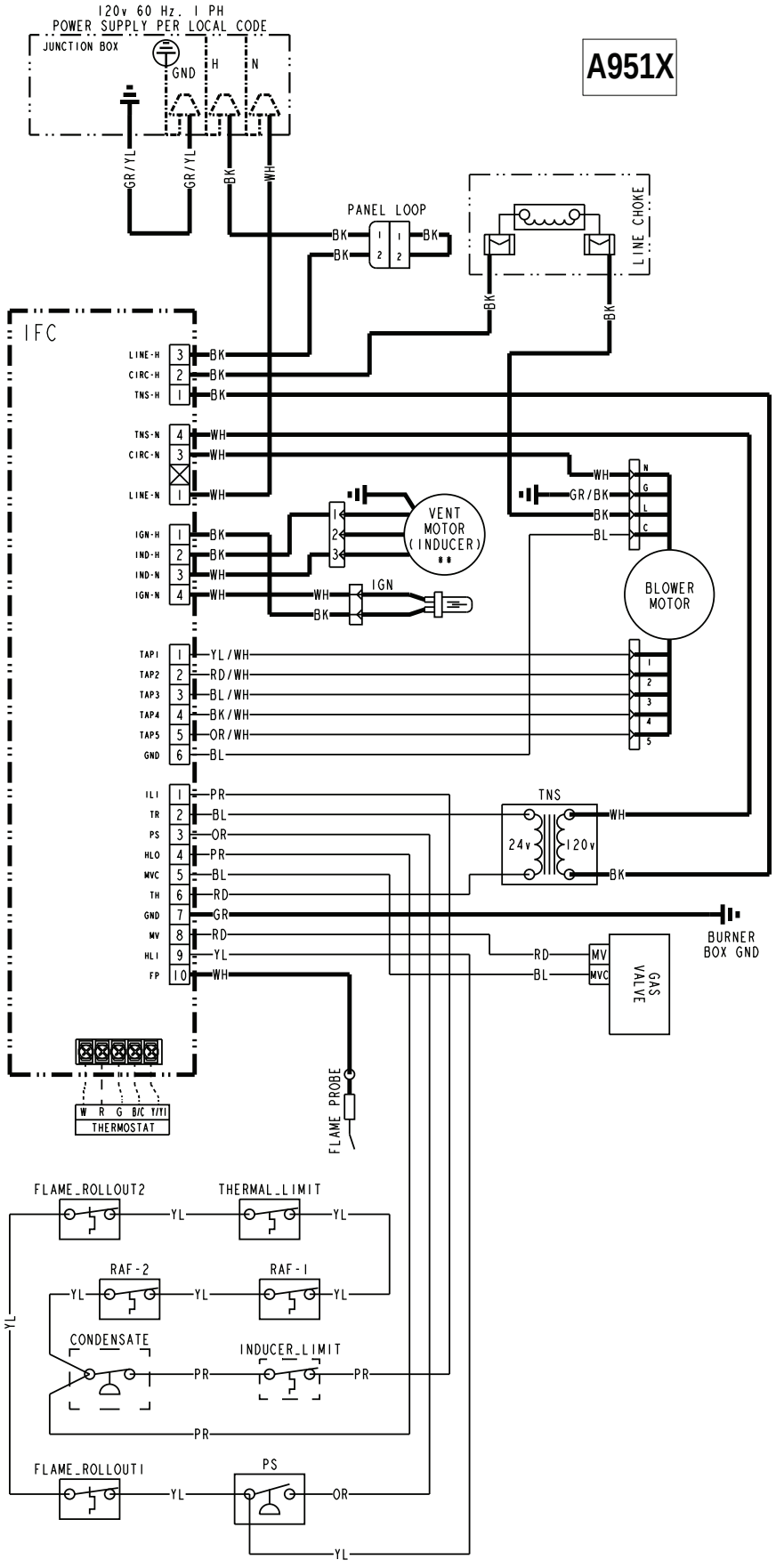
Note: *Natural gas units should not have any yellow tipped flames. This condition indicates that a service call is required. For best operation, burners must be cleaned annually using brushes and vacuum cleaner*

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

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

Wiring Diagrams




A951X
120v 60 Hz. 1 PH
POWER SUPPLY PER LOCAL CODE
JUNCTION BOX
GND
H
N
GR/YL
GR/YL
BK
WH
PANEL LOOP
LINE CHOKE
IFC
LINE-H
CIRC-H
TNS-H
TNS-N
CIRC-N
LINE-N
IGN-H
IND-H
IND-N
IGN-N
VENT MOTOR (INDUCER) **
IGN
BLOWER MOTOR
TAP1
TAP2
TAP3
TAP4
TAP5
GND
YL/WH
RD/WH
BL/WH
BK/WH
OR/WH
BL
ILI
TR
PS
HLO
MVC
TH
GND
MV
HLI
FP
PR
BL
OR
PR
BL
RD
GR
RD
YL
WH
TNS
24v
120v
BURNER BOX GND
GAS VALVE
MV
MVC
RD
BL
FLAME PROBE
W R G B/C Y/Y1
THERMOSTAT
FLAME_ROLLOUT2
THERMAL_LIMIT
RAF-2
RAF-1
CONDENSATE
INDUCER_LIMIT
FLAME_ROLLOUT1
PS
YL
PR
OR

Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	**Tap**		**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A951X040BU3SAA	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**
A951X060BU4SAA	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

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	**Tap**		**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A951X080BU4SAA	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**
A951X080CU5SAA	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

Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	**Tap**		**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A951X100CU5SAA	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**
A951X120DU5SAA	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

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	**Tap**		**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A951X040BD3SAA	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**
A951X060BD3SAA	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

Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	**Tap**		**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A951X080BD4SAA	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**
A951X100CD5SAA	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

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)							
Model	**Tap**		**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A951X120DD5SAA	1	SCFM	680	419	159	-	-
		Watts	47	56	66	-	-
	2	SCFM	1025	1063	1101	1139	1177
		Watts	237	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

Table 1. Heating Table — Upflow

CFM VS. TEMPERATURE RISE																	
MODEL																	
	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
A951X040BU3SAA	55	48	44	39	36	33	30										
A951X060BU4SAA			63	58	52	49	46	43	41	40							
A951X080BU4SAA					64	61	57	54	51	48	44	39	35				
A951X080CU5SAA					65	59	56	54	49	46	44	42	40	38	36		
A951X100CU5SAA									65	61	57	55	53	49	46	44	43
A951X120CU5SAA									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
A951X040BD3SAA		53	46	45	37	34	31												
A951X060BD3SAA					63	58	52	48	44	41	37								
A951X080BD4SAA								62	57	53	49	48	46						
A951X100CD5SAA										65	62	58	55	53	50	48	44		
A951X120DD5SAA												66	64	58	56	53	52	49	44

Integrated Furnace Control Display Codes

Menu Options	
IdL	Idle
Err	Active Alarm Errors
L6F	Last 6 Faults (To clear — Hold Option button down for 5 seconds after entering the L6F menu)
Cr	Code Release Number
COd	Cooling Off Delay (Seconds)
OdU	Outdoor Unit Type
COF	Blower Constant Fan Airflow
HOd	Heat Off Delay (Seconds)
9HC	Gas Heating CFM
rUn	Run Test Mode

Error Codes	
Alarm Error Code	Alarm Explanation
E01	Loss of the IRQ or other internal failures (Internal IFC error)
E2_1	Retry Exceeded (Flame never sensed, one hour lockout after 6 times)
E2_2	Recycles Exceeded (Flame sensed then lost, one hour lockout after 10 times)
E2_3	Gas Valve Not Energized When It Should Be exceeded after 10 times
E3_1	Shorted Pressure Switch
E3_2	Open Pressure Switch
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	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	Gas valve not energized when it should be
	Gas valve relay stuck closed
E12	Open fuse

Fault Code Recovery

Fault Code Recovery

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

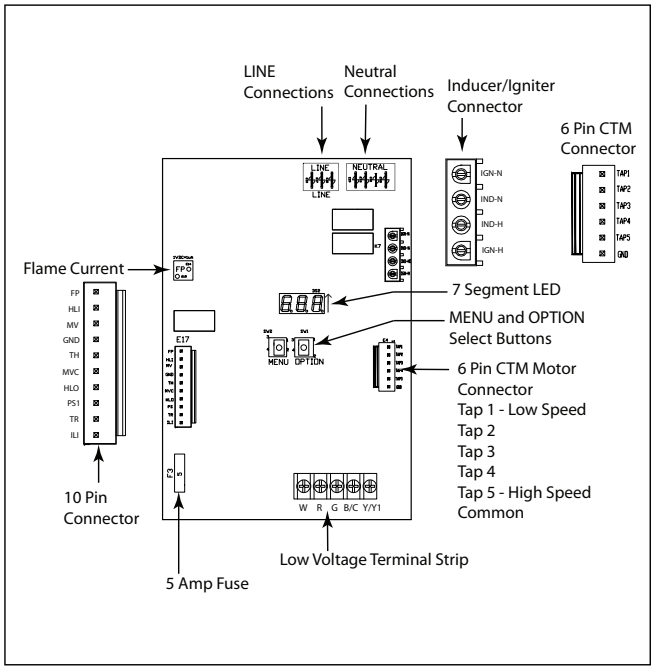
Clearing the Last 6 Faults

1. To clear the last 6 faults, press the "Menu" key until the "Last 6 Faults" (LbF) 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.

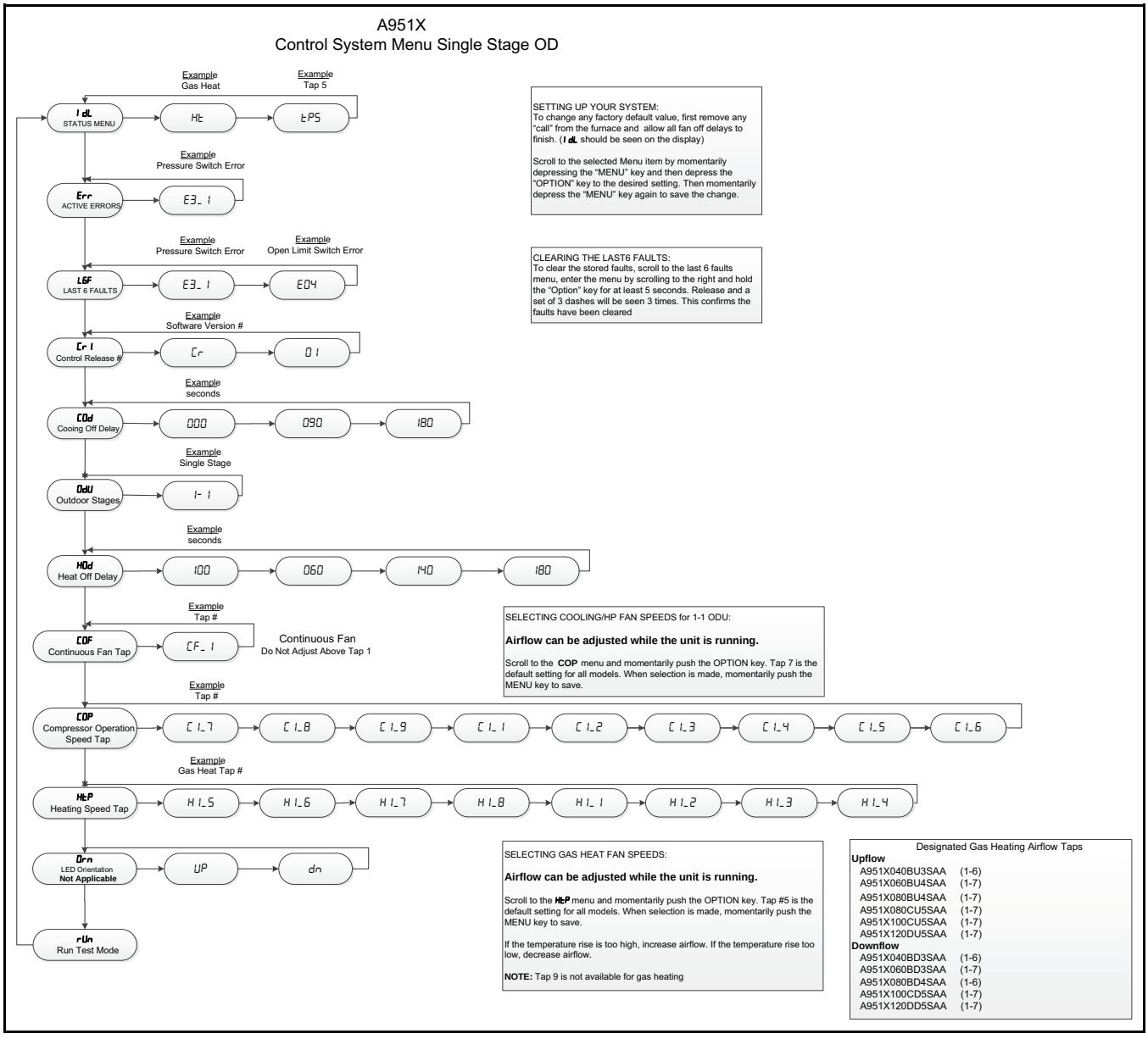
Resetting Factory Defaults

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.

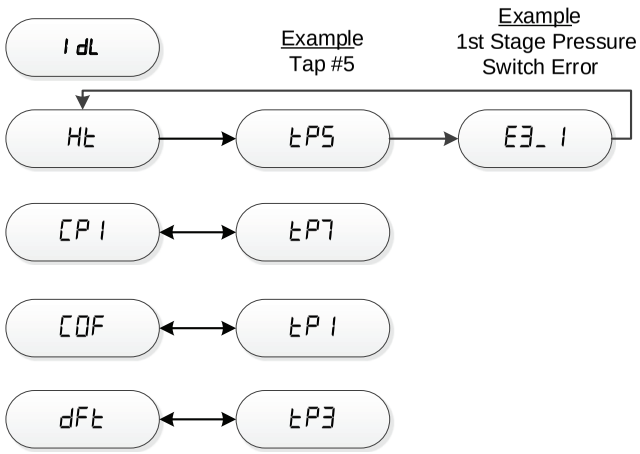
A951X IFC Component Layout



Integrated Furnace Control Menu



A951X
System Status Menu



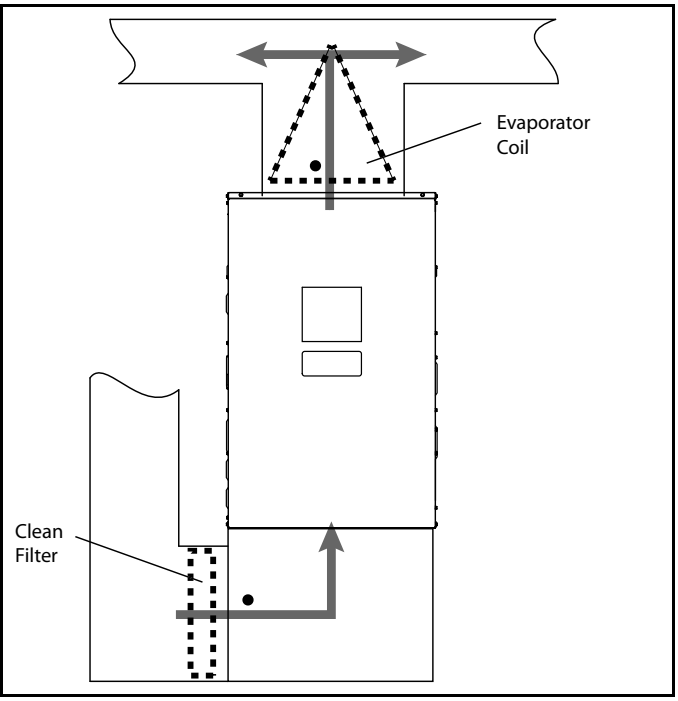
IdL = Idle, no demand for cooling, heating, or fan
Ht = Demand for 1st stage gas heat
CP1 = Demand for compressor cooling / Heat pump
COF = Demand for continuous fan
dFt = Demand for outdoor unit defrost,furnace running in gas heat mode
tP1-9 = Tap selected for airflow

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.



A951X080BU4 Furnace Airflow (CFM) at. External Static Pressure (in. W.C.) versus Tap							
			Static				
			0.1	**0.3**	**0.5**	**0.7**	**0.9**
Tap	Torque (%)						
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[(a)]	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
		Watts	453	477	500	524	547
9	100	SCFM	1878	1815	1752	1690	1627
		Watts	669	686	702	718	735

[(a)] Example 1

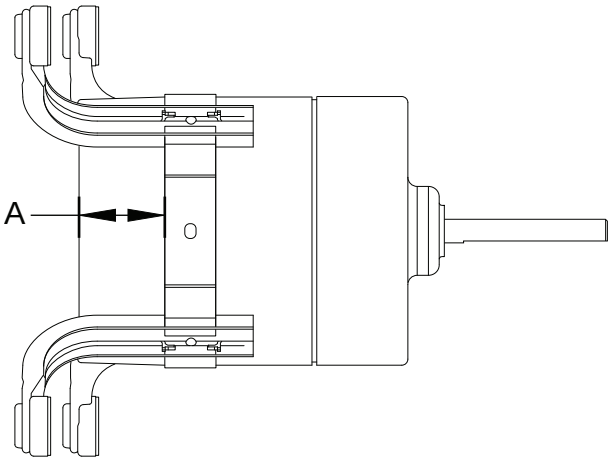
Example 1: A951X080BU4SAA (Default Tap 7)

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)

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)
A951X060BU4SAA A951X080BU4SAA	3.05
A951X080BD4SAA	3.29
A951X040BU3SAA A951X040BD3SAA A951X060BD3SAA	3.54
A951X080CU5SAA A951X120DU5SAA A951X100CD5SAA A951X120DD5SAA	3.79
A951X100CU5SAA	3.81

Part List

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

Troubleshooting

The following pages include troubleshooting flowcharts in reference to the A951X single stage furnaces only

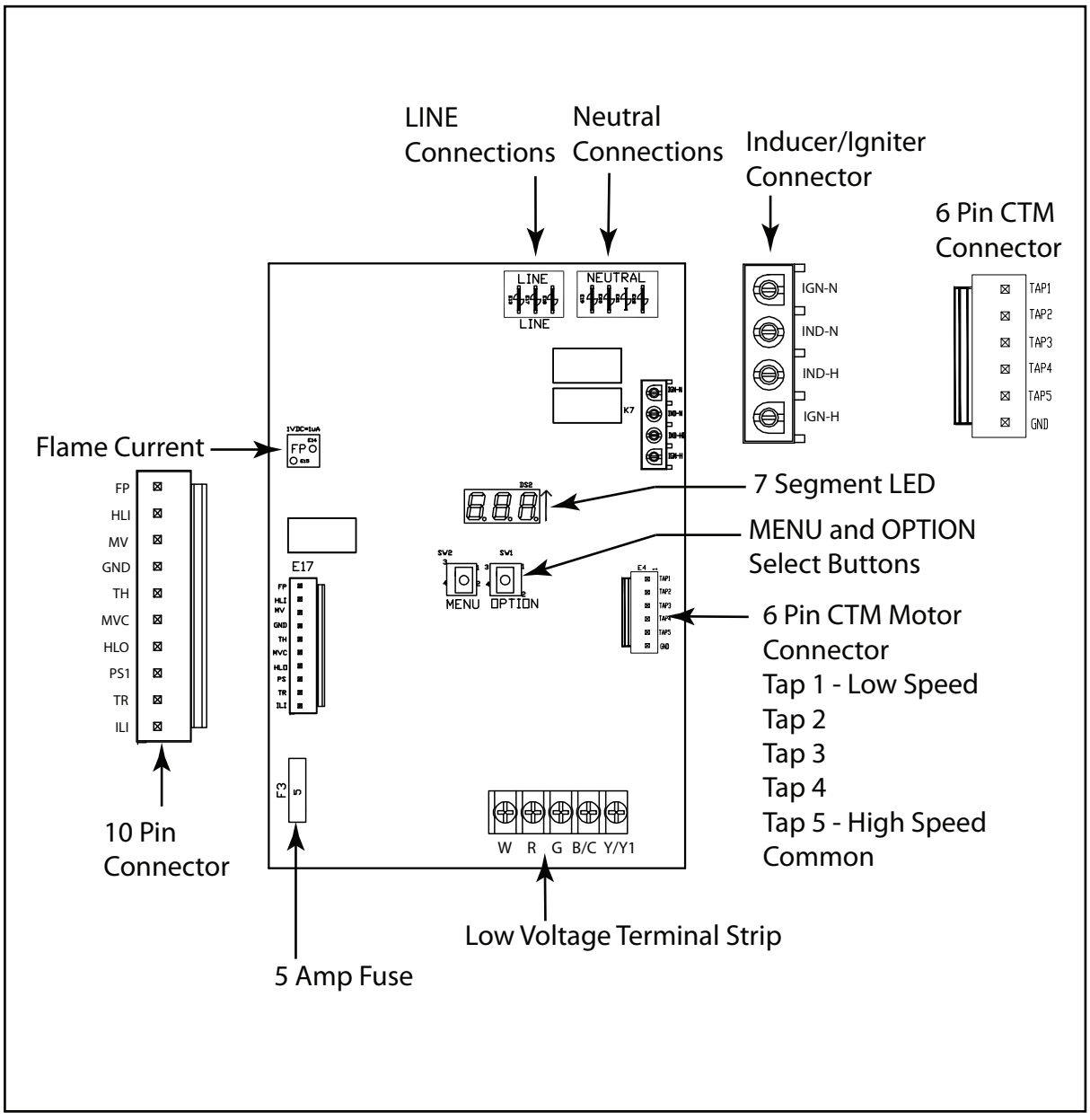
The information contained is for reference only and does not cover all scenarios or problems that may be encountered.

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

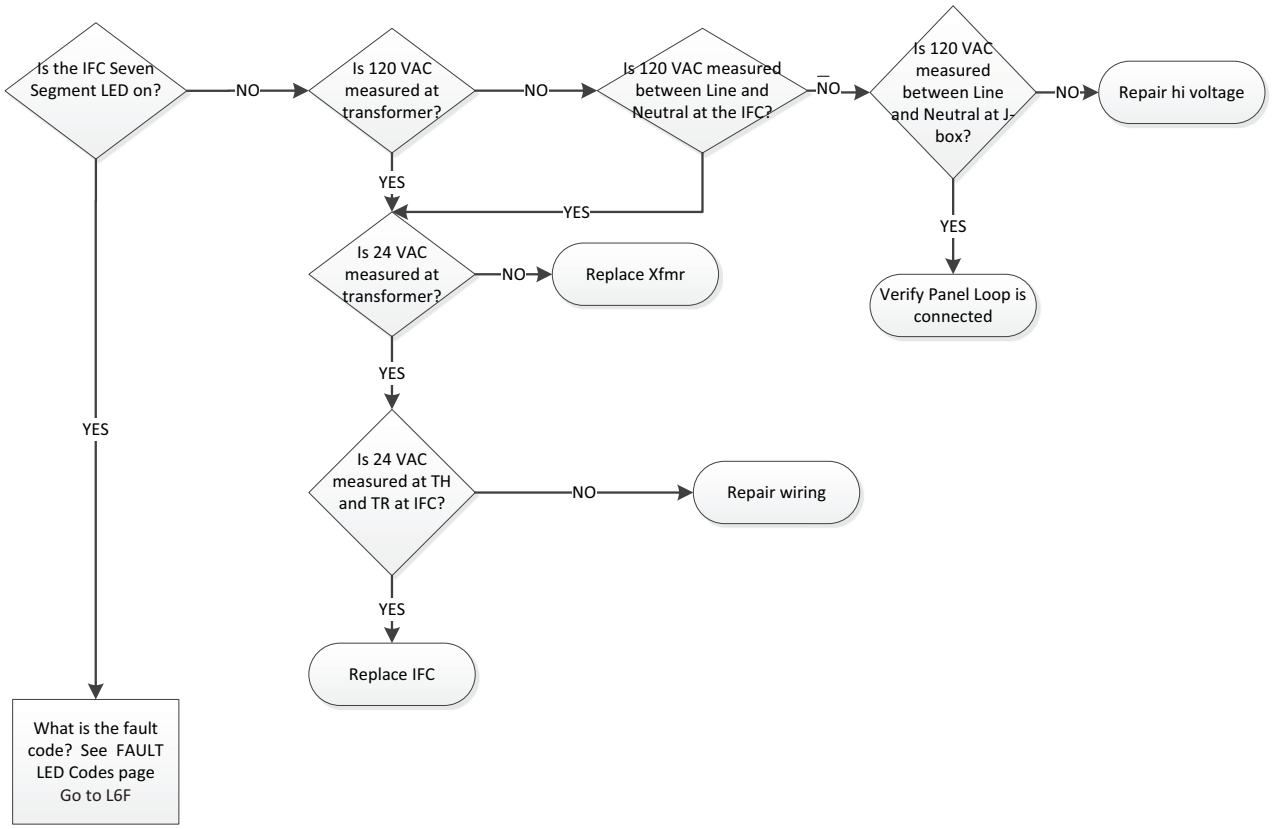
Failure to follow all cautions and/or warnings could result in personal or property damage, including death.

Error Codes	
Alarm Error Code	Alarm Explanation
E01	Loss of the IRQ or other internal failures (Internal IFC error)
E2_1	Retry Exceeded (Flame never sensed, one hour lockout after 6 times)
E2_2	Recycles Exceeded (Flame sensed then lost, one hour lockout after 10 times)
E2_3	gas Valve Not Energized When It Should Be exceeded after 10 times
E3_1	Shorted Pressure Switch
E3_2	Open Pressure Switch
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	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
E 11	See Troubleshooting Instructions
E 12	Open fuse

A951X IFC Component Layout



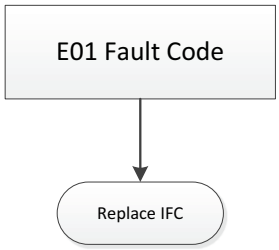
GETTING STARTED



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



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

2.1 Fault Code

Turn all gas appliances on

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

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

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

NO

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

Is any gas pressure present?

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

YES

Does gas ignite?

NO

YES

Is manifold pressure ~3.5"WC (NG) ~10.0"WC (LP) **

NO → Adjust manifold gas pressure to ~3.5"WC (NG) ~10.0"WC (LP) Check operation **

YES

Do all burners ignite within 4 seconds?

NO → Possible causes
Burner alignment
Dirty burners
Low manifold pressure

YES

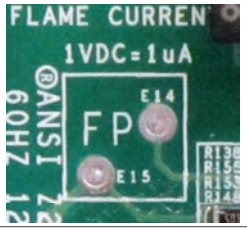
Check igniter position and correct if needed. Check operation

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

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

NO

Flame sensor is good



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

2.2 Fault Code

Turn all gas appliances on

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

NO

Cycle power to furnace and call for 1st stage heat

Is manifold pressure ~3.5"WC (NG) ~10.0" WC (LP) **

NO → Adjust manifold gas pressure to ~3.5"WC (NG) ~10.0" WC (LP) Check operation **

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

YES → Is minimum outlet gas manifold pressure maintained?

YES → Possible Causes: Plugs, Blower door, Wind gust, Power interrupt

NO → Disconnect electrical power to furnace. Connect manometer to inlet gas pressure connector

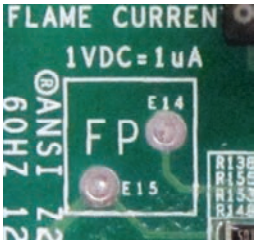
Cycle power to furnace and call for 1st stage heat

Is minimum outlet gas manifold pressure maintained?

YES → Possible Causes: Plugs, Blower door, Wind gust, Power interrupt

NO → Correct incoming gas supply pressure

NO → Possible Causes: Dirty Sensor, Dirty burners, Poor grounding, Sensor location, Wire connections

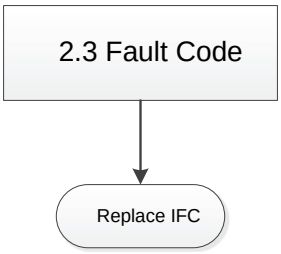


There are two flame sense pads located on the IFC, marked “FP”. To measure flame current, use a VOM set to DC volts. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3.0 VDC)

DEFINITION

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

24VAC not sensed on MVL 10 times

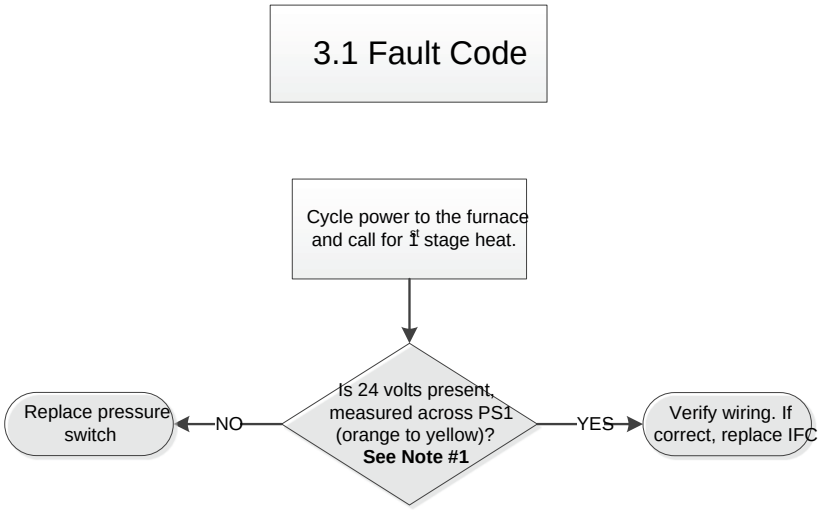


DEFINITION
An error has occurred with the PS1, indicating that the pressure switch is closed when it should be open.

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

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

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



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

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

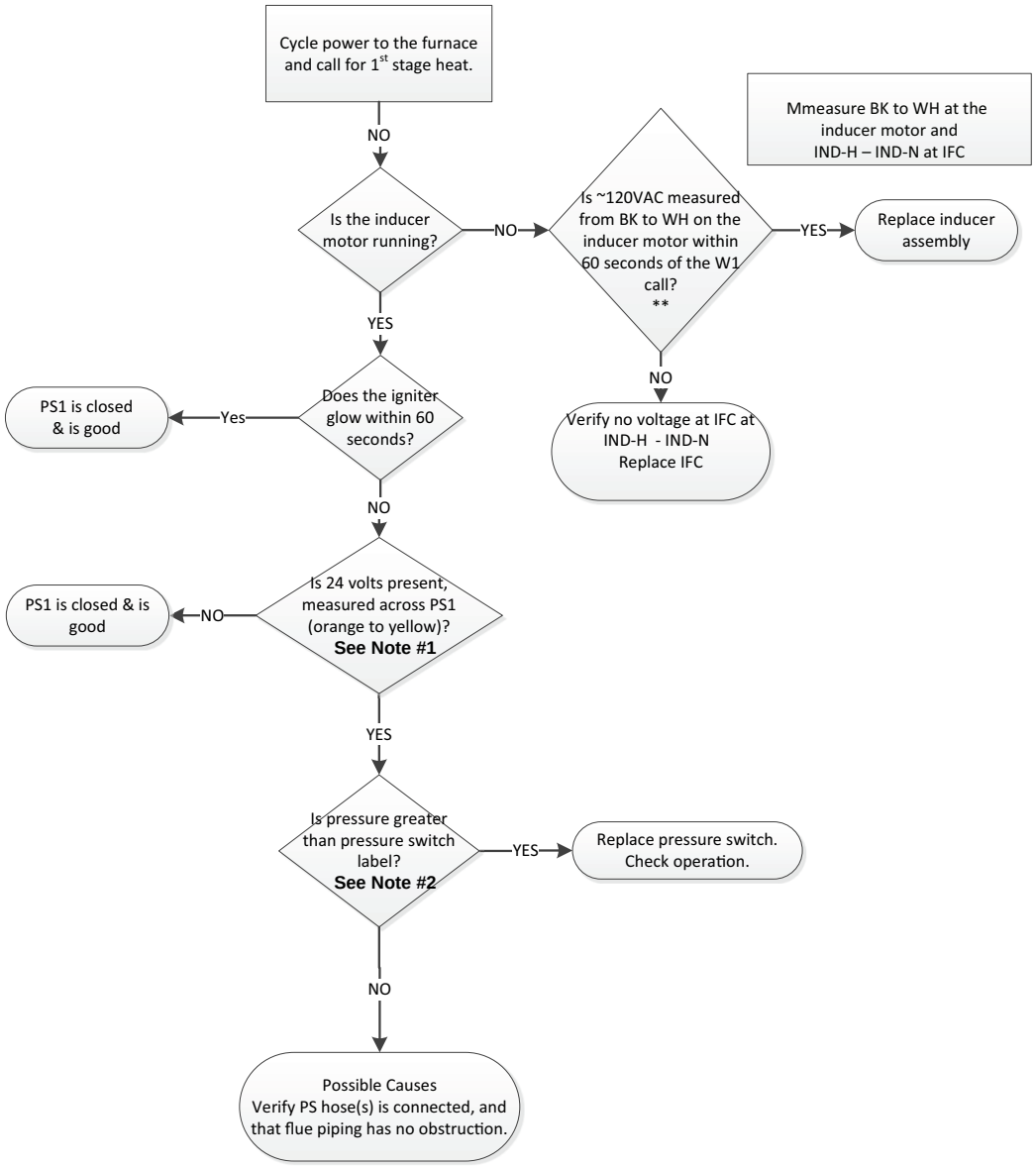
NOTE: Verify pressure switch wiring and tube routing are correct.

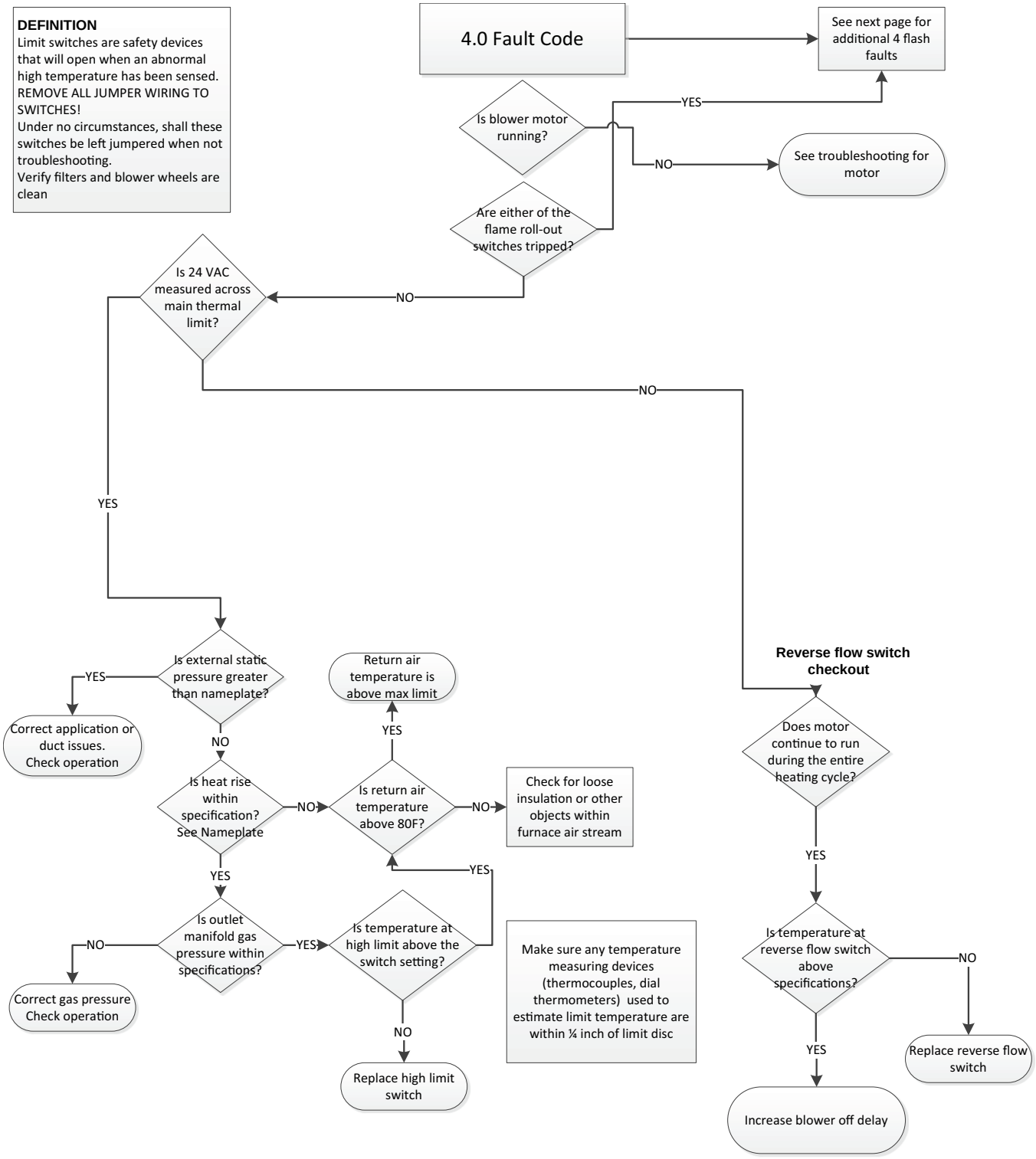
PS1 Open errors can occasionally happen when wind gusts occur.

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.

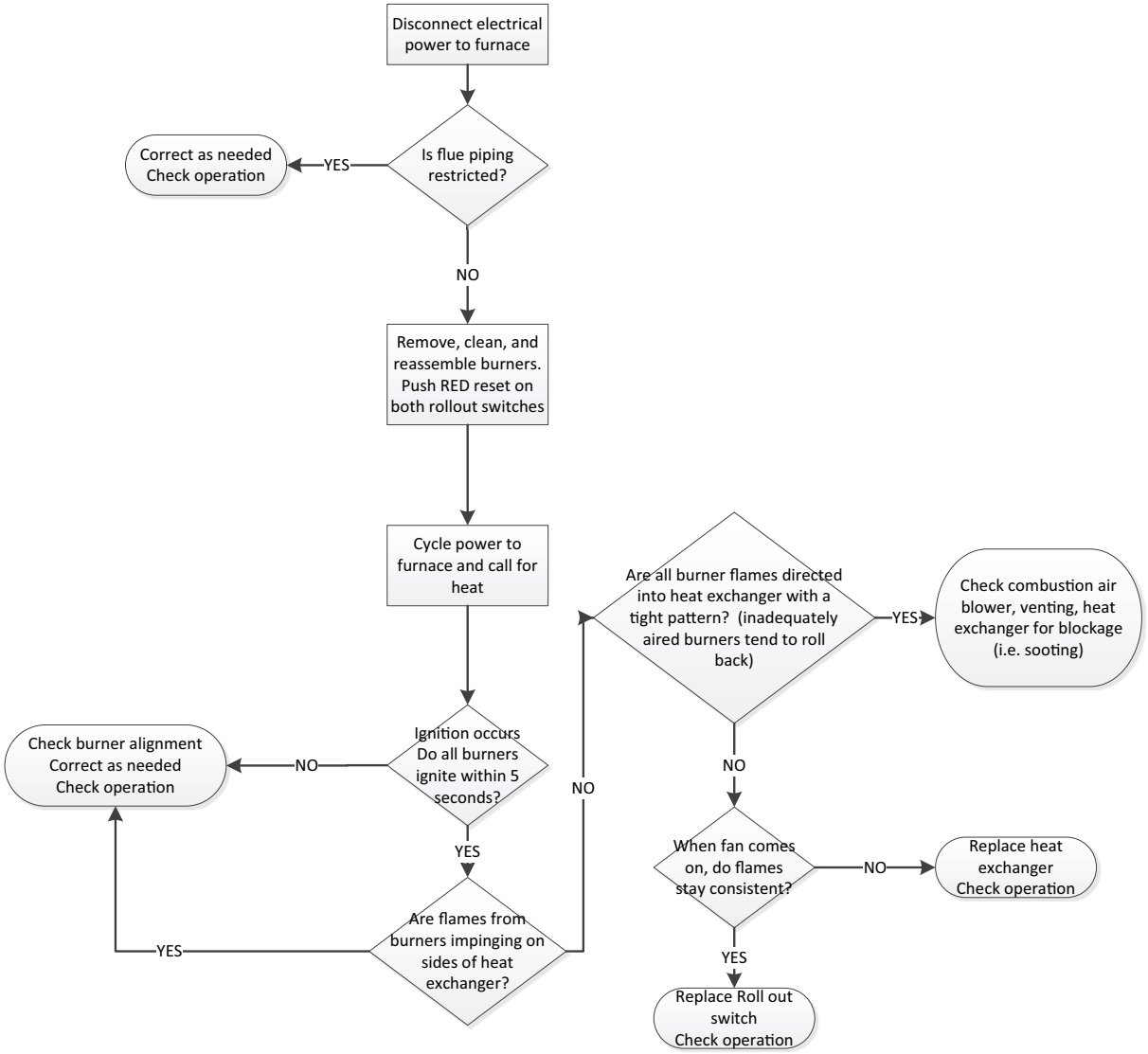



DEFINITION
Limit switches are safety devices that will open when an abnormal high temperature has been sensed.
REMOVE ALL JUMPER WIRING TO SWITCHES!
Under no circumstances, shall these switches be left jumpered when not troubleshooting.
Verify filters and blower wheels are clean
4.0 Fault Code
See next page for additional 4 flash faults
Is blower motor running?
YES
NO
See troubleshooting for motor
Are either of the flame roll-out switches tripped?
Is 24 VAC measured across main thermal limit?
NO
NO
YES
Is external static pressure greater than nameplate?
YES
Correct application or duct issues. Check operation
NO
Is heat rise within specification? See Nameplate
NO
Is return air temperature above 80F?
NO
Check for loose insulation or other objects within furnace air stream
YES
Return air temperature is above max limit
YES
YES
Is outlet manifold gas pressure within specifications?
NO
Correct gas pressure Check operation
YES
Is temperature at high limit above the switch setting?
NO
Replace high limit switch
Make sure any temperature measuring devices (thermocouples, dial thermometers) used to estimate limit temperature are within ¼ inch of limit disc
Reverse flow switch checkout
Does motor continue to run during the entire heating cycle?
YES
Is temperature at reverse flow switch above specifications?
NO
Replace reverse flow switch
YES
Increase blower off delay

DEFINITION:

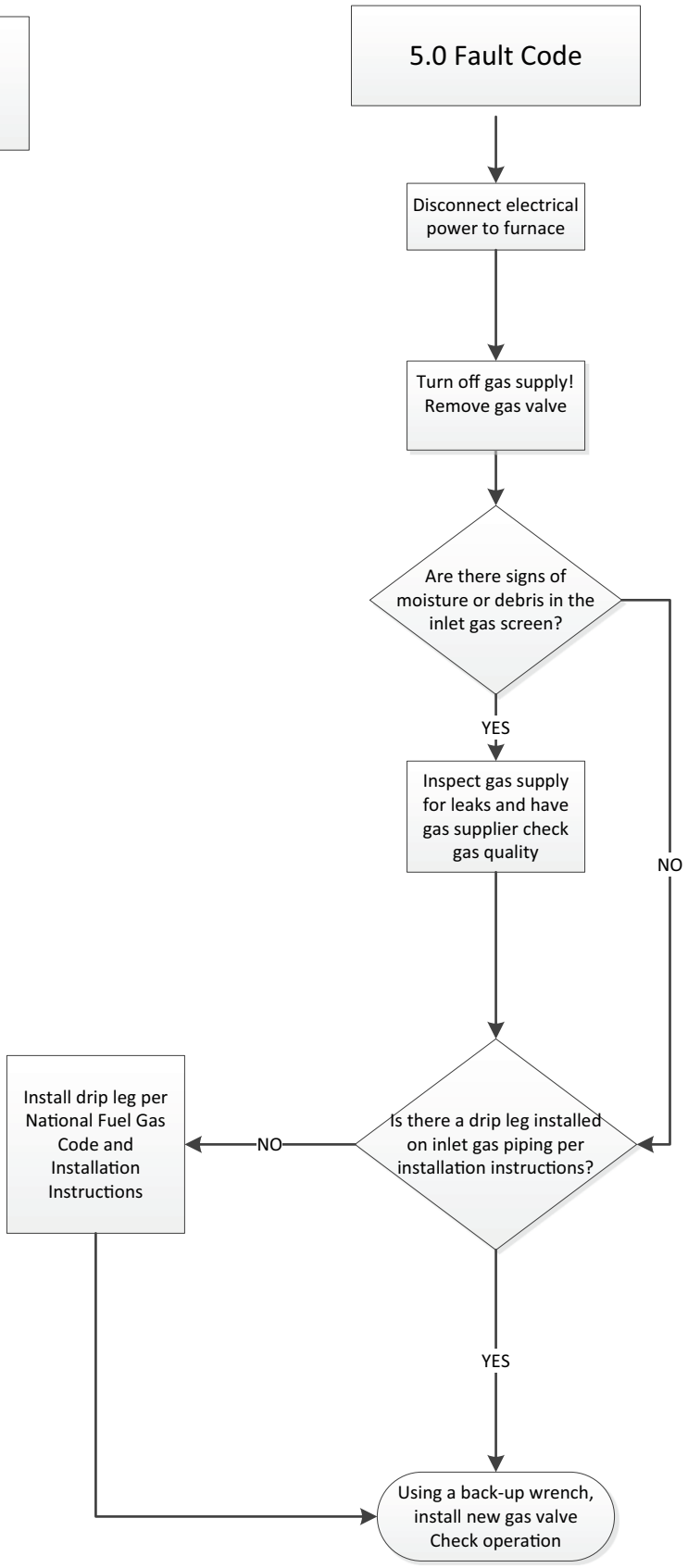
Limit switches are safety devices that will open when an abnormal high temperature has been sensed.
REMOVE ALL JUMPER WIRING TO SWITCHES!
Under no circumstances, shall these switches be left jumpered when not troubleshooting.

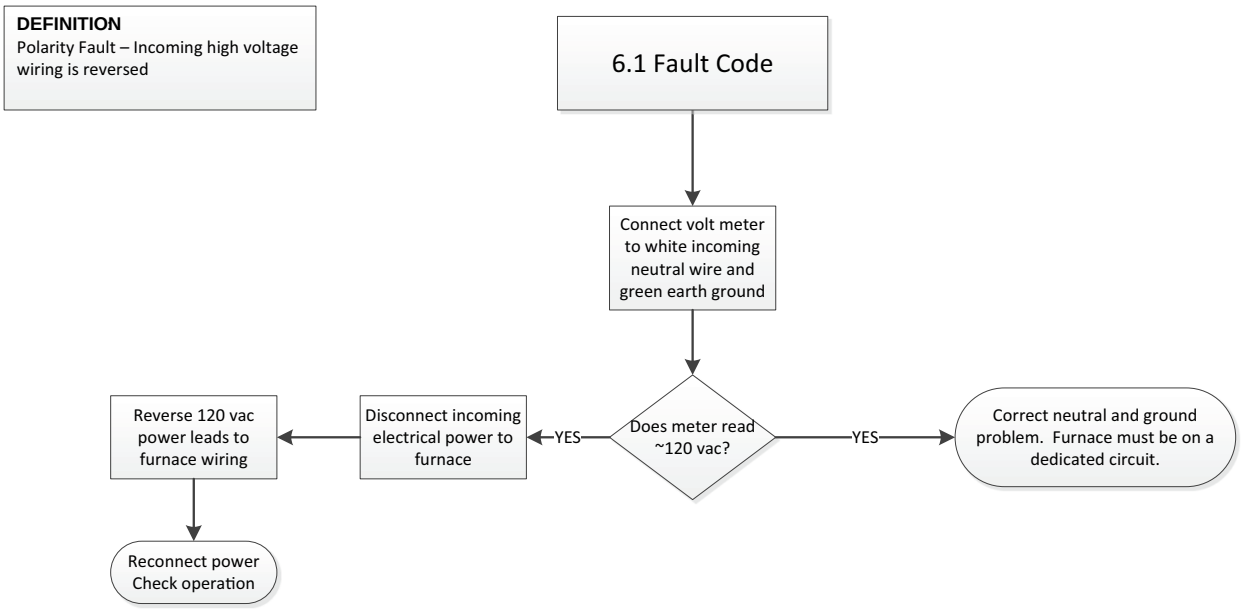
4.0 Fault Code
Flame Rollout

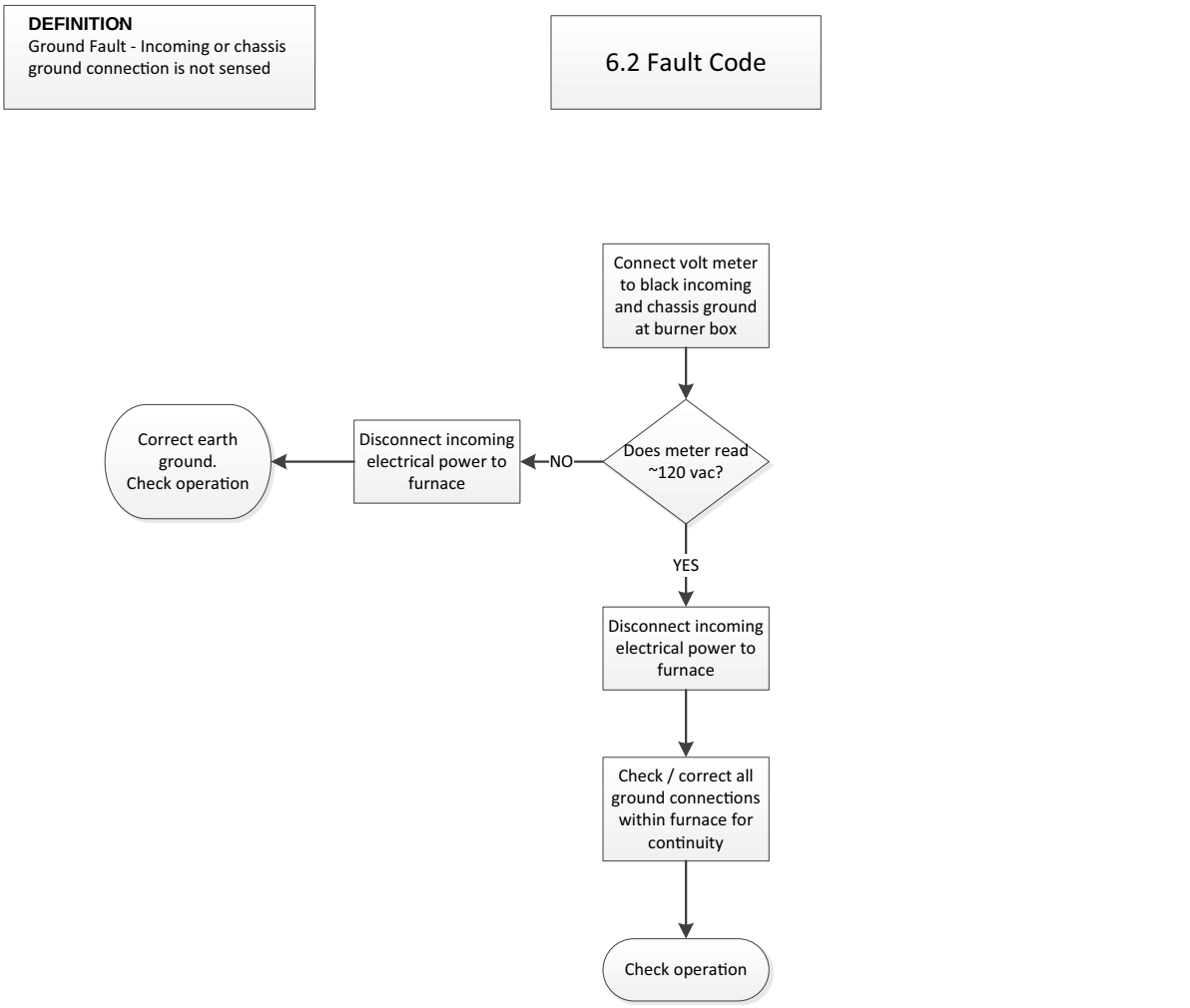


DEFINITION:

Flame is sensed when it should not be sensed.



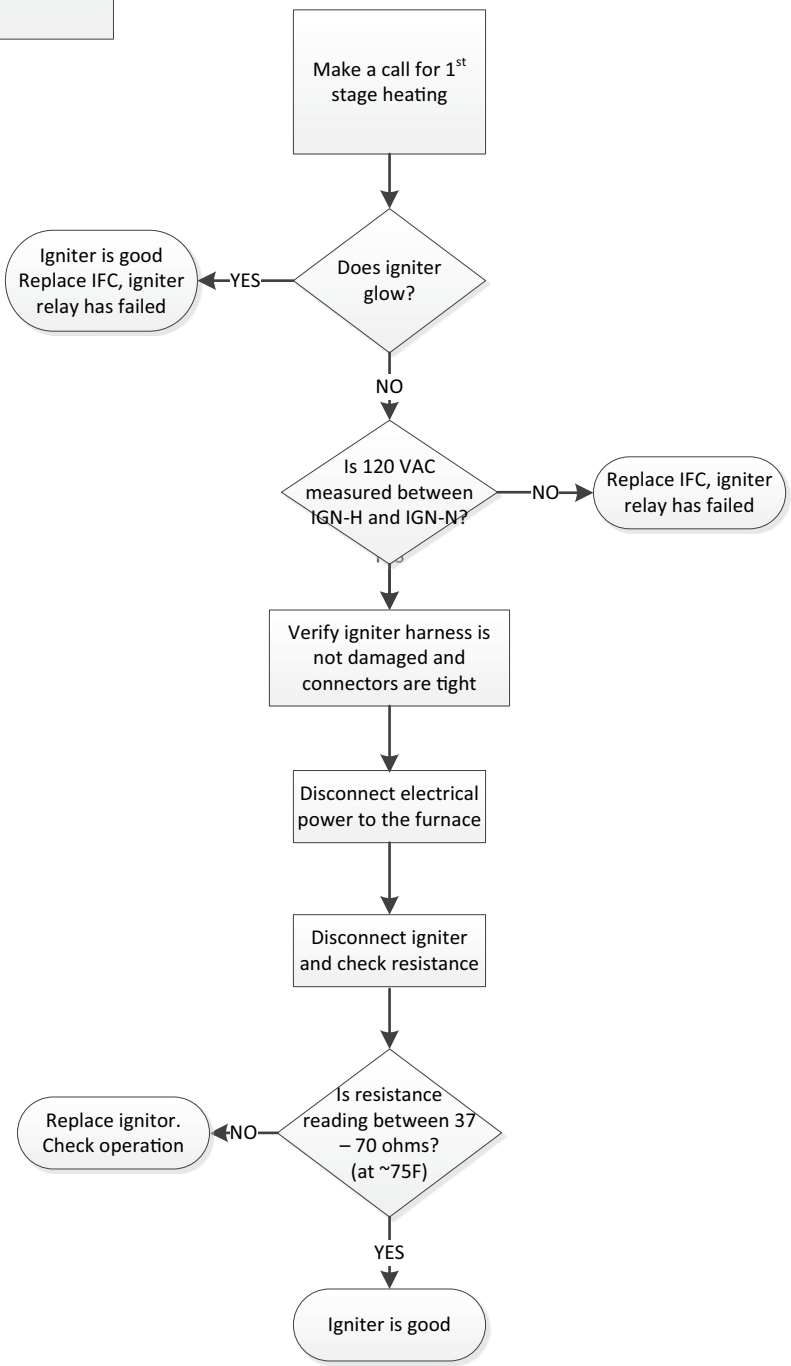

DEFINITION
Polarity Fault – Incoming high voltage wiring is reversed
6.1 Fault Code
Connect volt meter to white incoming neutral wire and green earth ground
Does meter read ~120 vac?
YES
Correct neutral and ground problem. Furnace must be on a dedicated circuit.
YES
Disconnect incoming electrical power to furnace
Reverse 120 vac power leads to furnace wiring
Reconnect power Check operation


DEFINITION
Ground Fault - Incoming or chassis ground connection is not sensed
6.2 Fault Code
Connect volt meter to black incoming and chassis ground at burner box
Does meter read ~120 vac?
NO
Disconnect incoming electrical power to furnace
Correct earth ground. Check operation
YES
Disconnect incoming electrical power to furnace
Check / correct all ground connections within furnace for continuity
Check operation

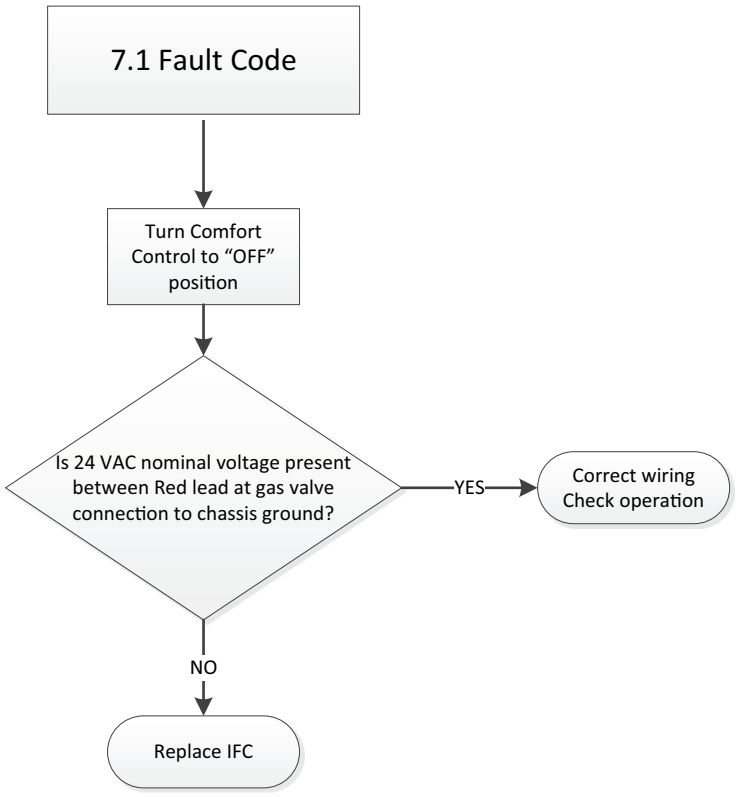
DEFINITION
Igniter Relay Fault – The control board has sensed that the igniter relay has stuck closed

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

6.3 Fault Code

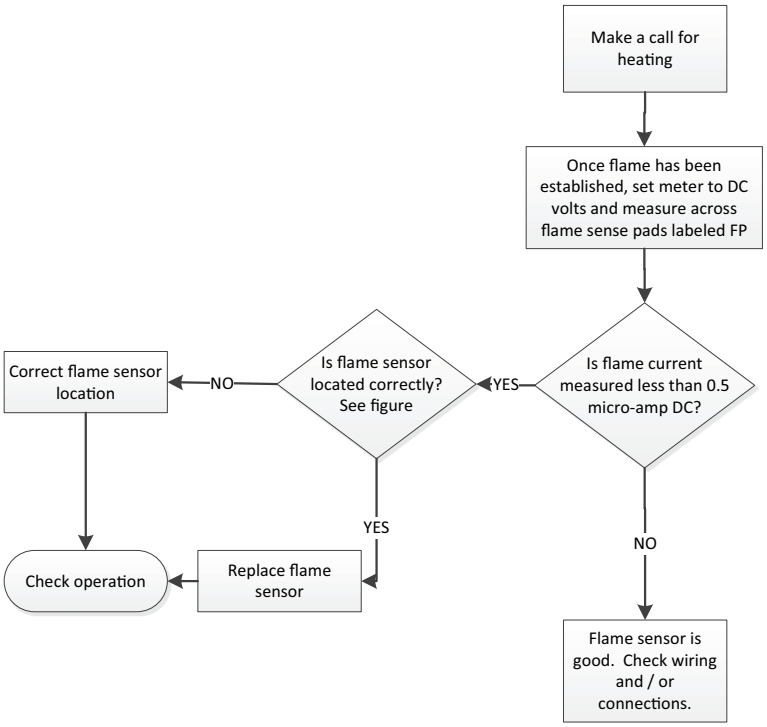


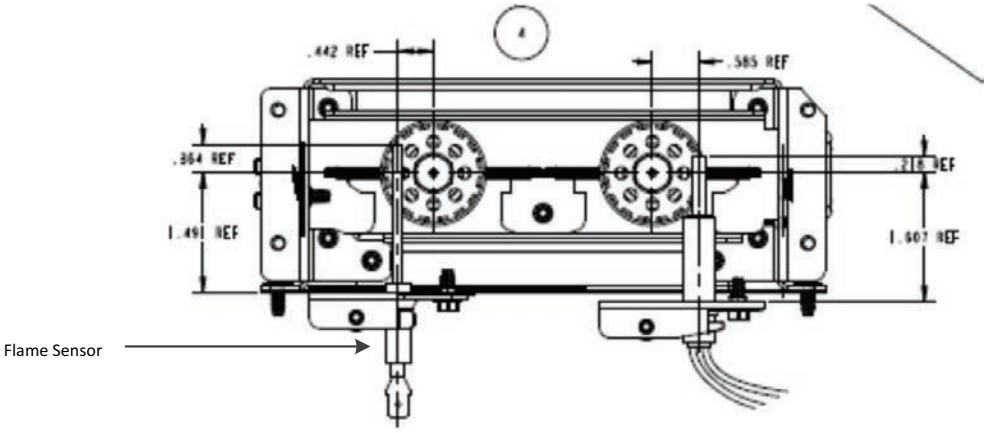
DEFINITION: External Gas Valve Circuit Error (24 volts is present when it should not be present)



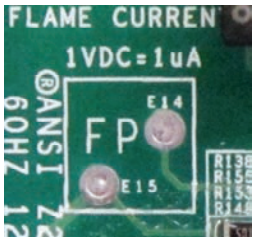
DEFINITION:
The flame sense current is less than 0.7 micro-amp DC

08 Fault Code



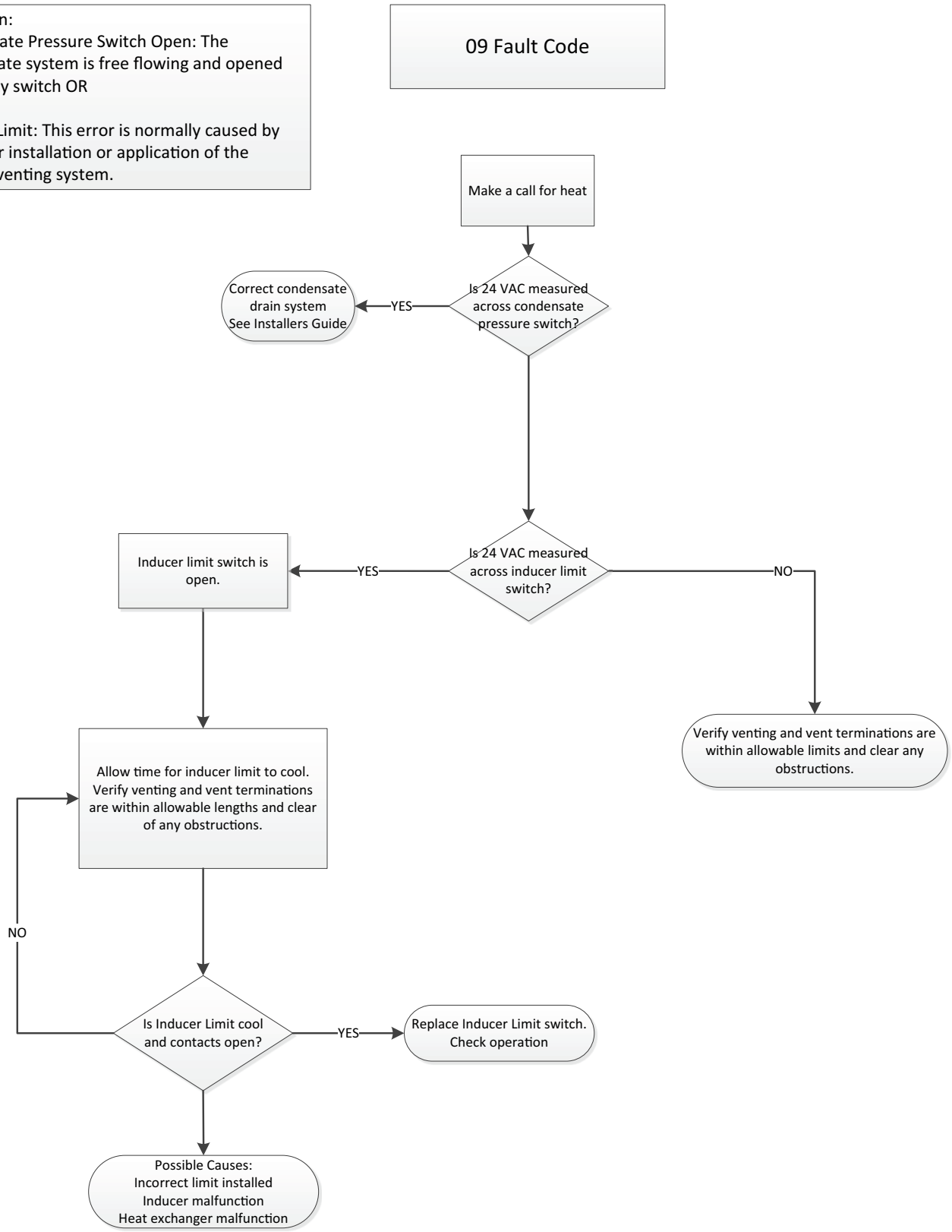


There are two flame sense pads located on the IFC, marked “FP”. To measure flame current, use a VOM set to DC volts. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3.0 VDC)



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.



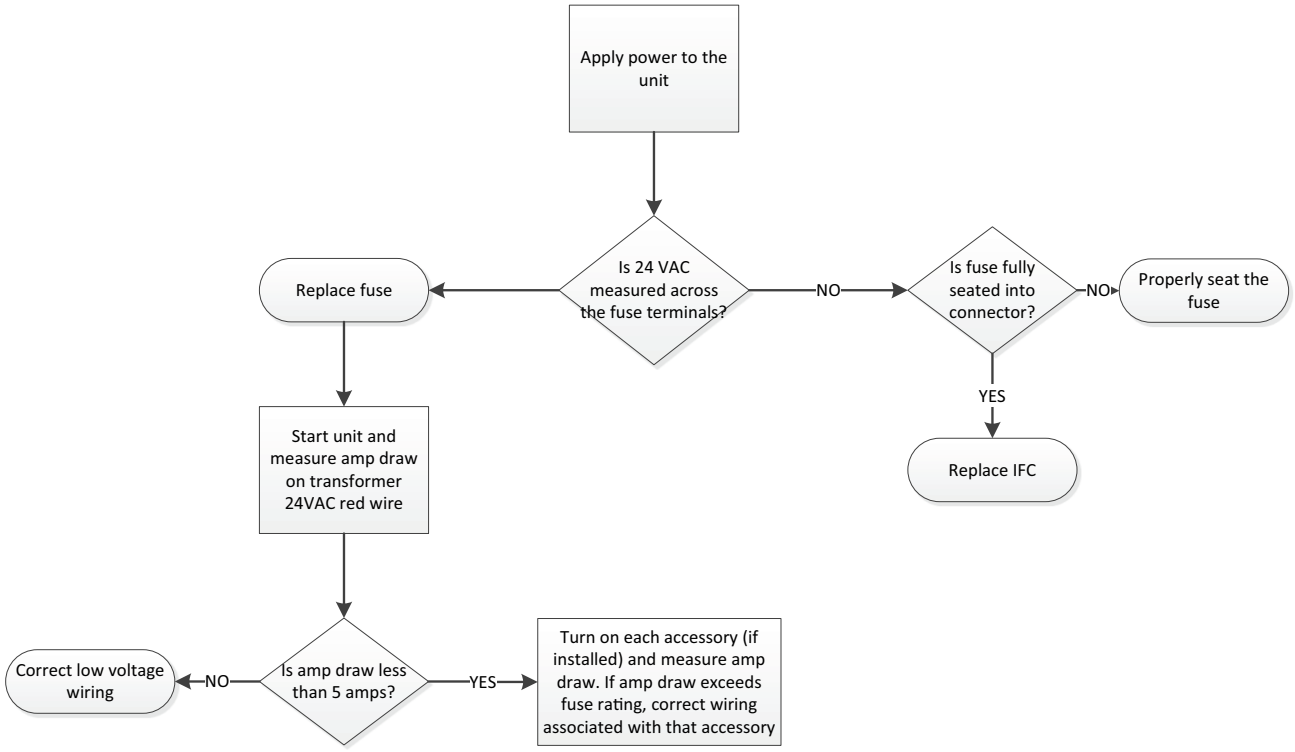
Definition:
The IFC has detected that internal gas valve relays have failed.

11 Fault Code

Verify all wiring
Replace IFC

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

12 Fault Code



Notes



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Supersedes A951X-SF-1A-EN (June 2019)
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