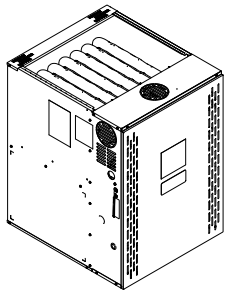
Service Facts

Upflow/Downflow/Horizontal Left/Right Gas-Fired, Single Stage Induced Draft Furnaces with High Efficiency Motor

Upflow, Downflow, Horizontal Right/Left

Single Stage
A801X026AM2SAA
A801X040AM3SAA
A801X040BM2SAA
A801X060BM3SAA
A801X060BM4SAA
A801X080BM4SAA
A801X080CM5SAA
A801X100CM5SAA
A801X120DM5SAA

Note: *Models may have a "T" in the 12th digit designating they meet California less than 40 ng/J (NOx) emissions requirements.*



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

⚠ 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.

June 2019

A801X-SF-1A-EN

Ingersoll Rand

SAFETY SECTION NON-CONDENSING 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.
When replacing a furnace, ensure the venting system is adequate for the new furnace.

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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 manufactured (mobile) housing, trailers, or recreational vehicles.

⚠ 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

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

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.
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

IGNITION FUNCTION!

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

⚠ CAUTION

WATER DAMAGE!

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

⚠ CAUTION

HOT SURFACE!

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

⚠ CAUTION

FURNACE SERVICE CAUTION!

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

⚠ CAUTION

DO NOT USE AS CONSTRUCTION HEATER!

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

⚠ CAUTION

WIRING INFORMATION!

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

⚠ 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

⚠ 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 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.**
- **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.**

Product Specifications

MODEL	A801X026AM2SAA	A801X040AM3SAA	A801X040BM2SAA
TYPE	Upflow / Horizontal / Downflow	Upflow / Horizontal / Downflow	Upflow / Horizontal / Downflow
RATINGS [a]			
Input BTUH	26,000	40,000	40,000
Capacity BTUH (ICS) [b] [c]	20,800	32,000	32,000
Temp. Rise (Min.-Max.)	25 - 55	30 - 60	30 - 60
AFUE (%) [c]	80	80	80
BLOWER DRIVE	DIRECT	DIRECT	DIRECT
Diameter — Width (In.)	11 X 8	11 X 8	11 X 8
No. Used	1	1	1
Speeds (No.) [d]	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	1/3	1/2	1/3
RPM	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	4.8	6.8	4.8
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	1.39	1.39	1.39
FILTER — Furnished?	No	No	No
Type recommended	High Velocity	High Velocity	High Velocity
High Vel. (No.-Size-Thk.)	1 — 14x25 — 1 in.	1 — 14x25 — 1 in.	1 — 16x25 — 1 in.
VENT PIPE DIAMETER — Min (in.) [e]	4 Round	4 Round	4 Round
HEAT EXCHANGER			
Type	Aluminized Steel	Aluminized Steel	Aluminized Steel
Gauge (Fired)	20	20	20
ORIFICES — Main			
Nat. Gas Qty. — Drill Size	2 - 51	2 - 45	2 - 45
GAS VALVE	Redundant - Single Stage	Redundant - Single Stage	Redundant - Single Stage
PILOT SAFETY DEVICE			
Type	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS — QTY	2	2	2
POWER CONN. — V/Ph/Hz [f]	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (Amps)	7.6	10.1	7.6
Max. Overcurrent Protection (Amps)	15	15	15
PIPE CONN. SIZE (in.)	1/2	1/2	1/2

[a] 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.
[b] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 — latest edition.
[c] Based on U.S. government standard tests.
[d] 9 Speed constant torque ECM blower motor.
[e] Refer to the Installer's Guide.
[f] The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

MODEL	A801X060BM3SAA	A801X060BM4SAA	A801X080BM4SAA
TYPE	Upflow / Horizontal / Downflow	Upflow / Horizontal / Downflow	Upflow / Horizontal / Downflow
RATINGS [a]			
Input BTUH	60,000	60,000	80,000
Capacity BTUH (ICS) [b] [c]	48,000	48,000	64,000
Temp. Rise (Min.-Max.)	30 - 60	30 - 60	30 - 60
AFUE (%)	80	80	80
BLOWER DRIVE	DIRECT	DIRECT	DIRECT
Diameter — Width (In.)	11 X 8	11 X 8	11 X 8
No. Used	1	1	1
Speeds (No.) [d]	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	1/2	3/4	3/4
RPM	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	6.8	8.4	8.4
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	1.39	1.39	1.39
FILTER — Furnished?	No	No	No
Type recommended	High Velocity	High Velocity	High Velocity
High Vel. (No.-Size-Thk.)	1 — 16x25 — 1 in.	1 — 16x25 — 1 in.	1 — 16x25 — 1 in.
VENT PIPE DIAMETER — Min (in.) [e]	4 Round	4 Round	4 Round
HEAT EXCHANGER			
Type	Aluminized Steel	Aluminized Steel	Aluminized Steel
Gauge (Fired)	20	20	20
ORIFICES — Main			
Nat. Gas Qty. — Drill Size	3 - 45	3 - 45	4 - 45
GAS VALVE	Redundant - Single Stage	Redundant - Single Stage	Redundant - Single Stage
PILOT SAFETY DEVICE			
Type	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS — QTY	3	3	4
POWER CONN. — V/Ph/Hz [f]	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (Amps)	10.1	12.1	12.1
Max. Overcurrent Protection (Amps)	15	15	15
PIPE CONN. SIZE (in.)	1/2	1/2	1/2

[a] 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.
[b] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 — latest edition.
[c] Based on U.S. government standard tests.
[d] 9 Speed constant torque ECM blower motor.
[e] Refer to the Installer's Guide.
[f] The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

MODEL	A801X080CM5SAA	A801X100CM5SAA	A801X120DM5SAA
TYPE	Upflow / Horizontal / Downflow	Upflow / Horizontal / Downflow	Upflow / Horizontal / Downflow
RATINGS [a]			
Input BTUH	80,000	100,000	120,000
Capacity BTUH (ICS) [b] [c]	64,000	80,000	96,000
Temp. Rise (Min.-Max.)	30 - 60	30 - 60	30 - 60
AFUE (%) [c]	80	80	80
BLOWER DRIVE	DIRECT	DIRECT	DIRECT
Diameter — Width (In.)	11 X 11	11 X 11	11 X 11
No. Used	1	1	1
Speeds (No.) [d]	9	9	9
CFM vs. in. w.g.	See Fan Performance Table	See Fan Performance Table	See Fan Performance Table
Motor HP	1	1	1
RPM	1075	1075	1075
Volts/Ph/Hz	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
FLA	10.9	10.9	10.9
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	0.30	0.30	0.34
FILTER — Furnished?	No	No	No
Type recommended	High Velocity	High Velocity	High Velocity
High Vel. (No.-Size-Thk.)	1 — 20x25 — 1 in.	1 — 20x25 — 1 in.	1 — 24x25 — 1 in.
VENT PIPE DIAMETER — Min (in.) [e]	4 Round	4 Round	4 Round
HEAT EXCHANGER			
Type	Aluminized Steel	Aluminized Steel	Aluminized Steel
Gauge (Fired)	20	20	20
ORIFICES — Main			
Nat. Gas Qty. — Drill Size	4 - 45	5 - 45	6 - 45
GAS VALVE	Redundant - Single Stage	Redundant - Single Stage	Redundant - Single Stage
PILOT SAFETY DEVICE			
Type	120 V SiNi Igniter	120 V SiNi Igniter	120 V SiNi Igniter
BURNERS — QTY	4	5	6
POWER CONN. — V/Ph/Hz [f]	120 / 1 / 60	120 / 1 / 60	120 / 1 / 60
Ampacity (Amps)	14.1	14.1	14.1
Max. Overcurrent Protection (Amps)	15	15	15
PIPE CONN. SIZE (in.)	1/2	1/2	1/2

[a] 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.
[b] Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3 — latest edition.
[c] Based on U.S. government standard tests.
[d] 9 Speed constant torque ECM blower motor.
[e] Refer to the Installer's Guide.
[f] The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

Sequence of Operation

Note: *The seven-segment LED readout is based on thermostat input.*

Gas Heating

1. R – W1 contacts close on the thermostat sending 24VAC to the W1 low voltage terminal of the IFC. Technician should read 24VAC from W1 to B/C. The seven segment LED will read: .

- HE

2. The IFC performs a self-check routine and then confirms:
   a. 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.
   b. The pressure switch is opened by sending 24VAC out the HLO terminal, through the limit switch, and monitoring the PS input.

   Note: *If a thermal limit is open, 24VAC will not be present at the pressure switch.*
3. After steps a & b 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. Flame sensing 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 the 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= Tap 5

9. When the temperature raises enough to satisfy the thermostat setting, contacts R-W1 will open.
10. The gas valve relay will open, closing the gas valve. The inducer will continue to run for approximately 5 seconds to remove any combustion byproducts 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 airflow. The seven-segment LED for example will alternately read:

- CPI = Cooling / Heat Pump
- tP7 = Tap 7

4. When the temperature is lowered / raised (HP 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.*

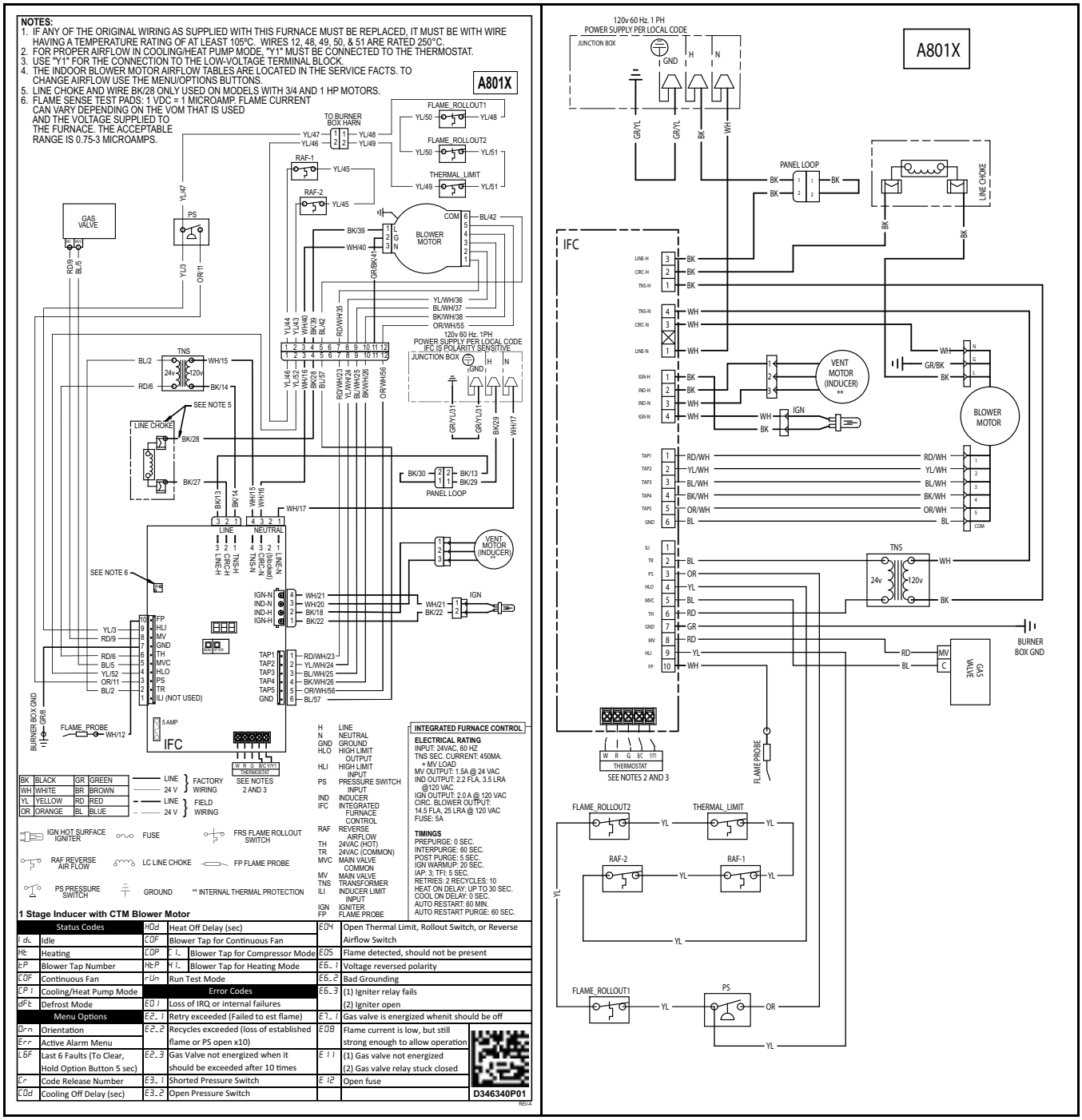
Clean burners with brush and/ or vacuum cleaner. Reassemble parts by reversal of the above procedure.

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



Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X026AM2SAA	1	559	36	—	—	—
	2	646	266	—	—	—
	3	687	369	50	—	—
	4	755	466	177	—	—
	5	971	755	539	323	106
	6	1024	843	662	481	299
	7	1057	908	758	609	460
	8	1139	999	859	719	579
	9	1275	1152	1028	904	781

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X040AM3SAA	1	580	34	—	—	—
	2	716	471	226	—	—
	3	743	533	323	113	—
	4	929	742	556	370	183
	5	988	831	675	518	361
	6	1112	975	839	702	566
	7	1174	1046	917	788	659
	8	1280	1164	1049	933	817
	9	1558	1475	1392	1309	1226

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X040BM2SAA	1	582	—	—	—	—
	2	815	546	277	8	—
	3	872	639	406	172	—
	4	1001	809	617	424	232
	5	1022	838	654	470	286
	6	1075	917	759	601	442
	7	1132	988	844	700	557
	8	1186	1055	925	795	664
	9	1325	1211	1097	983	869

Airflow tables

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X060BM3SAA	1	629	67	—	—	—
	2	987	795	603	411	219
	3	1184	1042	901	759	618
	4	1244	1109	973	837	701
	5	1366	1244	1123	1001	880
	6	1398	1283	1168	1053	938
	7	1479	1374	1270	1165	1061
	8	1547	1447	1348	1248	1148
	9	1634	1541	1449	1357	1264

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X060BM4SAA	1	707	225	—	—	—
	2	870	617	363	110	—
	3	1073	895	716	538	360
	4	1264	1126	988	850	713
	5	1384	1260	1137	1013	890
	6	1422	1304	1186	1069	951
	7	1555	1452	1348	1244	1141
	8	1658	1559	1460	1361	1262
	9	2047	1971	1895	1818	1743

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X080BM4SAA	1	633	297	—	—	—
	2	957	800	719	428	213
	3	1220	1080	940	800	660
	4	1403	1298	1192	1087	981
	5	1524	1428	1336	1248	1164
	6	1684	1574	1544	1401	1337
	7	1700	1625	1551	1476	1401
	8	1858	1790	1723	1656	1589
	9	1967	1898	1829	1760	1691

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X080CM5SAA	1	908	346	—	—	—
	2	964	583	202	—	—
	3	1518	1323	1129	934	740
	4	1638	1455	1271	1087	904
	5	1798	1636	1475	1313	1152
	6	1911	1761	1611	1461	1310
	7	1993	1850	1708	1565	1423
	8	2214	2091	1969	1846	1723
	9	2652	2551	2450	2348	2247

Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X100CM5SAA	1	918	438	—	—	—
	2	1183	950	716	483	249
	3	1709	1546	1383	1220	1057
	4	1771	1676	1581	1486	1391
	5	1931	1793	1656	1518	1380
	6	2028	1898	1768	1638	1508
	7	2177	2057	1938	1818	1699
	8	2351	2246	2141	2036	1931
	9	2609	2522	2434	2347	2260

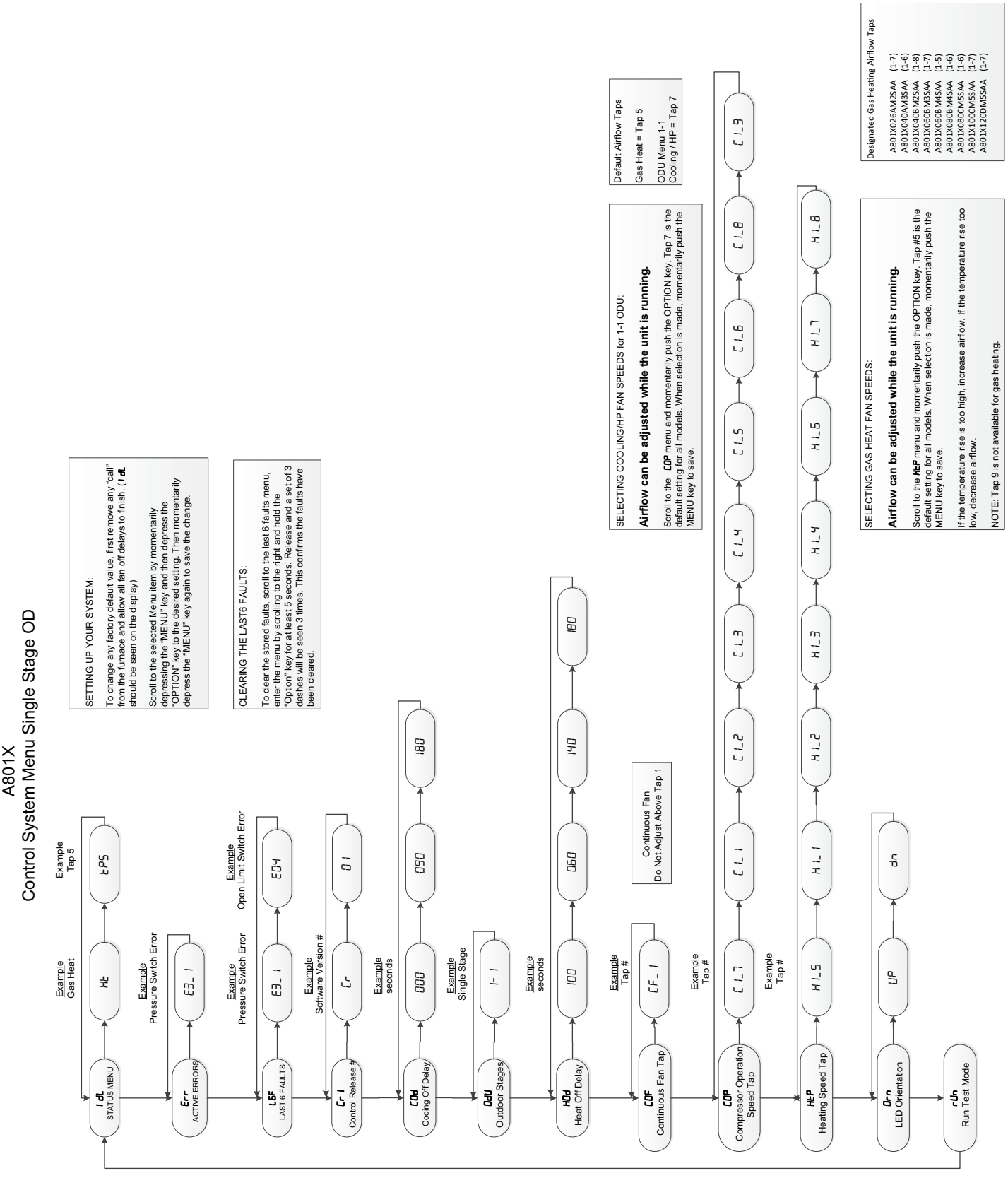
Furnace Airflow (CFM) Vs. External Static Pressure (in. W.C.)						
Model	**Tap**	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
A801X120DM5SAA	1	857	416	—	—	—
	2	1282	1043	804	565	326
	3	1596	1426	1255	1085	915
	4	1946	1810	1673	1537	1400
	5	2094	1970	1845	1721	1596
	6	2212	2096	1980	1864	1748
	7	2359	2249	2140	2030	1921
	8	2508	2405	2302	2199	2096
	9	2639	2542	2444	2346	2249

CFM Versus Temperature Rise

Table 1. A801X

Model	CFM Versus Temperature Rise																				
	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
A801X026AM2SAA	48	39	32																		
A801X040AM3SAA		59	49	42	37	33	30	27													
A801X040BM2SAA		59	49	42	37	33	30	27													
A801X060BM3SAA					56	49	44	40	37	34	32										
A801X060BM4SAA					56	49	44	40	37	34	32										
A801X080BM4SAA							59	54	49	46	42	40	37	35	33						
A801X080CM4SAA							59	54	49	46	42	40	37	35	33						
A801X100CM5SAA										57	53	49	46	44	41	39	37	35	34	32	31
A801X120DM5SAA												59	56	52	49	47	44	42	40	39	37

Integrated Furnace Control Menu



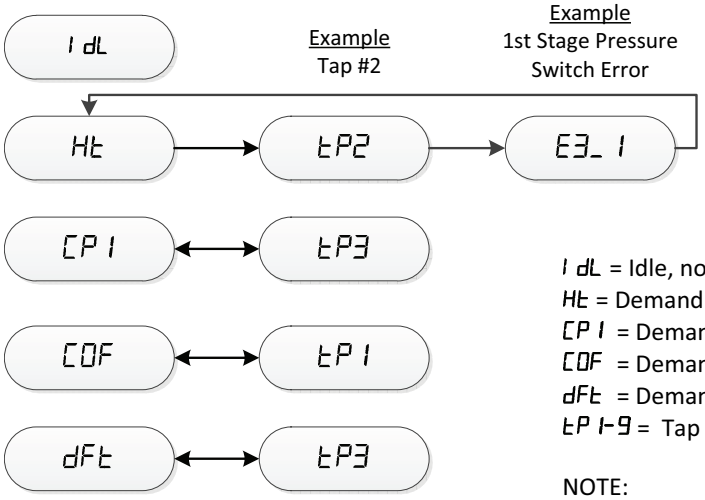
A801X
Run Test Mode

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
rU1 -Turns the inducer on in 1st stage for 30 seconds
rU2 – Not applicable
rU3 – Turns the ignitor on for 10 seconds
rU4 – Turns the circulating blower on 1st stage compressor speed for 10 seconds
rU5 – Not applicable
rU6 – Turns the circulating blower on 1st stage gas heat speed for 10 seconds
rU7 – Not applicable
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.

A801X
System Status Menu

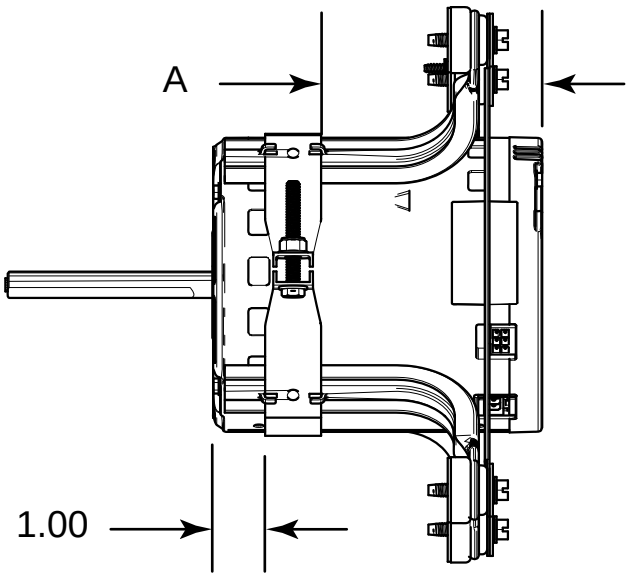


I dL = Idle, no demand for cooling, heating, or fan
Ht = Demand for stage gas heat
CP1 = Demand for cooling/heatpump
COF = Demand for continuous fan
dFt = Demand for outdoor unit defrost, furnace running in gas heat mode
tP1-9 = Tap selected for airflow

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

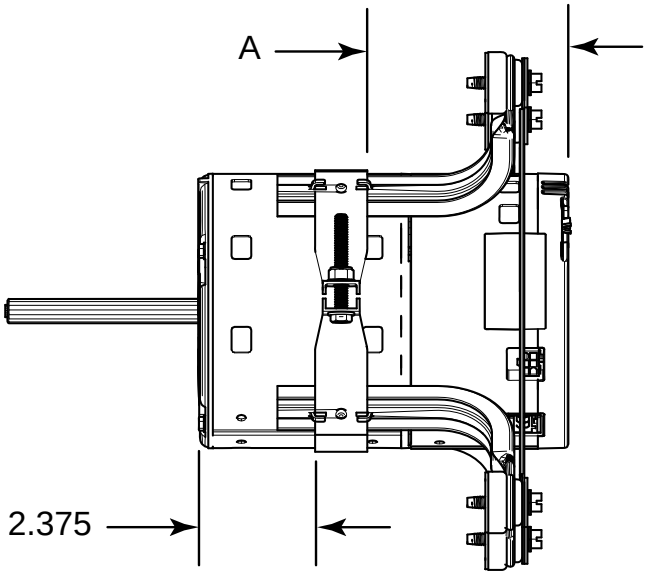
Belly Band Location

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



Blower housing and wheel removed from view for clarity.

Furnace Model	Dimension "A" (inches)
A026	3.5 (3–1/2)
A040	3.75 (3–3/4)
B040	3.5 (3–1/2)
B060 3 ton	3.75 (3–3/4)
B060 4 ton	4.25 (4–1/4)
B080	4.25 (4–1/4)



Blower housing and wheel removed from view for clarity.

Furnace Model	Dimension "A" (inches)
C080	4.125 (4–1/8)
C100	4.125 (4–1/8)
D120	4.125 (4–1/8)

Troubleshooting

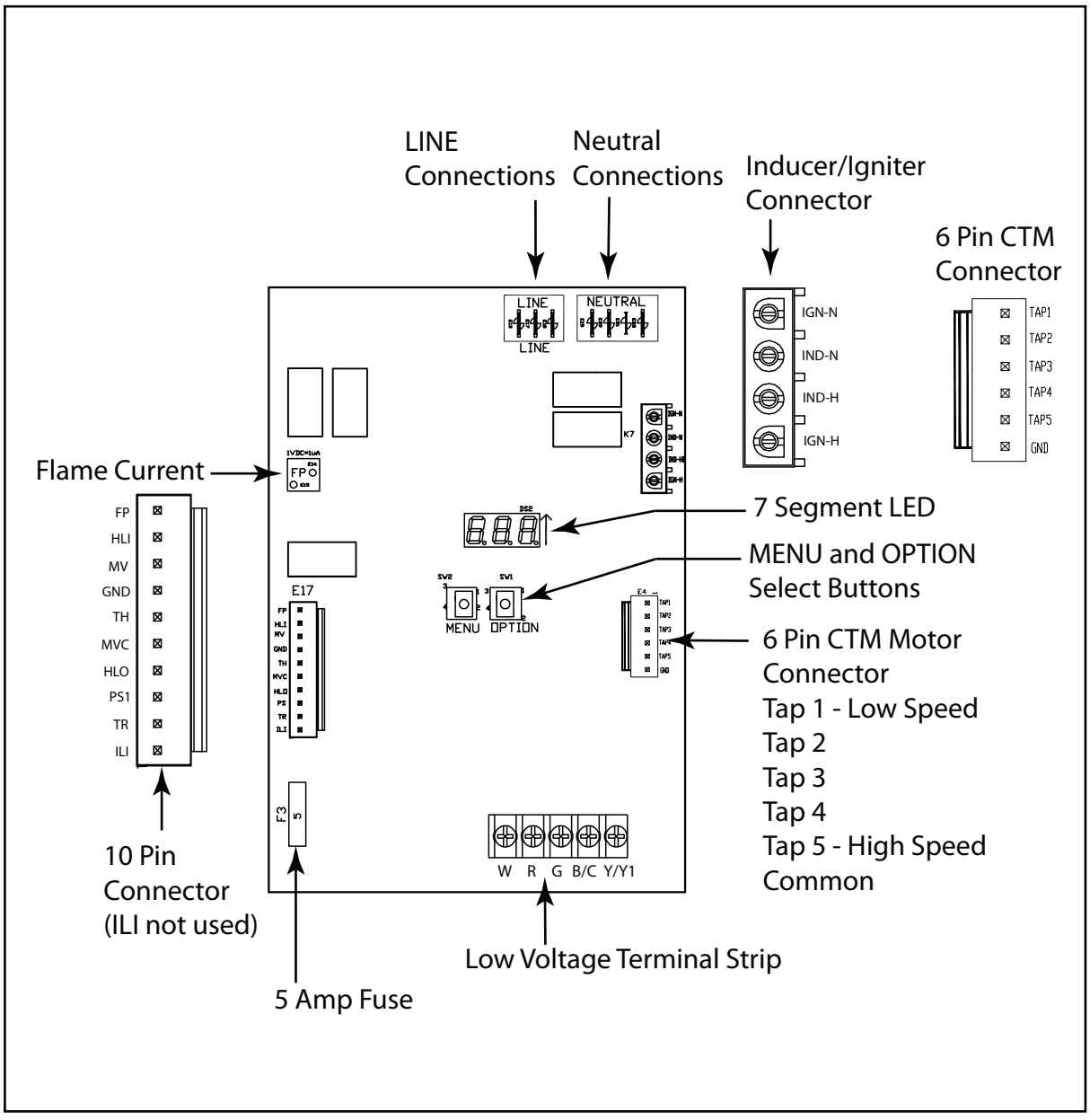
The following pages include troubleshooting flowcharts in reference for the Single Stage A801X family of furnaces only.
The information contained is for reference only and does not cover all scenarios or problems that may be encountered.
ONLY qualified technicians should attempt to install, troubleshoot, or repair this appliance. Failure to follow all cautions and /or warnings could result in personal or property damage, including death.

Troubleshooting Flowchart Index

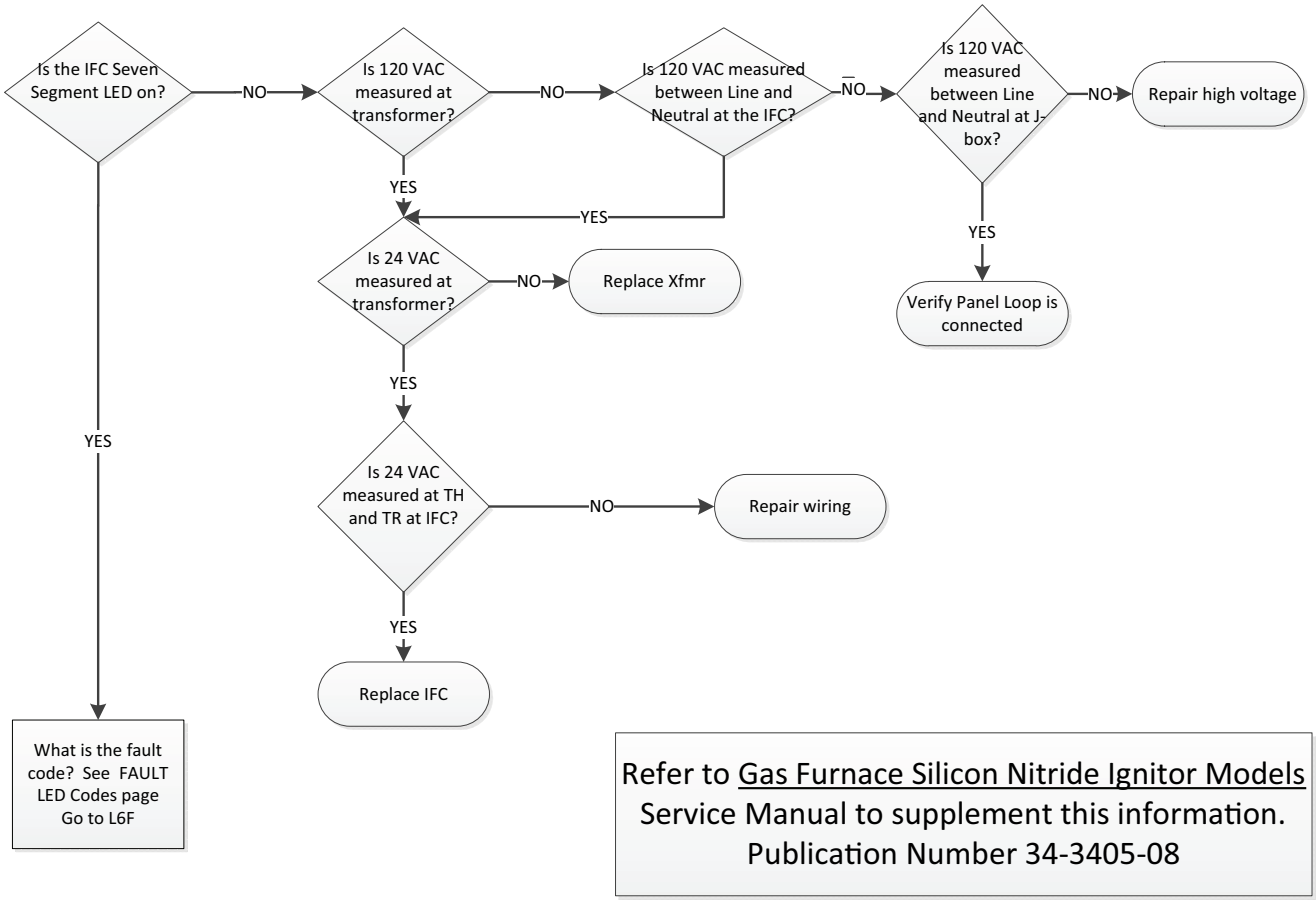
IFC Component Layout
Getting Started

Error Codes
E0 – Internal Failure
E2.1 – Retries Exceeded (flame never sensed)
E2.2 – Recycles Exceeded (loss of flame after being sensed)
E2.3 – 1 st Stage Gas Valve energized when it should not be (10 times)
E3.1 – Shorted Pressure Switch
E3.2 – Open Pressure Switch
E04 – Open Thermal Limit
E04 – Flame Rollout
E05 – Flame Detected , should not be present
E6.1 – Reversed Polarity (High Voltage)
E6.2 – Faulty Ground
E6.3 – Igniter Circuit
E7.1 – Gas Valve (MVL) energized when it should not be
E08 – Flame Current Low, operation allowed
E11 – See troubleshooting Instructions
E12 – Open Fuse

A801X 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

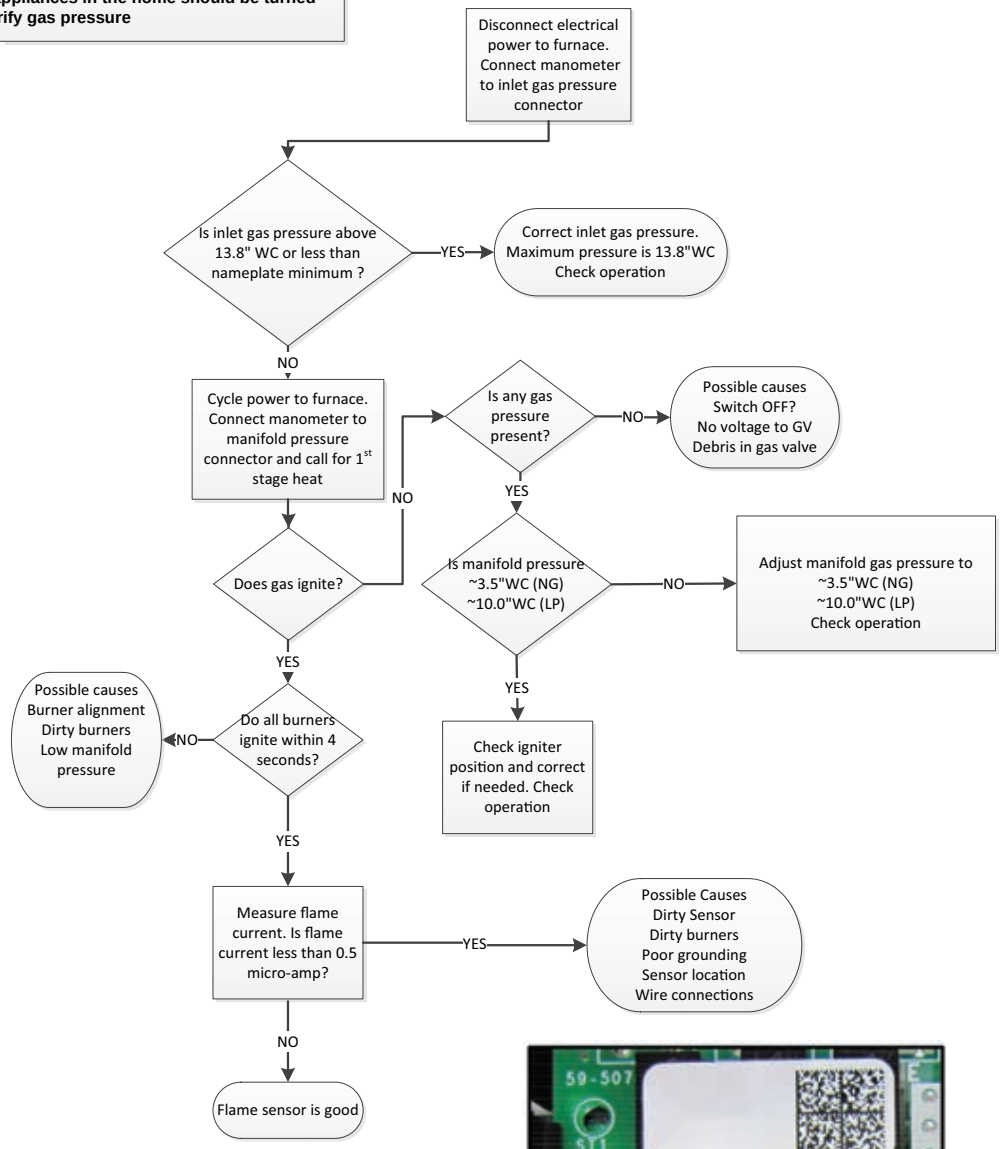
DEFINITION

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

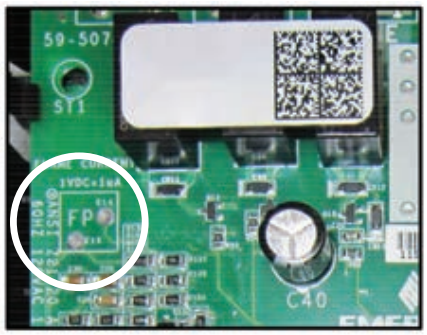
Flame is sensed & then lost

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

2.1 Fault Code



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



DEFINITION

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

Flame is sensed & then lost

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

2.2 Fault Code

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)

YES

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

NO

Adjust manifold gas pressure to ~3.5"WC (NG) ~10.0" WC (LP) Check operation

YES

Is minimum outlet gas manifold pressure maintained?

YES

Possible Causes
Plugs
Blower door
Wind gust
Power interrupt

NO

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

NO

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

Cycle power to furnace and call for 1st stage heat

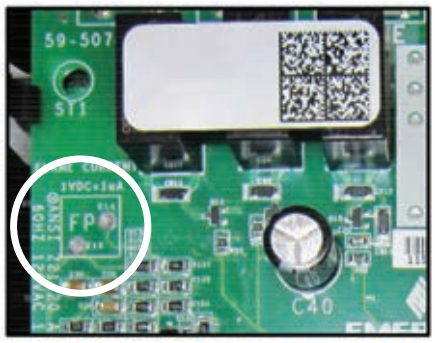
Is minimum outlet gas manifold pressure maintained?

YES

Possible Causes
Plugs
Blower door
Wind gust
Power interrupt

NO

Correct incoming gas supply pressure



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

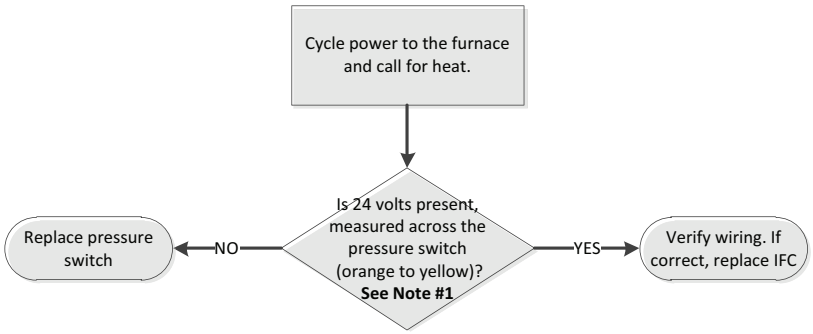
DEFINITION
An error has occurred with the PS, indicating that the pressure switch is closed when it should be open.

In most cases, the pressure switch is not the problem. If winds are in excess of 15mph, a 90 degree elbow may be required to inhibit the switch from closing

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

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

3.1 Fault Code



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

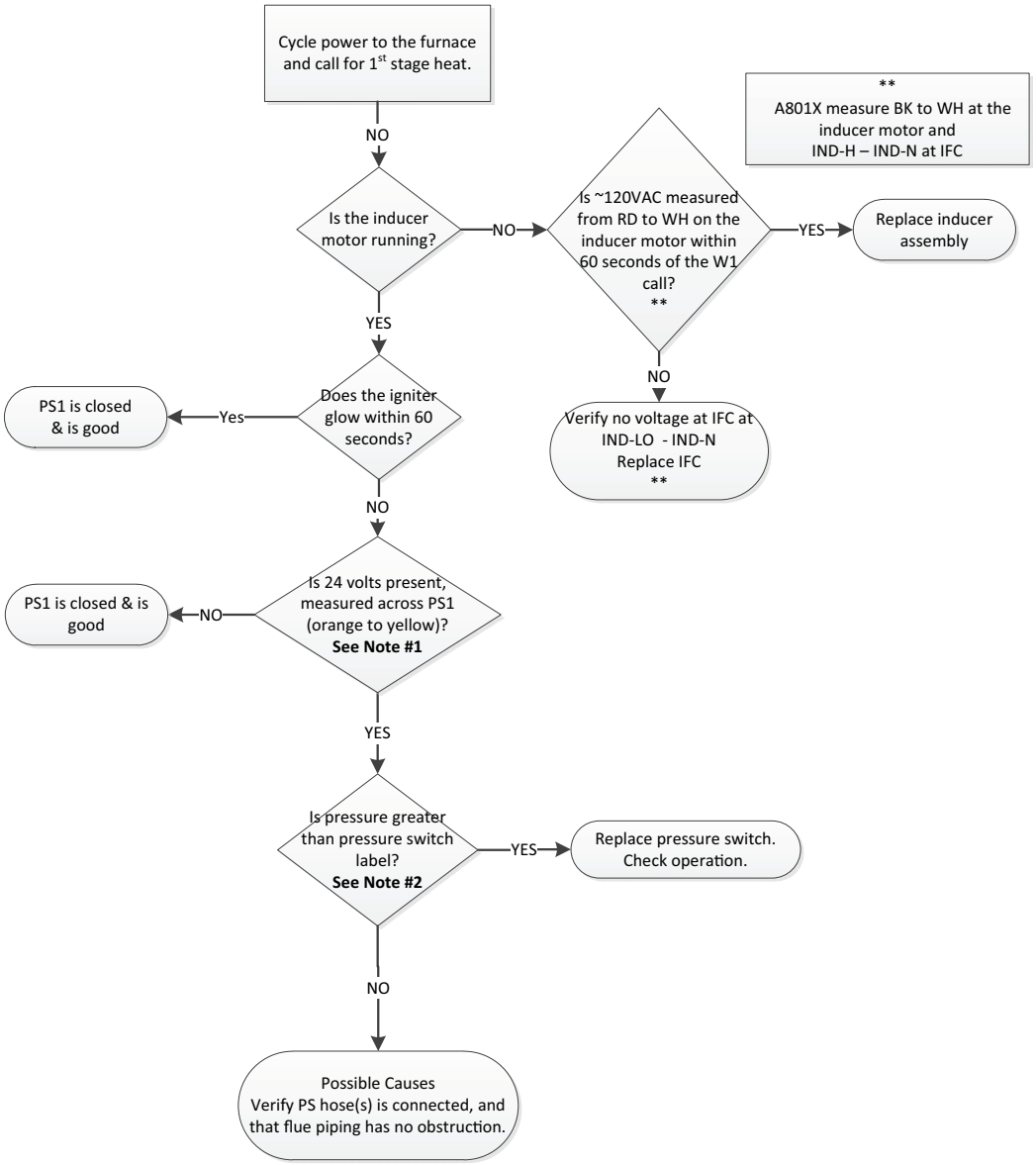
In most cases, the pressure switch is not the problem.

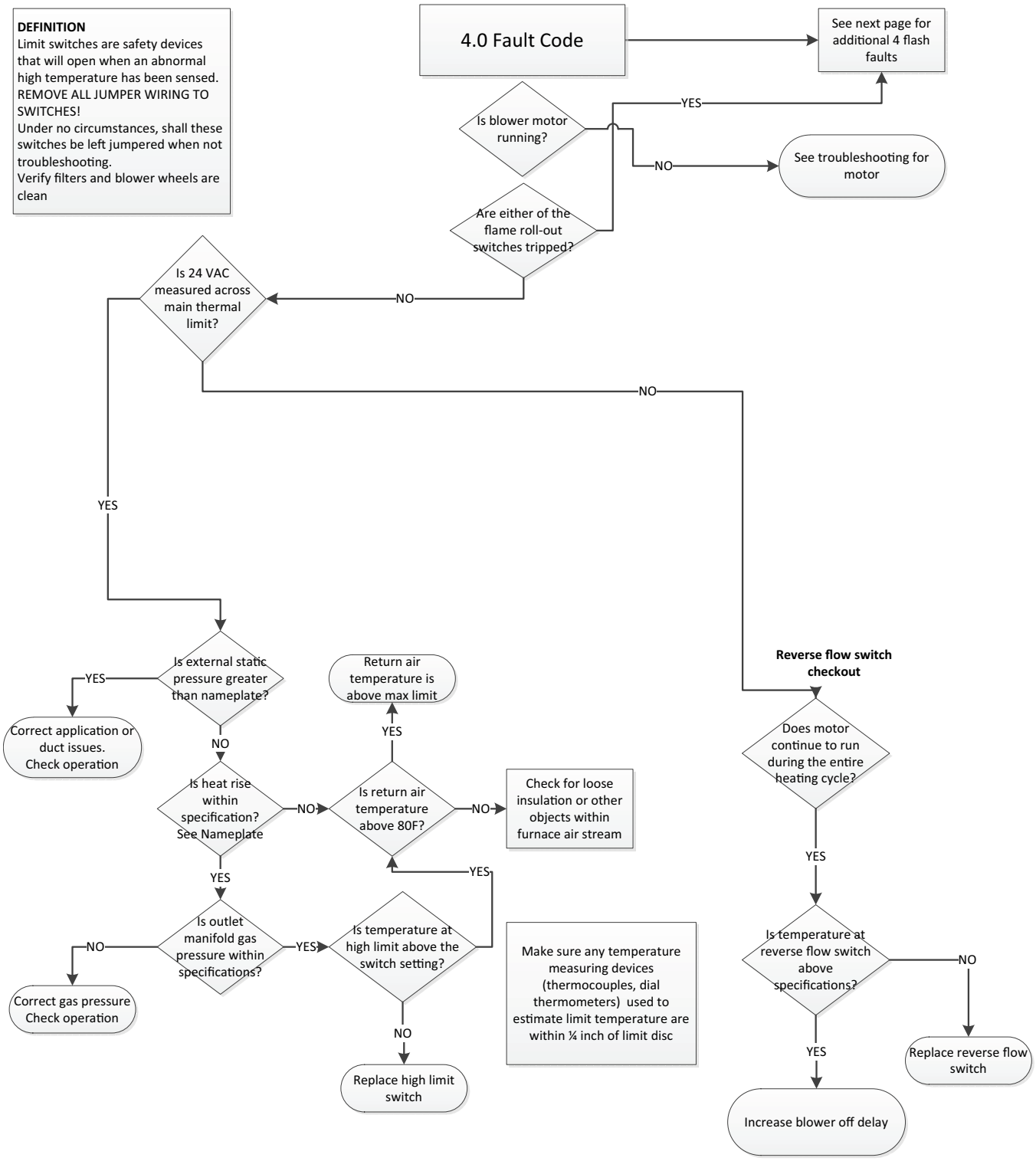
NOTE: Verify pressure switch wiring and tube routing are correct.

3.2 Fault Code

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

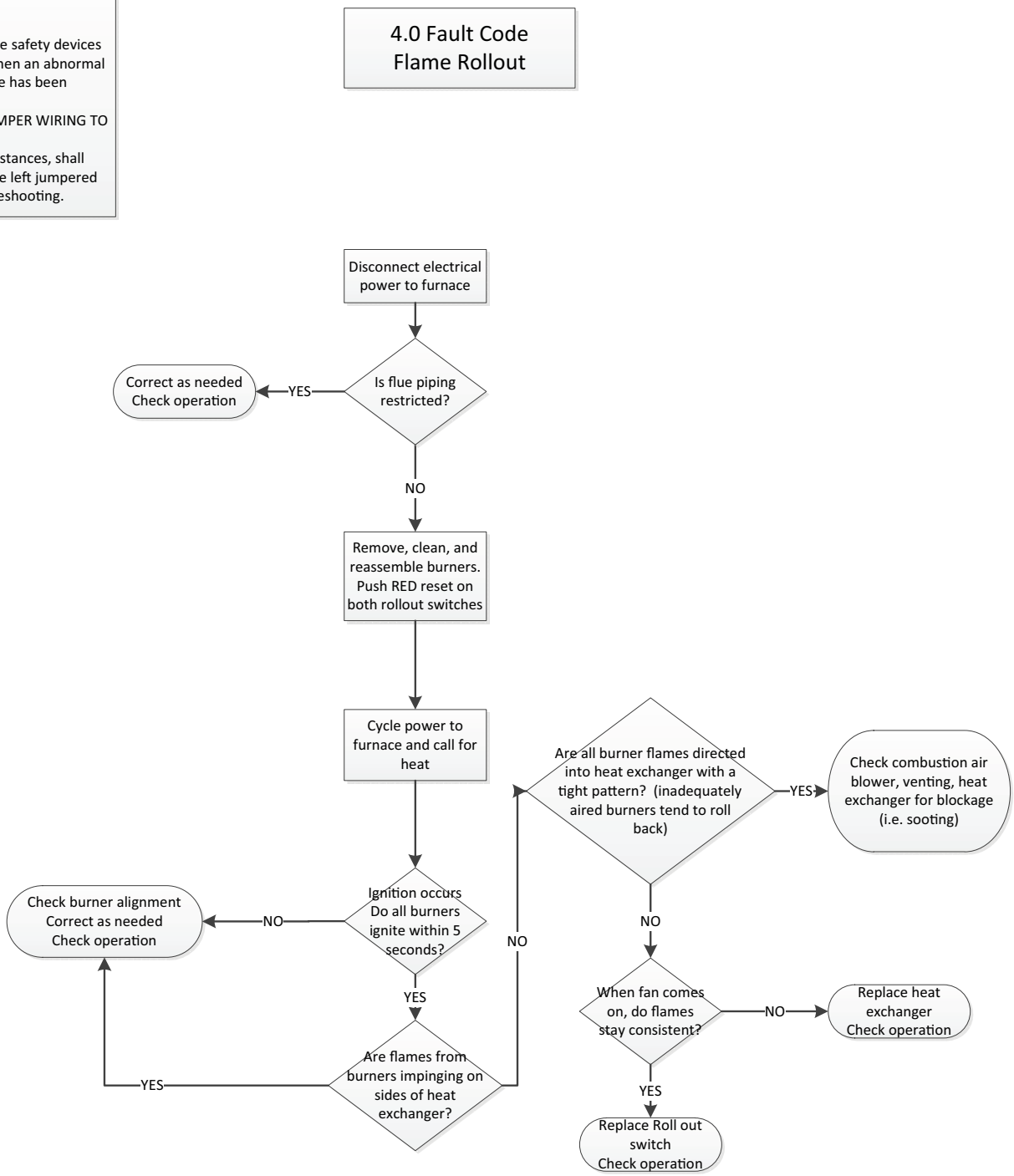
Note #2
Measured pressure is negative, greater than refers to magnitude only.




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
Return air temperature is above max limit
YES
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
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

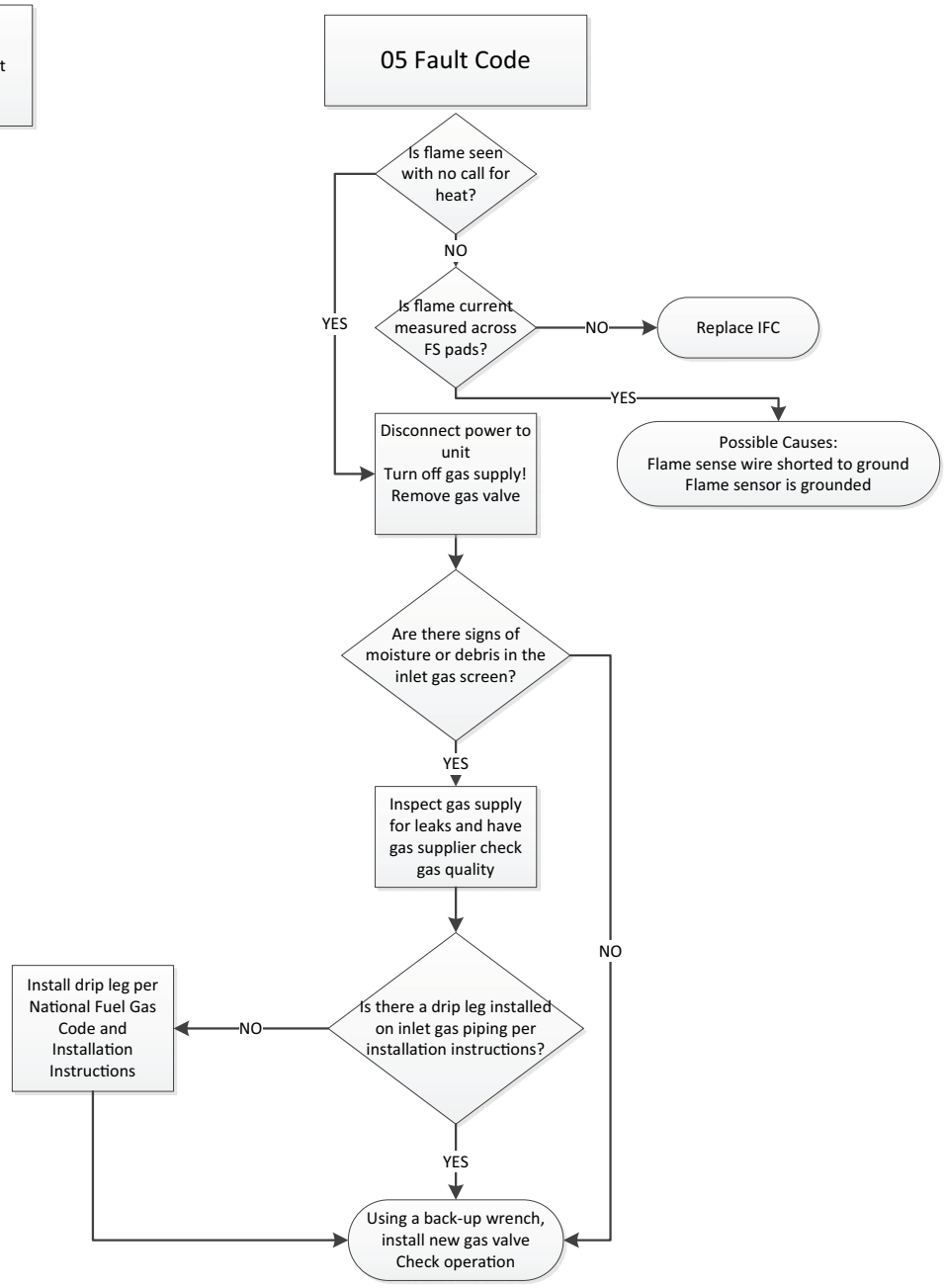
DEFINITION:

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.

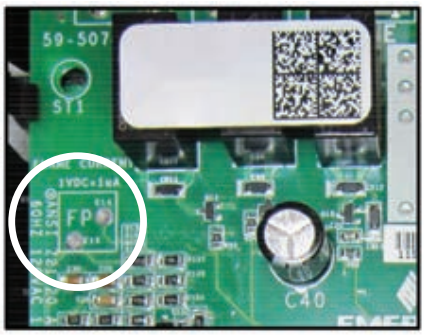


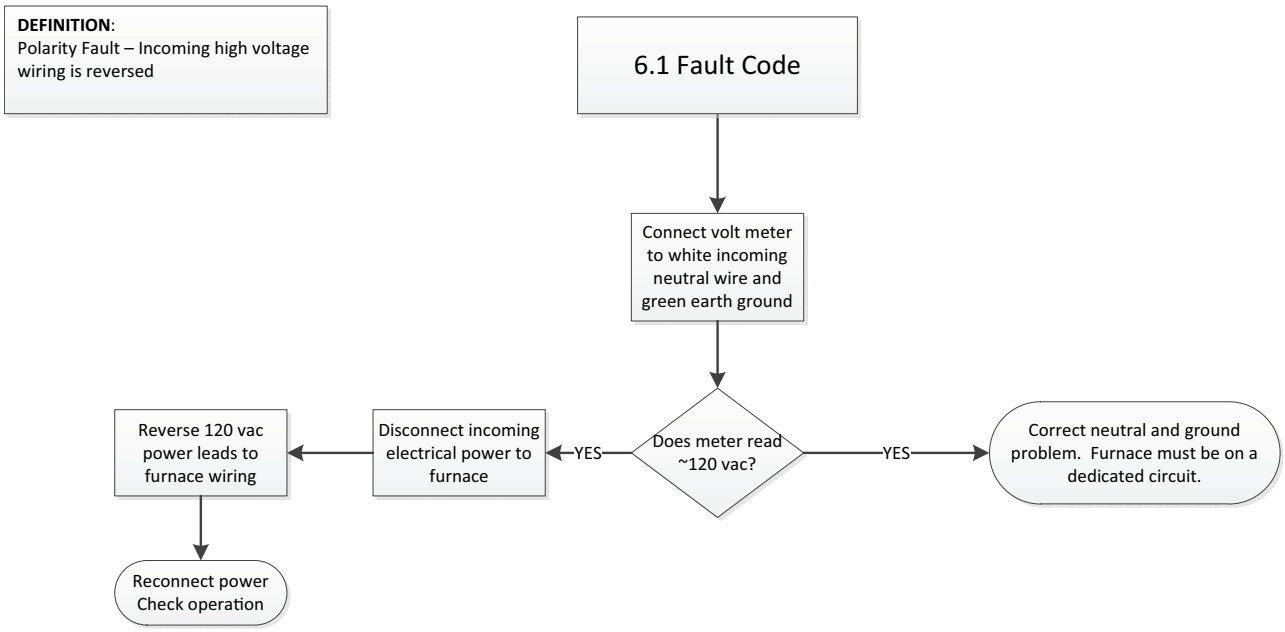
DEFINITION:

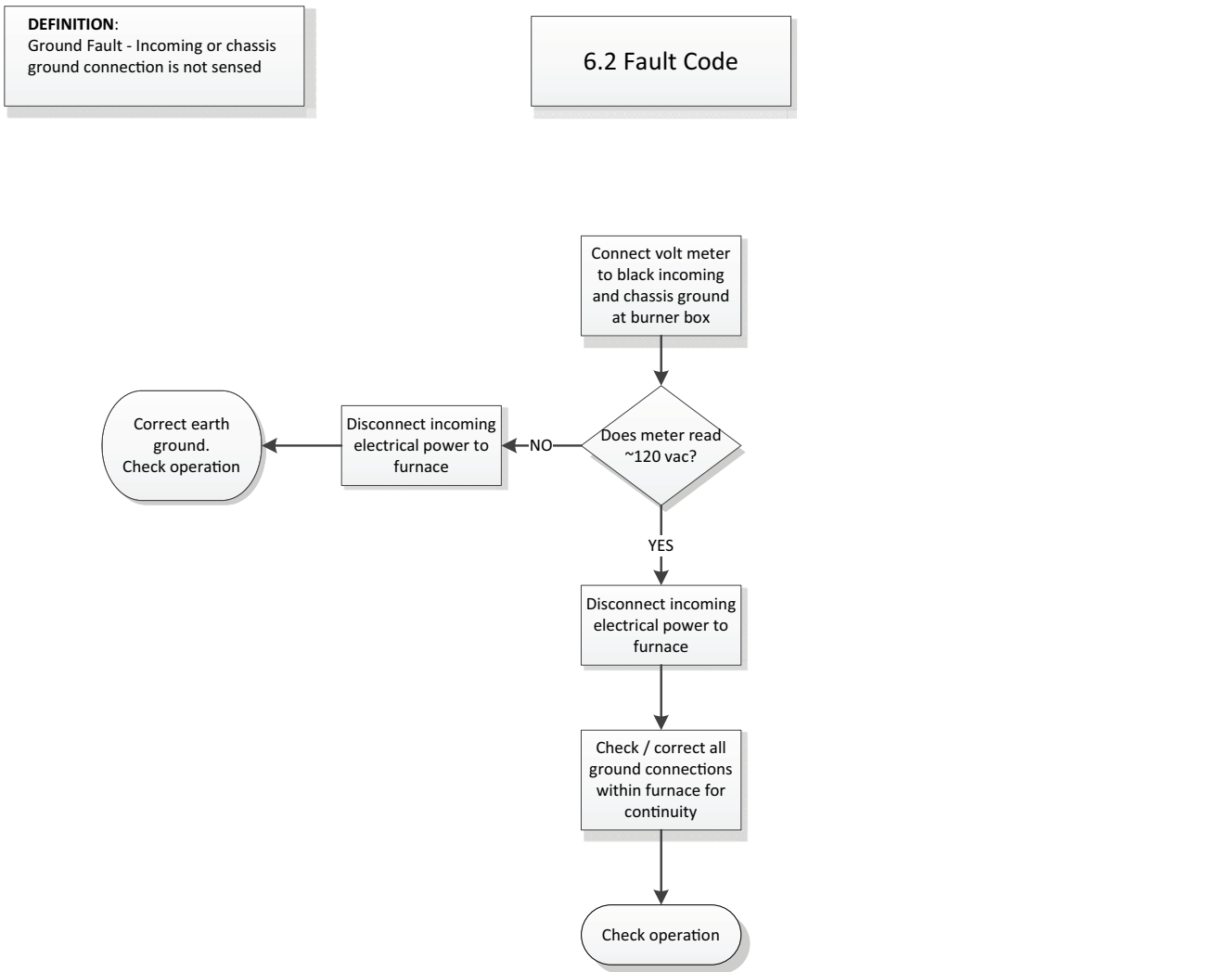
Flame is sensed when it should not be.



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



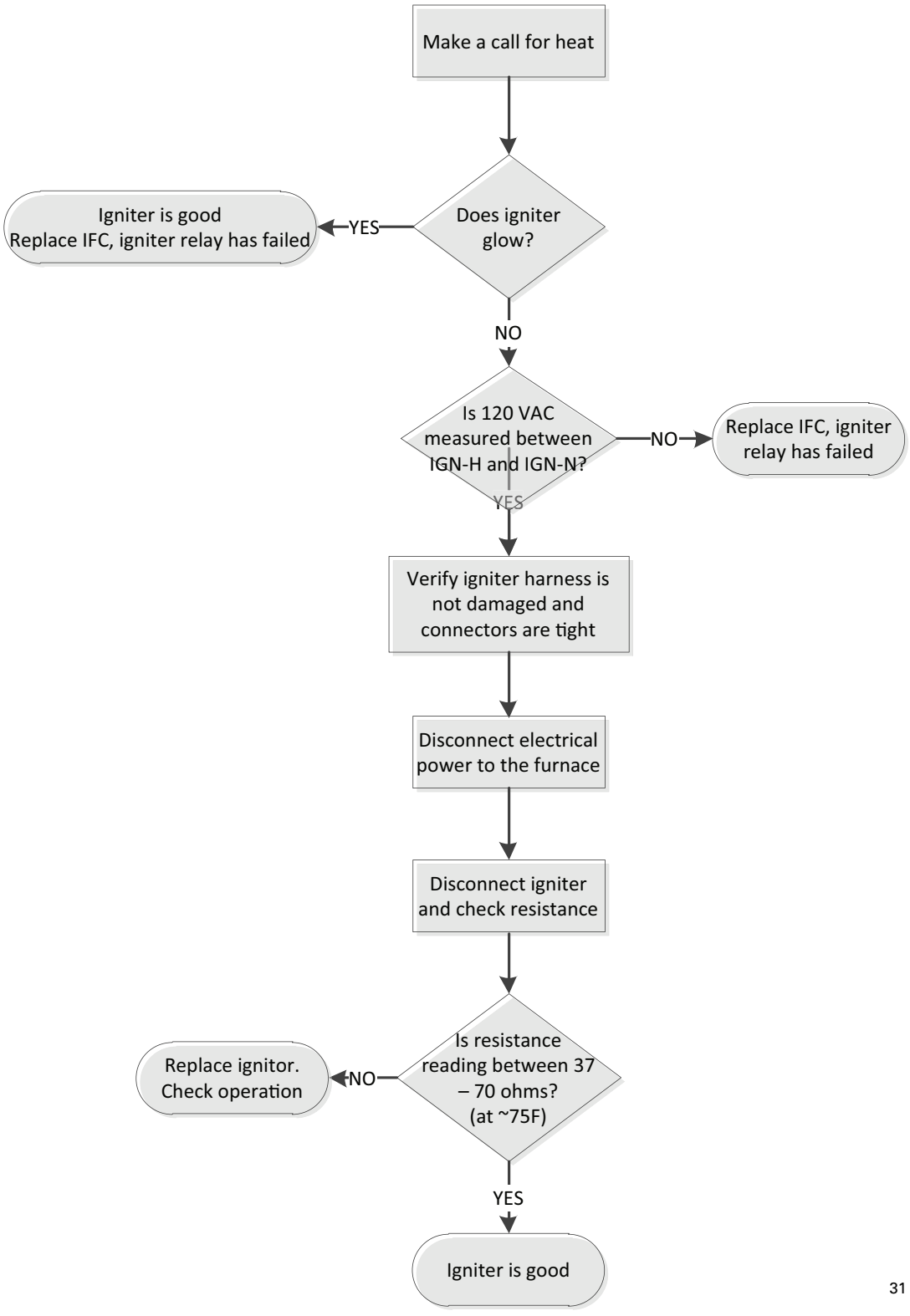

DEFINITION:
Polarity Fault – Incoming high voltage wiring is reversed
6.1 Fault Code
Connect volt meter to white incoming neutral wire and green earth ground
Does meter read ~120 vac?
YES
Correct neutral and ground problem. Furnace must be on a dedicated circuit.
YES
Disconnect incoming electrical power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

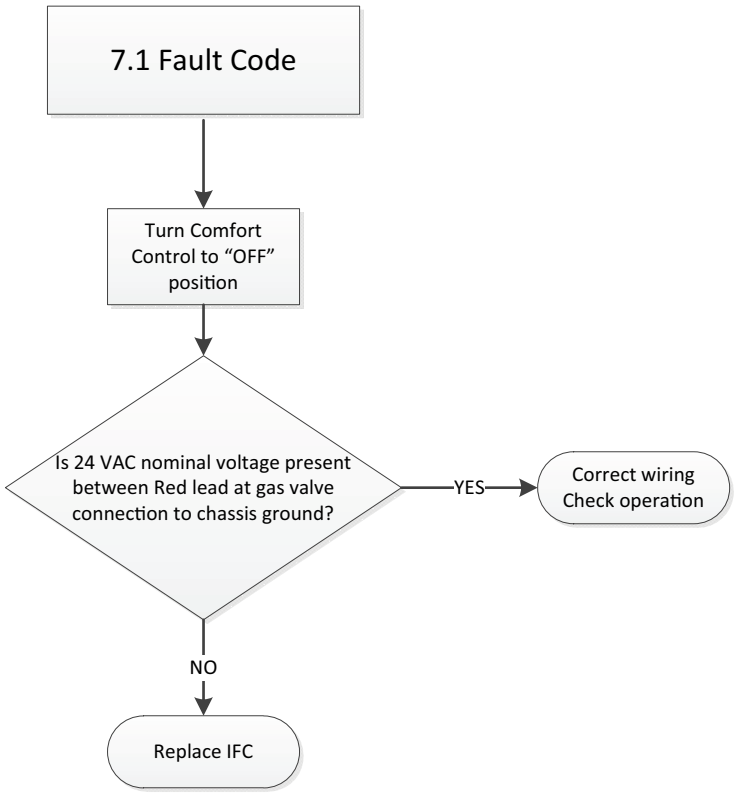
DEFINITION:
Igniter Relay Fault – The control board has sensed that the igniter relay has stuck closed

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

6.3 Fault Code

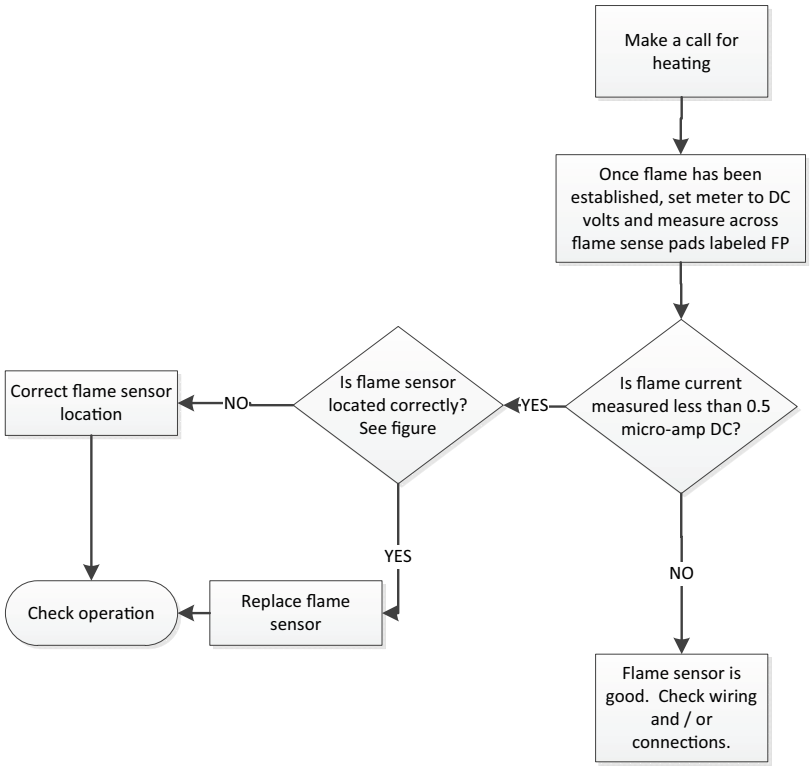


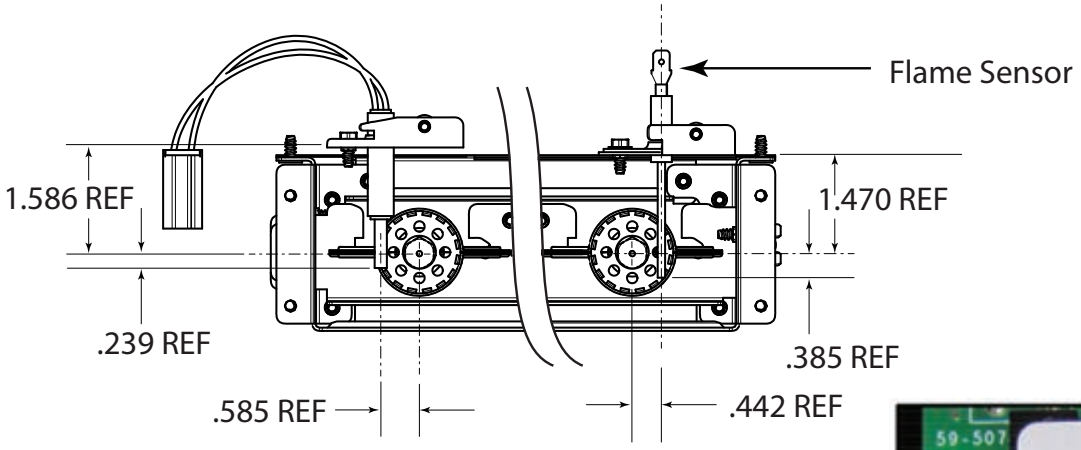
DEFINITION: External Gas Valve Circuit Error (24 volts is present when it should not be present)



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

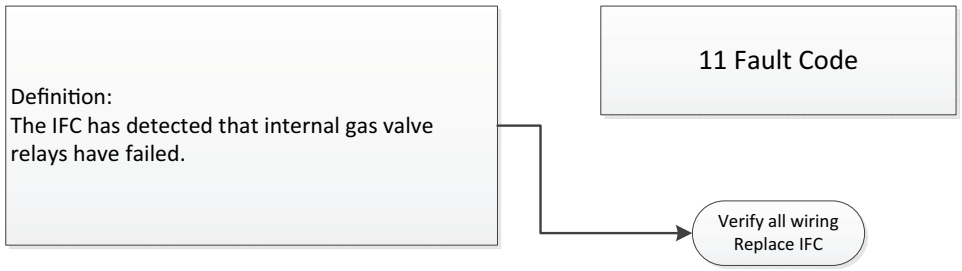
08 Fault Code

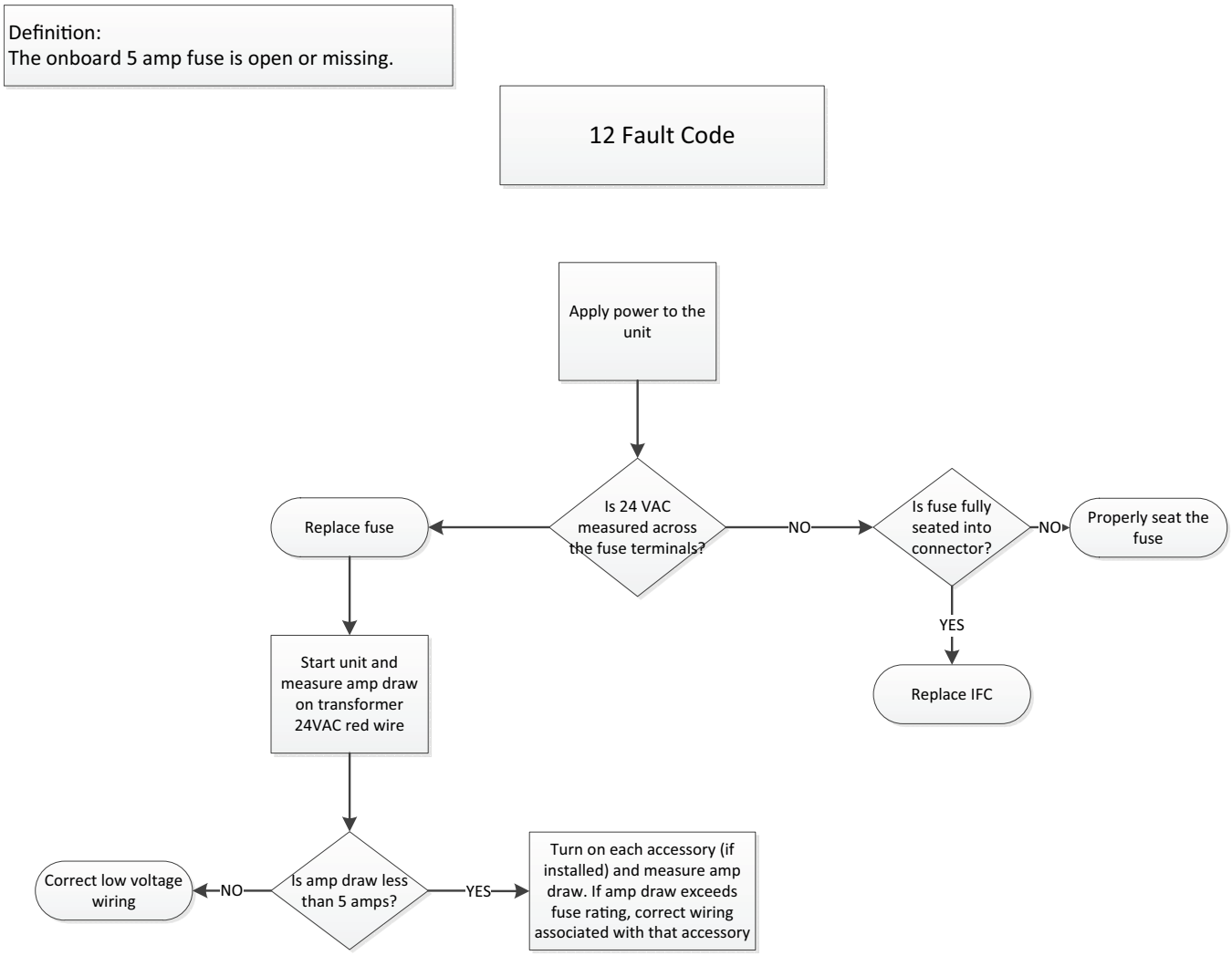




There are two flame sense pads located on the IFC, marked “FP”. To measure flame current, use a VOM set to DC volts. Flame current will vary depending on the type of meter used. Typical flame current ranges from 0.75 – 3.0 micro-amps (0.75 – 3.0 VDC)




Definition:
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
Apply power to the unit
Is 24 VAC measured across the fuse terminals?
NO
Is fuse fully seated into connector?
NO
Properly seat the fuse
YES
Replace IFC
Replace fuse
Start unit and measure amp draw on transformer 24VAC red wire
Is amp draw less than 5 amps?
NO
Correct low voltage wiring
YES
Turn on each accessory (if installed) and measure amp draw. If amp draw exceeds fuse rating, correct wiring associated with that accessory

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

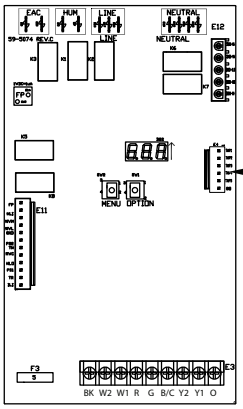
Does motor run?

YES → Motor & IFC are good

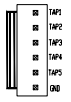
NO → Verify voltage(s) listed

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

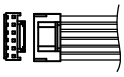
1. Remove the 6-pin low voltage connector from the IFC
2. Apply 24 VAC to Common tap (Blue) and any speed tap on the CTM motor 6-pin plug. The motor should run.



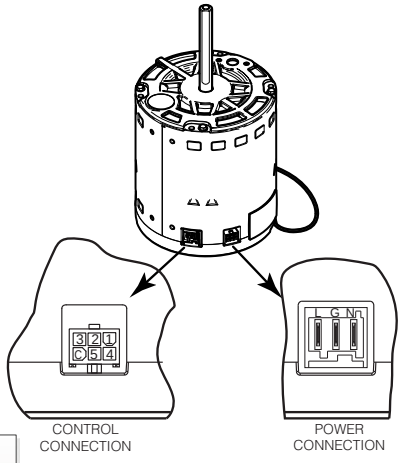
6 Pin CTM Connector



6-Pin low volltage CTM motor connector plug



6 Pin CTM Motor Connector
Tap 1 - Low Speed
Tap 2
Tap 3
Tap 4
Tap 5 - High Speed
Common



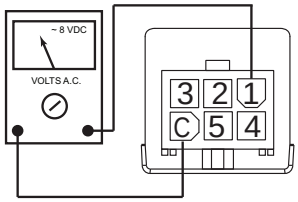
A801X CTM Output Voltage

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

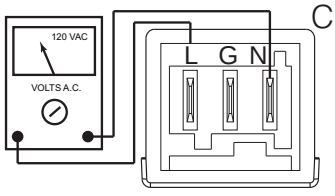
Tap 1	~ 8vdc	
Tap 2	~ 8vdc	
Tap 3	~ 18vdc	
Tap 4	~ 8vdc	
Tap 5	~ 18vdc	
Tap 6 (1+2)	~ 8vdc	~ 8vdc
Tap 7 (1+3)	~ 8vdc	~ 18vdc
Tap 8 (1+4)	~ 8vdc	~ 8vdc
Tap 9 (1+5)	~ 8vdc	~ 18vdc

All Voltages Reference Ground

CONTROL CONNECTION



POWER CONNECTION



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)

Notes



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Supersedes (New)

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