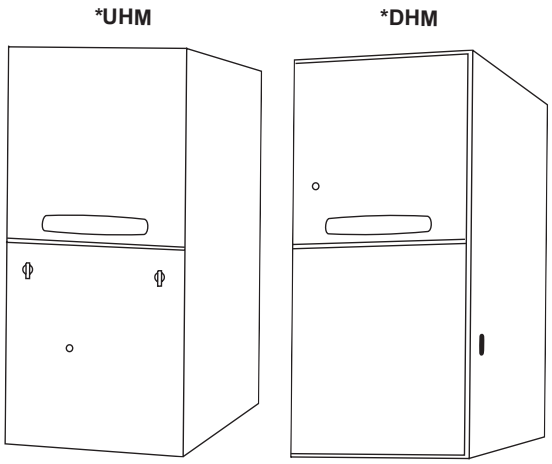
Service Facts

Upflow/ Horizontal Left and Downflow/ Horizontal Right, Gas-Fired, Direct/Non-Direct Vent, Variable Speed, Modulating, Condensing, Communicating Furnaces

*UHMB060CCV3VA	*DHMB060CCV3VA
*UHMB080CCV3VA	*DHMB080CCV3VA
*UHMC100CCV4VA	*DHMC100CCV4VA
*UHMD120CCV5VA	*DHMD120CCV5VA

Note: * First letter may be "A" or "T"
This furnace can be configured for Communicating or 24 VAC modes.



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

⚠ WARNING

FIRE HAZARD!
Failure to follow this Warning could result in property damage, severe personal injury, or death.
This Warning applies to installations with a flammammable refrigeration system. The furnace must be powered except for service. The furnace shall be installed and connected according to installation instructions and wiring diagrams that are provided with the evaporator coil.

Note: This furnace can only be applied with a flammable refrigerant system when it is setup in 24 volt mode.

⚠ 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.

September 2023 **UHM–DHM–SF–1W–EN**

Service Facts

IMPORTANT – This document 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 DISCONNECT POWER BEFORE SERVICING

PRODUCT SPECIFICATIONS ①

MODEL	*UHMB060CCV3VA ⑦	*UHMB080CCV3VA ⑦	*UHMC100CCV4VA ⑦	*UHMD120CCV5VA ⑦
TYPE	Upflow/Horizontal	Upflow/Horizontal	Upflow/Horizontal	Upflow/Horizontal
RATINGS ②				
40% (low) heat Input BTUH	24,000	32,000	40,000	54,000
40% (low) heat Capacity BTUH (ICS) ③⑥	23,000	31,000	39,000	52,000
100% (high) heat Input BTUH	60,000	80,000	100,000	120,000
100% (high) heat Capacity BTUH (ICS) ③	57,000	76,000	96,000	114,000
Temp. rise (Min.-Max.) °F.	35 - 65	35 - 65	35 - 65	40 - 70
AFUE (Upflow / Horizontal)	97.3 / 96.5	97.0 / 96.2	96.0 / 95.2	97.0 / 96.2
BLOWER DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
Diameter - Width (In.)	10 x 8	10 x 8	10 x 10	10 x 10
No. Used	1	1	1	1
Speeds (No.)	Variable	Variable	Variable	Variable
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	1/2	3/4	1
R.P.M.	Variable	Variable	Variable	Variable
Volts/Ph/Hz	115/1/60	115/1/60	115/1/60	115/1/60
FLA ⑧	6.4	6.4	8.0	10.0
COMBUSTION FAN – Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Drive - No. Speeds	Direct - Variable	Direct - Variable	Direct - Variable	Direct - Variable
Motor HP - RPM	1/50 - 5000	1/50 - 5000	1/50 - 5000	1/50 - 5000
Volts/Ph/Hz	115/3/60	115/3/60	115/3/60	115/3/60
FLA	1.0	1.0	1.0	1.0
FILTER — Furnished?	Yes	Yes	Yes	Yes
Type Recommended	High Velocity	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 - 17x25 - 1 in.	1 - 17x25 - 1 in.	1 - 20x25 - 1 in.	1 - 24x25 - 1 in.
VENT Size Min. (in.)	2 Round	2 Round	2.5 Round	3 Round
HEAT EXCHANGER				
Type -Fired -Unfired	Aluminized Steel - Type I	Aluminized Steel - Type I	Aluminized Steel - Type I	Aluminized Steel - Type I
Gauge (Fired)	20	20	20	20
ORIFICES — Main				
Nat. Gas. Qty. — Drill Size	3 — 45	4 — 45	5 — 45	6 — 45
L.P. Gas Qty. — Drill Size ⑤	3 — 56	4 — 56	5 — 56	6 — 56
GAS VALVE	Modulating	Modulating	Modulating	Modulating
PILOT SAFETY DEVICE				
Type	Hot Surface Igniter	Hot Surface Igniter	Hot Surface Igniter	Hot Surface Igniter
BURNERS — Type	Multiport Inshot	Multiport Inshot	Multiport Inshot	Multiport Inshot
Number	3	4	5	6
POWER CONN. — V/Ph/Hz ④	115/1/60	115/1/60	115/1/60	115/1/60
Ampacity (In Amps)	9.2	9.2	11.2	13.7
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
Crated (In.)	41-3/4 x 19-1/2 x 30-1/2	41-3/4 x 19-1/2 x 30-1/2	41-3/4 x 23 x 30-1/2	41-3/4 x 26-1/2 x 30-1/2
WEIGHT				
Shipping (Lbs.)/Net (Lbs)	158 / 146	168 / 156	197 / 185	206 / 193

① Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3.
② 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.
③ Based on U.S. government standard tests.
④ The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.
⑤ Furnace ships in natural gas configuration. The LP conversion kit used with the modulating furnace is BAYLPSS220B or BAYLPKT220B.
⑥ 45% (low) heat for *UHMD120CCV5VA.
⑦ EnergyStar
⑧ Check motor nameplate for actual FLA

PRODUCT SPECIFICATIONS ①

MODEL	*DHMB060CCV3VA ⑥	*DHMB080CCV3VA ⑥	*DHMC100CCV4VA ⑥	*DHMD120BCV5VA ⑥
TYPE	Downflow / Horizontal	Downflow / Horizontal	Downflow / Horizontal	Downflow / Horizontal
RATINGS ②				
40% (low) heat Input BTUH	24,000	32,000	40,000	48,000
40% (low) heat Capacity BTUH (ICS) ③	23,000	32,000	39,000	47,000
100% (high) heat Input BTUH	60,000	80,000	100,000	120,000
100% (high) heat Capacity BTUH (ICS) ③	57,000	76,000	96,000	114,000
Temp. rise (Min.-Max.) °F.	30 - 60	35 - 65	35 - 65	40 - 70
AFUE	95.0	96.0	96.0	95.0
BLOWER DRIVE	DIRECT	DIRECT	DIRECT	DIRECT
Diameter - Width (In.)	10 x 8	10 x 8	10 x 10	10 x 10
No. Used	1	1	1	1
Speeds (No.)	Variable	Variable	Variable	Variable
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	1/2	3/4	1
R.P.M.	Variable	Variable	Variable	Variable
Volts / Ph / Hz	115/1/60	115/1/60	115/1/60	115/1/60
FLA ⑦	6.4	6.4	8.0	10.0
COMBUSTION FAN – Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Drive - No. Speeds	Direct - Variable	Direct - Variable	Direct - Variable	Direct - Variable
Motor HP - RPM	1/50 - 5000	1/50 - 5000	1/50 - 5000	1/50 - 5000
Volts / Ph / Hz	115/3/60	115/3/60	115/3/60	115/3/60
FLA	1.0	1.0	1.0	1.0
FILTER — Furnished?	Yes	Yes	Yes	Yes
Type Recommended	High Velocity	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	2 - 14x20 - 1 in.	2 - 14x20 - 1 in.	2 - 16x20 - 1 in.	2 - 16x20 - 1 in.
VENT Size Min. (in.)	2 Round	2 Round	2.5 Round	3 Round
HEAT EXCHANGER				
Type -Fired -Unfired	Aluminized Steel - Type I	Aluminized Steel - Type I	Aluminized Steel - Type I	Aluminized Steel - Type I
Gauge (Fired)	20	20	20	20
ORIFICES — Main				
Nat. Gas. Qty. — Drill Size	3 — 45	4 — 45	5 — 45	6 — 45
L.P. Gas Qty. — Drill Size ⑤	3 — 56	4 — 56	5 — 56	6 — 56
GAS VALVE	Modulating	Modulating	Modulating	Modulating
PILOT SAFETY DEVICE				
Type	Hot Surface Igniter	Hot Surface Igniter	Hot Surface Igniter	Hot Surface Igniter
BURNERS — Type	Multiport Inshot	Multiport Inshot	Multiport Inshot	Multiport Inshot
Number	3	4	5	6
POWER CONN. — V / Ph / Hz ④	115/1/60	115/1/60	115/1/60	115/1/60
Ampacity (In Amps)	9.2	9.2	11.2	13.7
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
Crated (In.)	41-3/4 x 19-1/2 x 30-1/2	41-3/4 x 19-1/2 x 30-1/2	41-3/4 x 23 x 30-1/2	41-3/4 x 26-1/2 x 30-1/2
WEIGHT				
Shipping (Lbs.) / Net (Lbs)	160/ 146	168 / 158	185 / 175	206 / 196

① Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3.
② 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.
③ Based on U.S. government standard tests.
④ The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.
⑤ Furnace ships in natural gas configuration. The LP conversions kit used with the modulating furnace is BAYLPSS220B or BAYLPKT220B.
⑥ EnergyStar
⑦ Check motor nameplate for actual FLA

NOTE:

This furnace can be configured for Communicating or 24 VAC modes. Using fully Communicating or 24 VAC modes, the furnace can support single or multi stage heat pump, AC, or heating only applications. Combined with a communicating Comfort Control only, the furnace will support a single stage 24 VAC cooling outdoor unit only.

ENERGY EFFICIENT OPERATION

Furnace is certified to leak 2% or less of nominal air conditioning CFM delivered when pressurized to .5" water column with all inlets, outlets, and drains sealed.

NOTE:

CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.
A communicating comfort control will disable a continuous fan call if the relative humidity exceeds the set point. See the Troubleshooting Information section of the Communicating Comfort Control Installer's Guide for details.

SAFETY SECTION

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:

1. Seal any unused openings in the venting system.
2. 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 CAN/CGA B149 Installation Codes and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
3. As far as practical, close all building doors and windows and all doors between the space in which the appliance(s) connected to the venting system are located and other deficiencies which could cause an unsafe condition.
4. Close fireplace dampers.
5. Turn on clothes dryers and any appliance not connected to the venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they are operating at maximum speed. Do not operate a summer exhaust fan.
6. Follow the lighting instructions. Place the appliance being inspected into operation. Adjust the thermostat so appliance is operating continuously.
7. 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 CAN/CGA B149 Installation Codes.
8. After it has been determined that each appliance connected to the venting system properly vents where tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-fired burning appliance to their previous conditions of use.

WARNING

The cabinet must have an uninterrupted or unbroken ground according to 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.
Failure to follow this warning could result in an electri–cal shock, fire, injury, or death.

WARNING

CARBON MONOXIDE POISONING HAZARD
Failure to follow the installation instructions for the venting system being placed into operation could re–sult in carbon monoxide poisoning or death.

WARNING

FIRE OR EXPLOSION HAZARD
Failure to follow the safety warnings exactly could re–sult 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

FIRE OR EXPLOSION HAZARD
Failure to follow the safety warnings exactly could re–sult in serious injury, death or property damage.
Improper servicing could result in dangerous opera–tion, serious injury, death, or property damage.

WARNING

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 ELECTRICAL SUPPLY MUST BE DISCONNECTED AND THE MAIN GAS VALVE MUST BE TURNED OFF. IF OPERATING CHECKS MUST BE PERFORMED WITH THE UNIT OPERATING, IT IS THE TECHNICIAN'S RESPONSIBILITY TO RECOGNIZE THESE HAZARDS AND PROCEED SAFELY.

WARNING

Should overheating occur, or the gas supply fail to shut off, shut off the Gas Valve to the unit before shut–ting off the electrical supply.
Failure to follow this warning could result in property damage, personal injury, or death.

⚠ CAUTION

The integrated furnace control is polarity sensitive. The hot leg of the 115 VAC power must be connected to the BLACK field lead

NOTE:

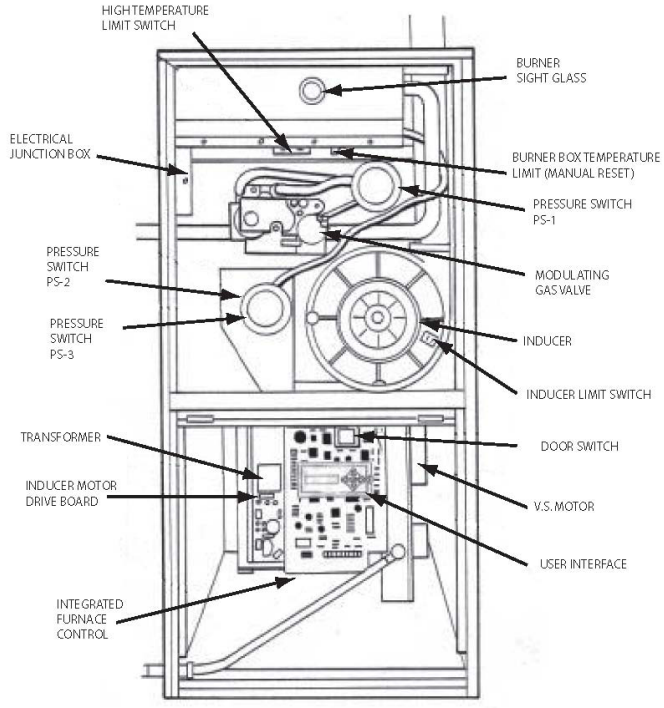
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the in–door air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.
A communicating comfort control will disable a con–tinuous fan call if the relative humidity exceeds the set point. See the Troubleshooting Information section of the Communicating Comfort Control Installer's Guide for details.

WARNING

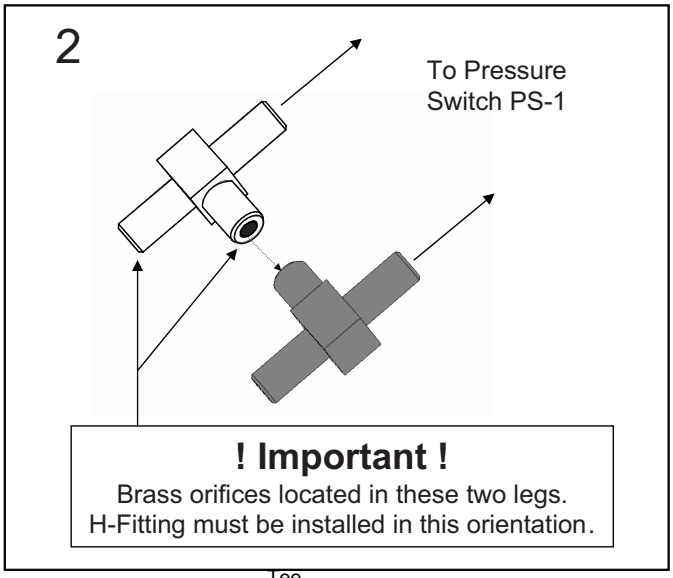
FIRE – EXPLOSION HAZARD
DO NOT RUN FLEXIBLE GAS LINE THROUGH THE FURNACE CABINET WALL OR WITHIN THE FUR–NACE CABINET. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN PROPERTY DAMAGE, SERIOUS PERSONAL INJURY, OR DEATH.

FURNACE COMPONENTS

1

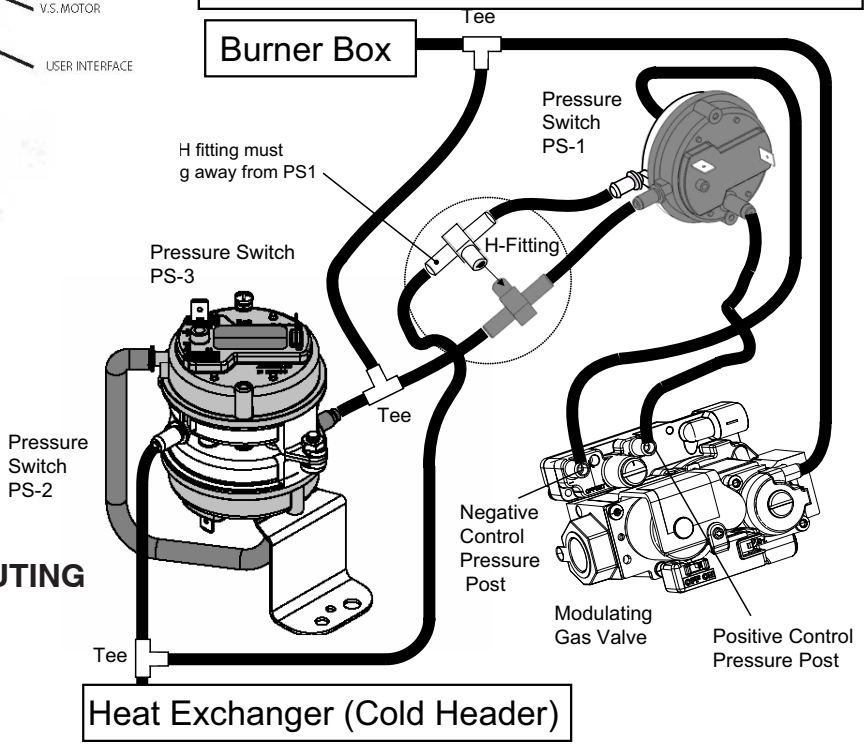


2



VACUUM HOSE ROUTING

3



Service procedure to access the User Interface for the Modulating Furnace

This procedure must only be performed by trained service personnel.

WARNING

ELECTRICAL SHOCK HAZARD
DO NOT BYPASS THE DOOR SWITCH BY ANY PERMANENT MEANS.
FAILURE TO FOLLOW WARNING COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

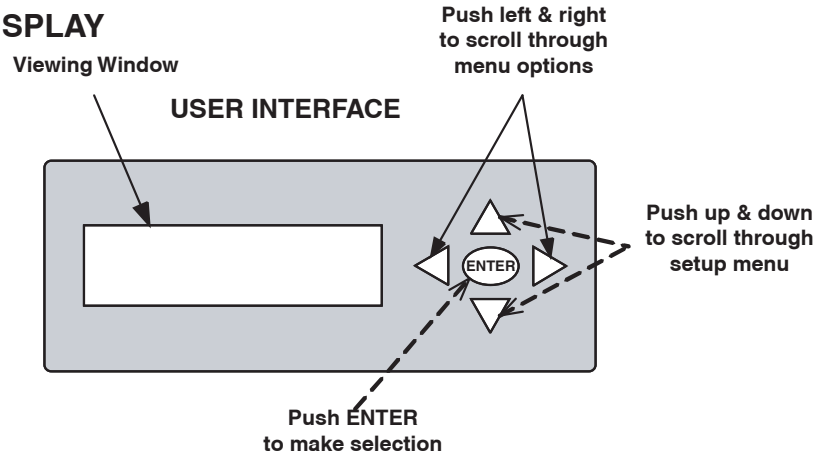
WARNING

ELECTRICAL SHOCK HAZARD
DO NOT TOUCH ANY COMPONENTS OTHER THAN THE DISPLAY ASSEMBLY AND THE DOOR SWITCH DURING THIS PROCEDURE.
FAILURE TO FOLLOW WARNING COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

1. Remove Blower Door panel by turning the two door latches ¼ turn.
2. Lower door panel and remove from service access area.
3. Using one hand, depress the door switch (there must be power to the control system for the Display Assembly to function) and keep the door switch depressed during programming.
4. Using the other hand move through the Display Assembly menu using the arrow buttons.
5. The User Interface menu on pages 7 and 8 is a guide to the menu options.
6. When programming is complete release door switch and replace the Blower Door.

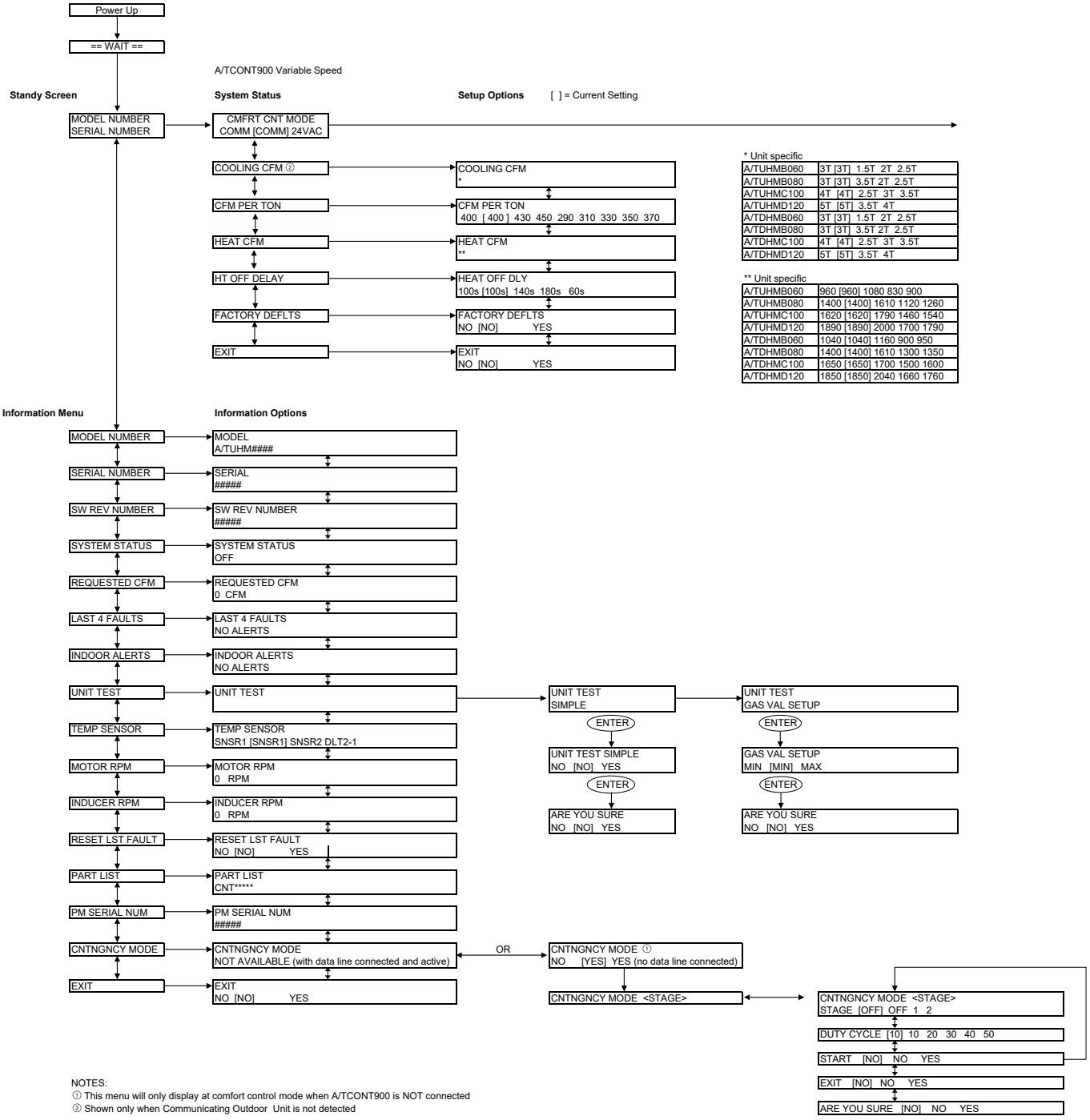
USER INTERFACE DISPLAY

4



User Interface pictured above adjusts variable speed airflow options and other unit settings

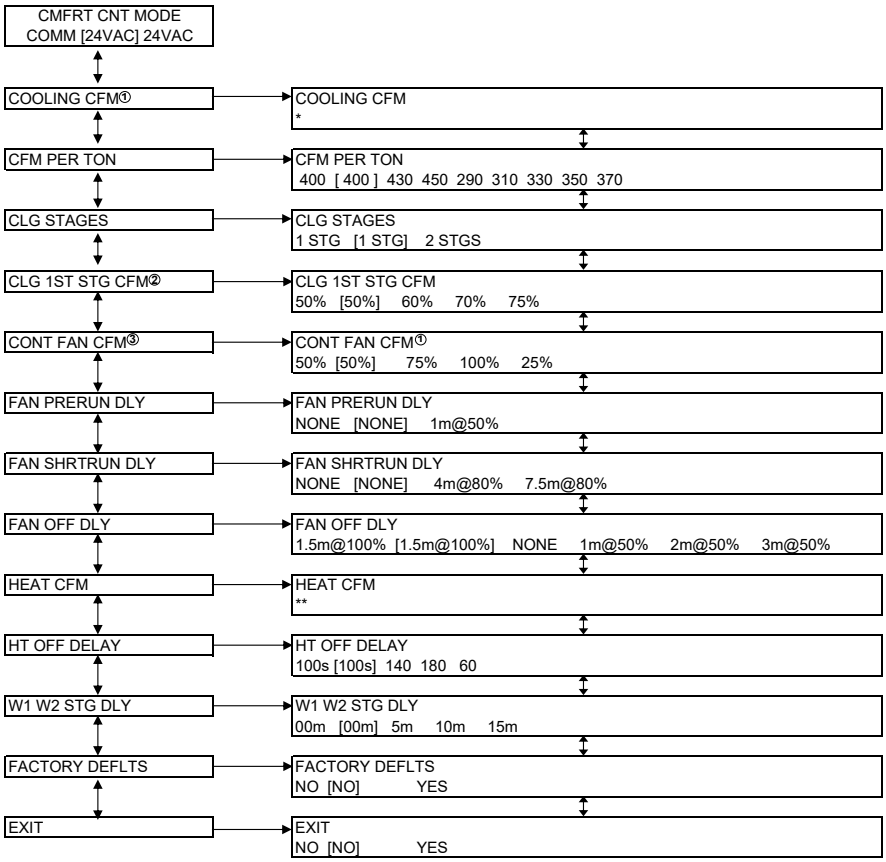
USER INTERFACE MENU



NOTES:
① This menu will only display at comfort control mode when A/TCONT900 is NOT connected
② Shown only when Communicating Outdoor Unit is not detected

24V Variable Speed

System Status **Setup Options** [ ] = Current Setting



* Unit specific

A/TUHMB060	3T [3T] 1.5T 2T 2.5T
A/TUHMB080	3T [3T] 3.5T 2T 2.5T
A/TUHMC100	4T [4T] 2.5T 3T 3.5T
A/TUHMD120	5T [5T] 3.5T 4T
A/TDHMB060	3T [3T] 1.5T 2T 2.5T
A/TDHMB080	3T [3T] 3.5T 2T 2.5T
A/TDHMC100	4T [4T] 2.5T 3T 3.5T
A/TDHMD120	5T [5T] 3.5T 4T

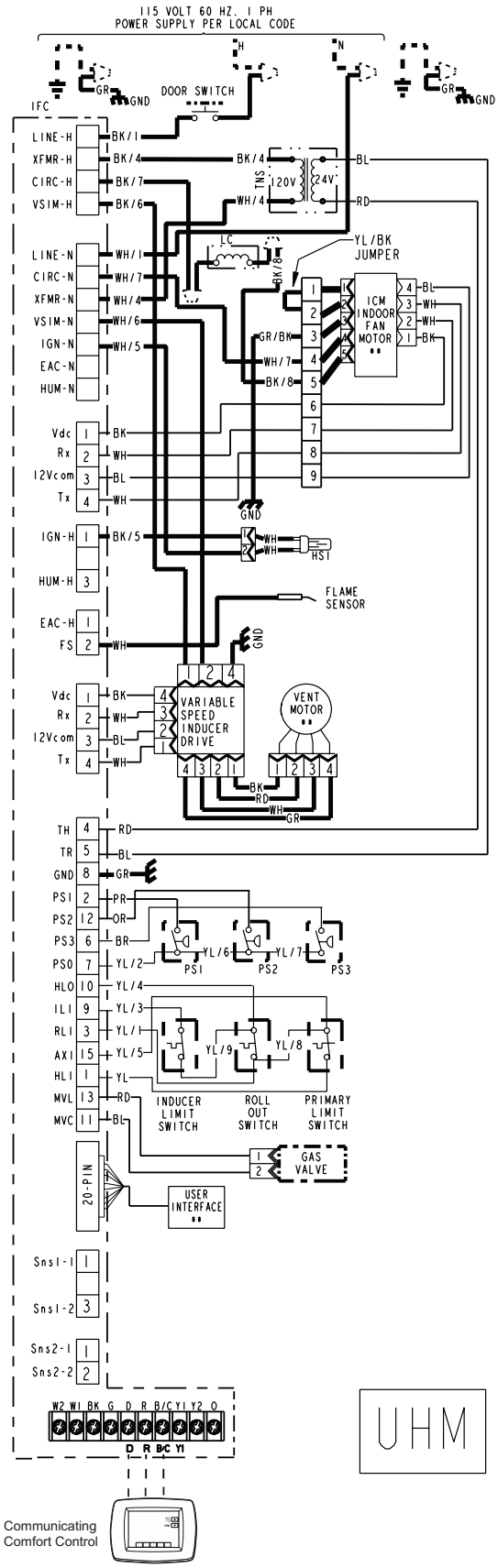
** Unit specific

A/TUHMB060	960 [960] 1080 830 900
A/TUHMB080	1400 [1400] 1610 1120 1260
A/TUHMC100	1620 [1620] 1790 1460 1540
A/TUHMD120	1890 [1890] 2000 1700 1790
A/TDHMB060	1040 [1040] 1160 900 950
A/TDHMB080	1400 [1400] 1610 1300 1350
A/TDHMC100	1650 [1650] 1700 1500 1600
A/TDHMD120	1850 [1850] 2040 1660 1760

NOTES:

① Shown only when Communicating Outdoor Unit is not detected.
② This menu will only display when 2 STGS is chosen in previous menu.
③ Do not adjust CONT FAN CFM above 50%.

5



NOTE: Y1 is output to non-communicating outdoor unit

SEQUENCE OF OPERATION

SEQUENCE OF OPERATION – COMMUNICATING MODE

1. This furnace is fully modulating between 40% and 100% of capacity in 1% increments. The furnace always lights at approximately 65% and will modulate up or down; depending on the communicating comfort control demand. Requested capacity can be seen in the “STATUS” section of the User Interface menu.

Note:

Pressure Switch 1 closes at approximately 40% of capacity.
Pressure Switch 2 closes at approximately 65% of capacity.
Pressure Switch 3 closes at approximately 95% of capacity.

2. The communicating comfort control signals the furnace IFC for heat.
3. The IFC then checks all safeties, thermostats, and pressure switches PS1, PS2, and PS3.
4. The IFC signals the variable speed inducer drive to start the vent motor at the speed needed to close pressure switches PS1 and PS2.
5. PS1 and PS2 close.
6. The IFC receives a 24 VAC signal from PS1 and PS2 when they close. This verifies the vent motor is moving the correct amount of combustion air through the furnace and the vent system.
7. IFC starts the hot surface ignitor learning routine warm-up time cycle.
8. IFC turns on the gas valve. Trial time for ignition is 5 seconds.

Note:

The furnace lights at approximately 65% of capacity.

9. The IFC verifies ignition by the flame current sensing method. If a flame is not detected, the IFC will cycle the furnace three times to try and verify a flame. If no flame is detected, the IFC will lockout for one hour. The IFC will send an alert code to the communicating comfort control and User Interface. The Red alert LED two times repeatedly.
10. If a flame is detected, the IFC will start the heat exchanger warm-up time delay for the indoor blower.
11. “IGNITION” will now be displayed in the “STATUS” section of the User Interface menu.
12. After 45 seconds, the IFC signals the indoor blower motor to run at the programmed ignition sequence speed.
13. Depending on the communicating comfort control demand, the IFC will then signal the variable speed inducer motor drive board and the indoor blower motor to ramp up or down.
14. With a heat demand less than 65% from the communicating comfort control, the IFC signals the variable speed inducer motor drive board to ramp down to that corresponding demand speed. The reduction

of the vent motor speed in steps allows the gas flow through the gas valve to also be reduced in steps, decreasing the chance of burner flame out. The minimum capacity change is 1%.

15. The minimum capacity of all furnaces is 40%, with the exception of the *UHMD120. The minimum capacity for this furnace is 45%.
16. The communicating comfort control will continue to call for the requested capacity demand until the indoor temperature is back at the set point OR,
17. If the communicating comfort control does not detect that the indoor temperature is moving back towards its set point or the indoor temperature is still moving away from the set point, it will signal the IFC to go to a higher capacity of heat.
18. The IFC then signals the variable speed inducer drive to ramp up the vent motor in steps. As the vent motor speed increases the amount of gas coming through the gas valve will increase. The IFC will also increase the indoor blower motor speed.
19. The communicating comfort control will continue to monitor the indoor temperature and send signals to the IFC to modulate the heating capacity or turn off to maintain the homeowner's set point.
20. Once the communicating comfort control senses that the heating requirements have been satisfied, the gas valve will be de-energized and gas flow will cease. The variable speed vent motor will de-energize approximately after a 5 second post purge. All pressure switches will open and the indoor blower motor will then run the heat off delay that is selected in the User Interface menu.

Indoor Blower motor operation thermostat fan switch "ON" (Communicating Mode)

The communicating comfort control signals a continuous fan call. The factory setting is 50% of the cooling cfm selected but can be adjusted from 25% - 100% through the Installer Setup menu on the communicating comfort control. If the outdoor unit is a 2 stage system, the factory setting is 50% of the 2nd stage cooling cfm. If the outdoor unit is a 24 volt single stage cooling system, the factory setting is 50% of the cooling cfm.

NOTE: If the actual relative humidity (RH) is at or below the set-point, the fan will run until the continuous fan call is removed or the actual RH exceeds the set-point. If the actual RH is above the set-point, the fan will not turn on. See the communicating comfort control Installer's Guide for additional information.

SEQUENCE OF OPERATION – 24VAC Mode

1. This furnace modulates between 40% and 100% of capacity, in 3% increments, every 1 minute. The furnace always lights at approximately 65% and will modulate up or down; depending on the 24VAC thermostat signal. Requested capacity can be seen in the "STATUS" section of the User Interface menu.

Note:

Pressure Switch 1 closes at approximately 40% of capacity.

Pressure Switch 2 closes at approximately 65% of capacity.

Pressure Switch 3 closes at approximately 95% of capacity.

Thermostat call for W1 (2 stage heating thermostat)

2. R and W1 contacts close signaling the control board (IFC) to run its self- check routine. After the control has verified that all safeties are closed and PS1, PS2, and PS3 pressure switch contacts are open, the IFC signals the variable speed inducer drive to start the vent motor at the speed needed to close pressure switches PS1 and PS2.

Note:

The furnace lights at approximately 65% of capacity.

3. PS1 and PS2 close.
4. The IFC receives a 24 VAC signal from PS1 and PS2 when they close. This verifies the vent motor is moving the correct amount of combustion air through the furnace and the vent system.
5. IFC starts the hot surface ignitor learning routine warm-up time cycle.
6. IFC turns on the gas valve. Trial time for ignition is 5 seconds.
7. The IFC verifies ignition by the flame current sensing method. If a flame is not detected, the IFC will cycle the furnace three times to try and verify a flame. If no flame is detected, the IFC will lockout for one hour. The IFC will send an alert code to the communicating comfort control and User Interface as well as flash its Red alert LED two times repeatedly.
8. If a flame is detected, the IFC will start the heat exchanger warm-up time delay for the indoor blower.
9. "IGNITION" will now be displayed in the "STATUS" section of the User Interface menu.
10. After 45 seconds, the IFC signals the indoor blower motor to run at the programmed ignition sequence speed.
11. The IFC then signals the variable speed inducer motor drive board to ramp down to the corresponding speed to keep PS1 closed. The reduction of the vent motor speed in steps allows the gas flow through the gas valve to also be reduced in steps, decreasing the chance of burner flame out. The W1 heating capacity is 40%. The IFC will also decrease the indoor blower motor speed.

Thermostat call for W2 after W1

12. R and W2 thermostat contacts close signaling a call for W2 heat. The IFC then signals the variable speed inducer drive to ramp up the vent motor allowing flow through the gas valve to also be increased in 3% steps.

13. If the call for W2 remains, this 3% increase will be repeated every 1 minute until the capacity requested is 100%. The IFC will also increase the indoor blower motor speed in appropriate steps.

W2 satisfied, W1 still called for

14. R and W2 thermostat contacts open signaling that W2 heating requirements have been satisfied. The IFC will signal the variable speed vent motor to slow down to its learned W1 speed. The gas valve will reduce the gas flow to 40% capacity and the indoor blower motor speed will be reduced.

W1 satisfied

15. R and W1 thermostat contacts open signaling that W1 heating requirements have been satisfied. The gas valve will be de-energized and gas flow will cease. The variable speed vent motor will de-energize approximately after a 5 second post purge. The indoor blower motor will be de-energized after the fan off delay period has ended. (The indoor blower heat fan off delay is field selectable and can be adjusted using the User Interface menu. It is factory set at 100 seconds but can be set to 60, 140, or 180 seconds)

Thermostat call for heat (1 stage heating thermostat)

16. W1 and W2 must be jumpered at the IFC. R and W1 contacts close signaling the control board (IFC) to run its self- check routine. After the control has verified that all safeties are closed and PS1, PS2, and PS3 pressure switch contacts are open, the IFC signals the variable speed inducer drive to start the vent motor at the speed needed to close pressure switches PS1 and PS2.

Note:
The furnace lights at approximately 65% of capacity.

17. PS1 and PS2 close.
18. The IFC receives a 24 VAC signal from PS1 and PS2 when they close. This verifies the vent motor is moving the correct amount of combustion air through the furnace and the vent system.
19. IFC starts the hot surface ignitor learning routine warm-up time cycle.
20. IFC turns on the gas valve. Trial time for ignition is 5 seconds.
21. The IFC verifies ignition by the flame current sensing method. If a flame is not detected, the IFC will cycle the furnace three times to try and verify a flame. If no flame is detected, the IFC will lockout for one hour. The IFC will send an alert code to the communicating comfort control and User Interface as well as flash its Red alert LED two times repeatedly.
22. If a flame is detected, the IFC will start the heat exchanger warm-up time delay for the indoor blower.
23. “IGNITION” will now be displayed in the “STATUS” section of the User Interface menu.
24. After 45 seconds, the IFC signals the indoor blower motor to run at the programmed ignition sequence speed.
25. Every 1 minute, the IFC will signal the vent motor to ramp up. The increase of the vent motor speed allows the gas flow through the gas valve to also be increased in 3% steps. This 3% increase will be repeated every 1 minute until the capacity requested is 100%. Pressure switch 3 closes at approximately 95% of capacity.
26. The IFC will also increase the indoor blower motor speed in appropriate steps. (The inter-stage delay is field selectable and can be adjusted through the User interface menu.
    It is factory set at 0 minutes but can be adjusted to 5, 10, or 15 minutes.) This option can help optimize the furnace to try to satisfy the heating requirement during low heating load conditions.

Indoor Blower motor operation thermostat fan switch “CONTINUOUS” (24V Mode)

R and G comfort control contacts close signaling a continuous fan call. The continuous fan cfm is field selectable and can be adjusted through the User Interface menu. The factory setting is 50% of the cooling cfm selected but can be set at 25%. If the system has a 2 stage outdoor unit, the setting is 50% of the 2nd stage cooling cfm.

UNIT TEST MODE

A) SIMPLE

Note:

Stage 1 = 40% (low) heat, Stage 2 = 100% (high) heat

A qualified technician can cycle the Variable Speed Indoor Blower and the Modulating Gas Furnace through its operation at the User Interface.

- The unit test cycle is entered at the user interface.
- The test cycle can only be entered when the comfort control has **no demand** and the furnace IFC is **not reporting a fault.** Turn the comfort control to the Off position and turn the fan control to Auto. This will ensure the unit test cycle will not be interrupted.
- Scroll down using the ▼ **button** at the user interface until the display reads:
- **UNIT TEST.** Press the **Enter** button.
- **UNIT TEST** and ◀ **NO (NO)** ▶ will now be displayed. Use the ◀ or ▶ arrow button to change the **NO** to a **YES** and then press **ENTER**.
- **ARE YOU SURE** and **NO (NO)** will now be displayed. Use the ◀ or ▶ arrow button to change the **NO** to a **YES** and then press **ENTER**.
- **UNIT TEST** and **Y1 ON FAN ON** will now be displayed. The variable speed indoor blower will then be turned on by the IFC for 10 seconds and then off.
- Furnace will then transition to the ignition sequence. **STAGE OFF** will now be displayed. After a 45 second heat fan on delay, **Stage 1** will be displayed and 40% (low) heat inducer speed will be energized for 10 seconds.
- **Stage 2** will be displayed and 100% (high) heat inducer speed will be energized for 10 seconds.
- The control transitions to off.
- The **Model** and **Serial Number** will be displayed.
- The variable speed indoor blower will now operate for the heat exchanger cool down cycle and then shut off at the end of the cycle.
- The comfort control can now be returned to the homeowner's desired settings.

B) GAS VALVE SETUP (MANIFOLD PRESSURE ADJUSTMENT)

NOTE: To obtain an accurate manifold pressure measurement ,the manifold pressure must be referenced to the burner box, since the burner box pressure tap equalizes the gas valve pressure regulator. To do so, install a tee and section of tube (field supplied) in the tubing between the tee coming from the burner box tube and the gas valve manifold pressure measurement fitting. This tube and tee is <u>in addition</u> to the tube attached to the gas valve pressure tap on the outlet side of the gas valve. See Figure 7.

NOTE: In order to properly set the manifold gas pressure, the incoming line gas pressure should be tested with the unit off and again with the unit operating at the high heat setting to ensure adequate fuel supply to the furnace. The incoming gas pressure should be 5" W.C. minimum and 13.8" W.C. maximum for natural gas.

1) <u>**Before Setting Manifold Gas Pressure**</u>

Setting the manifold gas pressures is critical for the correct operation of this furnace.

<u>Before</u> entering the Gas Valve Setup mode:

a. Turn comfort control system switch to the OFF position and fan switch to the AUTO position.

b. Prime the furnace condensate trap.

Any call for heat or fan by the comfort control will abort or cancel the Gas Valve Setup mode. The unit will stay in Gas Valve Setup mode for a maximum of 20 minutes.

c. Connect dual port manometer & field tubing per Figure 6.

Note: MIN = 40% (low) heat, MAX = 100% (high) heat

<u>**Setting Manifold Gas Pressure**</u>

2) Setting "MIN" manifold gas pressure

To enter the Gas Valve Setup mode:

a. Scroll down on the user interface to Unit Test.

b. Scroll to the right and select "Gas Val Setup".

c. Push the Enter button.

d. Select "MIN" and push the Enter button.

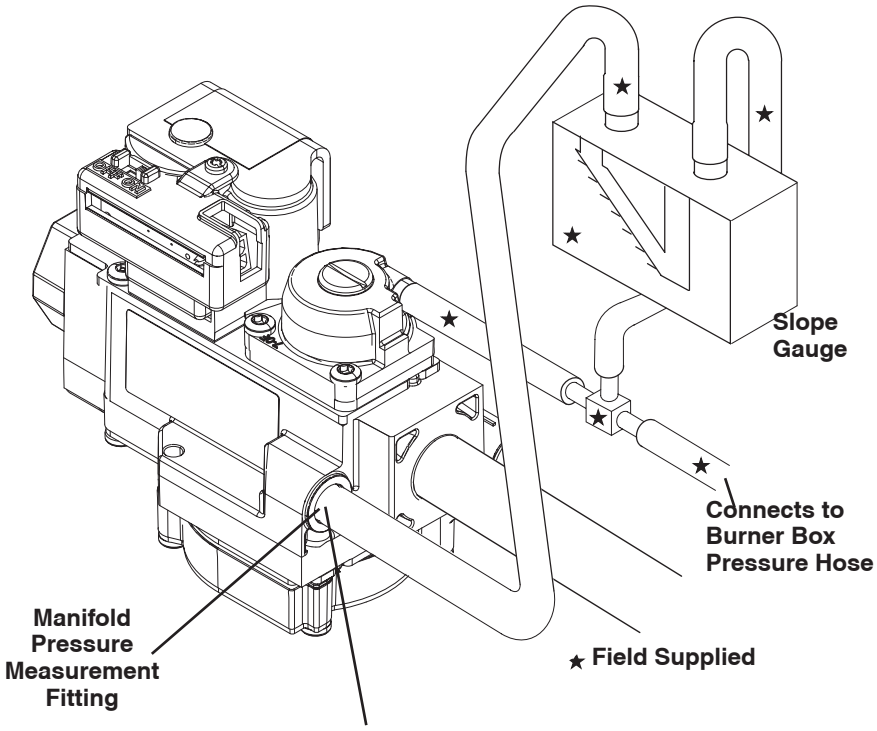
e. When asked "Are You Sure", select Yes, and push the Enter button.

f. The furnace will now begin the ignition sequence.

g. If pressure switch 1 & 2 learning routines have not been performed; after successful ignition, the inducer will go through this operation. (see Inducer Learning Routine section).

6

CORRECT METHOD OF CHECKING DIRECT VENT MANIFOLD PRESSURE WITH BURNER BOX REFERENCED



WARNING

EXPLOSION HAZARD

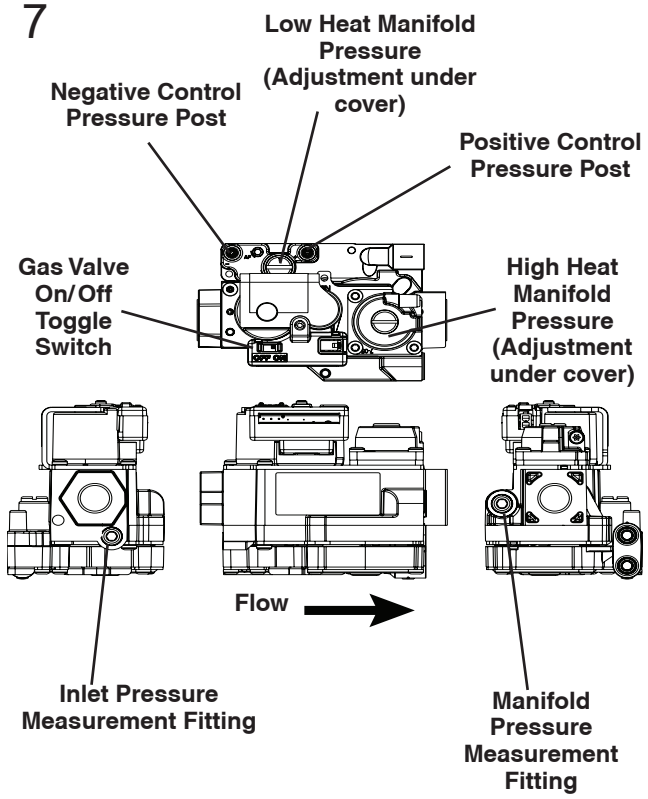
REPLACE AND/OR TIGHTEN ALL PLUGS REMOVED OR LOOS– ENED WHEN ADJUSTING GAS PRESSURE. LEAK CHECK THE FITTINGS BEFORE PLACING INTO REGULAR SERVICE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS PERSONAL INJURY, PROPERTY DAMAGE, OR DEATH

TABLE 1

Furnace Input rate (KBTU/hr)	FINAL NG MANIFOLD PRESSURE SETTINGS (inches w.c.)		
	40%	65%	100%
60	0.7 + 0.2 / - 0.0	Not Adjustable	3.5 ± 0.2
80	0.7 + 0.2 / - 0.0	Not Adjustable	3.5 ± 0.2
100	0.7 + 0.2 / - 0.0	Not Adjustable	3.5 ± 0.2
Downflow 120	0.7 + 0.2 / - 0.0	Not Adjustable	3.5 ± 0.2
Upflow 120	0.9 + 0.2 / - 0.0	Not Adjustable	3.5 ± 0.2
For upflow 120KBTU/hr model, 1st stage is 45% Manifold pressures apply for Natural Gas applications ONLY			

Furnace Input rate (KBTU/hr)	FINAL LP MANIFOLD PRESSURE SETTINGS (inches w.c.)		
	40%	65%	100%
60	2.1 ± 0.5	Not Adjustable	10.0 ± 0.5
80	2.1 ± 0.5	Not Adjustable	10.0 ± 0.5
100	2.1 ± 0.5	Not Adjustable	10.0 ± 0.5
Downflow 120	2.1 ± 0.5	Not Adjustable	10.0 ± 0.5
Upflow 120	2.9 ± 0.5	Not Adjustable	10.0 ± 0.5
For upflow 120KBTU/hr model, 1st stage is 45% Manifold pressures apply for Propane applications ONLY			

7



h. Allow 5 minutes to pass before attempting to adjust the 40% manifold pressure. This will insure that the learning routine is complete and that the heat rise is stable.

j. Read the 40% manifold pressure.

k. If needed, remove the low heat manifold adjustment cover and adjust to obtain the correct manifold pressure. See Figure 7.

40% (LOW) HEAT ADJUSTMENT: TURN CLOCKWISE TO DECREASE MANIFOLD PRESSURE OR COUN–TERCLOCKWISE TO INCREASE MANIFOLD PRES–SURE.

l. Use Manifold Pressure Settings Table 1 for the correct manifold pressure setting in Inches of Water Column.

m. Once the 40% manifold pressure has been adjusted; push the Enter button on the user interface. This will stop the gas valve setup mode and take you back to the home screen.

3) Setting "MAX" manifold gas pressure

To enter the Gas Valve Setup mode:

a. Scroll down on the user interface to Unit Test.

b. Scroll to the right and select "Gas Val Setup".

c. Push the Enter button.

d. Scroll to the right and select MAX; then push the Enter button.

e. Select "MAX" and push the Enter button.

f. When asked "Are You Sure", select Yes, and push the Enter button.

g. The furnace will now begin another ignition sequence.

h. If pressure switch 2 & 3 learning routines have not been performed; after successful ignition, the inducer will go through this operation. (see Inducer Learning Routine section).

i. Allow 5 minutes to pass before attempting to adjust the 100% manifold pressure. This will insure that the learning routine is complete and that the heat rise is stable.

j. Read the 100% manifold pressure.

k. If needed, remove the high heat manifold adjustment cover and adjust to obtain the correct manifold pressure. See Figure 7.

100% (HIGH) HEAT ADJUSTMENT: COUNTER–CLOCKWISE TO DECREASE MANIFOLD PRESSURE OR CLOCKWISE TO INCREASE MANIFOLD PRES–SURE.

l. Use Manifold Pressure Settings Table 1 for the correct manifold pressure setting in Inches of Water Column.

m. Replace and tighten the adjustment cover for the high heat and read the manifold pressure again. This procedure may need to be repeated until the correct manifold pressure is obtained.

NOTE: The adjustment cover over the high heat must be in place during manifold gas pressure readings. See Figure 6.

n. If the firing rate cannot be obtained with the manifold pressures specified in Table 1, the orifices must be changed. If a change of orifices is required to correct the furnace input rating, refer to Table 17 on page 39 of the Installer's guide.

o. Once the 100% manifold pressure has been adjusted; push the Enter button on the user interface. This will stop the gas valve setup mode and take you back to the home screen.

WARNING

EXPLOSION HAZARD

REPLACE AND/OR TIGHTEN ALL PLUGS REMOVED OR LOOSENED WHEN ADJUST–ING GAS PRESSURE. LEAK CHECK THE FITTINGS BEFORE PLACING INTO REGU–LAR SERVICE.

FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS PERSONAL INJURY, PROPERTY DAMAGE, OR DEATH.

p. Remove all field supplied tubing and measurement devices. Reinstall and tighten all covers and outlet pressure tap screw.

q. Leak test all gas fittings using a leak detection solution or soap suds.

r. Turn comfort control to home owners desired temperature.

PERSONALITY MODULE

The Personality Module is a removable memory device, on which is stored model specific data required for proper furnace operation. The Personality Module is tethered to the unit and must remain with the furnace at all times. The Personality module must remain plugged into the furnace IFC.

STAND ALONE OPERATION
(CONTINGENCY MODE)

The Contingency Mode allows the installer to set the equipment to operate in an ON/ OFF Duty Cycle mode. This mode will be activated using the User Interface. Contingency Mode is NOT available in 24VAC mode. The user will select the desired level of capacity required, Stage 1 (40%) or 2 (100%). The user will select the desired ON/ OFF Duty Cycle, 10% minimum to 50% maximum, (10% increments, 10% = 2 minutes On, 18 minutes Off; 50% = 10 minutes on, 10 minutes off).

CONTINGENCY MODE

Note:
Stage 1 = 40% (low) heat, Stage 2 = 100% (high) heat

Note:
If a communicating comfort control is detected to be present and the contingency mode is selected, NOT AVAILABLE will be displayed on the User Interface.

- Stand alone operation can only be entered at the user interface.
- Stand alone operation can be set up to operate the furnace in **Heating Only.**
- The contingency mode is used when the communicating comfort Control is not communicating with the furnace or when setting gas manifold pressures.
- Before attempting to enter contingency mode, disconnect the Data wire "D" from the Furnace IFC terminal block.
- The contingency mode will function only when the Furnace IFC is not flashing a fault code at its Fault LED.
- To enter the contingency mode of operation, turn 115 VAC power off. When the Green LED on the variable speed inducer drive goes out, turn 115 VAC power back on.
- Scroll down using the down arrow ▼ at the User Interface until you see **CNTNGNCY Mode**, then press the **Enter** button.
- **CNTNGNCY MODE** and ◀ **STAGE** ▶ will now be displayed. Press the **Enter** button.
- **STAGE** and ◀ **OFF [OFF]** will now be displayed. First or Second heat stage **must** be selected. Use the ◀ or ▶ arrows to select the stage of heat wanted and then push the **Enter** button and then the ▼ button.
- **DUTY CYCLE** and **10% [10%]** will now be displayed. A duty cycle **must** now be selected from 10 to 50%. A 10% duty cycle will run the furnace for 2 minutes and then off for 18 minutes. A 50% duty cycle will run the furnace for 10 minutes and then be off for 10 minutes. These duty cycles will be repeated 3 times per hour. Use the ◀ or ▶ arrows to select a duty cycle and then push the **Enter** button and then the ▼ button.
- **Start** and **NO [NO]** will now be displayed. With a **NO/ NO** question being asked, use the ◀ or ▶ arrows to select the **YES** and then press the **ENTER** button.
- **Are you Sure and NO [NO]** will now be displayed. With a **NO/ NO** question being asked, use the ◀ or ▶ arrows to select the **YES** and then press the **ENTER** button.
- Turn 115VAC power off. When the Green LED on the variable speed inducer drive goes out, turn 115 VAC power back on.
- When the furnace is operating in the contingency mode (stand alone operating cycle), the user interface will display the following information. The top line will say **CNTNGNCY MODE**. The bottom line will show the duty cycle stage number **STG** (**1 or 2)** selected, and the percent number **10–50 %** selected.
- All furnace operating controls, pressure switches and communications between the IFC and the variable speed inducer drive and the variable speed indoor blower will be functional during contingency mode operation of the furnace.
- The ◀ ▶ ▲ ▼ and **ENTER** buttons do not function in the contingency mode of operation.
- To exit the contingency mode of operation turn off the 115 VAC power to the furnace.
- The contingency mode will stop for any of the following reasons:
  (1) If the furnace IFC receives a signal from the communicating comfort control. This will only happen if the data wire "D" from the comfort control has been reconnected to the furnace IFC terminal board terminal "D".
  (2) Power is removed from the furnace and then turned back on.
  (3) The Furnace IFC enters a **RESET** mode of operation.
  (4) A fault is detected by the furnace IFC. Fault LED will be flashing an Alert Code.

24V CONTINGENCY MODE

An alternative method for the contingency mode can be used by changing the mode of operation in the Use Interface to 24V mode and installing a conventional 24V comfort control.

To set this mode of operation:

Remove all wiring from the *CONT900 comfort control and install a 24V comfort control. If the comfort control requires a 24V common; connect R and B to respective terminals. Connect a third wire to "W". At the control board, connect the same three wires to the corresponding terminals. Jumper W1 to W2 at the control board. The stage delay between W1 and W2 can be set by scrolling thru the User Interface. It is factory set to zero minutes but can be adjusted to 5, 10, or 15 minutes.

IFC INDUCER LEARNING ROUTINE SEQUENCE

Note:
Stage 1 = 40% (low) heat, Stage 2 = 100% (high) heat

- The furnace IFC will go through an inducer learning routine for three pressure switches.
- The learning routine is done to determine the correct amount of ventilation air for complete combustion.
- The inducer motor speed may be different for each installation due to the different length and size of the ventilation pipe, exhaust vent pipe, number of pipe fittings used, and the type of vent cap installed.
- The inducer learning routine is repeated each time the power to the furnace is interrupted. Once power is restored and the furnace receives a call for heat, the PS-1, PS-2 inducer learning routine will be initiated. The furnace IFC will not go through a PS-3 inducer learning routine until it receives a call for 100% (high) heat.
- To ensure the furnace heating efficiency is maintained the furnace IFC will repeat the inducer motor learning routine after :
  150 Cycles at 40% (low) heat
  100 Cycles at 65% (medium) heat
  50 Cycles at 100% (high) heat

PS-1, PS-2 Inducer Learning Routine

- The furnace IFC checks the pressure switches PS-1, PS-2 and PS-3. They all have to be open before a heating cycle can begin.
- The furnace IFC sends a digital signal to the variable speed inducer drive to run the inducer motor at the preset factory 65% (medium) heat RPM.
- The furnace IFC waits for the PS-1 and PS-2 pressure switches to close. A 24 Volt AC signal is sent to the furnace IFC when a pressure switch closes.
- If PS-1 and PS-2 do not close at the preset factory 65% (medium) heat RPM, the furnace IFC will continue to signal the variable speed inducer drive to increase the inducer speed in steps until PS-1 and PS-2 close or until the maximum RPM for 65% (medium) heat is reached.
- When PS-1 and PS-2 switches close, the furnace IFC will then start the ignition cycle.
- The IFC now starts the igniter warm up cycle.
- Near the end of the warm up cycle the furnace IFC will turn on the gas valve.

NOTE: The furnace lights at approximately 65% of capacity.

- When the burner flame is detected by the furnace IFC, a forty-five second time delay for indoor blower operation begins. The forty-five second time delay allows the heat exchanger and the recuperative cell to warm up.
- The furnace IFC will now start its 65% (medium) heat inducer learning routine.
- The furnace IFC will signal the variable speed inducer drive beginning to reduce the inducer motor speed in steps until the furnace IFC detects that PS-2 is open.
- When PS-2 opens, the furnace IFC will NOTE the inducer motor RPM.
- The furnace IFC then adds an additional number of RPM to the 65% (medium) heat inducer motor NOTED RPM until PS-2 closes.
- The additional number of RPM plus this NOTED RPM is the learned 65% (medium) heat inducer operating RPM.
- The furnace IFC now stores this learned operating inducer RPM for 65% (medium) heat in its memory.
- The furnace IFC will use this stored learned operating inducer RPM for 65% (medium) heat calls it receives in the future.
- If the furnace IFC is still receiving a call for low heat operation it will now start the learning routine for 40% (low) heat.
- The furnace IFC will then continue to reduce the inducer motor RPM in steps until the furnace IFC detects that PS-1 is open.
- When PS-1 opens, the furnace IFC will NOTE the inducer motor RPM.
- The furnace IFC then adds an additional number of RPM to the 40% (low) heat inducer motor NOTED RPM until PS-1 closes.
- The additional number of RPM plus this NOTED RPM is the learned 40% (low) heat inducer operating RPM.
- The furnace IFC now stores this learned inducer operating RPM for 40% (low) heat in its memory.
- The furnace IFC will use this stored learned inducer operating RPM for 40% (low) heat calls it receives in the future.
- Whenever the furnace is powered up or after a RESET, the furnace IFC will not go through a learning routine for 100% (high) heat until it receives a call for 100% (high) heat.

PS-3 Inducer Learning Routine

Note:

Stage 1 = 40% (low) heat, Stage 2 = 100% (high) heat

- When the furnace IFC receives a digital signal for 100% (high) heat from the comfort control it will begin the PS-3 inducer learning routine.
- The furnace will start the heating cycle in 65% (medium) heat, if not already on, and then begins the PS-3 inducer learning routine.
- The furnace IFC will send a digital signal to the variable speed inducer drive to run the inducer motor at the preset factory 100% (high) heat RPM.
- The furnace IFC waits for PS-3 pressure switch to close. A 24 Volt AC signal is sent to the furnace IFC when the pressure switch closes.
- If PS-3 does not close at the factory preset 100% (high) heat RPM, the furnace IFC will continue to signal the variable speed inducer drive to increase the inducer speed in steps until PS-3 closes or until the maximum RPM for 100% (high) heat is reached.
- The furnace IFC enters a time delay so that the heat exchanger and the recuperative cell warm up to their high heat operating temperature. At the end of this time delay, the inducer discharge air temperature will be at its high heat operating temperature and the density of the products of combustion will be stabilized.
- The furnace will now signal the variable speed inducer drive to reduce the inducer speed in steps until PS-3 opens.
- When PS-3 opens, the furnace IFC will NOTE the inducer motor RPM.
- The furnace IFC then adds an additional number of RPM to the 100% (high) heat inducer motor NOTED RPM until PS-3 closes.
- The furnace IFC now stores this learned inducer operating RPM for 100% (high) heat in its memory.
- The furnace IFC will use this stored learned inducer operating RPM for 100% (high) heat calls it receives in the future.
- If PS-3 is not closed when the inducer reaches its maximum RPM, the furnace IFC will signal the variable speed inducer drive to reduce the inducer Motor speed in steps to its low heat LEARNED SPEED.
- The furnace IFC flashes its Red Fault LED three times repeatedly. The furnace IFC will keep operating at low heat for 10 minutes and then retry the PS-3 learning routine.

INDOOR BLOWER TIMING

Heating: The Integrated Furnace Control module controls the Indoor Blower. The Blower start is fixed at 45 seconds after ignition. The FAN-OFF period is field selectable via the User Interface menu at 60, 100, 140, or 180 seconds. The factory setting is 100 seconds.

Cooling: Continuous Fan mode is 50% of the cooling CFM. This is a selectable range on the Comfort Control menu.

When in communicating mode, see Use Interface Menu in furnace Installer's Guide.

PERIODIC SERVICING REQUIREMENTS

WARNING

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

WARNING

CARBON MONOXIDE POISONING HAZARD
Failure to follow the service and/ or periodic maintenance instructions for the Furnace and venting system, could result in carbon monoxide poisoning or death.

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.
   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.
   e. There are no obvious signs of deterioration of the Furnace.
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 Box cover (6 to 8 screws) and top burner bracket. Lift burners from orifices.

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. The Burner Box must be resealed when replacing box cover.

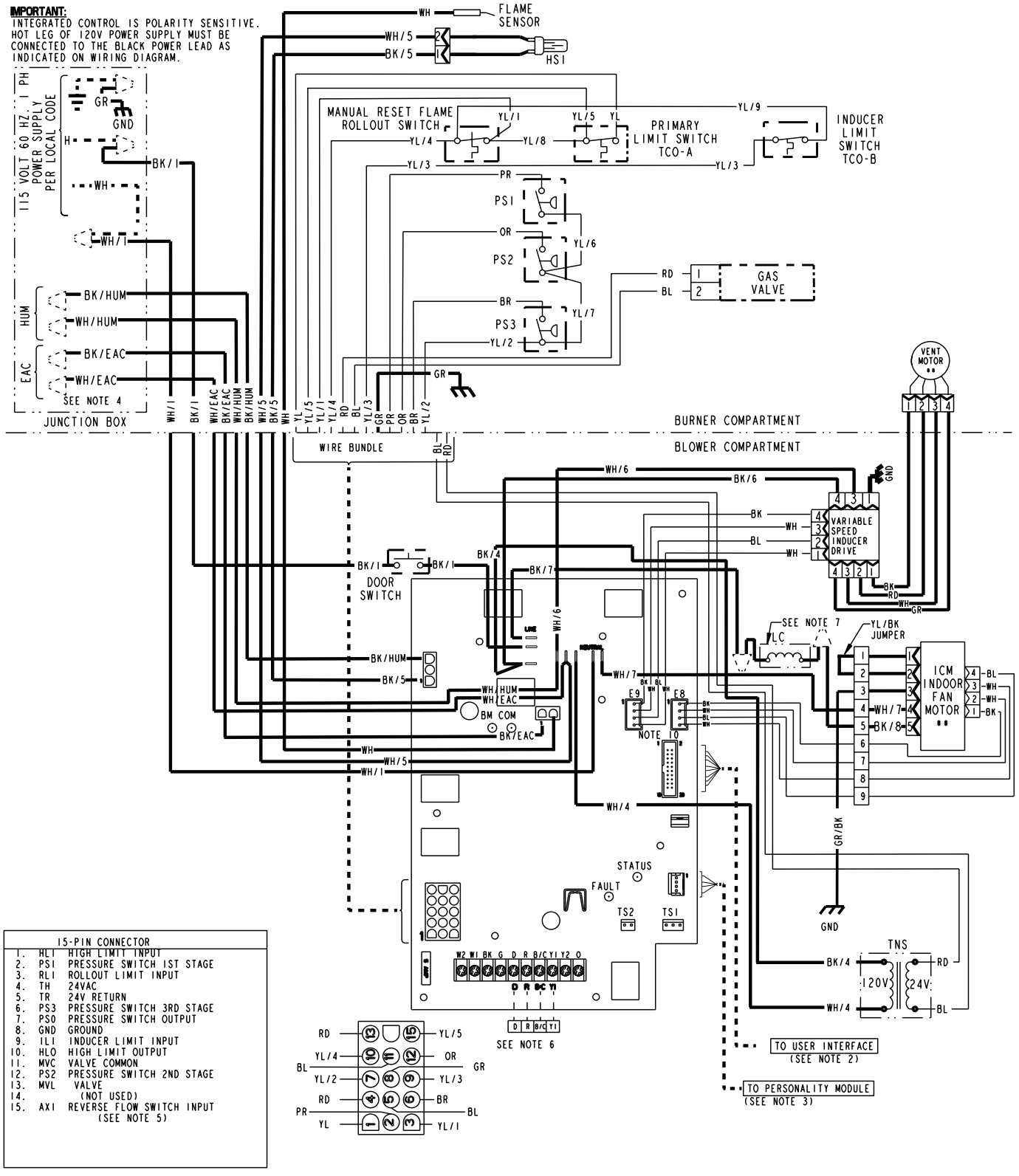
NOTE:

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 LP (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 burner compartment 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 Burner Box cover, 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.)

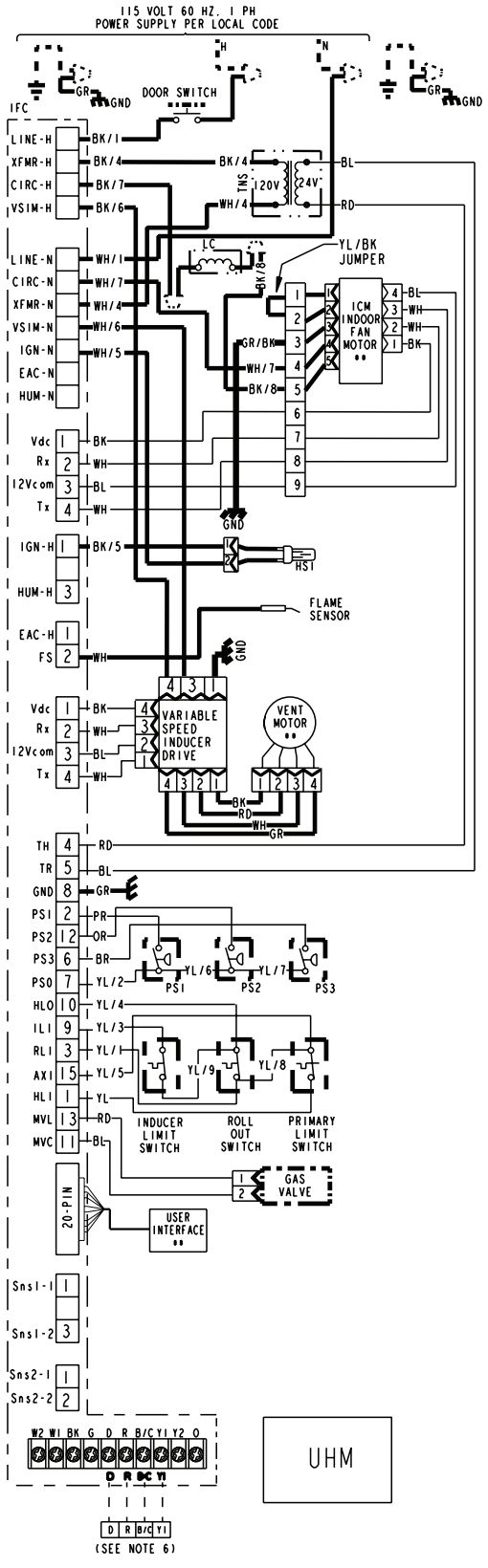
*UHM WIRING DIAGRAM



⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

*UHM SCHEMATIC DIAGRAM



DIAGNOSTIC CODES	
RED LED - FAULT Data - 1 Flash every 20 seconds	
2 FLASHES - SYSTEM LOCKOUT RETRIES OR RECYCLES EXCEEDED	6 FLASHES - 115 VOLT AC POWER REVERSED OR IGNITER FAULT
3 FLASHES - PRESSURE SWITCH FAULT	7 FLASHES - GAS VALVE CIRCUIT ERROR
	8 FLASHES - LOW FLAME SENSE SIGNAL
4 FLASHES - OPEN LIMIT SWITCH	9 FLASHES - OPEN INDUCER LIMIT
5 FLASHES - FLAME SENSED WHEN NO FLAME SHOULD BE PRESENT	10 FLASHES - COMMUNICATION FAULT
	CONTINUOUS ON - INTERNAL CONTROL FAILURE
GREEN LED - STATUS	
SLOW FLASH - NORMAL, NO CALL FOR HEAT	
FAST FLASH - NORMAL, CALL FOR HEAT PRESENT	
GREEN AND RED LED'S ON CONTINUOUS - INTERNAL CONTROL FAILURE	
GREEN AND RED LED'S OFF CONTINUOUS - FUSE OPEN	

WARNING ⚠	CAUTION ⚠
HAZARDOUS VOLTAGE DISCONNECT ALL ELECTRICAL POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING. FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.	USE COPPER CONDUCTORS ONLY! UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

INTEGRATED FURNACE CONTROL

REPLACE WITH PART CNT 07080 OR EQUIVALENT
ELECTRICAL RATING
INPUT: 25 V.A.C., 60 HZ.
XFMR SEC. CURRENT: 450 MA. + MV LOAD
MV OUTPUT: 1.5 A @ 24 V.A.C.
IND OUTPUT: 3 PHASE OUTPUT
IGN OUTPUT: 2.0 A @ 120V.A.C.
CIRC. BLOWER OUTPUT: 14.5 FLA, 25 LRA @ 120 VAC
HUMIDIFER & AIR CLEANER MAX. LOAD: 1.0 A @ 120 VAC

TIMINGS
PREPURGE: 0 SEC.; INTERPURGE: 60 SEC.
POST PURGE: 5 SECONDS
IGNITOR WARMUP: 20 SECONDS
IAP: 3; TFI: 5 SECONDS
RETRIES: 2; RECYCLES: 10
HEAT ON DELAY: 45 SECONDS
COOL ON DELAY: 0 SECONDS
AUTO RESTART: 60 MINUTES
AUTO RESTART PURGE: 15 SECONDS

TCO THERMAL CUT OUT
PS PRESSURE SWITCH
FRS FLAME ROLLOUT SWITCH
FP FLAME SENSOR
CHASSIS GROUND
HSI HOT SURFACE IGNITER
DOOR SWITCH
FUSE
LC LINE CHOKE
CF CAPACITOR
COIL

LINE / 24 V — FACTORY WIRING
LINE / 24 V — FIELD WIRING

BK	BLACK	GR	GREEN
WH	WHITE	BR	BROWN
YL	YELLOW	RD	RED
OR	ORANGE	BL	BLUE

** INTERNAL THERMAL PROTECTION

WIRE COLOR
BK/1
NUMBER ID (IF ANY)

L	LINE	TH	24 VAC (HOT)
N	NEUTRAL	TR	24 VAC (COMMON)
GND	GROUND	MV	MAIN GAS VALVE
B/C	COMMON	TNS	TRANSFORMER
HLO	HIGH LIMIT OUTPUT	ILI	INDUCER LIMIT INPUT
HLI	HIGH LIMIT INPUT		

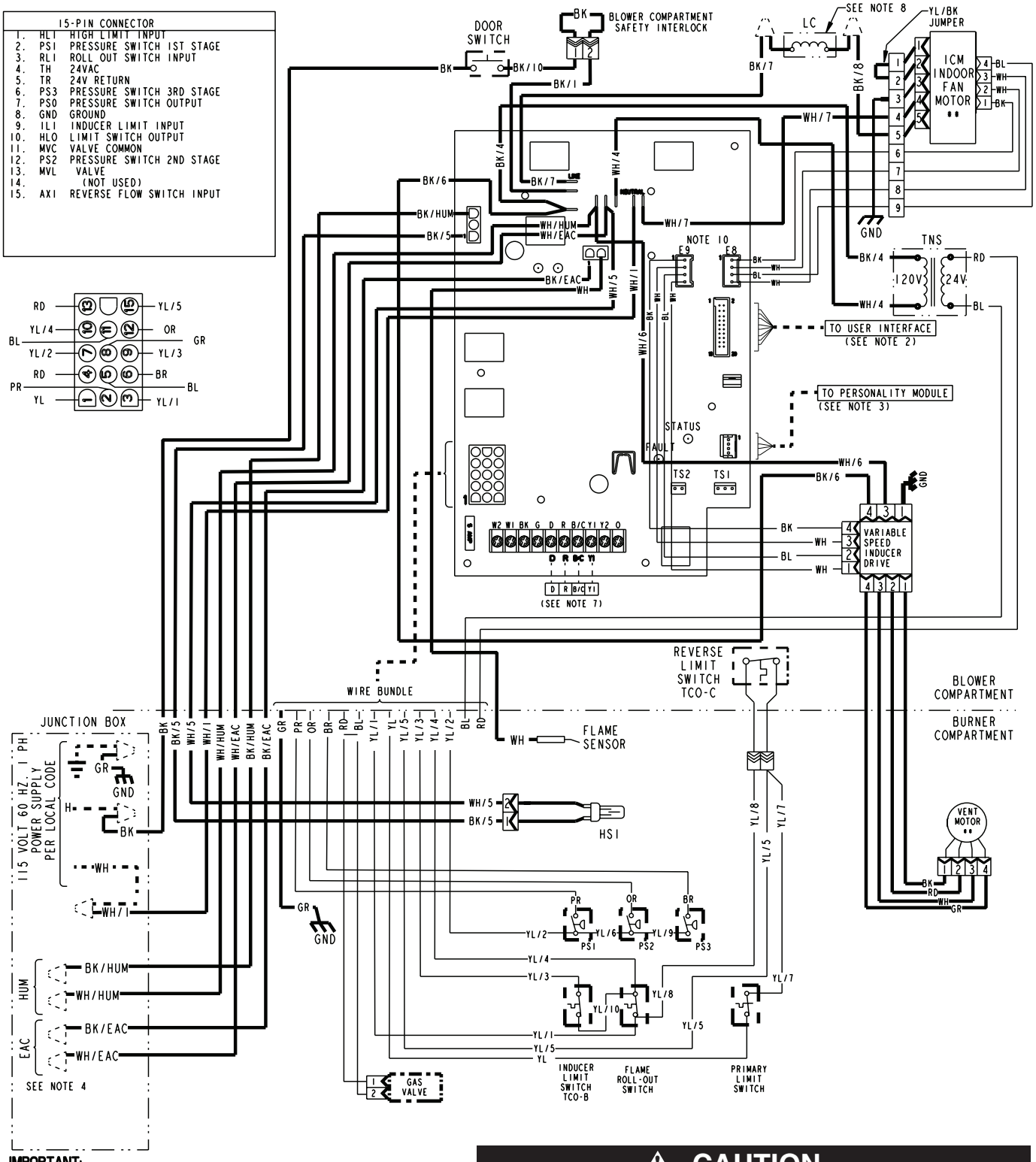
NOTES:

1. IF ANY OF THE ORIGINAL WIRING AS SUPPLIED WITH THIS FURNACE MUST BE REPLACED, IT, MUST BE WITH WIRE HAVING A TEMPERATURE RATING OF AT LEAST 105° C.
2. USER INTERFACE MUST BE INSTALLED FOR PROPER FURNACE INSTALLATION & SET-UP.
3. CORRECT PERSONALITY MODULE IS REQUIRED FOR PROPER FURNACE OPERATION. PERSONALITY MODULE IS SPECIFIC TO EACH MODEL & SERIAL NUMBER, AND IS TO REMAIN WITHIN IT'S ORIGINAL UNIT.
4. THESE LEADS PROVIDE 120V POWER CONNECTIONS FOR ELECTRONIC AIR CLEANER (EAC) AND HUMIDIFIER (HUM). MAX. LOAD: 1.0 AMPS EACH.
5. ON POWER-UP, LAST FOUR FAULTS, IF ANY, WILL BE FLASHED ON RED LED. GREEN LED WILL BE SOLID ON DURING LAST FAULT RECOVERY.
6. YI IS OUTPUT TO NON-COMMUNICATING OUTDOOR UNIT.
7. LINE CHOKE (LC) NOT USED ON ALL MODELS.
8. IN 24 VOLT MODE, AN OPTIONAL HUMIDISTAT CAN BE CONNECTED BETWEEN THE "R" AND "BK" TERMINALS. FACTORY INSTALLED "BK JUMPER" ON THE CIRCUIT BOARD MUST BE CUT. SEE FURNACE INSTALLERS GUIDE FOR DETAILS.
9. USED ON UHM/UXM MODELS ONLY.
10. THESE TWO MOTOR CONNECTIONS (E8 & E9) ARE INTERCHANGEABLE.

⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

*DHM WIRING DIAGRAM

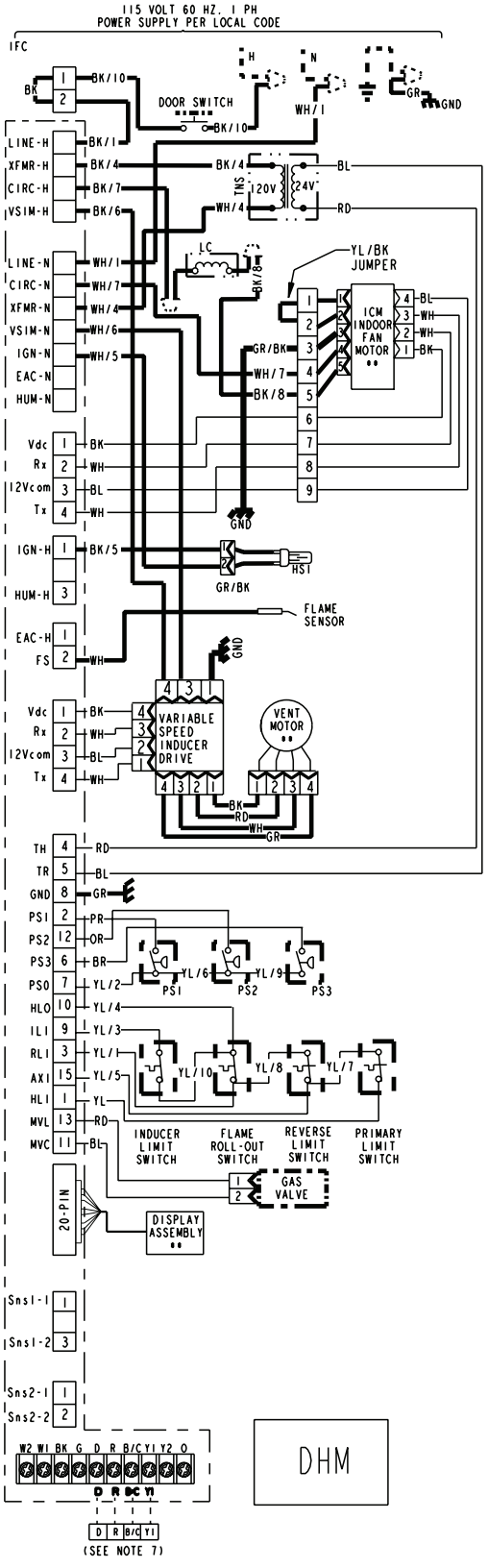


IMPORTANT:
INTEGRATED CONTROL IS POLARITY SENSITIVE.
HOT LEG OF 120V POWER SUPPLY MUST BE CONNECTED TO THE BLACK POWER LEAD AS INDICATED ON WIRING DIAGRAM.

⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

*DHM SCHEMATIC DIAGRAM



DIAGNOSTIC CODES	
RED LED - FAULT Data - 1 Flash every 20 seconds	
2 FLASHES - SYSTEM LOCKOUT RETRIES OR RECYCLES EXCEEDED	6 FLASHES - 115 VOLT AC POWER REVERSED OR IGNITER FAULT
3 FLASHES - PRESSURE SWITCH FAULT	7 FLASHES - GAS VALVE CIRCUIT ERROR
	8 FLASHES - LOW FLAME SENSE SIGNAL
4 FLASHES - OPEN LIMIT SWITCH	9 FLASHES - OPEN INDUCER LIMIT
5 FLASHES - FLAME SENSED WHEN NO FLAME SHOULD BE PRESENT	10 FLASHES - COMMUNICATION FAULT
	CONTINUOUS ON - INTERNAL CONTROL FAILURE
GREEN LED - STATUS	
SLOW FLASH - NORMAL, NO CALL FOR HEAT	
FAST FLASH - NORMAL, CALL FOR HEAT PRESENT	
GREEN AND RED LED'S ON CONTINUOUS - INTERNAL CONTROL FAILURE	
GREEN AND RED LED'S OFF CONTINUOUS - FUSE OPEN	

WARNING ⚠	CAUTION ⚠
HAZARDOUS VOLTAGE DISCONNECT ALL ELECTRICAL POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING. FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.	USE COPPER CONDUCTORS ONLY! UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

INTEGRATED FURNACE CONTROL

REPLACE WITH PART CNT 07080 OR EQUIVALENT
ELECTRICAL RATING
INPUT: 25 V.A.C., 60 HZ.
XFMR SEC. CURRENT: 450 MA. + MV LOAD
MV OUTPUT: 1.5 A @ 24 V.A.C.
IND OUTPUT: 3 PHASE OUTPUT
IGN OUTPUT: 2.0 A @ 120V.A.C.
CIRC. BLOWER OUTPUT: 14.5 FLA, 25 LRA @ 120 VAC
HUMIDIFER & AIR CLEANER MAX. LOAD: 1.0 A @ 120 VAC

TIMINGS
PREPURGE: 0 SEC.; INTERPURGE: 60 SEC.
POST PURGE: 5 SECONDS
IGNITOR WARMUP: 20 SECONDS
IAP: 3; TFI: 5 SECONDS
RETRIES: 2; RECYCLES: 10
HEAT ON DELAY: 45 SECONDS
COOL ON DELAY: 0 SECONDS
AUTO RESTART: 60 MINUTES
AUTO RESTART PURGE: 15 SECONDS

TCO THERMAL CUT OUT
PS PRESSURE SWITCH
FRS FLAME ROLLOUT SWITCH
FP FLAME SENSOR
CHASSIS GROUND
HSI HOT SURFACE IGNITER
DOOR SWITCH
FUSE
LC LINE CHOKE
CF CAPACITOR
COIL

LINE, 24 V — FACTORY WIRING
LINE, 24 V — FIELD WIRING

•• INTERNAL THERMAL PROTECTION

BK	BLACK	GR	GREEN
WH	WHITE	BR	BROWN
YL	YELLOW	RD	RED
OR	ORANGE	BL	BLUE

WIRE COLOR
BK/1
NUMBER ID (IF ANY)

L	LINE	TH	24 VAC (HOT)
N	NEUTRAL	TR	24 VAC (COMMON)
GND	GROUND	MV	MAIN GAS VALVE
B/C	COMMON	TNS	TRANSFORMER
HLO	HIGH LIMIT OUTPUT	ILI	INDUCER LIMIT INPUT
HLI	HIGH LIMIT INPUT		

NOTES:

1. IF ANY OF THE ORIGINAL WIRING AS SUPPLIED WITH THIS FURNACE MUST BE REPLACED, IT MUST BE WITH WIRE HAVING A TEMPERATURE RATING OF AT LEAST 105 C.
2. USER INTERFACE MUST BE INSTALLED FOR PROPER FURNACE INSTALLATION & SET-UP.
3. CORRECT PERSONALITY MODULE IS REQUIRED FOR PROPER FURNACE OPERATION. PERSONALITY MODULE IS SPECIFIC TO EACH MODEL & SERIAL NUMBER, AND IS TO REMAIN WITHIN IT'S ORIGINAL UNIT.
4. THESE LEADS PROVIDE 120V POWER CONNECTIONS FOR ELECTRONIC AIR CLEANER (EAC) AND HUMIDIFIER (HUM). MAX. LOAD: 1.0 AMPS EACH.
5. USED FOR DHM/DXM
6. ON POWER-UP, LAST FOUR FAULTS, IF ANY, WILL BE FLASHED ON RED LED. GREEN LED WILL BE SOLID ON DURING LAST FAULT RECOVERY.
7. YI IS OUTPUT TO NON-COMMUNICATING OUTDOOR UNIT.
8. LINE CHOKE (LC) NOT USED ON ALL MODELS.
9. IN 24 VOLT MODE, AN OPTIONAL HUMIDISTAT CAN BE CONNECTED BETWEEN THE "R" AND "BK" TERMINALS. FACTORY INSTALLED "BK JUMPER" ON THE CIRCUIT BOARD MUST BE CUT. SEE FURNACE INSTALLERS GUIDE FOR DETAILS.
10. THESE TWO MOTOR CONNECTIONS (E9 INDOOR FAN MOTOR AND E8 INDUCER MOTOR) ARE INTERCHANGEABLE.

⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

*UHM AIRFLOW – HEATING

*UHMB060CCV3VA^ Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure (iwc)								
Minimum Stage Capacity = 23,000								
Maximum Stage Capacity = 57,000								
	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
40% (Low) Heat	Low	465	CFM	505	492	479	465	452
			Temp. Rise	52	55	58	61	63
			Watts	32	56	81	105	130
	Medium-Low	504	CFM	521	517	514	510	506
			Temp. Rise	52	53	54	54	55
			Watts	36	61	87	113	139
	Medium**	538	CFM	563	553	543	533	523
			Temp. Rise	49	49	50	50	51
			Watts	41	68	95	122	149
	High	605	CFM	609	622	635	648	661
			Temp. Rise	45	45	44	44	43
			Watts	51	82	112	142	173
65% (Medium) Heat	Low	623	CFM	656	636	616	596	577
			Temp. Rise	59	59	60	61	61
			Watts	55	82	109	135	162
	Medium-Low	675	CFM	698	696	695	694	692
			Temp. Rise	55	54	54	53	52
			Watts	66	97	128	159	190
	Medium**	720	CFM	745	734	723	712	700
			Temp. Rise	52	52	52	52	52
			Watts	74	105	136	167	197
	High	810	CFM	832	820	809	798	786
			Temp. Rise	47	47	46	46	46
			Watts	96	132	167	203	239
100% (High) Heat	Low	830	CFM	880	873	867	861	854
			Temp. Rise	57	58	58	59	60
			Watts	102	140	177	215	252
	Medium-Low	900	CFM	947	944	941	937	934
			Temp. Rise	53	54	54	54	55
			Watts	122	164	206	249	291
	Medium**	960	CFM	997	1002	1008	1013	1018
			Temp. Rise	51	51	50	50	50
			Watts	143	192	241	290	339
	High	1080	CFM	1137	1139	1141	1143	1145
			Temp. Rise	45	45	44	44	44
			Watts	201	256	312	367	423

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z".
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.
6. Target airflow is field selectable for high (100%) heat. Target airflow for low and medium heat are percentages of high heat and are not field selectable.

*UHM AIRFLOW – HEATING

*UHMB080CCV3VA^ Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure (iwc)								
Minimum Stage Capacity = 31,000								
Maximum Stage Capacity = 76,000								
	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
40% (Low) Heat	Low	571	CFM	652	660	668	676	684
			Temp. Rise	44	43	43	42	41
			Watts	44	71	99	127	154
	Medium-Low	643	CFM	714	720	726	732	738
			Temp. Rise	40	40	39	39	38
			Watts	56	86	117	147	177
	Medium**	714	CFM	786	796	805	814	824
			Temp. Rise	37	36	36	36	35
			Watts	66	101	135	170	205
	High	821	CFM	883	886	889	892	895
			Temp. Rise	33	33	33	33	33
			Watts	88	124	160	197	233
65% (Medium) Heat	Low	806	CFM	887	895	903	911	919
			Temp. Rise	53	52	52	51	50
			Watts	83	124	164	204	244
	Medium-Low	907	CFM	995	1001	1007	1013	1019
			Temp. Rise	47	47	46	46	46
			Watts	116	158	199	241	282
	Medium**	1008	CFM	1108	1109	1110	1111	1112
			Temp. Rise	42	42	42	42	42
			Watts	151	192	234	275	316
	High	1159	CFM	1274	1271	1268	1265	1263
			Temp. Rise	37	37	37	37	37
			Watts	221	273	326	378	430
100% (High) Heat	Low	1120	CFM	1228	1227	1225	1224	1223
			Temp. Rise	59	59	59	59	59
			Watts	184	236	287	338	390
	Medium-Low	1260	CFM	1384	1383	1382	1380	1379
			Temp. Rise	52	52	52	52	52
			Watts	263	317	371	425	479
	Medium**	1400	CFM	1551	1531	1511	1491	1471
			Temp. Rise	46	47	48	48	49
			Watts	364	418	471	525	579
	High	1610	CFM	1683	1626	1569	1512	1456
			Temp. Rise	43	44	46	48	49
			Watts	486	505	523	542	561

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be “A” through “Z”.
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.
6. Target airflow is field selectable for high (100%) heat. Target airflow for low and medium heat are percentages of high heat and are not field selectable.

*UHM AIRFLOW – HEATING

*UHMC100CCV4VA^ Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure (iwc)								
Minimum Stage Capacity = 39,000								
Maximum Stage Capacity = 96,000								
	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
40% (Low) Heat	Low	628	CFM	699	711	723	735	747
			Temp. Rise	51	50	50	49	49
			Watts	44	76	109	141	173
	Medium-Low	662	CFM	725	740	756	771	786
			Temp. Rise	50	47	43	40	36
			Watts	48	83	117	151	186
	Medium**	697	CFM	751	757	763	768	774
			Temp. Rise	48	47	45	43	41
			Watts	51	86	122	157	192
	High	770	CFM	807	827	848	868	888
			Temp. Rise	44	42	40	37	35
			Watts	62	100	138	177	215
65% (Medium) Heat	Low	1051	CFM	1120	1125	1130	1135	1140
			Temp. Rise	51	51	50	50	50
			Watts	126	180	233	286	340
	Medium-Low	1109	CFM	1174	1178	1183	1187	1192
			Temp. Rise	49	48	48	48	48
			Watts	145	200	254	309	363
	Medium**	1166	CFM	1219	1223	1226	1230	1234
			Temp. Rise	47	46	46	46	45
			Watts	159	221	283	345	408
	High	1289	CFM	1305	1328	1351	1375	1398
			Temp. Rise	43	43	42	41	40
			Watts	214	281	348	414	481
100% (High) Heat	Low	1460	CFM	1523	1525	1527	1529	1531
			Temp. Rise	58	58	58	58	58
			Watts	280	355	429	503	578
	Medium-Low	1540	CFM	1608	1608	1607	1607	1607
			Temp. Rise	56	56	55	55	55
			Watts	346	416	486	556	627
	Medium**	1620	CFM	1689	1685	1682	1678	1674
			Temp. Rise	53	53	53	53	53
			Watts	396	470	544	618	692
	High	1790	CFM	1837	1853	1870	1886	1903
			Temp. Rise	49	48	48	47	47
			Watts	516	609	702	796	889

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be “A” through “Z”.
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.
6. Target airflow is field selectable for high (100%) heat. Target airflow for low and medium heat are percentages of high heat and are not field selectable.

*UHM AIRFLOW – HEATING

***UHMD120CCV5VA^** Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter								
	Airflow Setting	Target Airflow (See Note 5)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
45% (low) Heat	Low	748	CFM	728	758	785	805	819
			Temp. Rise	62	59	57	56	55
			Watts	119	107	102	94	108
	Medium Low	788	CFM	769	797	822	840	853
			Temp. Rise	58	56	54	53	53
			Watts	113	107	111	113	133
	Medium**	832	CFM	813	841	864	880	890
			Temp. Rise	55	53	52	51	50
			Watts	108	107	122	135	160
	High	880	CFM	863	889	910	923	930
			Temp. Rise	52	50	49	49	48
			Watts	104	108	135	160	191
65% (medium) Heat	Low	1224	CFM	1213	1232	1237	1232	1220
			Temp. Rise	60	60	59	60	60
			Watts	131	160	253	345	405
	Medium Low	1289	CFM	1279	1297	1299	1290	1274
			Temp. Rise	57	57	56	57	58
			Watts	147	178	281	382	445
	Medium**	1361	CFM	1353	1369	1367	1355	1335
			Temp. Rise	54	54	54	54	55
			Watts	168	201	313	423	489
	High	1440	CFM	1434	1448	1443	1426	1402
			Temp. Rise	51	51	51	51	52
			Watts	197	229	352	469	538
100% (high) Heat	Low	1700	CFM	1699	1707	1690	1659	1621
			Temp. Rise	60	60	60	61	63
			Watts	325	349	495	628	698
	Medium Low	1790	CFM	1790	1797	1775	1740	1696
			Temp. Rise	57	57	57	59	60
			Watts	382	400	551	685	752
	Medium**	1890	CFM	1892	1896	1870	1830	1781
			Temp. Rise	54	54	54	56	57
			Watts	453	462	616	750	813
	High	2000	CFM	2004	2006	1975	1929	1873
			Temp. Rise	51	51	52	53	54
			Watts	540	538	694	822	880

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be “A” through “Z”.
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.
6. Target airflow is field selectable for high (100%) heat. Target airflow for low and medium heat are percentages of high heat and are not field selectable.

*UHM AIRFLOW – COOLING

***UHMB060CCV3VA^** Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter

	Unit Outdoor	Airflow Setting		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	1.5	290 CFM/ton	CFM	356	476	488	511	519
			Watts	29	67	97	132	167
		310 CFM/ton	CFM	389	504	516	538	545
			Watts	32	71	102	138	174
		330 CFM/ton	CFM	422	533	544	565	572
			Watts	36	75	107	144	181
		350 CFM/ton	CFM	455	561	566	589	592
			Watts	39	79	111	150	187
		370 CFM/ton	CFM	487	589	600	619	624
			Watts	43	84	119	158	197
		400 CFM/ton	CFM	537	631	655	669	673
			Watts	50	92	130	171	212
		430 CFM/ton	CFM	586	674	684	700	702
			Watts	57	101	139	182	223
		450 CFM/ton	CFM	619	695	717	727	733
			Watts	63	106	150	193	236
	2	290 CFM/ton	CFM	515	613	623	641	646
			Watts	47	88	124	164	204
		310 CFM/ton	CFM	559	650	660	677	681
			Watts	53	96	133	175	215
		330 CFM/ton	CFM	602	688	698	713	716
			Watts	60	104	143	186	228
		350 CFM/ton	CFM	646	707	737	748	752
			Watts	68	112	156	200	243
		370 CFM/ton	CFM	690	763	772	785	785
			Watts	76	123	165	211	255
		400 CFM/ton	CFM	764	816	778	847	844
			Watts	86	137	180	231	275
		430 CFM/ton	CFM	821	876	884	892	890
			Watts	108	159	206	256	303
		450 CFM/ton	CFM	937	968	977	985	984
			Watts	136	193	241	295	343
	2.5	290 CFM/ton	CFM	673	749	758	771	772
			Watts	73	119	161	206	250
		310 CFM/ton	CFM	732	791	756	766	818
			Watts	79	129	160	203	268
		330 CFM/ton	CFM	783	843	852	861	860
			Watts	98	147	193	242	288
		350 CFM/ton	CFM	848	894	908	917	917
			Watts	110	163	212	262	308
		370 CFM/ton	CFM	892	937	945	951	947
			Watts	129	182	232	284	333
		400 CFM/ton	CFM	972	1015	972	957	1036
			Watts	160	213	262	312	374
		430 CFM/ton	CFM	1057	1078	1085	1085	1078
			Watts	191	249	306	360	415
		450 CFM/ton	CFM	1115	1137	1142	1140	1139
			Watts	214	275	333	388	447
	3	290 CFM/ton	CFM	832	885	894	901	899
			Watts	111	162	210	260	308
		310 CFM/ton	CFM	898	942	950	955	951
			Watts	131	184	234	286	336
		330 CFM/ton	CFM	964	998	1006	1009	1004
			Watts	154	209	262	314	366
		350 CFM/ton	CFM	1039	1065	1073	1074	1075
			Watts	181	237	292	344	402
		370 CFM/ton	CFM	1095	1111	1118	1116	1108
			Watts	208	268	326	380	436
		400 CFM/ton	CFM	1189	1212	1214	1149	1207
			Watts	257	320	380	435	500
		430 CFM/ton	CFM	1292	1280	1285	1278	1201
			Watts	317	383	448	501	508
		450 CFM/ton	CFM	1326	1317	1361	1242	1166
			Watts	366	433	495	510	509

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z"
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.

NOTE:
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

*UHM AIRFLOW – COOLING

***UHMB080CCV3VA^** Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter

	Unit Outdoor	Airflow Setting		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2	290 CFM/ton	CFM	504	565	586	521	540
			Watts	34	70	104	138	172
		310 CFM/ton	CFM	547	604	624	559	579
			Watts	40	77	112	147	182
		330 CFM/ton	CFM	590	644	663	597	617
			Watts	47	85	121	157	193
		350 CFM/ton	CFM	656	695	701	703	694
			Watts	54	93	130	167	204
		370 CFM/ton	CFM	676	724	740	674	694
			Watts	62	102	140	179	217
		400 CFM/ton	CFM	764	792	801	795	789
			Watts	75	116	157	197	238
		430 CFM/ton	CFM	806	844	856	788	810
			Watts	89	133	175	216	259
		450 CFM/ton	CFM	877	899	901	895	886
			Watts	102	145	188	230	275
	2.5	290 CFM/ton	CFM	660	709	726	659	680
			Watts	59	99	136	174	212
		310 CFM/ton	CFM	740	768	772	769	764
			Watts	70	109	149	189	229
		330 CFM/ton	CFM	768	809	822	755	776
			Watts	81	123	164	205	246
		350 CFM/ton	CFM	848	869	871	868	858
			Watts	94	138	179	220	265
		370 CFM/ton	CFM	875	909	918	850	872
			Watts	107	153	197	240	284
		400 CFM/ton	CFM	978	994	992	989	980
			Watts	130	179	224	270	316
		430 CFM/ton	CFM	1037	1058	1063	994	1017
			Watts	157	209	258	305	354
		450 CFM/ton	CFM	1093	1096	1082	1065	1051
			Watts	174	227	276	324	378
	3	290 CFM/ton	CFM	816	854	865	798	819
			Watts	92	136	178	220	262
		310 CFM/ton	CFM	881	914	923	855	877
			Watts	108	155	199	242	286
		330 CFM/ton	CFM	945	974	981	912	935
			Watts	127	176	222	266	313
		350 CFM/ton	CFM	1029	1043	1043	1035	1028
			Watts	148	199	246	292	340
		370 CFM/ton	CFM	1074	1093	1097	1027	1050
			Watts	170	224	274	322	372
		400 CFM/ton	CFM	1170	1181	1184	1180	1174
			Watts	206	262	317	370	423
		430 CFM/ton	CFM	1268	1276	1270	1199	1224
			Watts	254	314	372	430	484
		450 CFM/ton	CFM	1321	1321	1306	1295	1251
			Watts	287	351	415	477	518
	3.5	290 CFM/ton	CFM	972	998	1005	936	959
			Watts	135	185	232	277	324
		310 CFM/ton	CFM	1047	1068	1073	1003	1026
			Watts	161	213	262	310	359
		330 CFM/ton	CFM	1123	1138	1140	1070	1094
			Watts	189	244	296	347	398
		350 CFM/ton	CFM	1195	1204	1208	1205	1195
			Watts	215	275	329	383	437
		370 CFM/ton	CFM	1273	1278	1275	1204	1228
			Watts	257	317	376	433	488
		400 CFM/ton	CFM	1375	1385	1384	1383	1305
			Watts	316	383	444	513	513
		430 CFM/ton	CFM	1499	1487	1491	1392	1303
			Watts	389	457	513	513	513
		450 CFM/ton	CFM	1513	1512	1508	1418	1341
			Watts	398	470	529	524	522

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z"
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.

NOTE:
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

*UHM AIRFLOW – COOLING

***UHMC100CCV4VA^** Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter

	Unit Outdoor	Airflow Setting		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2.5	290 CFM/ton	CFM	714	734	739	733	722
			Watts	79	118	157	194	231
		310 CFM/ton	CFM	765	784	789	782	770
			Watts	88	128	168	206	244
		330 CFM/ton	CFM	816	834	838	831	819
			Watts	96	138	179	220	258
		350 CFM/ton	CFM	868	884	887	880	867
			Watts	103	149	192	234	273
		370 CFM/ton	CFM	919	934	936	929	916
			Watts	117	161	205	249	290
		400 CFM/ton	CFM	995	1009	1009	1002	989
			Watts	135	181	227	274	316
		430 CFM/ton	CFM	1072	1084	1083	1075	1061
			Watts	156	204	253	302	346
		450 CFM/ton	CFM	1123	1134	1132	1124	1110
			Watts	171	220	271	322	368
	3	290 CFM/ton	CFM	862	879	882	875	863
			Watts	105	148	190	232	272
		310 CFM/ton	CFM	924	939	941	934	921
			Watts	118	162	207	250	291
		330 CFM/ton	CFM	985	999	1000	992	979
			Watts	133	178	224	270	313
		350 CFM/ton	CFM	1046	1059	1059	1051	1037
			Watts	149	196	244	292	336
		370 CFM/ton	CFM	1108	1119	1117	1109	1095
			Watts	167	215	265	316	362
		400 CFM/ton	CFM	1200	1209	1206	1197	1183
			Watts	197	248	301	355	404
		430 CFM/ton	CFM	1292	1299	1294	1285	1270
			Watts	232	286	343	400	453
		450 CFM/ton	CFM	1353	1359	1353	1344	1328
			Watts	258	314	373	432	488
	3.5	290 CFM/ton	CFM	1011	1024	1024	1017	1003
			Watts	139	185	232	279	322
		310 CFM/ton	CFM	1082	1094	1093	1085	1071
			Watts	159	207	256	306	351
		330 CFM/ton	CFM	1154	1164	1162	1153	1139
			Watts	181	231	283	335	382
		350 CFM/ton	CFM	1225	1234	1230	1222	1207
			Watts	206	258	312	367	417
		370 CFM/ton	CFM	1297	1304	1299	1290	1275
			Watts	234	288	345	402	455
		400 CFM/ton	CFM	1404	1409	1402	1393	1377
			Watts	281	340	400	462	520
		430 CFM/ton	CFM	1512	1514	1505	1495	1478
			Watts	336	399	464	530	595
		450 CFM/ton	CFM	1583	1584	1574	1564	1546
			Watts	377	444	512	580	650
	4	290 CFM/ton	CFM	1159	1169	1167	1158	1144
			Watts	183	233	285	337	385
		310 CFM/ton	CFM	1241	1249	1245	1236	1221
			Watts	212	264	319	374	425
		330 CFM/ton	CFM	1323	1329	1324	1315	1299
			Watts	244	300	358	416	470
		350 CFM/ton	CFM	1404	1409	1402	1393	1377
			Watts	281	340	400	462	520
		370 CFM/ton	CFM	1486	1489	1481	1471	1454
			Watts	322	384	448	513	576
		400 CFM/ton	CFM	1609	1609	1599	1588	1571
			Watts	393	461	530	599	671
		430 CFM/ton	CFM	1732	1730	1716	1705	1687
			Watts	475	550	624	698	781
		450 CFM/ton	CFM	1813	1810	1795	1783	1765
			Watts	536	617	694	772	864

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z"
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.

NOTE:
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

*UHM AIRFLOW – COOLING

***UHMD120CCV5VA^** Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter

	Unit Outdoor			External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	3.5	290 CFM/ton	CFM	1000	1024	1028	1022	1011
			Watts	122	168	209	251	300
		310 CFM/ton	CFM	1072	1094	1097	1089	1076
			Watts	140	188	234	281	331
		330 CFM/ton	CFM	1143	1164	1165	1157	1141
			Watts	160	211	261	313	364
		350 CFM/ton	CFM	1214	1233	1234	1224	1207
			Watts	182	236	291	347	400
		370 CFM/ton	CFM	1286	1303	1302	1291	1272
			Watts	207	264	323	384	438
		400 CFM/ton	CFM	1393	1408	1405	1392	1370
			Watts	250	311	377	444	500
		430 CFM/ton	CFM	1500	1513	1508	1492	1468
			Watts	300	365	437	509	565
		450 CFM/ton	CFM	1571	1582	1576	1559	1533
			Watts	337	406	481	555	611
	4	290 CFM/ton	CFM	1148	1169	1170	1161	1146
			Watts	161	213	263	315	367
		310 CFM/ton	CFM	1230	1248	1248	1238	1221
			Watts	187	242	297	355	408
		330 CFM/ton	CFM	1311	1328	1327	1315	1295
			Watts	217	274	335	398	452
		350 CFM/ton	CFM	1393	1408	1405	1392	1370
			Watts	250	311	377	444	500
		370 CFM/ton	CFM	1474	1488	1483	1468	1445
			Watts	287	352	422	493	549
		400 CFM/ton	CFM	1597	1607	1601	1583	1556
			Watts	352	421	497	572	628
		430 CFM/ton	CFM	1719	1727	1718	1699	1668
			Watts	427	503	581	655	711
		450 CFM/ton	CFM	1801	1807	1797	1775	1743
			Watts	483	563	642	712	768
	5	290 CFM/ton	CFM	1444	1458	1454	1440	1417
			Watts	273	336	405	475	530
		310 CFM/ton	CFM	1546	1557	1552	1535	1510
			Watts	324	391	465	538	594
		330 CFM/ton	CFM	1648	1657	1650	1631	1603
			Watts	381	454	531	606	662
		350 CFM/ton	CFM	1750	1757	1748	1727	1696
			Watts	447	525	603	676	732
		370 CFM/ton	CFM	1852	1857	1845	1823	1790
			Watts	522	604	682	749	804
		400 CFM/ton	CFM	2004	2006	1992	1967	1947
			Watts	651	742	811	863	966
		430 CFM/ton	CFM	2157	2156	2140	2050	1947
			Watts	803	902	966	966	966
		450 CFM/ton	CFM	2259	2255	2140	2050	1947
			Watts	966	966	966	966	966

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z"
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.

NOTE:
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

*UHM AIRFLOW – COOLING

*DHMB060CCV3VA^ Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure (iwc)								
Minimum Stage Capacity = 23,000								
Maximum Stage Capacity = 57,000								
	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
40% (Low) Heat	Low	414	CFM	501	477	452	427	403
			Temp. Rise	43	45	46	47	49
			Watts	32	56	80	103	127
	Medium-Low	437	CFM	511	506	502	497	492
			Temp. Rise	42	43	43	43	43
			Watts	33	58	83	107	132
	Medium**	478	CFM	543	530	517	504	491
			Temp. Rise	41	40	40	39	39
			Watts	37	62	88	113	139
	High	534	CFM	584	560	536	512	488
			Temp. Rise	38	38	38	38	39
			Watts	43	72	100	129	157
65% (Medium) Heat	Low	603	CFM	646	644	642	641	639
			Temp. Rise	54	54	54	54	54
			Watts	50	82	114	146	178
	Medium-Low	637	CFM	683	672	660	649	637
			Temp. Rise	52	53	54	55	56
			Watts	55	87	120	152	185
	Medium**	697	CFM	712	723	733	744	755
			Temp. Rise	50	49	48	47	46
			Watts	65	101	138	174	210
	High	777	CFM	782	799	816	833	850
			Temp. Rise	45	44	43	41	40
			Watts	81	121	161	202	242
100% (High) Heat	Low	900	CFM	909	911	913	914	916
			Temp. Rise	57	56	56	55	55
			Watts	111	155	199	242	286
	Medium-Low	950	CFM	967	966	964	962	961
			Temp. Rise	52	52	52	52	52
			Watts	127	174	220	266	312
	Medium**	1040	CFM	1050	1050	1050	1050	1050
			Temp. Rise	49	48	48	48	47
			Watts	157	210	262	314	367
	High	1160	CFM	1148	1152	1157	1161	1165
			Temp. Rise	45	44	43	43	42
			Watts	209	266	324	382	440

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z".
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.
6. Target airflow is field selectable for high (100%) heat. Target airflow for low and medium heat are percentages of high heat and are not field selectable.

*UHM AIRFLOW – COOLING

*DHMB080CCV3VA^ Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure (iwc)								
Minimum Stage Capacity = 32,000								
Maximum Stage Capacity = 76,000								
	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
40% (Low) Heat	Low	676	CFM	662	672	681	691	701
			Temp. Rise	43	40	38	35	33
			Watts	59	99	139	179	218
	Medium-Low	702	CFM	695	718	742	765	788
			Temp. Rise	41	40	38	36	34
			Watts	65	105	146	186	227
	Medium**	728	CFM	728	728	729	730	730
			Temp. Rise	39	39	40	40	40
			Watts	70	106	143	179	215
	High	837	CFM	824	827	831	835	839
			Temp. Rise	34	35	36	37	38
			Watts	94	141	187	234	280
65% (Medium) Heat	Low	923	CFM	899	903	906	909	913
			Temp. Rise	42	40	38	37	35
			Watts	117	163	208	253	299
	Medium-Low	959	CFM	931	943	955	966	978
			Temp. Rise	40	38	37	35	34
			Watts	129	178	227	276	325
	Medium**	994	CFM	961	998	1035	1071	1108
			Temp. Rise	38	36	33	31	28
			Watts	140	198	256	315	373
	High	1143	CFM	1132	1143	1154	1166	1177
			Temp. Rise	33	31	30	28	27
			Watts	205	270	336	401	466
100% (High) Heat	Low	1300	CFM	1325	1324	1323	1322	1321
			Temp. Rise	50	50	49	49	49
			Watts	300	372	444	517	589
	Medium-Low	1350	CFM	1368	1372	1376	1380	1384
			Temp. Rise	48	48	47	47	47
			Watts	341	418	495	572	648
	Medium**	1400	CFM	1405	1411	1417	1423	1429
			Temp. Rise	47	46	46	45	45
			Watts	379	457	535	613	691
	High	1610	CFM	1589	1535	1481	1427	1373
			Temp. Rise	42	43	44	45	46
			Watts	555	579	602	626	649

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be “A” through “Z”.
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.
6. Target airflow is field selectable for high (100%) heat. Target airflow for low and medium heat are percentages of high heat and are not field selectable.

*UHM AIRFLOW – COOLING

*DHMC100CCV4VA^ Furnace Heating Airflow (CFM), Temp. Rise (°F), and Power (Watts) vs. External Static Pressure (iwc)								
Minimum Stage Capacity = 32,000								
Maximum Stage Capacity = 76,000								
	Airflow Setting	Target Airflow		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
40% (Low) Heat	Low	660	CFM	676	687	697	707	718
			Temp. Rise	53	52	51	50	50
			Watts	47	82	118	153	189
	Medium-Low	704	CFM	710	722	735	747	759
			Temp. Rise	50	49	49	48	48
			Watts	51	89	127	164	202
	Medium**	726	CFM	725	746	767	788	809
			Temp. Rise	49	48	47	47	46
			Watts	54	90	126	162	198
	High	748	CFM	746	765	784	804	823
			Temp. Rise	47	47	46	45	45
			Watts	56	94	133	171	210
65% (Medium) Heat	Low	1080	CFM	1103	1105	1107	1109	1111
			Temp. Rise	53	53	53	52	52
			Watts	128	182	236	290	343
	Medium-Low	1152	CFM	1170	1180	1191	1201	1211
			Temp. Rise	50	50	49	49	49
			Watts	160	213	267	320	374
	Medium**	1188	CFM	1196	1204	1212	1220	1228
			Temp. Rise	49	48	48	48	47
			Watts	167	227	288	348	409
	High	1224	CFM	1242	1239	1237	1234	1232
			Temp. Rise	47	47	47	46	46
			Watts	180	241	303	364	426
100% (High) Heat	Low	1500	CFM	1469	1479	1490	1500	1511
			Temp. Rise	61	60	60	59	58
			Watts	272	355	438	520	603
	Medium-Low	1600	CFM	1570	1576	1582	1588	1594
			Temp. Rise	57	57	56	56	55
			Watts	328	408	489	569	650
	Medium**	1650	CFM	1622	1626	1630	1634	1638
			Temp. Rise	55	55	55	54	54
			Watts	365	451	537	624	710
	High	1700	CFM	1673	1677	1681	1684	1688
			Temp. Rise	54	53	53	53	52
			Watts	397	497	597	697	797

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z".
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.
6. Target airflow is field selectable for high (100%) heat. Target airflow for low and medium heat are percentages of high heat and are not field selectable.

*DHM AIRFLOW – HEATING

***DHMD120CCV5VA^** Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter								
	Airflow Setting	Target Airflow (See Note 5)		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
40% (low) Heat	Low	780	CFM	827	870	800	779	785
			Temp. Rise	57	55	59	61	60
			Watts	76	98	142	175	212
	Medium Low	827	CFM	871	917	846	827	834
			Temp. Rise	55	52	56	57	57
			Watts	85	108	153	188	226
	Medium**	870	CFM	911	959	889	872	878
			Temp. Rise	52	50	53	54	54
			Watts	94	117	165	201	240
	High	959	CFM	994	1047	977	964	969
			Temp. Rise	48	45	49	49	49
			Watts	116	140	191	230	272
65% (medium) Heat	Low	1195	CFM	1214	1282	1211	1209	1212
			Temp. Rise	57	54	57	57	57
			Watts	193	223	285	334	385
	Medium Low	1267	CFM	1281	1353	1282	1283	1286
			Temp. Rise	54	51	54	53	53
			Watts	224	255	322	375	431
	Medium**	1469	CFM	1470	1553	1482	1493	1493
			Temp. Rise	47	44	46	46	46
			Watts	329	366	449	517	592
	High	1685	CFM	1671	1767	1696	1717	1715
			Temp. Rise	41	39	40	40	40
			Watts	479	519	633	722	831
100% (high) Heat	Low	1660	CFM	1648	1743	1671	1691	1690
			Temp. Rise	64	61	63	62	62
			Watts	459	499	609	695	799
	Medium Low	1760	CFM	1741	1842	1770	1795	1792
			Temp. Rise	61	57	60	59	59
			Watts	541	582	709	808	932
	Medium**	1850	CFM	1825	1931	1859	1888	1885
			Temp. Rise	58	55	57	56	56
			Watts	624	663	811	922	1068
	High	2040	CFM	2002	1983	1977	1902	1853
			Temp. Rise	53	53	53	55	57
			Watts	827	925	925	925	925

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be “A” through “Z”.
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.
6. Target airflow is field selectable for high (100%) heat. Target airflow for low and medium heat are percentages of high heat and are not field selectable.

*DHM AIRFLOW – COOLING

***DHMB060CCV3VA^** Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter

	Unit Outdoor Size (tons)	Airflow Setting		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	1.5	290 CFM/ton	CFM	458	456	477	481	491
			Watts	28	52	73	92	118
		310 CFM/ton	CFM	487	485	504	507	515
			Watts	32	56	77	97	124
		330 CFM/ton	CFM	516	514	532	533	540
			Watts	36	61	82	104	132
		350 CFM/ton	CFM	545	543	559	560	564
			Watts	40	66	88	111	141
		370 CFM/ton	CFM	574	572	586	586	589
			Watts	45	72	95	120	151
		400 CFM/ton	CFM	617	615	627	625	625
			Watts	54	81	107	135	169
		430 CFM/ton	CFM	660	658	668	665	662
			Watts	63	91	120	152	189
		450 CFM/ton	CFM	689	687	695	691	686
			Watts	70	99	130	164	203
	2	290 CFM/ton	CFM	598	596	609	608	609
			Watts	50	77	101	128	161
		310 CFM/ton	CFM	636	634	645	643	641
			Watts	58	85	113	142	177
		330 CFM/ton	CFM	675	673	682	678	674
			Watts	66	95	125	158	196
		350 CFM/ton	CFM	713	711	718	713	706
			Watts	76	105	139	175	216
		370 CFM/ton	CFM	752	750	754	748	739
			Watts	87	117	154	193	236
		400 CFM/ton	CFM	810	808	809	800	788
			Watts	104	136	178	222	269
		430 CFM/ton	CFM	868	866	863	853	836
			Watts	125	159	205	253	301
		450 CFM/ton	CFM	906	904	900	888	869
			Watts	140	175	223	274	323
	2.5	290 CFM/ton	CFM	738	735	741	735	727
			Watts	82	113	148	186	228
		310 CFM/ton	CFM	786	784	786	778	767
			Watts	97	128	168	210	255
		330 CFM/ton	CFM	834	832	831	822	808
			Watts	112	145	189	235	282
		350 CFM/ton	CFM	882	880	877	866	849
			Watts	130	164	212	261	310
		370 CFM/ton	CFM	930	928	922	909	889
			Watts	150	186	236	287	337
		400 CFM/ton	CFM	1003	1000	990	975	950
			Watts	183	222	274	326	375
		430 CFM/ton	CFM	1075	1073	1059	1041	1011
			Watts	220	263	314	364	408
		450 CFM/ton	CFM	1123	1121	1104	1084	1052
			Watts	248	294	341	389	427
	3	290 CFM/ton	CFM	877	875	872	861	845
			Watts	128	162	209	258	307
		310 CFM/ton	CFM	935	933	927	914	893
			Watts	152	188	238	289	339
		330 CFM/ton	CFM	993	991	981	966	942
			Watts	178	217	268	321	370
		350 CFM/ton	CFM	1051	1049	1036	1019	991
			Watts	207	249	300	352	398
		370 CFM/ton	CFM	1109	1106	1090	1071	1040
			Watts	239	284	333	381	422
		400 CFM/ton	CFM	1195	1193	1172	1150	1113
			Watts	294	345	384	422	449
		430 CFM/ton	CFM	1282	1280	1254	1229	1186
			Watts	357	414	436	456	463
		450 CFM/ton	CFM	1334	1351	1272	1201	1125
			Watts	405	466	463	459	455

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z"
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.

NOTE:
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

*DHM AIRFLOW – COOLING

***DHMB080CCV3VA^** Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter

	Unit Outdoor	Airflow Setting		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2	290 CFM/ton	CFM	535	558	572	580	580
			Watts	44	74	108	142	175
		310 CFM/ton	CFM	579	601	614	620	619
			Watts	51	82	118	152	187
		330 CFM/ton	CFM	622	643	655	660	659
			Watts	58	92	128	163	199
		350 CFM/ton	CFM	665	697	705	697	694
			Watts	67	104	141	175	214
		370 CFM/ton	CFM	709	728	738	741	737
			Watts	76	113	151	187	225
		400 CFM/ton	CFM	779	802	809	797	793
			Watts	90	131	169	207	250
		430 CFM/ton	CFM	839	854	863	862	855
			Watts	110	152	192	231	272
		450 CFM/ton	CFM	903	917	916	906	891
			Watts	125	168	208	248	287
	2.5	290 CFM/ton	CFM	692	712	723	726	722
			Watts	72	109	146	182	220
		310 CFM/ton	CFM	747	765	774	776	771
			Watts	85	123	162	199	238
		330 CFM/ton	CFM	801	817	826	827	820
			Watts	99	140	179	217	257
		350 CFM/ton	CFM	855	870	878	877	869
			Watts	115	157	198	237	278
		370 CFM/ton	CFM	909	923	930	927	918
			Watts	132	177	218	259	301
		400 CFM/ton	CFM	1005	1014	1014	1003	993
			Watts	164	211	252	295	337
		430 CFM/ton	CFM	1072	1082	1086	1078	1065
			Watts	196	246	291	336	381
		450 CFM/ton	CFM	1126	1134	1137	1129	1114
			Watts	221	272	319	366	411
	3	290 CFM/ton	CFM	849	865	873	872	864
			Watts	113	156	196	235	276
		310 CFM/ton	CFM	915	928	935	932	923
			Watts	134	179	221	261	303
		330 CFM/ton	CFM	980	992	997	993	982
			Watts	158	205	248	290	333
		350 CFM/ton	CFM	1045	1055	1060	1053	1041
			Watts	184	233	278	322	366
		370 CFM/ton	CFM	1110	1119	1122	1114	1100
			Watts	213	264	311	357	402
		400 CFM/ton	CFM	1211	1208	1209	1202	1195
			Watts	260	312	366	418	465
		430 CFM/ton	CFM	1305	1309	1309	1295	1242
			Watts	319	373	428	482	502
		450 CFM/ton	CFM	1370	1372	1371	1320	1242
			Watts	360	415	473	502	502

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z"
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.

NOTE:
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

*DHM AIRFLOW – COOLING

***DHMC100CCV4VA^** Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure With Filter

	Unit Outdoor	Airflow Setting		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	2.5	290 CFM/ton	CFM	723	713	699	682	661
			Watts	58	109	157	204	234
		310 CFM/ton	CFM	773	763	747	729	707
			Watts	72	125	174	222	256
		330 CFM/ton	CFM	823	812	795	776	753
			Watts	87	141	182	241	279
		350 CFM/ton	CFM	873	861	842	823	798
			Watts	103	158	210	260	302
		370 CFM/ton	CFM	923	910	892	870	844
			Watts	120	177	229	279	325
		400 CFM/ton	CFM	998	984	964	940	912
			Watts	148	206	258	309	360
		430 CFM/ton	CFM	1072	1058	1036	1011	981
			Watts	179	238	290	341	396
		450 CFM/ton	CFM	1122	1107	1084	1058	1026
			Watts	201	260	312	362	420
	3	290 CFM/ton	CFM	868	856	839	818	794
			Watts	101	157	208	258	299
		310 CFM/ton	CFM	928	915	896	874	849
			Watts	122	179	231	281	327
		330 CFM/ton	CFM	988	974	954	931	903
			Watts	144	202	254	305	356
		350 CFM/ton	CFM	1047	1033	1012	987	958
			Watts	169	227	279	330	384
		370 CFM/ton	CFM	1107	1092	1070	1044	1013
			Watts	195	253	305	356	413
		400 CFM/ton	CFM	1197	1181	1157	1128	1095
			Watts	237	296	346	395	455
		430 CFM/ton	CFM	1287	1269	1243	1213	1177
			Watts	284	341	390	436	498
		450 CFM/ton	CFM	1347	1329	1301	1269	1232
			Watts	317	373	420	465	526
	3.5	290 CFM/ton	CFM	1013	999	978	954	926
			Watts	154	212	265	315	367
		310 CFM/ton	CFM	1082	1068	1048	1020	990
			Watts	184	242	294	345	401
		330 CFM/ton	CFM	1152	1137	1113	1086	1054
			Watts	215	274	325	375	434
		350 CFM/ton	CFM	1222	1206	1181	1152	1118
			Watts	250	308	358	406	467
		370 CFM/ton	CFM	1292	1274	1248	1218	1182
			Watts	286	344	392	439	500
		400 CFM/ton	CFM	1397	1378	1349	1316	1277
			Watts	346	401	446	489	548
		430 CFM/ton	CFM	1501	1481	1451	1415	1373
			Watts	411	463	503	541	595
		450 CFM/ton	CFM	1571	1550	1518	1481	1437
			Watts	457	507	543	577	625
	4	290 CFM/ton	CFM	1157	1142	1118	1091	1058
			Watts	218	276	328	377	436
		310 CFM/ton	CFM	1237	1220	1195	1166	1131
			Watts	257	315	365	413	474
		330 CFM/ton	CFM	1317	1299	1272	1241	1204
			Watts	300	357	405	450	512
		350 CFM/ton	CFM	1397	1378	1349	1316	1277
			Watts	346	401	446	489	548
		370 CFM/ton	CFM	1476	1456	1426	1392	1350
			Watts	395	448	489	529	584
		400 CFM/ton	CFM	1596	1575	1542	1504	1460
			Watts	474	523	558	591	636
		430 CFM/ton	CFM	1716	1693	1658	1617	1569
			Watts	560	604	631	726	726
		450 CFM/ton	CFM	1796	1771	1735	1693	1642
			Watts	622	661	682	726	726

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z"
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.

NOTE:
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

*DHM AIRFLOW – COOLING

	***DHMD120CCV5VA^** Furnace Cooling Airflow (CFM) & Power (Watts) vs. External Static Pressure w/Filter							
	Unit Outdoor Size (tons)	Airflow Setting		External Static Pressure				
				0.1	0.3	0.5	0.7	0.9
Cooling	3.5	290 CFM/ton	CFM	1046	1103	1032	1027	1022
			Watts	131	157	210	251	295
		310 CFM/ton	CFM	1111	1172	1102	1099	1095
			Watts	153	180	237	280	326
		330 CFM/ton	CFM	1177	1242	1171	1171	1167
			Watts	178	207	266	313	363
		350 CFM/ton	CFM	1242	1311	1240	1243	1240
			Watts	205	236	300	350	404
		370 CFM/ton	CFM	1307	1381	1310	1315	1312
			Watts	236	269	337	392	450
		400 CFM/ton	CFM	1405	1485	1414	1422	1421
			Watts	289	325	401	464	531
		430 CFM/ton	CFM	1503	1589	1518	1530	1530
			Watts	351	389	476	547	627
		450 CFM/ton	CFM	1569	1658	1587	1602	1603
			Watts	397	436	533	610	700
	4	290 CFM/ton	CFM	1181	1247	1176	1176	1172
			Watts	180	209	269	316	365
		310 CFM/ton	CFM	1256	1326	1255	1258	1255
			Watts	212	243	308	359	413
		330 CFM/ton	CFM	1331	1405	1335	1340	1338
			Watts	248	282	352	408	468
		350 CFM/ton	CFM	1405	1485	1414	1422	1421
			Watts	289	325	401	464	531
		370 CFM/ton	CFM	1480	1564	1493	1505	1504
			Watts	336	373	457	526	602
		400 CFM/ton	CFM	1592	1683	1612	1628	1629
			Watts	415	454	554	634	728
		430 CFM/ton	CFM	1704	1802	1731	1751	1753
			Watts	507	548	667	761	877
		450 CFM/ton	CFM	1778	1882	1810	1833	1836
			Watts	577	617	753	857	991
	5	290 CFM/ton	CFM	1452	1534	1463	1474	1473
			Watts	318	354	436	502	574
		310 CFM/ton	CFM	1545	1634	1562	1577	1577
			Watts	380	419	512	587	673
		330 CFM/ton	CFM	1639	1733	1661	1679	1681
			Watts	452	492	599	685	787
		350 CFM/ton	CFM	1732	1832	1760	1782	1784
			Watts	533	573	699	796	918
		370 CFM/ton	CFM	1825	1931	1859	1885	1888
			Watts	624	663	811	922	925
		400 CFM/ton	CFM	1965	2080	1977	1902	1853
			Watts	781	925	925	925	925
		430 CFM/ton	CFM	2064	2229	1977	1902	1853
			Watts	925	925	925	925	925
		450 CFM/ton	CFM	2064	2250	1977	1902	1853
			Watts	925	925	925	925	925

Notes:
1. * First letter may be "A" or "T".
2. ^ Letter may be "A" through "Z"
3. ** Factory setting.
4. Continuous Fan Setting: Heating or cooling airflow is approximately 50% of selected cooling value.
5. LOW 350 cfm/ton is recommended for variable speed application for COMFORT & HUMID CLIMATE setting; NORMAL is 400 cfm/ton; HIGH 450 cfm/ton is for DRY CLIMATE setting.

NOTE:
CONTINUOUS fan mode during COOLING operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

Alert Codes sorted by furnace Flash Codes

Alert codes are taken from the Alert Code Addendum and are organized by the furnace flash codes for easier reference.

Alert Notification				Alert Code	Alert Group	Alert Description
Fault LED	COM LED	User Interface Display	Control Display			
2 Flash	Device count	RECYCLE	N/A	20	Flame lost or Ignition failure	Flame is off when flame should be detected. Furnace tries to relight itself.
		RETRY				Furnace tries to light, but no flame is detected.
		RECYCLE LO	ERR 22	22	Soft lockout due to flame lost or ignition retries	10 recycles within a single call for heat will cause 1hr lockout.
		RETRY LO				3 ignition attempts in a row within a single call for heat results in 1 hr lockout.
3 Flash	Device count	PS3 OPEN	N/A	1	Pressure Switch Failure	Open Pressure Switch, third stage
		PS3 CLOSED				Shorted Pressure Switch, third stage
		PS2 OPEN				Open Pressure Switch, second stage
		PS2 CLOSED				Shorted Pressure Switch, second stage
		PS1 OPEN				Open Pressure Switch, first stage
		PS1 CLOSED				Shorted Pressure Switch, first stage
4 Flash	Device count	AUX LIMIT	ERR 26	26	High Temp Limit Fault	Open Reverse Flow - Heat exchanger temperature too high. Could be caused by low airflow or fan failure.
		HIGH LIMIT				Open High Limit - Heat exchanger temperature too high. Could be caused by low airflow or fan failure.
		ROLLOUT OPEN	ERR 87	87	Roll Out Fault	Open flame rollout
5 Flash	Device count	FLAME ERROR	ERR 34	34	Flame Detect Fault	Flame detected, should not be present
6 Flash	Device count	POLARITY ERR	N/A	33	Line Polarity Fault	Voltage reverse polarity
		GND FAULT	N/A	88	Ground Fault	Occurs when proper earth ground is not detected.
		IGNITER ERR	ERR 10	10	Ignition Means Fault	Igniter fault
		TRIAC ERR				Triac fault
7 Flash	Device count	EXT GV ERR	ERR 93	93	Gas Valve Fault	Control senses 24V present at the gas valve when it should not be present.
Solid ON		INT GV ERR				Control tried to turn on gas valve, but 24V not sensed.
						Control senses 24V present at the gas valve when it should not be present.
8 Flash	Device count	LO FLAME SNS	N/A	4	Low Flame Signal	Flame current is low, but still strong enough to allow operation.
9 Flash	Device count	IND LIMIT	ERR 26	26	High Temp Limit Fault	Flue gas temperature too high. Could be caused by low airflow or fan failure.
10 Flash	Device count	SYS COMM CRC	N/A	90	Communication Busy Fault	COMM system unrecognized response
		IND COMM CRC				Inducer Motor unrecognized response
		BLW COMM CRC				Blower motor unrecognized response
	Device count	BLW COMM ERR	ERR 91	91	Communication Fault	Blower motor no COMM response [1]
		IND COMM ERR				Inducer motor no COMM response
	Fast Flash	SYS COMM ERR				Loss of heat/cool demand
		NO SYS CLK				Loss of clock signal
	Device count	24V COMM MSMTCH	ERR 139	139	Communication Failure	Communication Message has been detected while configured for 24V Mode
Solid ON	Device count	CNTRL FAULT	ERR 18	18	Control Failure	Internal control failure
None	Device count	TWIN ERROR	N/A	19	Twinning Fault	Twinning Not Allowed with Variable Speed
None	Device count	PM DATA ERR	N/A	114	Bad or Missing PM	Data Section is Corrupt but PM is useable
		CAP MISMATCH				Compressor size does not match capacity in PM
		ID MTR ERR	ERR 114			Blower HP/OEM does not match PM Data
		PM MISSING				No PM
		PM UNIT ERR	N/A			Primary Copy of Unit Data File is Corrupt.
		PM MEM ERROR	ERR 114			Primary and Secondary copies of Unit Data File are Corrupt
None	Device count	AC VOLTS LOW	N/A	59	AC Line Fault	Voltage too low
		AC VOLTS HI				Voltage too high
None	Device count	CHECK FUSE	N/A	92	Fuse	24V Fuse Open
None	Device count	Y1 OFF ERR	ERR 101	101	Y1 Relay Failure	Y1 Output OFF when it should be ON
		Y1 ON ERR				Y1 Output ON when it should be OFF
None	Device count	TS 1 SHORT	N/A	119	Temperature Sensor Failure	Temperature sensor 1 shorted.
		TS 1 OPEN				Temperature sensor 1 open.
		TS 2 SHORT				Temperature sensor 2 shorted.
		TS 2 OPEN				Temperature sensor 2 open.
Notes:	[1] Comfort Control will switch system to "OFF" until this fault condition clears					
	D342960P01		PRINTED FROM: D802247P01			

From drawing D802247P01

Service Facts

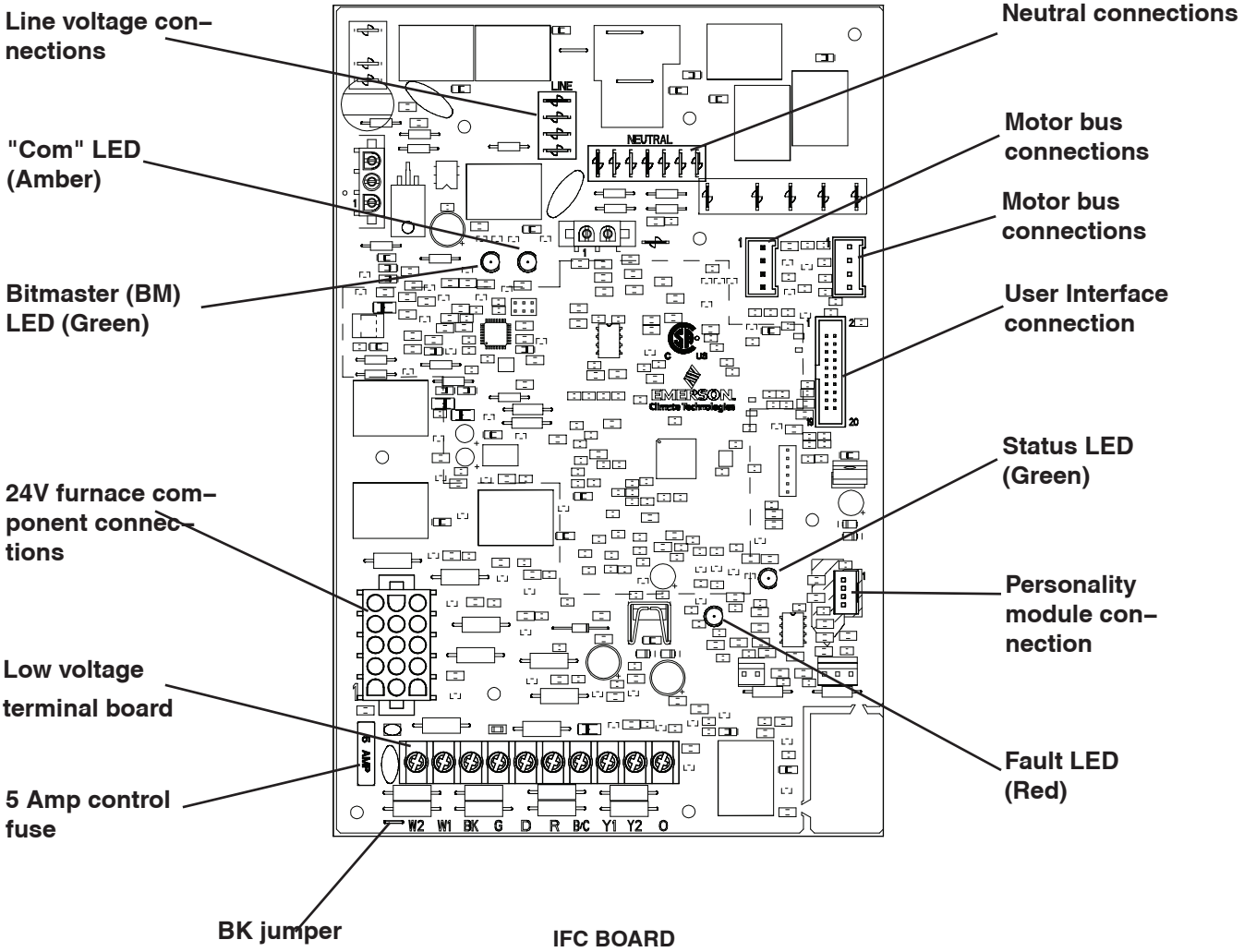
ALERT CODE RECOVERY

On power up, last 4 Alerts, if any, will be flashed on the Red Alert LED. The newest Alert detected will flash first and the oldest last. There will be a 2 second delay between Alert Code flashes. Solid Red LED error codes will not be displayed.

The Green BM LED will be on solid when the control is powered. The Green status LED indicator light will operate as shown in the table and the Red LED will flash (one flash) every 20 seconds.

NOTE:
Use the flash code menu for detail of the alerts. Alert codes also are displayed on the User Interface menu using a descriptive text message and on the comfort control display using an alert code number. A complete list of the alert codes is included with the comfort control.

LED	DESCRIPTION	FUNCTION
GREEN	STATUS LED	FAST FLASH - CALL FOR HEAT SLOW FLASH - NO CALL FOR HEAT
RED	ALERT LED	NO. OF FLASHES - SEE DIAGNOSTIC CODES
GREEN (BM)	BITMASTER	ON SOLID WHEN UNIT POWERED
AMBER	COM	FLASHES DEVICE COUNT



IFC BOARD

Troubleshooting Flowchart Index

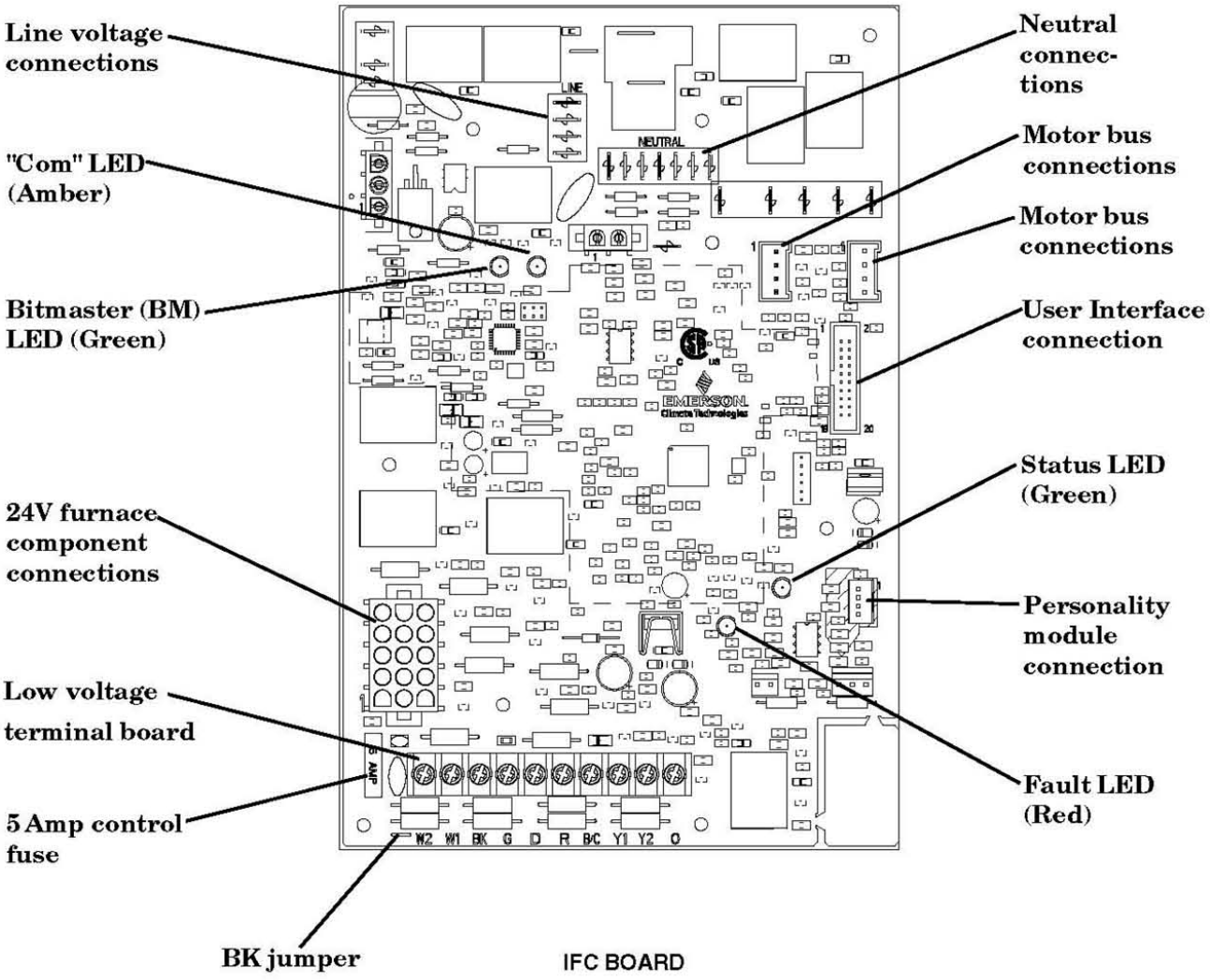
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The following pages include troubleshooting flowcharts in reference to the modulating 95% communicating furnaces ONLY; using the FAULT LED and the User Interface as starting points.

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

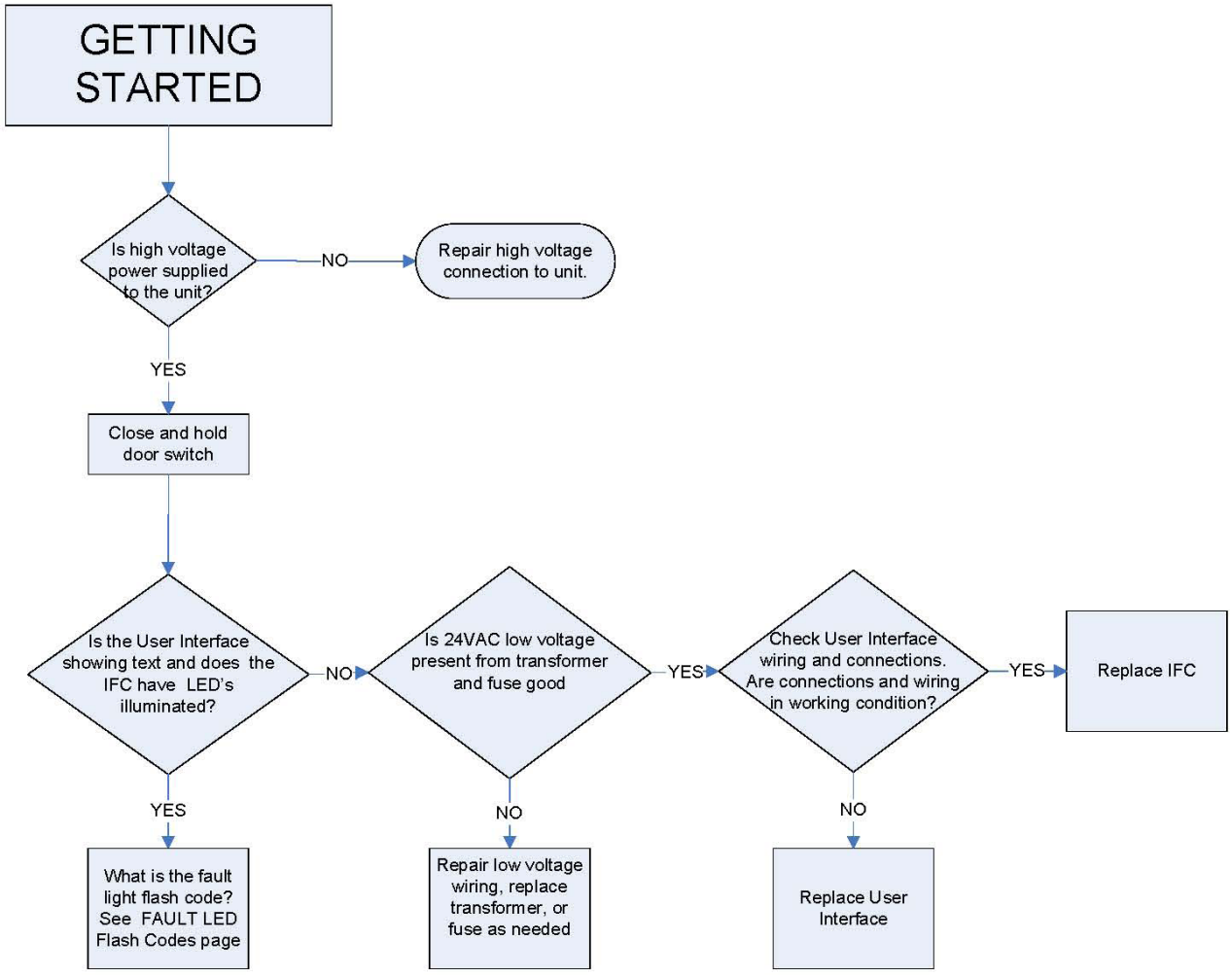
Only qualified technicians should should attempt to install, troubleshoot, or repair this appliance. Failure to follow all cautions and/or warnings could result in personal or property damage; including death.

Integrated Furnace Control (IFC) Component Layout

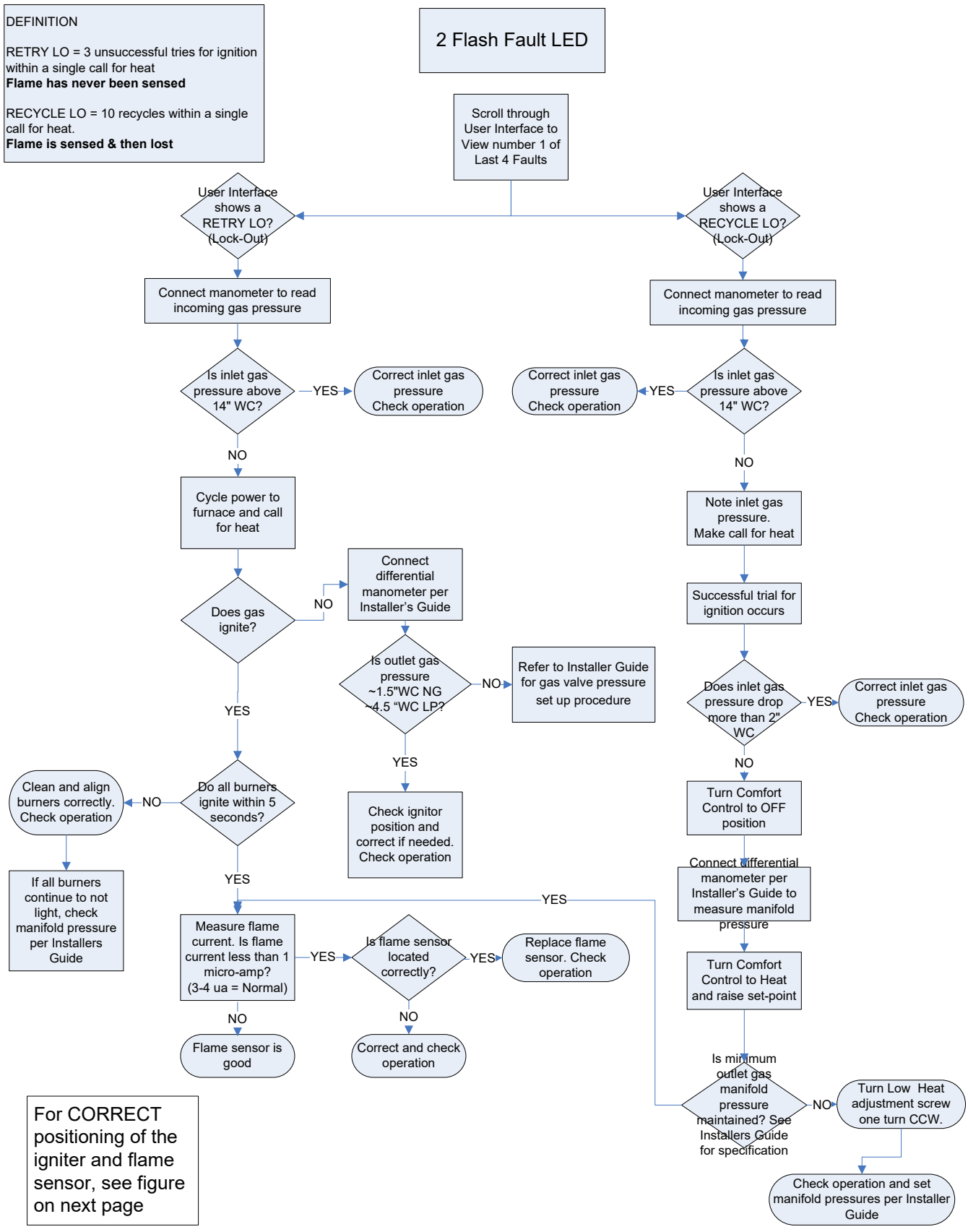


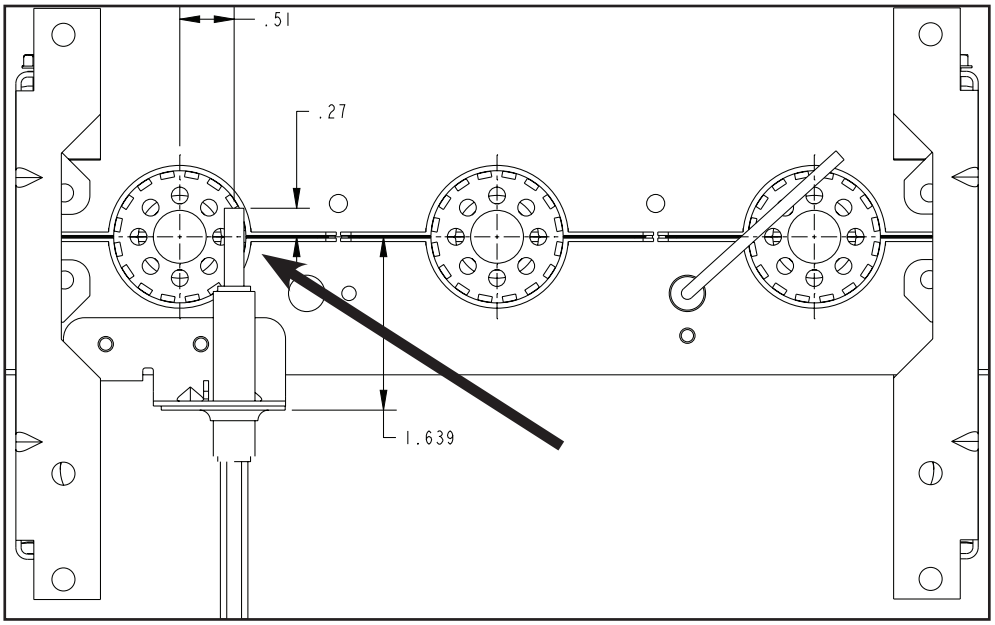
LED Flash Codes

RED LED FLASH	ERROR
2	External Lockout (3 Retries or 11 Recycles Exceeded)
3	Pressure Switch or Inducer Error
4	Open High, Auxiliary, or Roll-out Limit Switch
5	Flame Sensed When No Flame Should Be Present
6	Earth Ground Not Detected or Poor, Reversed Polarity, Igniter or Triac Error
7	External Gas Valve Circuit Error (Voltage present when it should not be)
8	Low Flame Sensor (Less than 1 dc micro-amp)
9	Open Inducer Limit
10	Communiction Error (Loss of communication between comfort control & furnace control)
SOLID RED	Internal Gas Valve Circuit Error (Damaged furnace control)
SOLID RED SOLID STATUS	Continuous Reset Caused by an Internal Error (Damaged furnace control)
RED OFF STATUS OFF	24VAC Fuse Open (Short circuit or high secondary load)



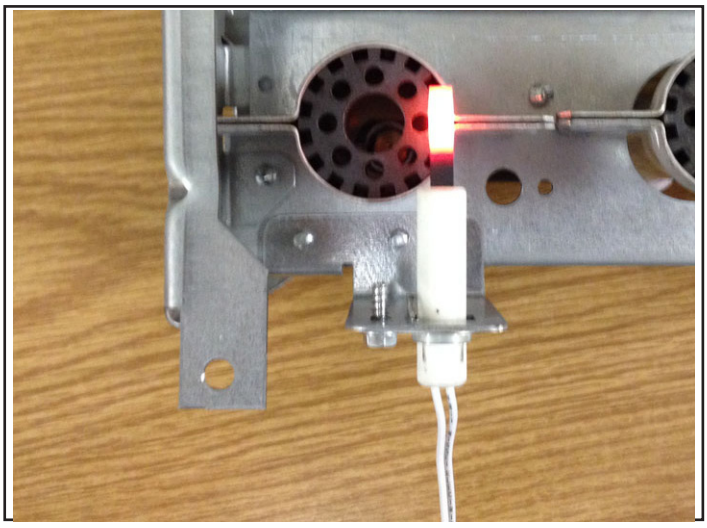
Refer to Communicating Controls Service Manual to supplement this information. Publication Number 34-4093-01


DEFINITION
RETRY LO = 3 unsuccessful tries for ignition within a single call for heat
Flame has never been sensed
RECYCLE LO = 10 recycles within a single call for heat.
Flame is sensed & then lost
2 Flash Fault LED
Scroll through User Interface to View number 1 of Last 4 Faults
User Interface shows a RETRY LO? (Lock-Out)
User Interface shows a RECYCLE LO? (Lock-Out)
Connect manometer to read incoming gas pressure
Connect manometer to read incoming gas pressure
Is inlet gas pressure above 14" WC?
YES
Correct inlet gas pressure Check operation
Correct inlet gas pressure Check operation
YES
Is inlet gas pressure above 14" WC?
NO
NO
Cycle power to furnace and call for heat
Note inlet gas pressure. Make call for heat
Does gas ignite?
NO
Connect differential manometer per Installer's Guide
Successful trial for ignition occurs
Is outlet gas pressure ~1.5"WC NG ~4.5 "WC LP?
NO
Refer to Installer Guide for gas valve pressure set up procedure
Does inlet gas pressure drop more than 2" WC
YES
Correct inlet gas pressure Check operation
YES
NO
Clean and align burners correctly. Check operation
NO
Do all burners ignite within 5 seconds?
Check ignitor position and correct if needed. Check operation
Turn Comfort Control to OFF position
If all burners continue to not light, check manifold pressure per Installers Guide
YES
YES
Connect differential manometer per Installer's Guide to measure manifold pressure
Measure flame current. Is flame current less than 1 micro-amp? (3-4 ua = Normal)
YES
Is flame sensor located correctly?
YES
Replace flame sensor. Check operation
Turn Comfort Control to Heat and raise set-point
NO
NO
Flame sensor is good
Correct and check operation
Is minimum outlet gas manifold pressure maintained? See Installers Guide for specification
NO
Turn Low Heat adjustment screw one turn CCW.
Check operation and set manifold pressures per Installer Guide
For CORRECT positioning of the igniter and flame sensor, see figure on next page



Correct positioning of ignitor and flame sensor.

NOTE the slight over lap of the ignitor and the burner.



Correct positioning of igniter.

HOT ZONE must be centered over the cross-over.

Igniter must overlap burner.

DEFINITION

An error has occurred with either PS1, PS2, or PS3. The error will be reported, indicating that a pressure switch is either opened or closed, contrary to normal operating sequence
In most cases, the pressure switch is not the problem

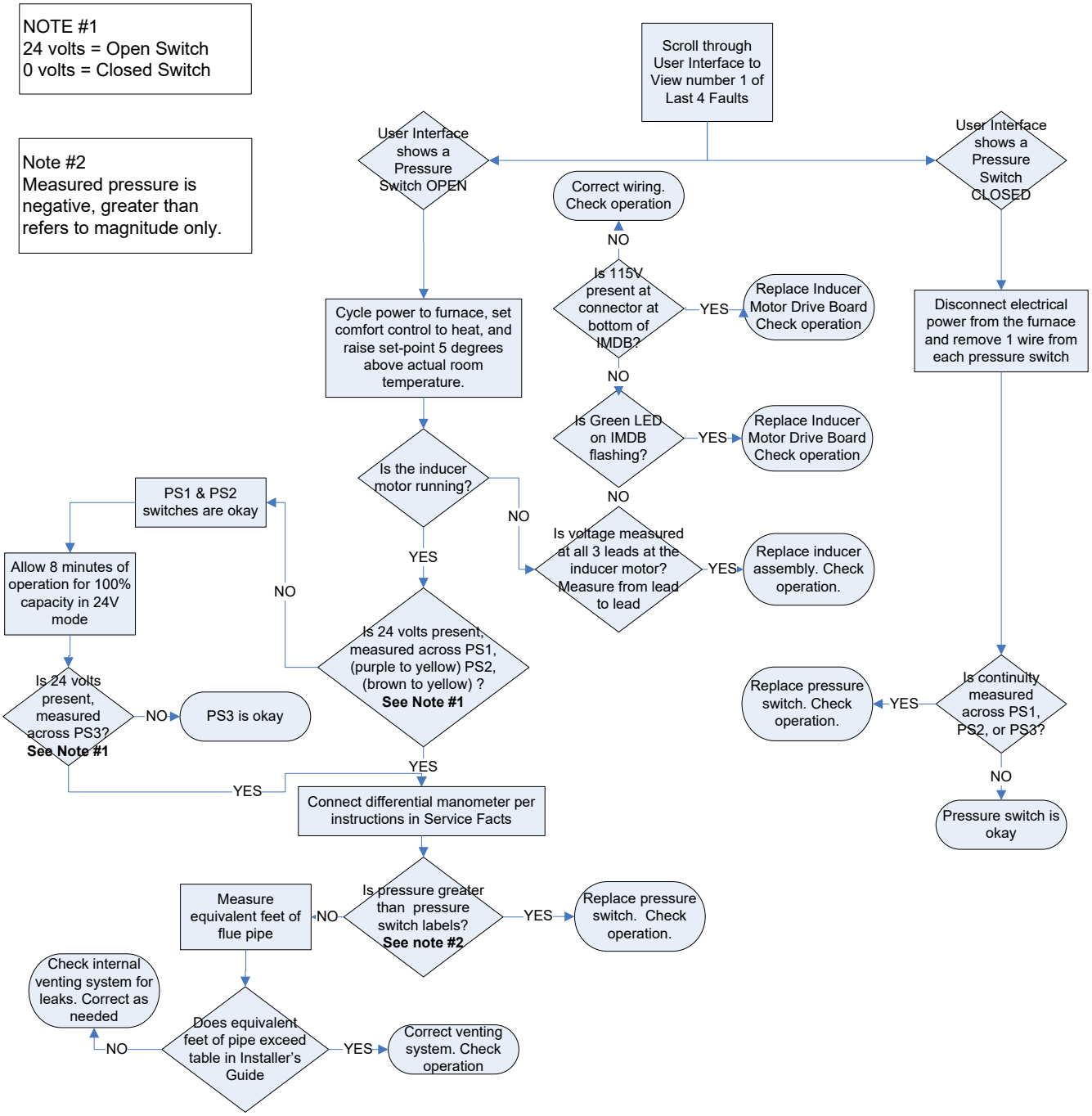
Note: Verify all wiring and pressure switch tubing to pressure switches is correct per the diagrams found in the Service Facts

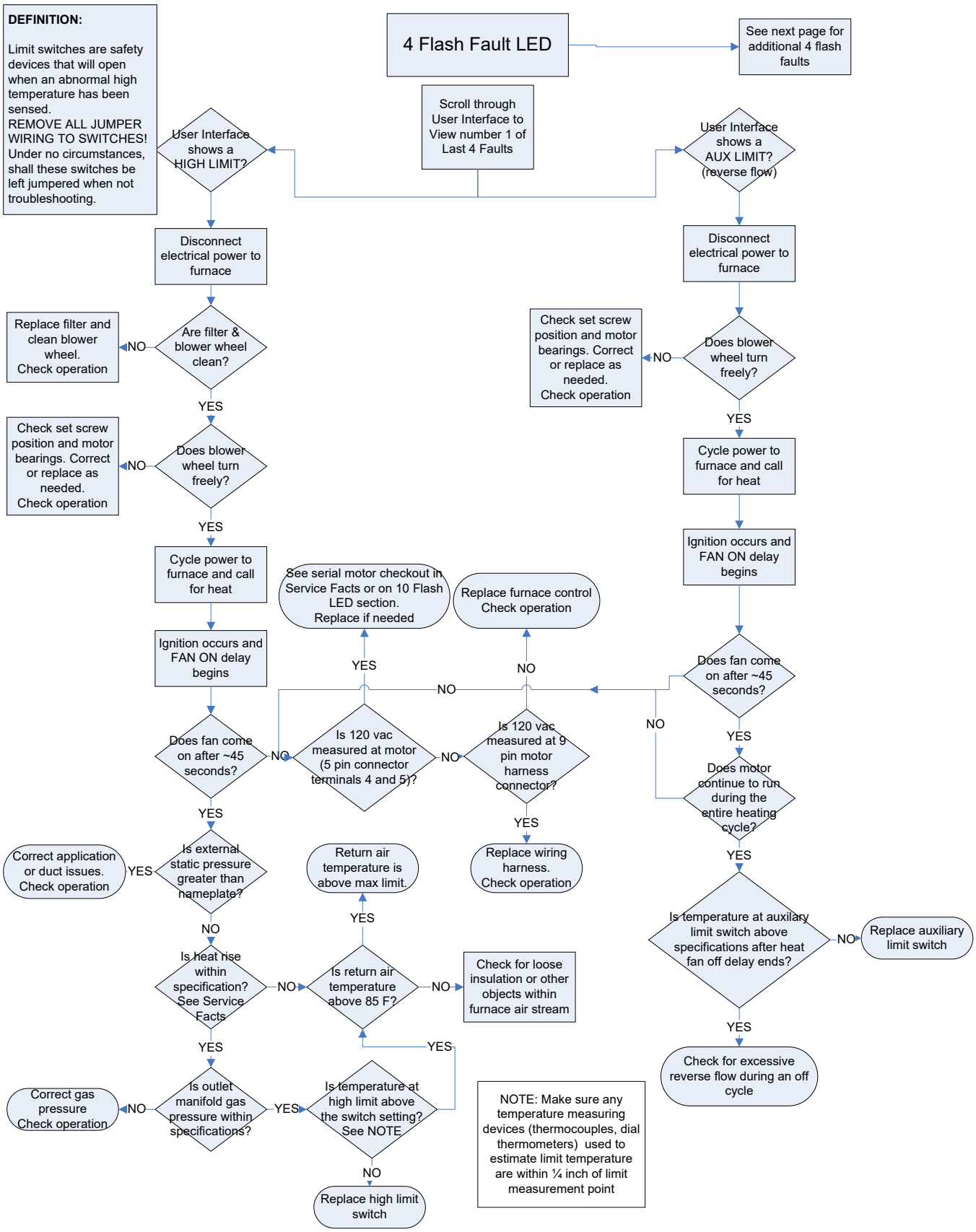
Each time power is interrupted to the furnace (ie. door switch), the furnace will go through an inducer learning routine to determine the most efficient speed to close the pressure switches

3 Flash Fault LED

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

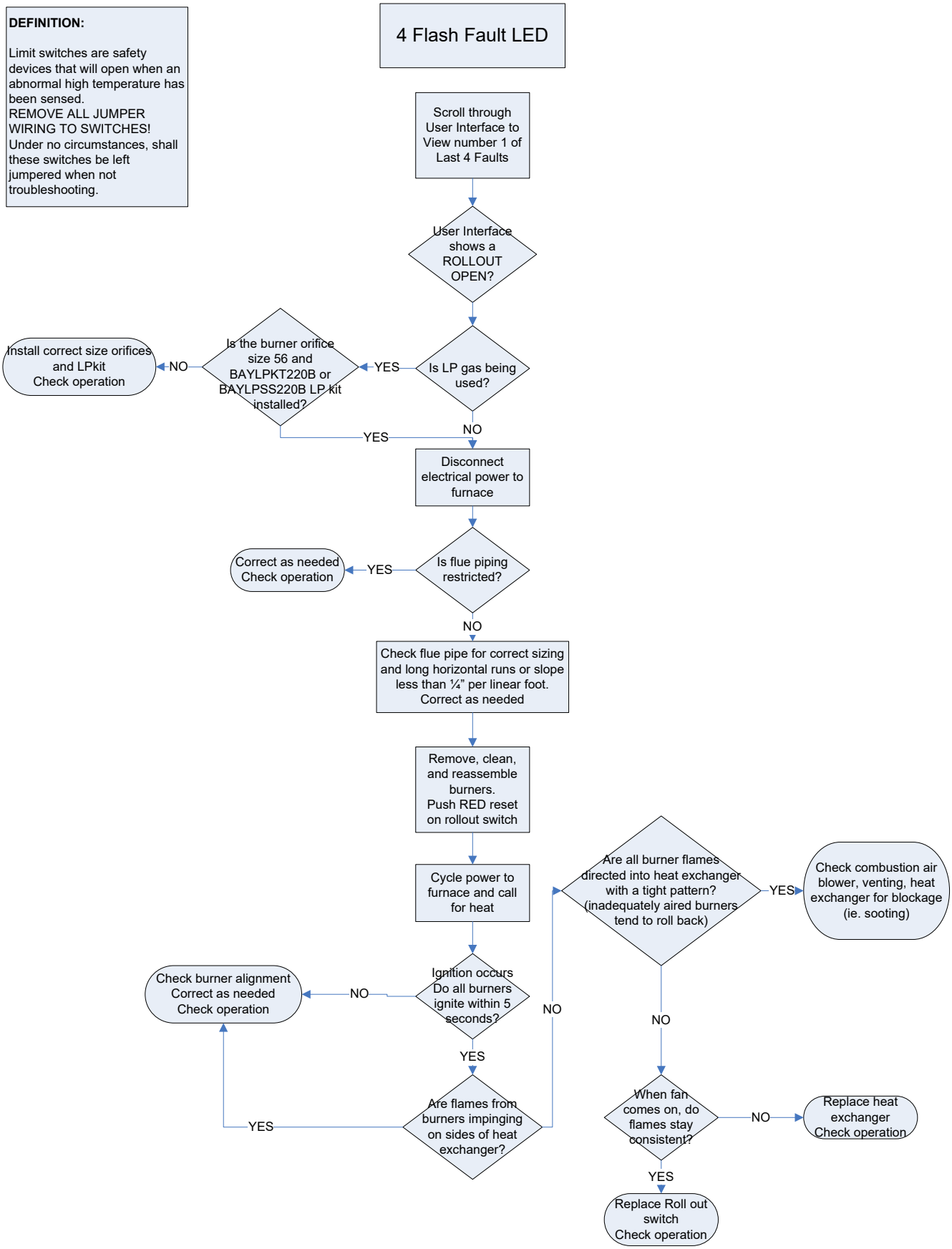
Note #2
Measured pressure is negative, greater than refers to magnitude only.




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.
4 Flash Fault LED
See next page for additional 4 flash faults
Scroll through User Interface to View number 1 of Last 4 Faults
User Interface shows a HIGH LIMIT?
User Interface shows a AUX LIMIT? (reverse flow)
Disconnect electrical power to furnace
Disconnect electrical power to furnace
Replace filter and clean blower wheel. Check operation
NO
Are filter & blower wheel clean?
YES
Check set screw position and motor bearings. Correct or replace as needed. Check operation
NO
Does blower wheel turn freely?
YES
Check set screw position and motor bearings. Correct or replace as needed. Check operation
NO
Does blower wheel turn freely?
YES
Cycle power to furnace and call for heat
Cycle power to furnace and call for heat
Ignition occurs and FAN ON delay begins
See serial motor checkout in Service Facts or on 10 Flash LED section. Replace if needed
Replace furnace control Check operation
Ignition occurs and FAN ON delay begins
YES
NO
Does fan come on after ~45 seconds?
NO
Does fan come on after ~45 seconds?
NO
Is 120 vac measured at motor (5 pin connector terminals 4 and 5)?
NO
Is 120 vac measured at 9 pin motor harness connector?
YES
Does motor continue to run during the entire heating cycle?
YES
YES
Correct application or duct issues. Check operation
YES
Is external static pressure greater than nameplate?
Return air temperature is above max limit.
Replace wiring harness. Check operation
YES
NO
Is heat rise within specification? See Service Facts
NO
Is return air temperature above 85 F?
NO
Check for loose insulation or other objects within furnace air stream
YES
YES
Is temperature at auxilary limit switch above specifications after heat fan off delay ends?
NO
Replace auxiliary limit switch
YES
Check for excessive reverse flow during an off cycle
YES
Correct gas pressure Check operation
NO
Is outlet manifold gas pressure within specifications?
YES
Is temperature at high limit above the switch setting? See NOTE
NO
Replace high limit switch
NOTE: Make sure any temperature measuring devices (thermocouples, dial thermometers) used to estimate limit temperature are within ¼ inch of limit measurement point

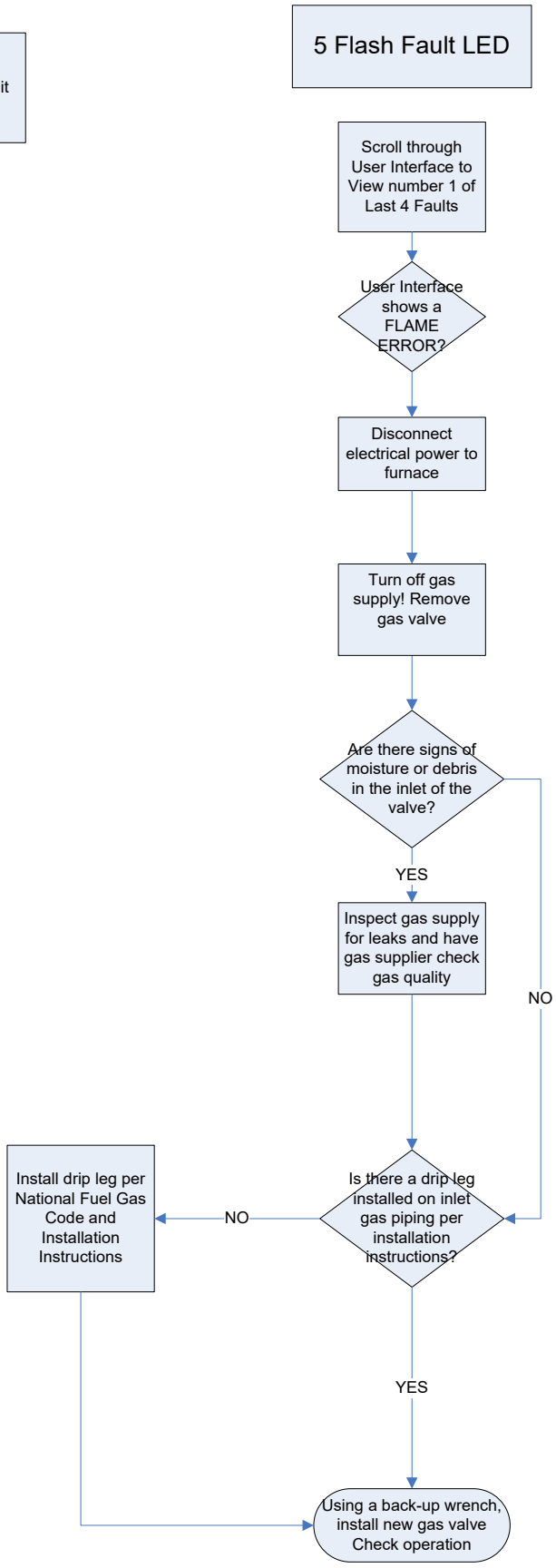
DEFINITION:

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.



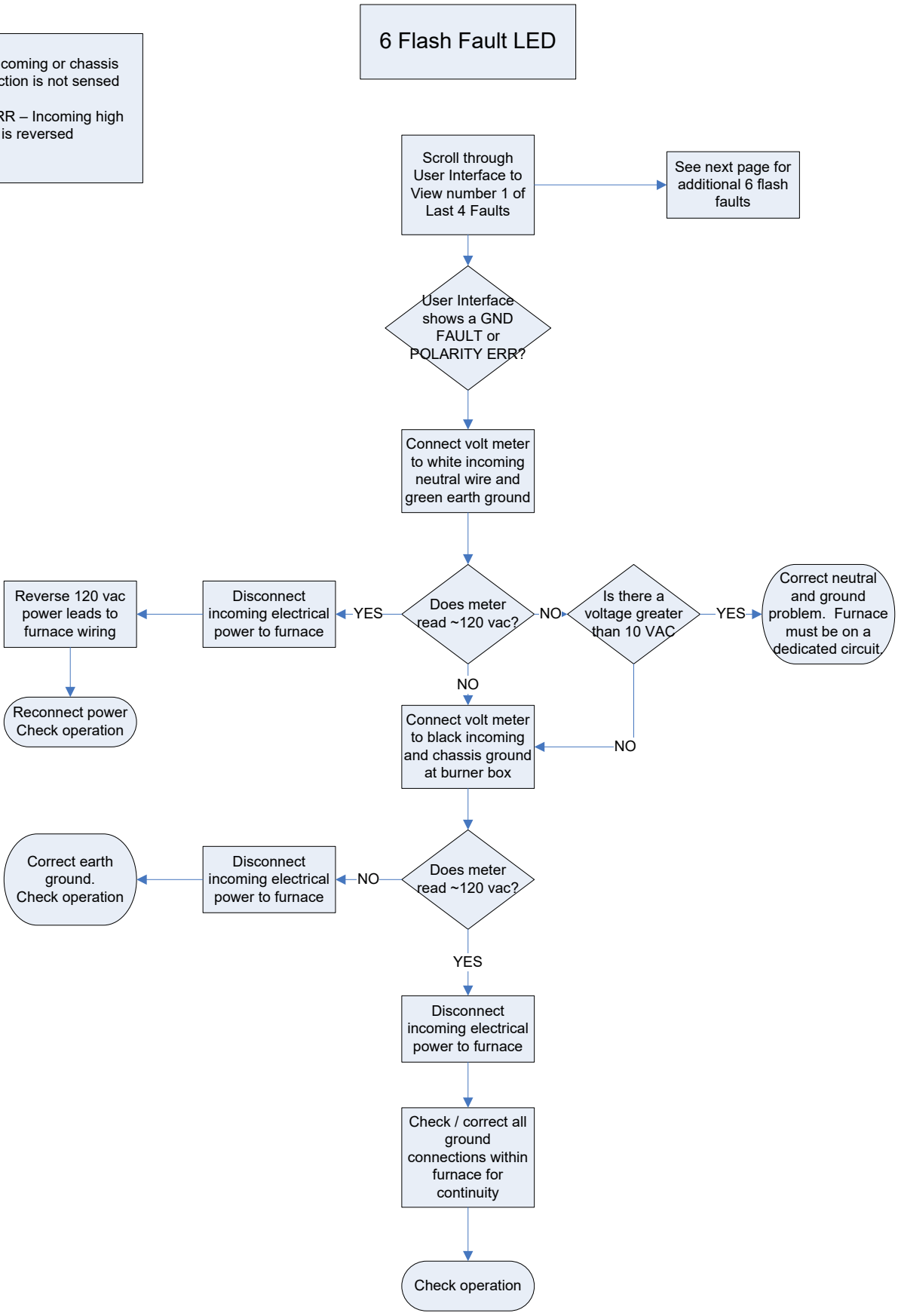
DEFINITION:

Flame is sensed when it should not be sensed.



DEFINITION:
GND ERR - Incoming or chassis ground connection is not sensed

POLARITY ERR – Incoming high voltage wiring is reversed



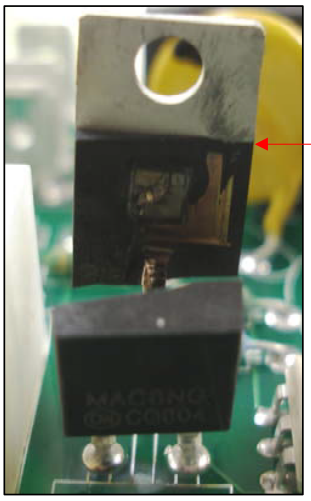
DEFINITION:
TRIAC ERR – The triac reduces voltage applied to the ignitor. A voltage error has been sensed

IGNITOR ERR – The control board has sensed that the ignitor circuit is open or shorted.
The Ignition system is very dependent on good earth ground connections. A poor earth ground can result in multiple ignitor and/or triac failures.

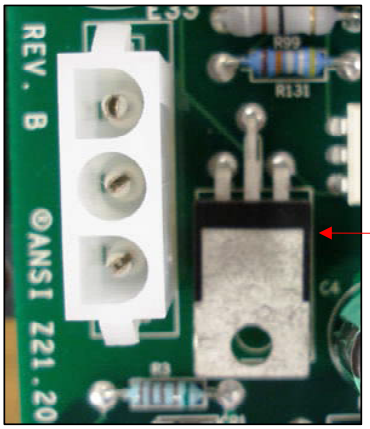
AC VOLTS HI – The control board has sensed that the applied voltage to the ignitor has exceeded it's limit

AC VOLTS LOW – 98 vac nominal

6 Flash Fault LED

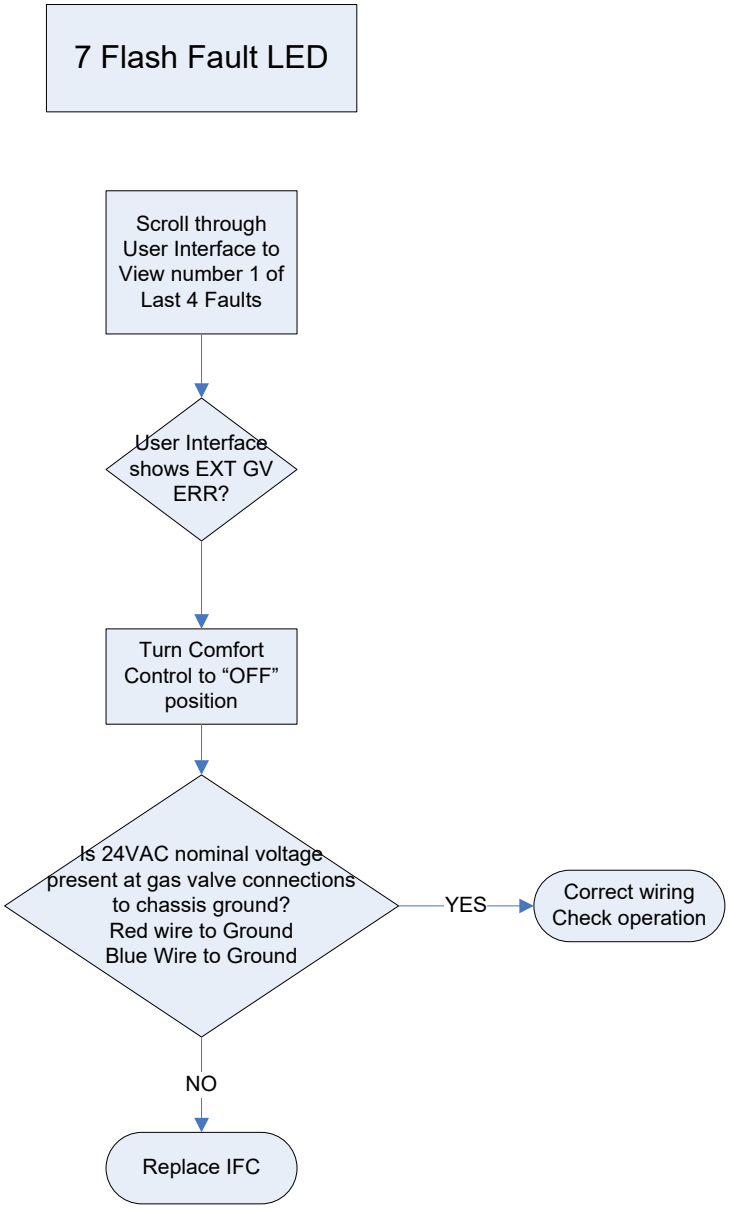


Damaged Triac



Good Triac

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



8 Flash Fault LED

DEFINITION:
The flame sense current is less than 1 micro-amp dc

Scroll through User Interface to View number 1 of Last 4 Faults

User Interface shows LO FLAME SNS?

Disconnect electrical power to the furnace

Connect volt meter leads in series with flame sensor

Meter must be set on dc micro-amp scale

Cycle power to furnace and call for heat

Is flame current measured less than 1.0 micro-amp DC?

YES

Is flame sensor located correctly? See figure

NO

Correct flame sensor location

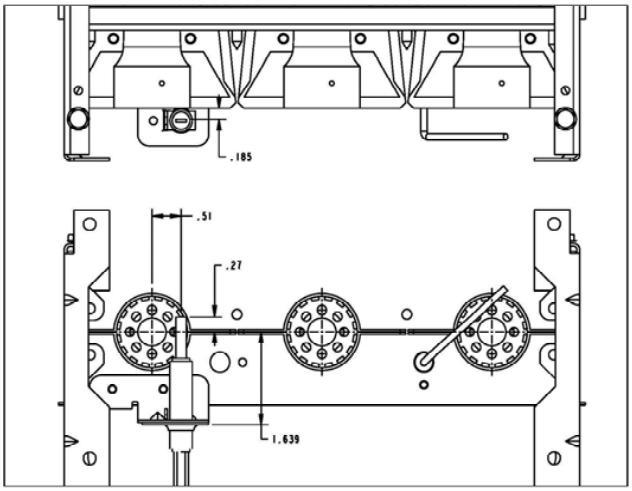
YES

Replace flame sensor

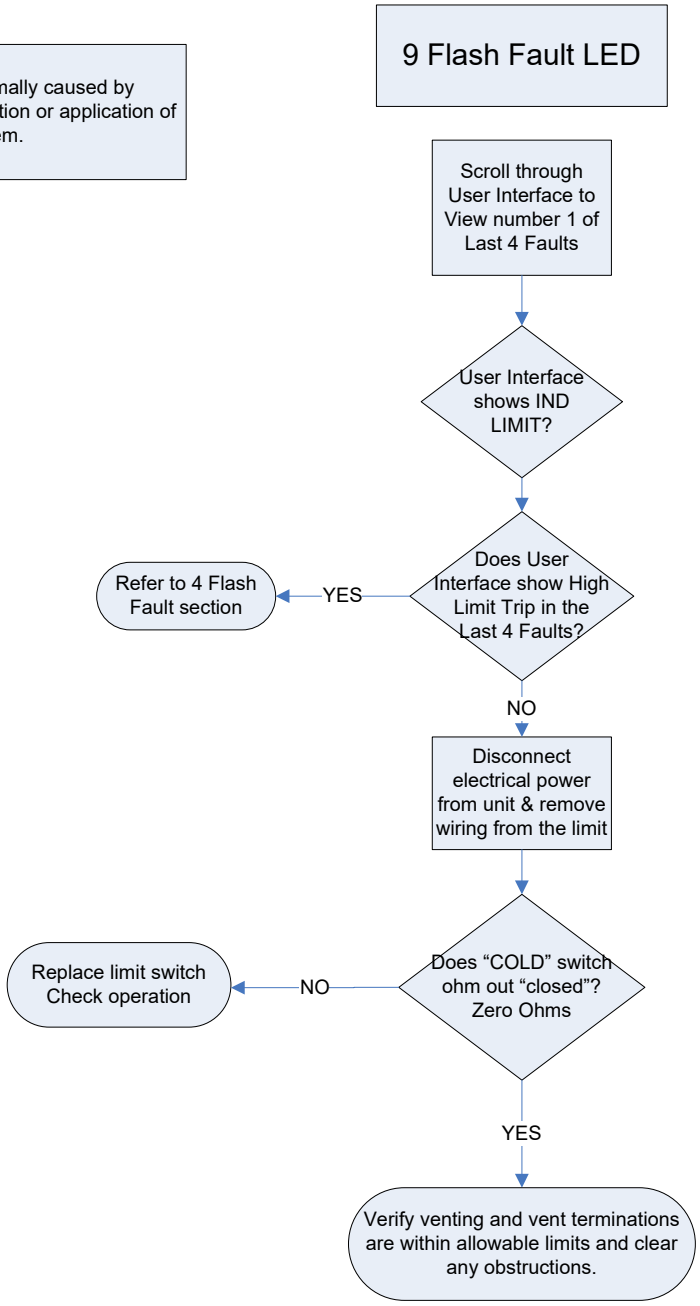
Check operation

NO

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



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



DEFINITION:
This fault can be generated by many communication errors.
The most likely is due to field mis-wiring of the low voltage control wires.
(See Installer Guide for field wiring diagrams)

10 Flash Fault LED

Scroll through User Interface to View number 1 of Last 4 Faults

See next page for additional 10 flash faults

User Interface shows a SYS COMM ERR?

- NO → Is A/TCONT900 comfort control installed? → Install 900 control Check operation
- YES → Is ~12vDC measured from terminals D-B at the IFC?
  - NO → Correct field wiring Check operation, Confirm IFC to A/TCONT900 R to R, D to D, B to B/C are correct. Confirm OD wiring is correct. POLARITY is sensitive between all devices.
  - YES → Is ~12VDC measured at D-B at Comfort Control?
    - NO → Correct field wiring Check operation, Confirm IFC to A/TCONT900 R to R, D to D, B to B/C are correct. Confirm OD wiring is correct. POLARITY is sensitive between all devices.
    - YES → Replace IFC Check operation

User Interface shows a BLW COMM ERR?

- NO → Are serial motor wires firmly connected to motor and IFC? → Correct, replace wiring. Check operation
- YES → Is 120 VAC measured at the line voltage connector at the motor? (5 pin connector terminals 4 and 5)
  - NO → Correct, replace wiring. Check operation
  - YES → See diagram #1 below and Service Facts for serial motor troubleshooting
  - YES → Remove the serial motor wiring harness at the IFC. Apply 24 VAC to wires 3 & 4. → See diagram #2 below and Service Facts for serial motor troubleshooting
    - Does motor run?
      - NO → Replace motor. Check operation
      - YES → Replace IFC. Check operation

DIAGRAM #1

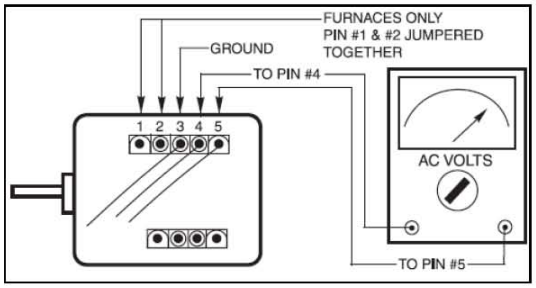
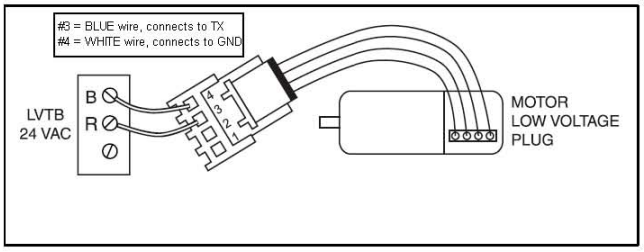
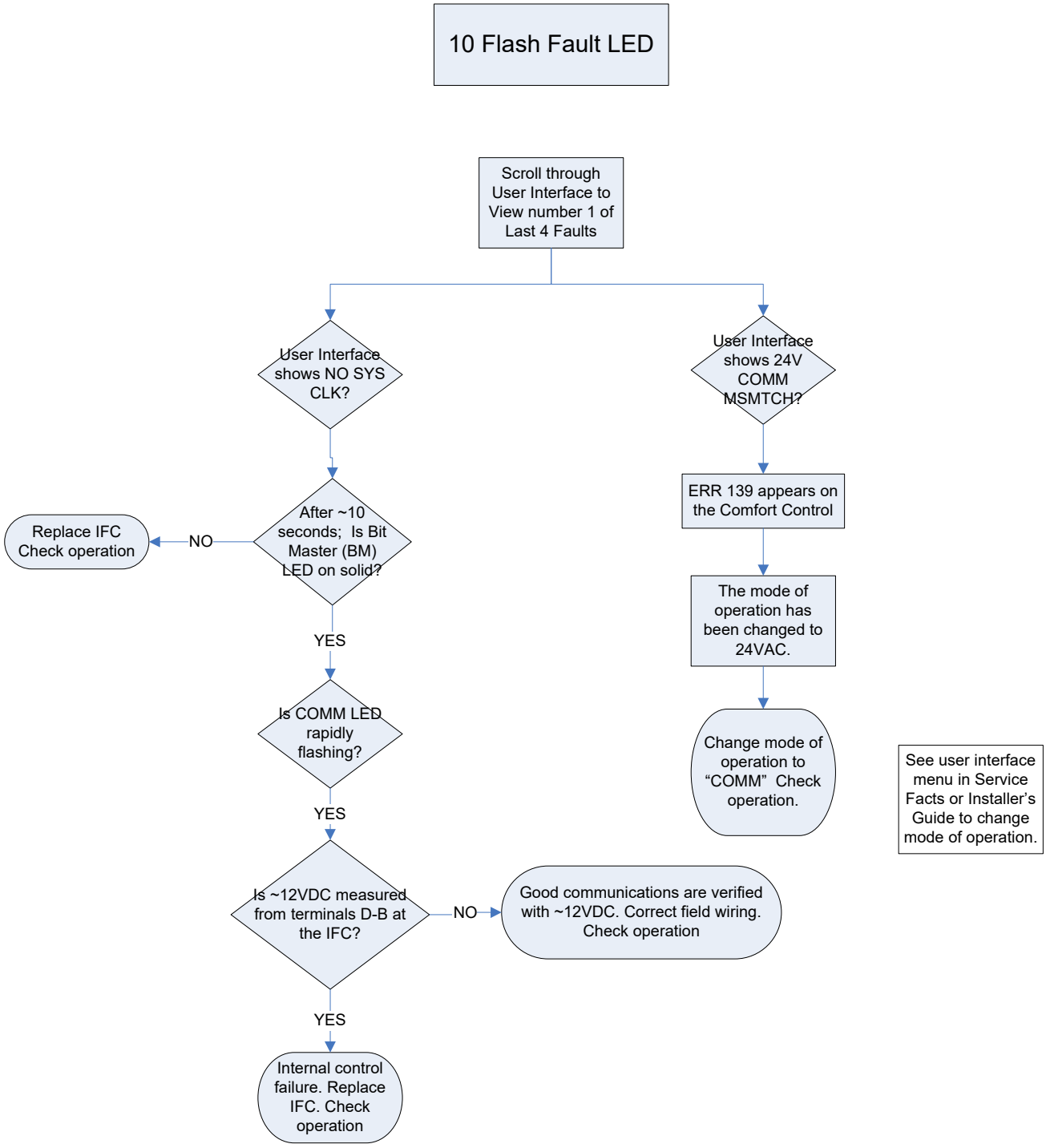


DIAGRAM #2




10 Flash Fault LED
Scroll through User Interface to View number 1 of Last 4 Faults
User Interface shows NO SYS CLK?
User Interface shows 24V COMM MSMTCH?
After ~10 seconds; Is Bit Master (BM) LED on solid?
NO
Replace IFC Check operation
YES
Is COMM LED rapidly flashing?
YES
Is ~12VDC measured from terminals D-B at the IFC?
NO
Good communications are verified with ~12VDC. Correct field wiring. Check operation
YES
Internal control failure. Replace IFC. Check operation
ERR 139 appears on the Comfort Control
The mode of operation has been changed to 24VAC.
Change mode of operation to "COMM" Check operation.
See user interface menu in Service Facts or Installer's Guide to change mode of operation.

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

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Supersedes UHM-DHM-SF-1V-EN (March 2020)

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