

Service Facts



UD2- ACV- SF- 1 D

Variable Speed, 2-Stage Upflow/Horizontal and Downflow/Horizontal, Gas-Fired Furnaces, “Fan Assisted Combustion System”

* - First letter may be “A” or “T”

*UD2B060ACV32A

*UD2C100ACV52A

*DD2B060ACV32A

*UD2B080ACV32A

*UD2D120ACV52A

*DD2B080ACV32A

*UD2C080ACV42A

*UD2D140ACV52A

*DD2C100ACV52A

*UD2B100ACV32A

*DD2D120ACV52A

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

Table of Contents

Product Specifications	2
Safety Section	5
User Interface	6
Sequence Of Operation (Communicating Mode)	9
Sequence Of Operation (24v Mode)	9
Personality Module	10
UNIT TEST MODE	10
STAND ALONE OPERATION (Contingency Mode)	11
Periodic Servicing Requirements	12
Wiring Diagram (UD2)	14
Schematic Diagram (UD2)	15
Wiring Diagram (DD2)	16
Schematic Diagram (DD2)	17
Airflow Tables	18
HUMIDISTAT HOOKUP - 24 V Mode ONLY	29
Furnace Alert Codes Table 22	30
Alert Code Recovery	31
IFC Board	31
VARIABLE SPEED, SERIAL INDOOR BLOWER MOTOR OPERATION	32
INDOOR SERIAL PORT VARIABLE SPEED BLOWER MOTOR TEST	33
Troubleshooting Flowcharts	34

NOTICE: Since the manufacturer has a policy of continuous product and product data improvement, it reserves the right to change design and specifications without notice.

Service Facts

Product Specifications ^①

MODEL	*UD2B060ACV32A	*UD2B080ACV32A	*UD2C080ACV42A
TYPE	Upflow/Horizontal	Upflow/Horizontal	Upflow/Horizontal
RATINGS ^②			
1st Stage Input BTUH	39,000	52,000	52,000
1st Stage Capacity BTUH (ICS) ^③	31,200	41,600	41,600
2nd Stage Input BTUH	60,000	80,000	80,000
2nd Stage Capacity BTUH (ICS) ^③	48,000	64,000	64,000
Temp. rise (Min.-Max.) °F.	30 - 60	30 - 60	30 - 60
BLOWER DRIVE ^{⑥⑦}	Direct	Direct	Direct
Diameter - Width (In.)	10 x 7	10 x 7	10 x 10
No. Used	1	1	1
Speeds (No.)	Variable	Variable	Variable
CFM vs. in. w.g.	See Airflow Table	See Airflow Table	See Airflow Table
Motor HP	1/2	1/2	3/4
R.P.M.	Variable	Variable	Variable
Volts/Ph/Hz	115/1/60	115/1/60	115/1/60
FLA	5.5	5.5	7.8
COMBUSTION FAN — Type	Centrifugal	Centrifugal	Centrifugal
Drive - No. Speeds	Direct - 2	Direct - 2	Direct - 2
Motor HP - RPM	1/100 - 2543/1727	1/100 - 2543/1727	1/100 - 2543/1727
Volts/Ph/Hz	115/1/60	115/1/60	115/1/60
FLA	0.70/0.40	0.70/0.40	0.70/0.40
FILTER — Furnished?	Yes	Yes	Yes
Type Recommended	High Velocity	High Velocity	High Velocity
Hi Vel. (No.-Size-Thk.)	1 - 17x25 - 1in.	1 - 17x25 - 1in.	1 - 20x25 - 1in.
VENT — Size (In.)	4 Round	4 Round	4 Round
HEAT EXCHANGER			
Type --Fired	Alum. Steel - Type 1	Alum. Steel - Type 1	Alum. Steel - Type 1
-Unfired			
Gauge (Fired)	20	20	20
ORIFICES — Main ^⑤			
Nat. Gas. Qty. — Drill Size	3 — 45	4 — 45	4 — 45
L.P. Gas Qty. — Drill Size	3 — 56	4 — 56	4 — 56
GAS VALVE	Redundant - Two Stage	Redundant - Two Stage	Redundant - Two Stage
PILOT SAFETY DEVICE			
Type	Hot Surface Ignition	Hot Surface Ignition	Hot Surface Ignition
BURNERS — Type	Multi-port In-shot	Multi-port In-shot	Multi-port In-shot
Number	3	4	4
POWER CONN. — V/Ph/Hz ^④	115/1/60	115/1/60	115/1/60
Ampacity (In Amps)	7.8	7.8	10.7
Max. Overcurrent Protection (Amps)	15	15	20
PIPE CONN. SIZE (In.)	1/2	1/2	1/2
DIMENSIONS	H x W x D	H x W x D	H x W x D
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
WEIGHT			
Shipping (Lbs.)/Net (Lbs.)	136 / 126	142 / 132	166 / 155

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.

③ 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.

④ Based on U.S. government standard tests.

⑤ The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

⑥ Furnace ships in natural gas configuration. The LP conversion kit used with the 2 stage furnace is BAYLPSS210B or BAYLPKT210B.

⑦ First stage output capacity is approximately equal to 65% of second stage capacity.

⑦ Direct drive variable speed blower motor is an ECM constant airflow blower motor.

Product Specifications ^①

MODEL	*UD2B100ACV32A	*UD2C100ACV52A	*UD2D120ACV52A	*UD2D140ACV52A
TYPE	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal	Upflow / Horizontal
RATINGS ^②				
1st Stage Input BTUH	65,000	65,000	78,000	91,000
1st Stage Capacity BTUH (ICS) ^③	52,000	52,000	62,400	72,800
2nd Stage Input BTUH	100,000	100,000	120,000	140,000
2nd Stage Capacity BTUH (ICS) ^③	80,000	79,000	97,000	111,000
Temp. rise (Min.-Max.) °F.	40 - 70	35 - 65	35 - 65	40 - 70
BLOWER DRIVE ^{③⑤⑦}				
Drive	Direct	Direct	Direct	Direct
Diameter - Width (In.)	10 x 7	10 x 10	10 x 10	10 x 10
No. Used	1	1	1	1
Speeds (No.)	Variable	Variable	Variable	Variable
CFM vs. in. w.g.	See Airflow Table	See Airflow Table	See Airflow Table	See Airflow Table
Motor HP	1/2	1	1	1
R.P.M.	Variable	Variable	Variable	Variable
Volts/Ph/Hz	115/1/60	115/1/60	115/1/60	115/1/60
FLA	5.5	10.2	10.2	10.2
COMBUSTION FAN — Type				
Drive - No. Speeds	Centrifugal Direct - 2	Centrifugal Direct - 2	Centrifugal Direct - 2	Centrifugal Direct - 2
Motor HP - RPM	1/75 - 2708/1868	1/75 - 2708/1868	1/60 - 3090/2225	1/60 - 3100/2350
Volts/Ph/Hz	115/1/60	115/1/60	115/1/60	115/1/60
FLA	0.87/0.49	0.87/0.49	1.14/0.51	1.16/0.54
FILTER — Furnished?				
Type Recommended	Yes High Velocity	Yes High Velocity	Yes High Velocity	Yes High Velocity
Hi Vel. (No.-Size-Thk.)	1 - 17x25 - 1in.	1 - 20x25 - 1in.	1 - 24x25 - 1in.	1 - 24x25 - 1in.
VENT — Size (In.)				
	4 Round	4 Round	4 Round	4 Round
HEAT EXCHANGER				
Type-Fired	Alum. Steel - Type 1	Alum. Steel - Type 1	Alum. Steel - Type 1	Alum. Steel - Type 1
-Unfired				
Gauge (Fired)	20	20	20	20
ORIFICES — Main ^⑤				
Nat. Gas. Qty. — Drill Size	5 — 45	5 — 45	6 — 45	7 — 45
L. P. Gas Qty. — Drill Size	5 — 56	5 — 56	6 — 56	7 — 56
GAS VALVE				
	Redundant - Two Stage	Redundant - Two Stage	Redundant - Two Stage	Redundant - Two Stage
PILOT SAFETY DEVICE				
Type	Hot Surface Ignition	Hot Surface Ignition	Hot Surface Ignition	Hot Surface Ignition
BURNERS — Type				
Number	Multi-port In-shot 5	Multi-port In-shot 5	Multi-port In-shot 6	Multi-port In-shot 7
POWER CONN. — V/Ph/Hz ^④				
	115/1/60	115/1/60	115/1/60	115/1/60
Ampacity (In Amps)	8.1	13.9	14.3	14.3
Max. Overcurrent Protection (Amps)	15	20	20	20
PIPE CONN. SIZE (In.)				
	1/2	1/2	1/2	1/2
DIMENSIONS				
H x W x D				
Crated (In.)	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	41-3/4 x 26-1/2 x 30-1/2
WEIGHT				
Shipping (Lbs.)/Net (Lbs.)	142 / 132	166 / 155	193 / 181	197 / 185

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 2 stage furnace is BAYLPSS210B or BAYLPKT210B.

⑥ First stage output capacity is approximately equal to 65% of second stage capacity.

⑦ Direct drive variable speed blower motor is an ECM constant airflow blower motor.

Service Facts

Product Specifications ^①

MODEL	*DD2B060ACV32A	*DD2B080ACV32A	*DD2C100ACV52A	*DD2D120ACV52A
TYPE	Downflow / Horizontal	Downflow / Horizontal	Downflow / Horizontal	Downflow / Horizontal
RATINGS ^②				
1st Stage Input BTUH	39,000	52,000	65,000	78,000
1st Stage Capacity BTUH (ICS) ^③	31,200	41,600	52,000	62,400
2nd Stage Input BTUH	60,000	80,000	100,000	120,000
2nd Stage Capacity BTUH (ICS) ^③	48,000	63,000	81,000	95,000
Temp. rise (Min.-Max.) °F.	35 - 65	35 - 65	35 - 65	35 - 65
BLOWER DRIVE ^{③⑥⑦}				
Drive	Direct	Direct	Direct	Direct
Diameter - Width (In.)	10 x 7	10 x 7	11 x 10	11 x 10
No. Used	1	1	1	1
Speeds (No.)	Variable	Variable	Variable	Variable
CFM vs. in. w.g.	See Airflow Table	See Airflow Table	See Airflow Table	See Airflow Table
Motor HP	1/2	1/2	1	1
R.P.M.	Variable	Variable	Variable	Variable
Volts/Ph/Hz	115/1/60	115/1/60	115/1/60	115/1/60
FLA	5.5	5.5	10.2	10.2
COMBUSTION FAN — Type				
Drive - No. Speeds	Centrifugal Direct - 2	Centrifugal Direct - 2	Centrifugal Direct - 2	Centrifugal Direct - 2
Motor HP - RPM	1/100 - 2543/1727	1/100 - 2543/1727	1/75 - 2708/1868	1/60 - 3090/2225
Volts/Ph/Hz	115/1/60	115/1/60	115/1/60	115/1/60
FLA	0.70/0.40	0.70/0.40	0.87/0.49	1.14/0.51
FILTER — Furnished?				
Type Recommended	Yes	Yes	Yes	Yes
Hi Vel. (No.-Size-Thk.)	High Velocity 2 - 14x20 - 1in.	High Velocity 2 - 14x20 - 1in.	High Velocity 2 - 16x20 - 1in.	High Velocity 2 - 16x20 - 1in.
VENT — Size (In.)				
	4 Round	4 Round	4 Round	4 Round
HEAT EXCHANGER				
Type-Fired	Alum. Steel - Type 1	Alum. Steel - Type 1	Alum. Steel - Type 1	Alum. Steel - Type 1
-Unfired				
Gauge (Fired)	20	20	20	20
ORIFICES — Main ^⑤				
Nat. Gas. Qty. — Drill Size	3 — 45	4 — 45	5 — 45	6 — 45
L. P. Gas Qty. — Drill Size	3 — 56	4 — 56	5 — 56	6 — 56
GAS VALVE				
	Redundant - Two Stage	Redundant - Two Stage	Redundant - Two Stage	Redundant - Two Stage
PILOT SAFETY DEVICE				
Type	Hot Surface Ignition	Hot Surface Ignition	Hot Surface Ignition	Hot Surface Ignition
BURNERS — Type				
Number	Multi-port In-shot 3	Multi-port In-shot 4	Multi-port In-shot 5	Multi-port In-shot 6
POWER CONN. — V/Ph/Hz ^④				
	115/1/60	115/1/60	115/1/60	115/1/60
Ampacity (In Amps)	7.8	7.8	13.9	14.3
Max. Overcurrent Protection (Amps)	15	15	20	20
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.)	140 / 129	146 / 135	166 / 155	197 / 185

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 2 stage furnace is BAYLPSS210B or BAYLPKT210B.

⑥ First stage output capacity is approximately equal to 65% of second stage capacity.

⑦ Direct drive variable speed blower motor is an ECM constant airflow blower motor.

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

ELECTRICAL HAZARD

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. A failure to follow this warning could result in an electrical 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 result in carbon monoxide poisoning or death.

WARNING

FIRE OR EXPLOSION HAZARD

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

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

WARNING

FIRE OR EXPLOSION HAZARD

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

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

WARNING

SERVICE PRODEDURE HAZARD

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 TECHNICIANS RESPONSIBILITY TO RECOGNIZE THESE HAZARDS AND PROCEED SAFELY. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH.

WARNING

FIRE OR EXPLOSION HAZARD

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

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

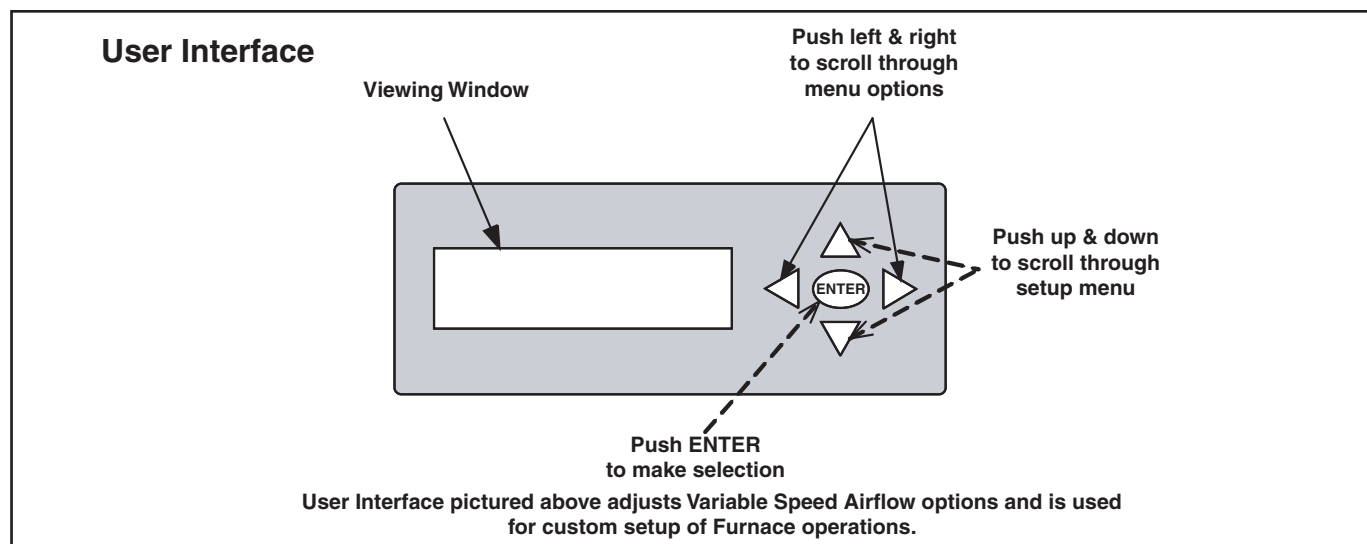
CAUTION

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 indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the AUTO mode.

Service Facts



SERVICE PROCEDURE TO ACCESS USER INTERFACE FOR 2-STAGE FURNACE

This procedure should 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.

⚠ WARNING

VOLTAGE HAZARD
Disconnect power to the unit before removing the Blower door. Allow a minimum of 10 seconds for IFC and motor power supply to discharge to 0 volts. Failure to follow this warning could result in property damage, personal injury or death.

⚠ CAUTION

Sharp Edge Hazard. Be careful of sharp edges on equipment or any cuts made on sheet metal while installing or servicing. Personal injury may result.

⚠ CAUTION

BURN HAZARD
Do NOT touch igniter. It is extremely hot.

⚠ CAUTION

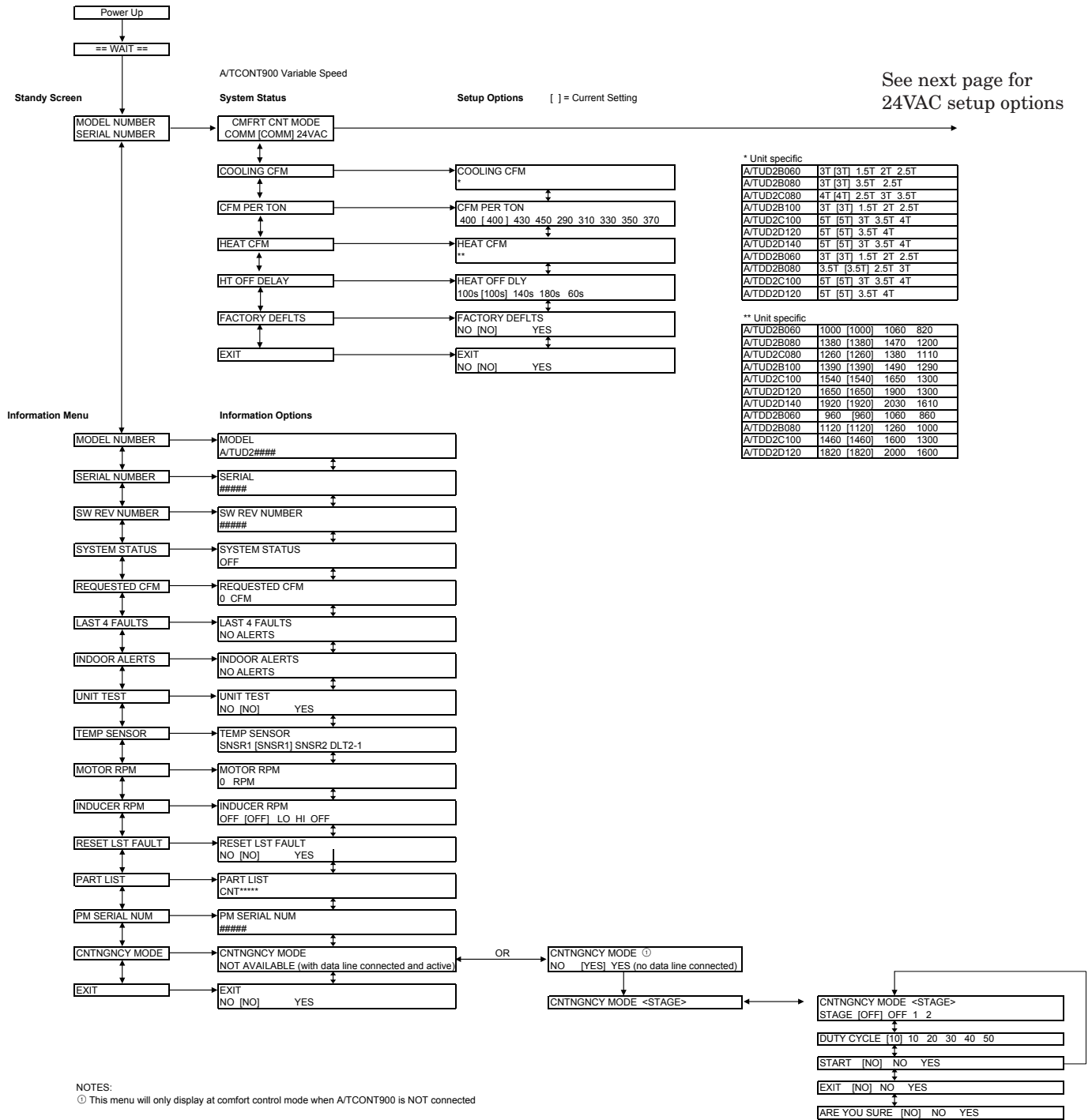
LABELING WIRES!

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

1. Remove Blower Door panel by a) turning the two door latches on the upflow furnace or b) removing the 5/16" screws on the downflow furnace.
2. Lower door panel and remove from service access area.
3. 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. Move through the Display Assembly menu using the arrow buttons.
5. The User Interface menu starting on page 27 is a guide to the menu options.
6. When programming is complete release Door Switch and replace the Blower Door.

NOTE:

If power is lost during programming, all changes made will be saved.



Service Facts

24V Variable Speed

System Status

Setup Options

[] = Current Setting

CMFRT CNT MODE COMM [24VAC] 24VAC	
COOLING CFM	COOLING CFM *
CFM PER TON	CFM PER TON 400 [400] 430 450 290 310 330 350 370
CLG STAGES	CLG STAGES 1 STG [1 STG] 2 STGS
CLG 1ST STG CFM ②	CLG 1ST STG CFM ② 50% [50%] 55% 65% 80%
CONT FAN CFM	CONT FAN CFM 50% [50%] 75% 100% 25%
FAN PRERUN DLY	FAN PRERUN DLY NONE [NONE] 1m@50%
FAN SHRTRUN DLY	FAN SHRTRUN DLY NONE [NONE] 4m@80% 7.5m@80%
FAN OFF DLY	FAN OFF DLY 1.5m@100% [1.5m@100%] NONE 1m@50% 2m@50% 3m@50%
HEAT CFM	HEAT CFM **
HT OFF DELAY	HT OFF DELAY 100s [100s] 140 180 60
W1 W2 STG DLY	W1 W2 STG DLY 00m [00m] 5m 10m 15m
FACTORY DEFLT	FACTORY DEFLT NO [NO] YES
EXIT	EXIT NO [NO] YES

* Unit specific

A/TUD2B060	3T [3T] 1.5T 2T 2.5T
A/TUD2B080	3T [3T] 3.5T 2.5T
A/TUD2C080	4T [4T] 2.5T 3T 3.5T
A/TUD2B100	3T [3T] 1.5T 2T 2.5T
A/TUD2C100	5T [5T] 3T 3.5T 4T
A/TUD2D120	5T [5T] 3.5T 4T
A/TUD2D140	5T [5T] 3T 3.5T 4T
A/TDD2B060	3T [3T] 1.5T 2T 2.5T
A/TDD2B080	3.5T [3.5T] 2.5T 3T
A/TDD2C100	5T [5T] 3T 3.5T 4T
A/TDD2D120	5T [5T] 3.5T 4T

** Unit specific

A/TUD2B060	1000 [1000] 1060 820
A/TUD2B080	1380 [1380] 1470 1200
A/TUD2C080	1260 [1260] 1380 1110
A/TUD2B100	1390 [1390] 1490 1290
A/TUD2C100	1540 [1540] 1650 1300
A/TUD2D120	1650 [1650] 1900 1300
A/TUD2D140	1920 [1920] 2030 1610
A/TDD2B060	960 [960] 1060 860
A/TDD2B080	1120 [1120] 1260 1000
A/TDD2C100	1460 [1460] 1600 1300
A/TDD2D120	1820 [1820] 2000 1600

NOTES:

② This menu will only display at the comfort control mode when 2 STGS is chosen in previous menu.

Sequence Of Operation (Communicating Mode)

Comfort control call for 1st stage heat (A/TCONT900):

The comfort control signals the control board (IFC) to run its self-check routine. After the control has verified that all safeties are closed and the 1st stage pressure switch contacts are open, the draft inducer will be energized on high speed. After the draft inducer comes up to speed, the 1st stage pressure switch contacts will close, the draft inducer switches to low speed, and the igniter warm-up period will begin. The igniter will heat for approximately 20 seconds; the 1st stage gas valve will be energized to permit gas flow to the burners. The flame sensor confirms that ignition has been achieved within the 4 second ignition trial period.

As the flame sensor confirms that ignition has been achieved, the delay to fan ON period begins timing and after approximately 45 seconds the indoor blower motor will be energized at the 1st stage speed and will continue to run during the heating cycle.

Comfort control call for 2nd stage after 1st stage:

The comfort control signals a call for 2nd stage heat. After a 30 second delay, the draft inducer will be energized on high speed. The 2nd stage pressure contacts will close allowing the 2nd stage gas valve to be energized. The indoor blower motor will ramp up to 2nd stage heating airflow.

2nd stage satisfied, 1st stage still called for:

The comfort control signals that 2nd stage heating requirements have been satisfied. The draft inducer motor is reduced to low speed allowing the 2nd stage pressure switch to open. The 2nd stage gas valve is de-energized allowing 1st stage heating operation. After approximately 30 seconds, the indoor blower motor is reduced to 1st stage heating airflow.

1st stage satisfied:

The comfort control signals that the 1st stage heating requirements have been satisfied. The 1st stage gas valve will be de-energized and gas flow will cease. The draft inducer motor will be de-energized 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)

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.

Indoor Blower Timing:

The furnace control module (IFC) controls the variable speed motor in the heating mode. The fan "ON" time is set at 45 seconds and is not field selectable. The blower "OFF" delay is factory set at 100 seconds and can be adjusted to 60, 140, or 180 seconds.

Sequence Of Operation (24v Mode)

Thermostat call for 1st stage heat (2 stage heating thermostat):

R and W1 thermostats contacts close signaling the control board (IFC) to run its self-check routine. After the control has verified that all safeties are closed and the 1st stage pressure switch contacts are open, the draft inducer will be energized on high speed.

After the draft inducer comes up to speed, the 1st stage pressure switch contacts will close, the draft inducer switches to low speed, and the igniter warm-up period will begin. The igniter will heat for approximately 20 seconds; the 1st stage gas valve will be energized to permit gas flow to the burners. The flame sensor confirms that ignition has been achieved within the 4 second ignition trial period.

As the flame sensor confirms that ignition has been achieved, the delay to fan ON period begins timing and after approximately 45 seconds the indoor blower motor will be energized at the 1st stage speed and will continue to run during the heating cycle.

Thermostat call for 2nd stage after 1st stage:

R and W2 thermostat contacts close signaling a call for 2nd stage heat. After a 30 second delay, the draft inducer will be energized on high speed. The 2nd stage pressure contacts will close allowing the 2nd stage gas valve to be energized. The indoor blower motor will ramp up to 2nd stage heating airflow.

2nd stage satisfied, 1st stage still called for:

R and W2 thermostat contacts open signaling that 2nd stage heating requirements have been satisfied. The draft inducer motor is reduced to low speed allowing the 2nd stage pressure switch to open. The 2nd stage gas valve is de-energized allowing 1st stage heating operation. After approximately 30 seconds, the indoor blower motor is reduced to 1st stage heating airflow.

1st stage satisfied:

R and W1 thermostat contacts open signaling that the 1st stage heating requirements have been satisfied. The 1st stage gas valve will be de-energized and gas flow will cease. The draft inducer motor will be de-energized after approximately 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)

W1 and W2 must be jumpered at the control board.

R and W thermostat contacts close signaling a call for heat. The control board (IFC) runs its self check routine. After the control has verified that all safeties are closed and the 1st stage pressure switch contacts are open, the draft inducer will be energized on high speed. After the draft inducer comes up to speed, the 1st stage pressure switch contacts will close, the draft inducer switches to low speed, and the igniter warm-up period will begin. The igniter will heat for approximately 20 seconds; the 1st stage gas valve will be energized to permit gas flow to the burners. The flame sensor confirms that ignition has been achieved within the 4 second ignition trial period.

As the flame sensor confirms that ignition has been achieved, the delay to fan ON period begins timing and after approximately 45 seconds the indoor blower motor will be energized at the 2nd stage speed heating airflow. At the same time, the 2nd stage draft inducer is energized and the 2nd stage pressure switch then closes. The 2nd stage gas valve is then energized. (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.

Service Facts

Thermostat satisfied:

R and W thermostat contacts open signaling the heating requirements have been satisfied. The gas valve is de-energized and after a 5 second draft inducer post purge, the draft inducer is de-energized.

If the inter-stage delay was met and the furnace was operating on 2nd stage heat, the indoor motor will operate at 2nd stage heating airflow for the duration of the 2nd stage heating fan off delay.

If the furnace was operating on 1st stage heat, the indoor motor will operate at 1st stage heating airflow for the duration of the 1st stage heating fan off delay.

Indoor Blower motor operation thermostat fan switch "ON" (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%, 50%, 75%, or 100%. If the system has a 2 stage outdoor unit, the setting is 50% of the 2nd stage cooling cfm.

Indoor Blower Timing:

The furnace control module (IFC) controls the variable speed motor in the heating mode. The fan "ON" time is set at 45 seconds and is not field selectable. The blower "OFF" delay is factory set at 100 seconds and can be adjusted.

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.

UNIT TEST MODE

Unit Test Mode

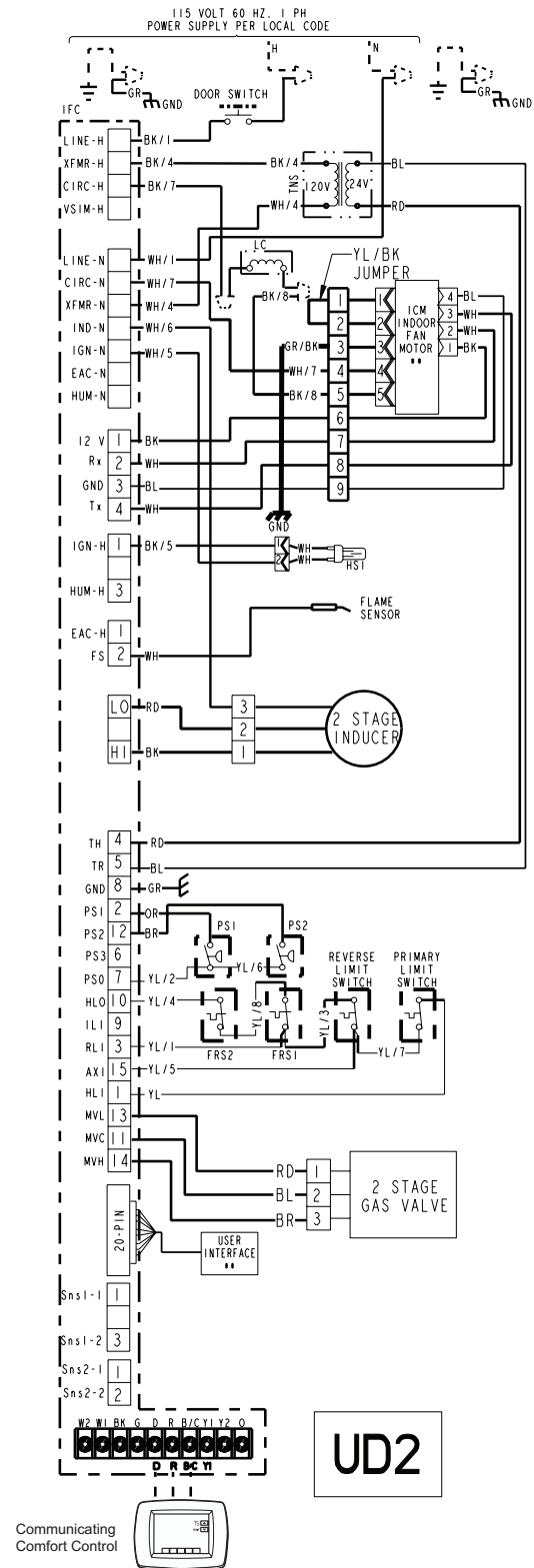
This furnace is equipped with a Unit Test mode that can be accessed through the User Interface. See the User Interface menu on how to enter this option. The test mode can be performed in communicating or 24vac modes.

In communicating or 24vac modes, the unit test can only be entered when there is not a heat, cool, continuous fan, or circulation demand. If a heat demand occurs when the unit test is running, the test mode will be aborted and the normal heating sequence will be started. If a cooling, circulator, or continuous fan demand occurs when the unit test is running, the test mode will be completed before the other demand is started.

All safety functions will be operable during the Unit Test function. Any safety device that is triggered during the test mode will terminate the test and the fault will be reported in the Indoor Alerts and the Last Four Faults sections of the user interface.

When the Unit Test option is activated, the unit will start the indoor blower and energize the Y1 output. After approximately 10 seconds, the indoor blower and Y1 will turn off. Next, the furnace will begin the ignition sequence. After the flame has been sensed, the 45 second fan on delay will be initiated. After the 45 second period, the indoor blower is energized for 10 seconds in 1st stage heating airflow. The furnace will then transition to 2nd stage gas valve and blower operation for 10 seconds. The furnace will then transition to off, running the normal post-purge and the normal heat off delays.

If a button on the Human Interface is pressed during the Unit Test mode, the test will be terminated. The furnace will exit the Unit Test mode and return to normal operation, automatically, after 180 seconds of operation in Unit Test mode.



The information to be displayed on the user interface during Unit Test mode is:

- On start of the Unit Test sequence, the words "UNIT TEST" will appear on the first line.
- "Y1 ON FAN ON" will appear on the second line during the first test.
- When the unit lights in first stage heating, "STAGE 1" will appear on the second line.
- When the unit transitions to second stage, "STAGE 2" will appear on the second line.
- When the unit transitions to the heat off delay, the user interface will return to the standby screen. If Unit Test mode operation is terminated for any reason, the user interface will return to the standby screen.

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. The user will select the desired level of capacity required, Stage 1 or 2. 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

- 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 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, cycle the 120 VAC power supply off and then 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. A First or Second Stage of heat **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 120 VAC power off and then 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 operating 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 indoor blower will be functional during continuous 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 120 VAC power to the furnace.
- The contingency mode (stand alone operation) 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.

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

- (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.

CONTINGENCY MODE - 24V

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

To set this mode of operation, see User Interface menu. Remove all wiring from the *CONT900 comfort control and install a 24v common; connect R and B to respective terminals. Connect 3rd wire to "W". At the control board, connect the same 3 wires to the corresponding terminals. Jumper W1 to W2 at the control board. The stage delay between W1 & W2 can be set by scrolling thru the user interface. It is factory set at zero minutes but can be adjusted to 5, 10, or 15 minutes.

Service Facts

Periodic Servicing Requirements

WARNING

VOLTAGE HAZARD

Disconnect power to the unit before removing the Blower door. Allow a minimum of 10 seconds for IFC and motor 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:*

- 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.
- The vent connector is in place, slopes upward and is physically sound without holes or excessive corrosion.
- The return air duct connection(s) is physically sound, is sealed to the Furnace and terminates outside the space containing the Furnace.
- 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.
- 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

BURN HAZARD

Do NOT touch igniter. It is extremely hot.

- 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 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.

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:

- Turn off gas and electric power supply.
- Inspect flue pipe exterior for cracks, leaks, holes or leaky joints.
- Remove burner compartment door from Furnace.
- Inspect around insulation covering flue collector box. Inspect induced draft Blower connections to the flue pipe connection.
- Remove burners.
- Use a mirror and flashlight to inspect interior of Heat Exchanger, be careful not to damage the Igniter, Flame Sensor or other components.
- If any corrosion is present, the Heat Exchanger should be cleaned by a qualified service technician.

- h. After inspection is complete replace Burner 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.)

The following warning complies with State of California law, Proposition 65.

WARNING

This product contains fiberglass wool insulation!

Fiberglass dust and ceramic fibers are believed by the State of California to cause cancer through inhalation. Glasswool fibers may also cause respiratory, skin, or eye irritation.

PRECAUTIONARY MEASURES

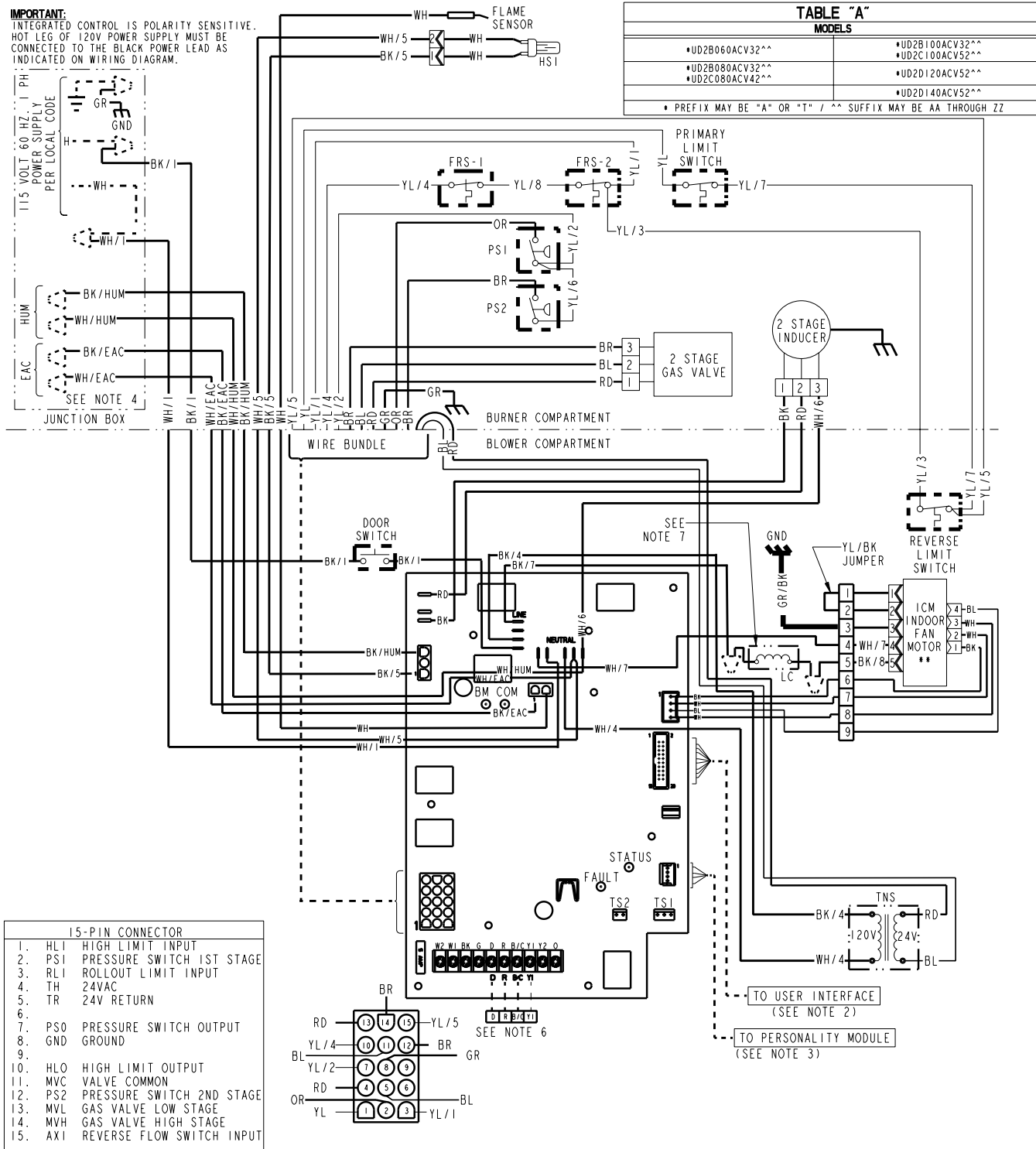
- Avoid breathing fiberglass dust.
- Use a NIOSH approved dust/mist respirator.
- Avoid contact with the skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.
- Wash clothes separately from other clothing: rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator in these situations.

FIRST AID MEASURES

Eye Contact – Flush eyes with water to remove dust. If symptoms persist, seek medical attention.

Skin Contact – Wash affected areas gently with soap and warm water after handling.

Wiring Diagram (UD2)



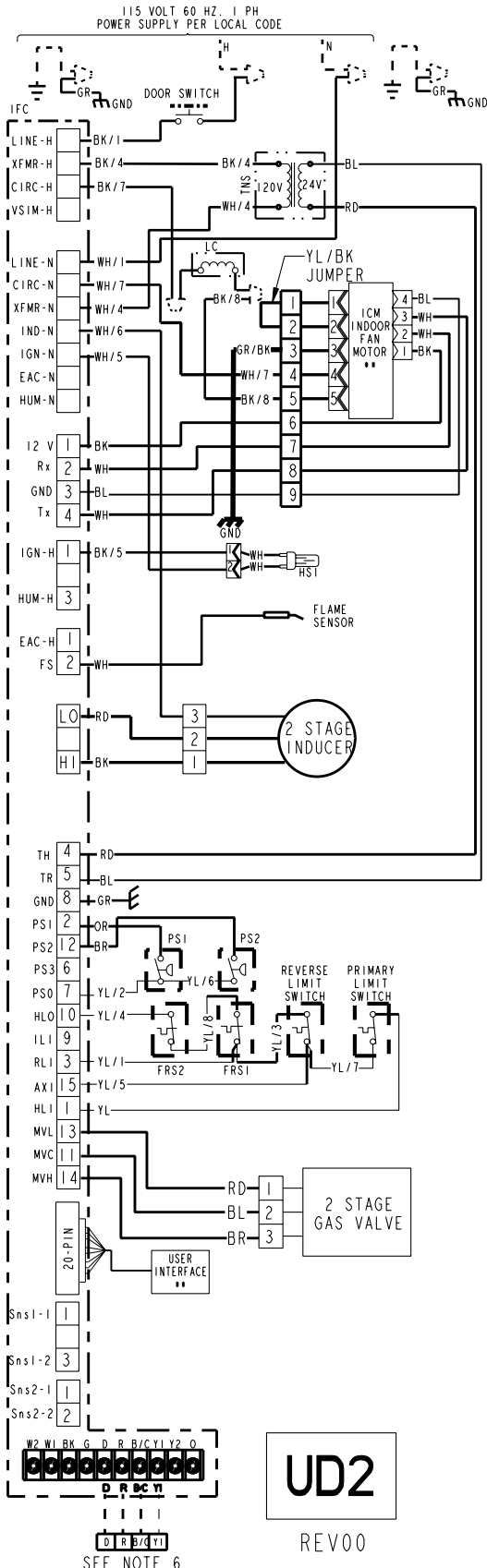
CAUTION

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

(continued on next page)

From Dwg. D343417 Rev. 1

Schematic Diagram (UD2)



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
4 FLASHES - OPEN LIMIT SWITCH	8 FLASHES - LOW FLAME SENSE SIGNAL
5 FLASHES - FLAME SENSED WHEN NO FLAME SHOULD BE PRESENT	9 FLASHES - OPEN INDUCER LIMIT
	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

HAZARDOUS VOLTAGE
DISCONNECT ALL ELECTRICAL POWER
INCLUDING REMOTE DISCONNECTS
BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE
SERVICING CAN CAUSE SEVERE PERSONAL
INJURY OR DEATH.

CAUTION

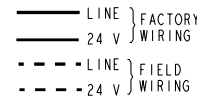
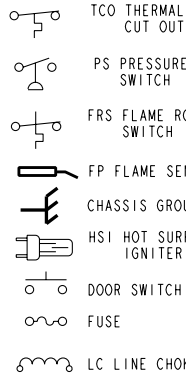
USE COPPER CONDUCTORS ONLY!
UNIT TERMINALS ARE NOT DESIGNED
TO ACCEPT OTHER TYPES OF CONDUCTORS.
FAILURE TO DO SO MAY CAUSE DAMAGE
TO THE EQUIPMENT.

INTEGRATED FURNACE CONTROL

REPLACE WITH PART CNT 04829 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
HUMIDIFIER & 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



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	IFC	INTEGRATED FURNACE CONTROL

NOTES:

- 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.
- USER INTERFACE MUST BE INSTALLED FOR PROPER FURNACE INSTALLATION & SET-UP.
- 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.
- THESE LEADS PROVIDE 120V POWER CONNECTIONS FOR ELECTRONIC AIR CLEANER (EAC) AND HUMIDIFIER (HUM). MAX. LOAD: 1.0 AMPS EACH.
- ON POWER-UP, LAST FOUR FAULTS, IF ANY, WILL BE FLASHED ON RED LED. GREEN LED WILL BE SOLID ON DURING LAST FAULT RECOVERY.
- YI IS AN OUTPUT ONLY WHEN USED WITH A NON-COMMUNICATING, A/C ONLY, OUTDOOR UNIT.
- LINE CHOKE (LC) NOT USED ON ALL MODELS.
- 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.

From Dwg. D343417 Rev. 1

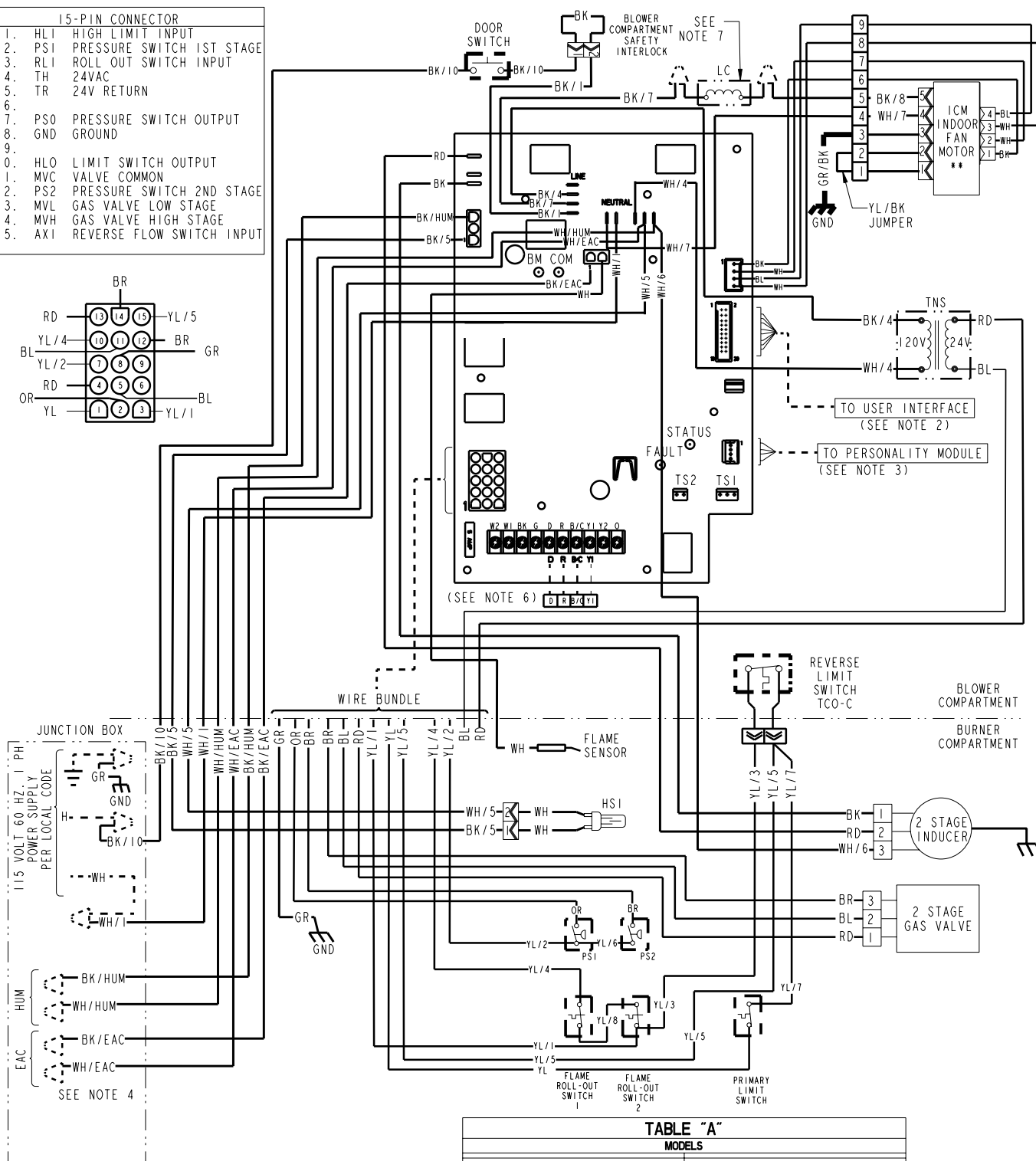
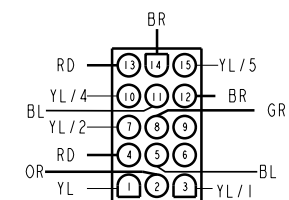
CAUTION

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

Service Facts

Wiring Diagram (DD2)

15-PIN CONNECTOR	
1.	HLI HIGH LIMIT INPUT
2.	PS1 PRESSURE SWITCH 1ST STAGE
3.	RLI ROLL OUT SWITCH INPUT
4.	TH 24VAC
5.	TR 24V RETURN
6.	
7.	PSO PRESSURE SWITCH OUTPUT
8.	GND GROUND
9.	
10.	HLO LIMIT SWITCH OUTPUT
11.	MVC VALVE COMMON
12.	PS2 PRESSURE SWITCH 2ND STAGE
13.	MVL GAS VALVE LOW STAGE
14.	MVH GAS VALVE HIGH STAGE
15.	AXI REVERSE FLOW SWITCH INPUT



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.

TABLE "A"	
MODELS	
*DD2B060ACV32^^	*DD2C100ACV52^^
*DD2B080ACV32^^	*DD2D120ACV52^^
* PREFIX MAY BE "A" OR "T" / ^^ SUFFIX MAY BE AA THROUGH ZZ	

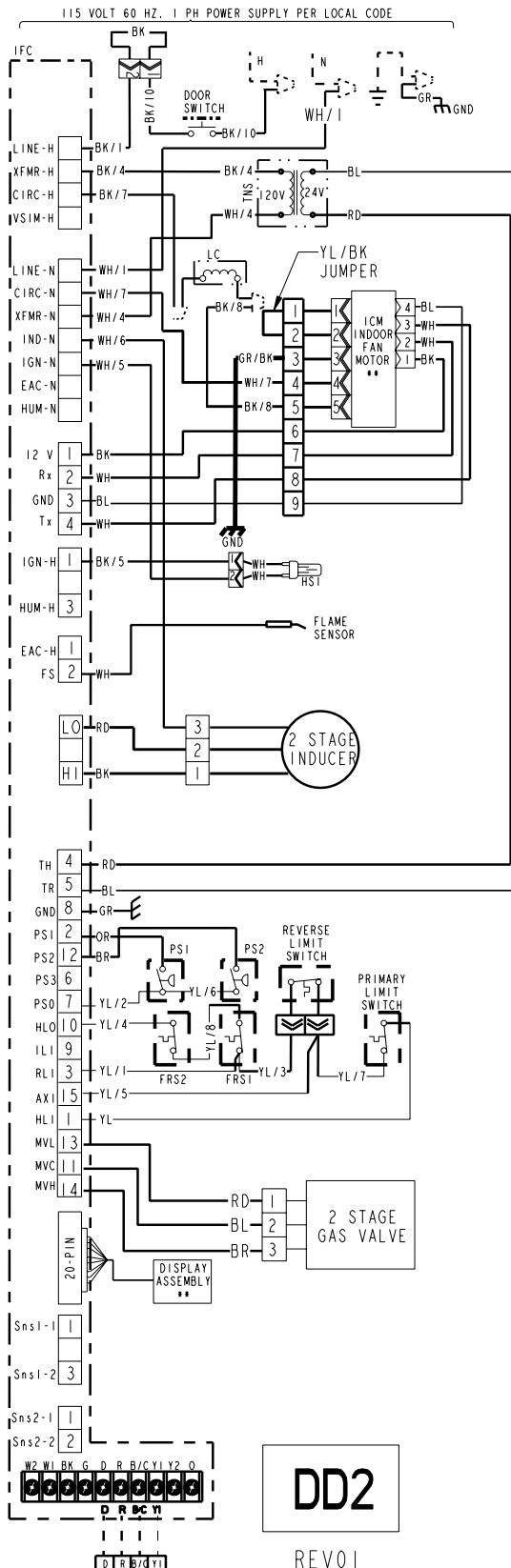
CAUTION

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

From Dwg. D343418 Rev. 2

(continued on next page)

Schematic Diagram (DD2)



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
4 FLASHES - OPEN LIMIT SWITCH	8 FLASHES - LOW FLAME SENSE SIGNAL
5 FLASHES - FLAME SENSED WHEN NO FLAME SHOULD BE PRESENT	9 FLASHES - OPEN INDUCER LIMIT
	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

HAZARDOUS VOLTAGE
DISCONNECT ALL ELECTRICAL POWER
INCLUDING REMOTE DISCONNECTS
BEFORE SERVICING.
FAILURE TO DISCONNECT POWER BEFORE
SERVICING CAN CAUSE SEVERE PERSONAL
INJURY OR DEATH.

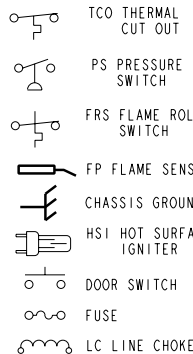
CAUTION

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 04829 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
HUMIDIFIER & 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



LINE } FACTORY
24 V } WIRING
LINE } FIELD
24 V } WIRING

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	IFC	INTEGRATED FURNACE CONTROL

NOTES:

- 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.
- USER INTERFACE MUST BE INSTALLED FOR PROPER FURNACE INSTALLATION & SET-UP.
- 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.
- THESE LEADS PROVIDE 120V POWER CONNECTIONS FOR ELECTRONIC AIR CLEANER (EAC) AND HUMIDIFIER (HUM). MAX. LOAD: 1.0 AMPS EACH.
- ON POWER-UP, LAST FOUR FAULTS, IF ANY, WILL BE FLASHED ON RED LED. GREEN LED WILL BE SOLID ON DURING LAST FAULT RECOVERY.
- YI IS AN OUTPUT ONLY WHEN USED WITH A NON-COMMUNICATING, A/C ONLY, OUTDOOR UNIT.
- LINE CHOKE (LC) NOT USED ON ALL MODELS.
- 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.

From Dwg. D343418 Rev. 2

CAUTION

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

Service Facts

Airflow Tables

*UD2B060ACV32A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	533	CFM	523	551	551	547	541
		TEMP RISE	55	52	52	53	53
		WATTS	52	83	103	119	150
	650**	CFM	651	674	673	667	657
		TEMP RISE	44	43	43	43	44
		WATTS	76	110	129	145	184
	689	CFM	694	714	714	707	696
		TEMP RISE	41	40	40	41	41
		WATTS	87	122	140	155	197
HEATING 2ND STAGE	820	CFM	838	851	850	841	826
		TEMP RISE	53	52	52	53	54
		WATTS	135	171	187	197	243
	1000**	CFM	1035	1039	1038	1024	1006
		TEMP RISE	43	43	43	43	44
		WATTS	227	263	277	271	318
	1060	CFM	1101	1102	1101	1086	1066
		TEMP RISE	40	40	40	41	42
		WATTS	265	300	313	301	346

*UD2B060ACV32A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
1.5	290	CFM	371	433	442	439	429
		WATTS	28	57	84	110	137
	350	CFM	547	571	573	564	549
		WATTS	40	68	96	125	152
	400	CFM	633	647	643	633	618
		WATTS	52	83	111	141	171
	450	CFM	701	715	711	704	694
		WATTS	64	97	128	160	193
2.0	290	CFM	546	573	574	567	554
		WATTS	49	80	108	139	168
	350	CFM	725	739	738	728	717
		WATTS	70	104	137	166	201
	400	CFM	832	842	837	829	817
		WATTS	94	131	166	201	237
	450	CFM	935	943	939	930	921
		WATTS	122	163	202	239	278
2.5	290	CFM	697	716	712	704	693
		WATTS	74	110	145	177	211
	350	CFM	909	915	911	904	895
		WATTS	116	155	193	230	266
	400	CFM	1040	1042	1043	1038	1027
		WATTS	160	204	247	291	332
	450	CFM	1178	1176	1175	1169	1164
		WATTS	220	270	318	365	413
3.0**	290	CFM	849	860	859	850	836
		WATTS	114	155	196	230	268
	350	CFM	1099	1097	1097	1089	1082
		WATTS	183	228	274	318	363
	400**	CFM	1253	1250	1250	1243	1238
		WATTS	258	312	364	415	466
	450	CFM	1406	1403	1405	1354	1281
		WATTS	363	420	484	503	500

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

*UD2B080ACV32A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	780	CFM	804	833	849	863	873
		TEMP RISE	48	46	45	44	44
		WATTS	66	110	190	229	278
	897**	CFM	930	950	958	960	958
		TEMP RISE	41	40	40	40	40
		WATTS	102	153	250	283	328
	955.5	CFM	993	1009	1012	1008	1001
		TEMP RISE	39	38	38	38	38
		WATTS	124	176	279	308	350
HEATING 2ND STAGE	1200	CFM	1258	1255	1239	1210	1179
		TEMP RISE	47	47	48	49	50
		WATTS	241	279	395	396	423
	1380**	CFM	1453	1436	1407	1359	1310
		TEMP RISE	41	41	42	43	45
		WATTS	354	362	475	446	457
	1470	CFM	1550	1526	1490	1433	1375
		TEMP RISE	38	39	40	41	43
		WATTS	419	407	513	465	467

*UD2B080ACV32A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
2.5	290	CFM	709	736	734	727	716
		WATTS	74	115	148	183	218
	350	CFM	916	937	939	936	929
		WATTS	109	154	193	233	272
	400	CFM	1060	1071	1073	1072	1067
		WATTS	156	204	250	295	340
	450	CFM	1199	1208	1207	1209	1209
		WATTS	216	269	322	374	428
3.0**	290	CFM	878	891	897	886	875
		WATTS	117	158	200	238	276
	350	CFM	1110	1124	1125	1125	1121
		WATTS	178	227	275	323	369
	400**	CFM	1277	1281	1282	1289	1291
		WATTS	263	318	375	434	493
	450	CFM	1445	1444	1445	1375	1300
		WATTS	370	433	498	503	502
3.5	290	CFM	1040	1044	1049	1042	1034
		WATTS	172	220	269	315	359
	350	CFM	1303	1302	1300	1299	1296
		WATTS	281	335	390	444	498
	400	CFM	1485	1496	1453	1374	1298
		WATTS	415	477	507	503	500
	450	CFM	1603	1530	1450	1369	1288
		WATTS	514	510	505	501	498

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

Service Facts

*UD2C080ACV42A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	722	CFM	760	776	774	768	764
		TEMP RISE	50	49	50	50	50
		WATTS	86	126	191	188	231
	819**	CFM	844	859	858	851	846
		TEMP RISE	45	45	45	45	45
		WATTS	88	133	207	200	253
	897	CFM	911	926	924	917	911
		TEMP RISE	42	41	41	42	42
		WATTS	93	142	224	211	273
HEATING 2ND STAGE	1110	CFM	1094	1108	1107	1099	1088
		TEMP RISE	54	53	53	54	54
		WATTS	124	183	287	258	337
	1260**	CFM	1222	1236	1236	1226	1213
		TEMP RISE	48	48	48	48	49
		WATTS	160	224	347	302	389
	1380	CFM	1325	1338	1338	1329	1313
		TEMP RISE	45	44	44	44	45
		WATTS	197	266	405	344	435

*UD2C080ACV42A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
2.5	290	CFM	732	758	759	744	728
		WATTS	61	100	137	171	207
	350	CFM	893	905	905	892	874
		WATTS	90	130	172	214	253
	400	CFM	1014	1024	1019	1013	995
		WATTS	117	163	206	251	294
	450	CFM	1091	1107	1110	1104	1101
		WATTS	137	188	237	284	337
3.0	290	CFM	888	900	897	889	876
		WATTS	86	130	170	212	253
	350	CFM	1069	1081	1081	1068	1063
		WATTS	121	179	226	270	321
	400	CFM	1202	1216	1211	1202	1190
		WATTS	175	231	281	329	380
	450	CFM	1307	1323	1328	1325	1322
		WATTS	202	277	338	392	453
3.5	290	CFM	1034	1050	1043	1034	1024
		WATTS	112	170	213	257	305
	350	CFM	1190	1208	1212	1206	1203
		WATTS	156	223	279	329	383
	400	CFM	1363	1370	1378	1377	1370
		WATTS	240	301	364	425	481
	450	CFM	1565	1572	1575	1558	1516
		WATTS	371	436	510	565	595
4.0**	290	CFM	1150	1154	1147	1142	1132
		WATTS	178	231	276	330	374
	350	CFM	1363	1370	1378	1377	1370
		WATTS	240	301	364	425	481
	400**	CFM	1594	1601	1603	1584	1536
		WATTS	390	456	531	585	611
	450	CFM	1824	1832	1829	1791	1703
		WATTS	539	610	697	746	742

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

*UD2B100ACV32A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	839	CFM	842	848	841	828	812
		TEMP RISE	57	57	57	58	59
		WATTS	79	178	188	204	236
	904**	CFM	907	912	906	893	875
		TEMP RISE	53	53	53	54	55
		WATTS	97	207	217	231	262
	969	CFM	973	976	971	958	939
		TEMP RISE	49	49	49	50	51
		WATTS	118	240	249	261	291
HEATING 2ND STAGE	1290	CFM	1298	1295	1293	1278	1253
		TEMP RISE	57	57	57	58	59
		WATTS	258	451	456	452	459
	1390**	CFM	1399	1394	1393	1378	1351
		TEMP RISE	53	53	53	54	55
		WATTS	315	533	537	527	521
	1490	CFM	1500	1493	1493	1478	1448
		TEMP RISE	49	49	49	50	51
		WATTS	378	623	627	608	588

*UD2B100ACV32A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
1.5	290	CFM	424	442	438	424	412
		WATTS	25	53	78	102	127
	350	CFM	514	533	526	512	493
		WATTS	33	65	91	118	143
	400	CFM	603	615	606	592	576
		WATTS	44	79	107	135	164
	450	CFM	686	691	676	667	652
		WATTS	65	95	125	154	186
2.0	290	CFM	575	588	582	569	552
		WATTS	40	75	101	130	158
	350	CFM	712	716	703	691	677
		WATTS	70	101	130	159	193
	400	CFM	801	806	800	783	772
		WATTS	84	127	160	192	227
	450	CFM	908	910	905	895	879
		WATTS	112	161	197	232	267
2.5	290	CFM	732	738	729	716	700
		WATTS	67	107	136	168	200
	350	CFM	884	884	880	867	851
		WATTS	104	151	186	220	256
	400	CFM	999	1004	1001	990	978
		WATTS	146	199	239	279	318
	450	CFM	1132	1134	1131	1123	1114
		WATTS	204	262	310	354	399
3.0**	290	CFM	878	882	875	859	844
		WATTS	104	150	185	220	254
	350	CFM	1055	1057	1054	1042	1036
		WATTS	178	224	266	307	350
	400**	CFM	1205	1202	1200	1195	1190
		WATTS	239	305	353	402	451
	450	CFM	1351	1354	1351	1323	1253
		WATTS	337	409	469	503	500

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

Service Facts

*UD2C100ACV52A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	845	CFM	738	806	847	881	908
		TEMP RISE	65	59	57	54	53
		WATTS	59	84	128	170	222
	1001**	CFM	915	971	1003	1028	1046
		TEMP RISE	52	49	48	47	46
		WATTS	70	129	197	250	315
	1073	CFM	996	1047	1074	1095	1109
		TEMP RISE	48	46	45	44	43
		WATTS	84	155	232	288	357
HEATING 2ND STAGE	1300	CFM	1254	1288	1302	1310	1310
		TEMP RISE	59	57	57	56	56
		WATTS	162	261	357	413	489
	1540**	CFM	1526	1543	1543	1536	1523
		TEMP RISE	48	48	48	48	48
		WATTS	303	411	512	553	623
	1650	CFM	1650	1659	1653	1640	1620
		TEMP RISE	45	44	45	45	46
		WATTS	387	493	590	620	683

*UD2C100ACV52A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
3.0	290	CFM	753	817	844	848	851
		WATTS	69	115	161	206	253
	350	CFM	972	1030	1057	1071	1067
		WATTS	105	165	218	271	321
	400	CFM	1140	1176	1193	1210	1214
		WATTS	153	214	273	333	392
	450	CFM	1284	1306	1314	1325	1337
		WATTS	212	276	337	406	474
3.5	290	CFM	939	984	1009	1017	1015
		WATTS	97	150	198	254	302
	350	CFM	1141	1168	1181	1204	1203
		WATTS	153	208	265	330	386
	400	CFM	1415	1455	1473	1486	1500
		WATTS	246	324	395	467	543
	450	CFM	1543	1569	1567	1564	1574
		WATTS	337	413	482	552	638
4.0	290	CFM	1083	1115	1129	1149	1147
		WATTS	137	195	249	311	366
	350	CFM	1415	1455	1473	1486	1500
		WATTS	246	324	395	467	543
	400	CFM	1619	1640	1650	1653	1654
		WATTS	364	447	525	601	678
	450	CFM	1855	1869	1874	1873	1867
		WATTS	526	614	699	784	866
5.0**	290	CFM	1390	1412	1417	1413	1426
		WATTS	257	327	395	457	532
	350	CFM	1740	1752	1755	1756	1749
		WATTS	468	557	629	718	796
	400**	CFM	2095	2102	2086	2027	1941
		WATTS	758	860	937	959	959
	450	CFM	2277	2197	2112	2035	1950
		WATTS	972	973	963	970	969

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

*UD2D120ACV52A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	845	CFM	844	869	894	915	940
		TEMP RISE	68	66	64	63	61
		WATTS	87	132	146	185	220
	1073**	CFM	1071	1090	1105	1116	1128
		TEMP RISE	54	53	52	52	51
		WATTS	126	186	227	296	345
	1235	CFM	1233	1248	1255	1259	1262
		TEMP RISE	47	46	46	46	46
		WATTS	175	244	297	380	432
HEATING 2ND STAGE	1300	CFM	1298	1311	1316	1317	1316
		TEMP RISE	68	67	67	67	67
		WATTS	200	272	327	415	467
	1650**	CFM	1647	1651	1640	1626	1606
		TEMP RISE	54	54	54	54	55
		WATTS	385	469	514	611	647
	1900	CFM	1897	1894	1872	1846	1812
		TEMP RISE	47	47	47	48	49
		WATTS	569	657	674	762	770

*UD2D120ACV52A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
3.5	290	CFM	1010	1036	1038	1039	1033
		WATTS	118	168	216	266	315
	350	CFM	1212	1228	1230	1228	1223
		WATTS	167	237	291	345	403
	400	CFM	1407	1420	1417	1416	1416
		WATTS	240	318	380	441	508
	450	CFM	1580	1584	1584	1581	1580
		WATTS	342	415	484	553	624
4.0	290	CFM	1141	1159	1165	1164	1157
		WATTS	157	211	263	316	373
	350	CFM	1407	1420	1417	1416	1416
		WATTS	240	318	380	441	508
	400	CFM	1595	1609	1610	1604	1600
		WATTS	356	428	500	571	639
	450	CFM	1814	1817	1813	1801	1788
		WATTS	505	582	655	729	803
5.0**	290	CFM	1441	1417	1425	1421	1422
		WATTS	267	322	386	447	512
	350	CFM	1765	1773	1771	1768	1762
		WATTS	457	550	627	705	780
	400**	CFM	2014	2011	2004	1992	1945
		WATTS	662	768	849	932	974
	450	CFM	2210	2193	2116	2038	1954
		WATTS	902	990	989	984	979

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

Service Facts

*UD2D140ACV52A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	1047	CFM	1012	1048	1068	1079	1095
		TEMP RISE	66	64	63	62	61
		WATTS	99	162	211	269	372
	1248**	CFM	1217	1240	1250	1251	1255
		TEMP RISE	55	54	54	54	53
		WATTS	170	251	320	383	502
	1320	CFM	1290	1308	1314	1312	1311
		TEMP RISE	52	51	51	51	51
		WATTS	203	288	360	423	546
HEATING 2ND STAGE	1610	CFM	1587	1584	1577	1560	1541
		TEMP RISE	65	65	65	66	67
		WATTS	378	458	531	587	721
	1920**	CFM	1903	1879	1857	1825	1787
		TEMP RISE	54	55	56	57	58
		WATTS	637	682	729	763	895
	2030	CFM	2015	1984	1956	1919	1874
		TEMP RISE	51	52	53	54	55
		WATTS	746	771	803	825	955

*UD2D140ACV52A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
3.5	290	CFM	960	1001	1010	1009	1010
		WATTS	106	167	218	268	320
	350	CFM	1194	1205	1213	1207	1202
		WATTS	187	243	297	356	420
	400	CFM	1364	1376	1383	1381	1378
		WATTS	249	327	392	454	525
	450	CFM	1562	1553	1545	1555	1553
		WATTS	373	434	530	573	636
4.0	290	CFM	1119	1144	1147	1144	1142
		WATTS	148	218	271	328	388
	350	CFM	1364	1376	1383	1381	1378
		WATTS	249	327	392	454	525
	400	CFM	1597	1593	1601	1586	1585
		WATTS	378	459	534	598	672
	450	CFM	1810	1812	1804	1796	1786
		WATTS	560	638	714	790	868
5.0**	290	CFM	1417	1427	1428	1417	1411
		WATTS	275	359	421	481	546
	350	CFM	1757	1754	1753	1739	1734
		WATTS	511	592	666	731	812
	400**	CFM	2005	2001	1994	1956	1884
		WATTS	751	844	930	975	982
	450	CFM	2183	2106	2031	1957	1880
		WATTS	992	988	982	977	974

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

*DD2B060ACV32A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	559	CFM	554	585	587	579	571
		TEMP RISE	52	49	49	50	50
		WATTS	50	73	85	124	171
	624**	CFM	622	652	655	648	637
		TEMP RISE	46	44	44	44	45
		WATTS	62	86	96	141	192
	689	CFM	690	719	723	716	704
		TEMP RISE	42	40	40	40	41
		WATTS	78	102	110	160	216
HEATING 2ND STAGE	860	CFM	869	896	902	896	879
		TEMP RISE	51	49	49	49	50
		WATTS	132	157	165	223	292
	960**	CFM	974	999	1006	1001	981
		TEMP RISE	45	44	44	44	45
		WATTS	173	198	210	269	345
	1060	CFM	1078	1102	1111	1107	1083
		TEMP RISE	41	40	40	40	41
		WATTS	220	246	263	322	405

*DD2B060ACV32A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
1.5	290	CFM	422	465	473	462	449
		WATTS	26	49	67	106	131
	350	CFM	518	550	562	554	535
		WATTS	34	60	75	122	149
	400	CFM	606	631	633	631	612
		WATTS	43	74	102	134	165
	450	CFM	683	705	705	699	687
		WATTS	59	88	99	163	190
2.0	290	CFM	583	609	614	610	591
		WATTS	42	68	82	135	162
	350	CFM	708	730	729	722	712
		WATTS	57	91	122	155	190
	400	CFM	805	837	830	823	817
		WATTS	75	114	150	183	220
	450	CFM	896	926	930	921	911
		WATTS	98	142	182	220	256
2.5	290	CFM	732	757	754	747	738
		WATTS	70	100	110	180	206
	350	CFM	873	904	905	896	887
		WATTS	112	146	152	245	265
	400	CFM	1000	1030	1034	1029	1026
		WATTS	126	176	222	264	308
	450	CFM	1144	1169	1178	1174	1146
		WATTS	213	253	252	392	394
3.0**	290	CFM	883	909	918	913	893
		WATTS	111	144	151	242	263
	350	CFM	1056	1083	1091	1086	1083
		WATTS	179	217	218	343	351
	400**	CFM	1223	1243	1260	1257	1252
		WATTS	210	271	329	384	436
	450	CFM	1404	1421	1442	1444	1362
		WATTS	301	367	439	505	504

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

Service Facts

*DD2B080ACV32A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	650	CFM	644	680	695	703	717
		TEMP RISE	60	56	55	55	53
		WATTS	66	91	108	129	167
	728**	CFM	723	754	766	770	778
		TEMP RISE	53	51	50	50	49
		WATTS	70	106	134	164	203
	819	CFM	816	841	849	848	849
		TEMP RISE	47	46	45	45	45
		WATTS	82	127	167	205	244
HEATING 2ND STAGE	1000	CFM	1001	1013	1014	1005	990
		TEMP RISE	59	58	58	59	60
		WATTS	131	186	237	284	319
	1120**	CFM	1123	1128	1123	1108	1083
		TEMP RISE	53	52	53	53	54
		WATTS	181	236	288	335	365
	1260	CFM	1266	1261	1250	1229	1192
		TEMP RISE	47	47	47	48	49
		WATTS	256	306	351	394	413

*DD2B080ACV32A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
2.5	290	CFM	723	742	738	726	715
		WATTS	63	98	130	162	196
	350	CFM	871	891	891	881	868
		WATTS	94	138	176	210	247
	400	CFM	1006	1019	1022	1013	1000
		WATTS	134	182	224	265	307
	450	CFM	1123	1131	1129	1120	1108
		WATTS	182	235	282	326	367
3.0**	290	CFM	868	891	884	877	866
		WATTS	95	137	176	208	245
	350	CFM	1055	1059	1063	1052	1045
		WATTS	155	199	246	288	329
	400**	CFM	1193	1192	1202	1200	1193
		WATTS	216	266	320	372	422
	450	CFM	1355	1359	1359	1356	1300
		WATTS	308	368	427	484	500
3.5	290	CFM	1026	1039	1040	1029	1017
		WATTS	142	188	232	272	311
	350	CFM	1225	1231	1239	1235	1231
		WATTS	224	281	336	386	437
	400	CFM	1412	1408	1410	1397	1319
		WATTS	333	390	462	509	504
	450	CFM	1596	1544	1469	1387	1315
		WATTS	492	516	512	509	508

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

*DD2C100ACV52A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	819	CFM	834	845	853	862	870
		TEMP RISE	57	57	56	56	55
		WATTS	71	138	155	178	225
	891**	CFM	904	913	919	925	930
		TEMP RISE	53	52	52	52	52
		WATTS	78	157	178	206	258
	1001	CFM	1012	1019	1021	1023	1023
		TEMP RISE	47	47	47	47	47
		WATTS	95	192	216	250	310
HEATING 2ND STAGE	1260	CFM	1266	1268	1260	1252	1241
		TEMP RISE	58	58	59	59	59
		WATTS	162	300	323	361	432
	1370**	CFM	1374	1373	1361	1350	1333
		TEMP RISE	54	54	54	55	55
		WATTS	202	357	375	411	485
	1540	CFM	1540	1536	1518	1500	1476
		TEMP RISE	48	48	49	49	50
		WATTS	278	459	464	492	567

*DD2C100ACV52A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
3.0	290	CFM	888	890	887	879	866
		WATTS	90	134	175	217	260
	350	CFM	1066	1065	1058	1052	1042
		WATTS	137	184	229	277	325
	400	CFM	1193	1196	1187	1182	1173
		WATTS	183	236	287	338	393
	450	CFM	1346	1349	1339	1334	1323
		WATTS	240	297	353	409	465
3.5	290	CFM	1035	1042	1031	1025	1015
		WATTS	123	172	217	264	311
	350	CFM	1212	1210	1207	1197	1187
		WATTS	190	242	294	346	399
	400	CFM	1403	1404	1396	1384	1378
		WATTS	256	319	378	432	492
	450	CFM	1573	1578	1566	1555	1542
		WATTS	358	427	486	550	612
4.0	290	CFM	1169	1166	1160	1153	1144
		WATTS	170	219	269	320	371
	350	CFM	1403	1404	1396	1384	1378
		WATTS	256	319	378	432	492
	400	CFM	1593	1597	1593	1583	1573
		WATTS	369	439	505	573	636
	450	CFM	1806	1805	1800	1795	1764
		WATTS	511	586	662	735	787
5.0**	290	CFM	1454	1448	1438	1434	1413
		WATTS	292	351	409	469	522
	350	CFM	1765	1778	1734	1726	1717
		WATTS	488	575	612	685	760
	400**	CFM	2011	2006	1988	1951	1891
		WATTS	697	779	848	900	920
	450	CFM	2212	2159	2081	1998	1917
		WATTS	912	956	953	951	947

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.

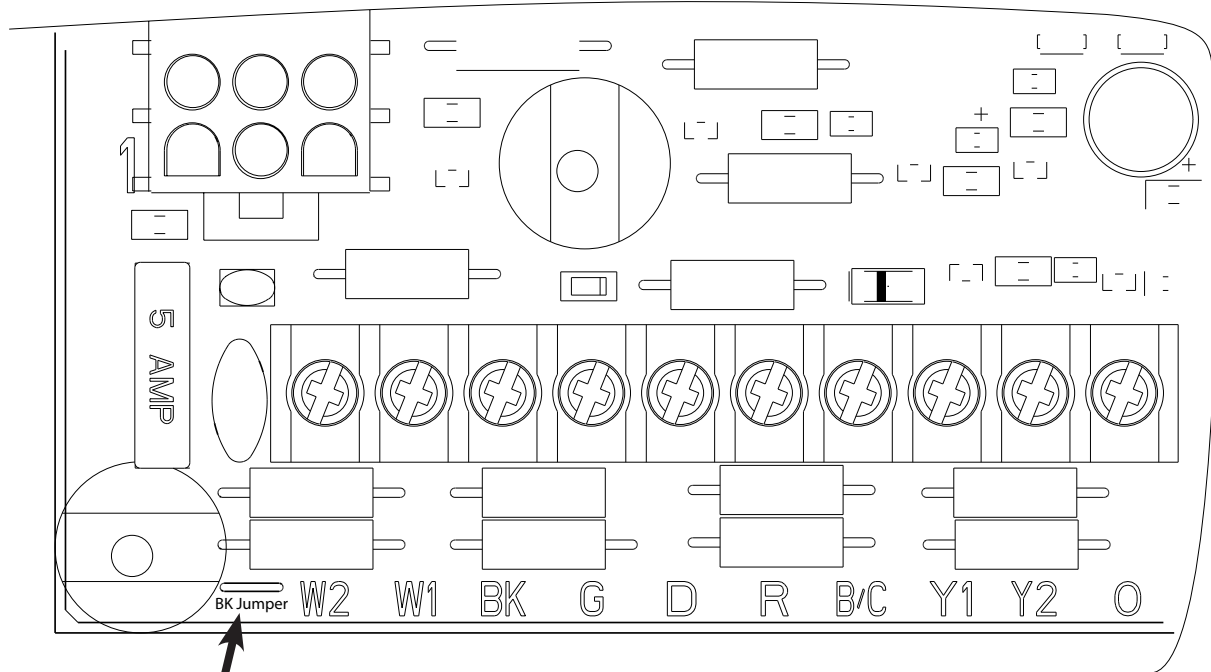
Service Facts

*DD2D120ACV52A Furnace Heating Airflow (CFM) and Power (Watts) vs. External Static Pressure							
			0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	1040	CFM	1041	1045	1040	1010	1042
		TEMP RISE	55	55	55	57	55
		WATTS	128	173	196	231	269
	1183**	CFM	1178	1181	1176	1147	1170
		TEMP RISE	49	49	49	50	49
		WATTS	169	218	241	284	334
	1300	CFM	1290	1292	1286	1259	1275
		TEMP RISE	45	45	45	46	45
		WATTS	211	264	286	333	390
HEATING 2ND STAGE	1600	CFM	1578	1578	1570	1547	1543
		TEMP RISE	56	56	56	57	57
		WATTS	352	414	433	482	543
	1820**	CFM	1789	1788	1778	1757	1739
		TEMP RISE	49	49	50	50	51
		WATTS	487	555	568	613	665
	2000	CFM	1962	1959	1949	1930	1900
		TEMP RISE	45	45	45	46	47
		WATTS	618	690	697	734	771

*DD2D120ACV52A Furnace Cooling Airflow (CFM) and Power (Watts) vs. External Static Pressure with Filter							
OD	AIRFLOW		0.1	0.3	0.5	0.7	0.9
3.5	290	CFM	1013	1020	1014	1004	993
		WATTS	100	153	192	238	283
	350	CFM	1216	1208	1210	1201	1187
		WATTS	155	213	259	304	358
	400	CFM	1380	1385	1377	1367	1362
		WATTS	217	287	339	387	439
	450	CFM	1557	1561	1556	1544	1539
		WATTS	312	377	434	490	550
4.0	290	CFM	1155	1158	1148	1000	1131
		WATTS	149	193	236	322	336
	350	CFM	1380	1385	1377	1367	1362
		WATTS	217	287	339	387	439
	400	CFM	1579	1583	1580	1570	1559
		WATTS	310	388	447	507	564
	450	CFM	1788	1783	1759	1774	1769
		WATTS	437	522	661	659	728
5.0**	290	CFM	1430	1431	1424	1416	1406
		WATTS	247	311	363	415	468
	350	CFM	1730	1732	1728	1719	1714
		WATTS	398	487	552	618	682
	400**	CFM	1980	1973	1967	1963	1966
		WATTS	586	676	750	832	922
	450	CFM	2175	2172	2157	2082	2009
		WATTS	777	886	959	962	968

NOTES:

1. *FIRST LETTER MAY BE "A" OR "T"
2. **FACTORY SETTING
3. CONTINUOUS FAN SPEED SETTING: HEATING OR COOLING AIRFLOW IS APPROXIMATELY 50% OF SELECTED COOLING VALUE.
4. WITH VARIABLE SPEED OUTDOOR UNIT APPLICATION, THE LOW SPEED AIRFLOWS ARE APPROXIMATELY 30% OF LISTED VALUES.
5. LOW 350 CFM/TON IS RECOMMENDED FOR VARIABLE SPEED APPLICATIONS FOR COMFORT & HUMID CLIMATE SETTING: NORMAL IS 400 CFM/TON: HIGH 450 CFM/TON IS FOR DRY CLIMATE SETTING.
6. 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.



The factory installed jumper between "R" and "BK" on the circuit board must be cut if an optional Humidistat is installed.

HUMIDISTAT HOOKUP - 24 V Mode ONLY

If an optional humidistat for humidity control in cooling is used, the factory installed "BK Jumper" must be cut.

The BK Jumper must also be cut if a multi-zone controller is connected or *CONT402 is installed and using the BK enabled feature.

See the 24VAC field hookup wiring diagrams for more information.

Service Facts

Furnace Alert Codes
Table 22

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	PS2 OPEN	N/A	1	Pressure Switch Failure	Open Pressure Switch, second stage
		PS2 CLOSED				Shorted Pressure Switch, second
		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
Solid ON		INT GV ERR				Control tried to turn on gas valve, but 24V not sensed.
	8 Flash		Device count	LO FLAME SNS	N/A	4
Flame current is low, but still strong enough to allow operation.						
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
		#REF!	#REF!			
	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					
D342960P02		PRINTED FROM: D802247P01 Rev 10				

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. The Red LED will only flash when a fault is present.

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.

Table 21

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

Line voltage connections

"Com" LED (Amber)

Bitmaster (BM) LED (Green)

24V furnace component connections

Low voltage Terminal board

5 Amp control fuse

BK Jumper

Neutral connections

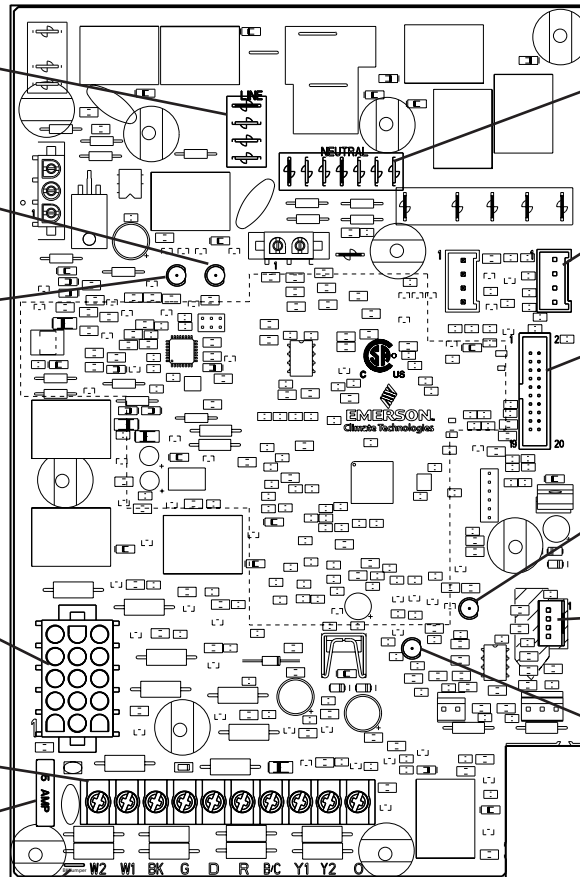
Motor bus connections

User interface connection

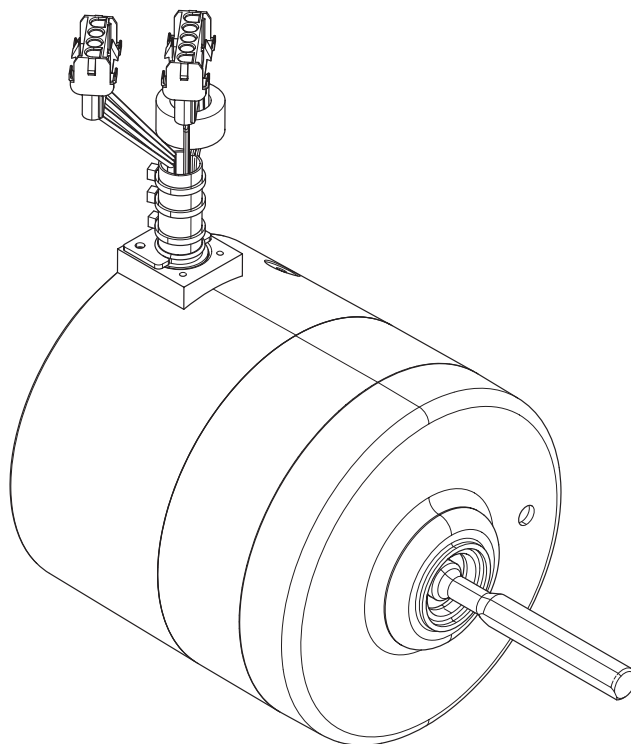
Status LED (Green)

Personality module connection

Fault LED (Red)

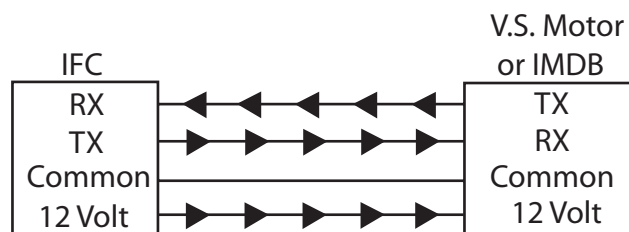


VARIABLE SPEED, SERIAL INDOOR BLOWER MOTOR OPERATION



Serial Port Communication

The Serial Port Communication type of variable speed motor operates the same as the 24 volt controlled V.S. type except the on/off control and speed signals are now a digital command signal. The Motor module receives the command signal and replies back to the indoor product control board. This type of motor module is not programmed at the factory. The horsepower, operating speeds, maximum RPM, and direction of rotation information are stored in the Personality Module, which is located on the Gas Furnace Control (IFC) or an Air Handler Control (AHC). When the system is powered up, the V.S. Motor programming information stored in the Personality Module is sent to the V.S. Motor module. The serial Port Communication V.S. Motor has four low voltage wires plugged into it. The four wires are; (1) The TX wire which is used to send all digital information, (2) The RX wire which is used to receive all digital information, (3) 24 Volt AC and DC common wire, and (4) 12 Volt DC wire. The 12 volts are supplied by the IFC or AHC control and used to power the inputs and output circuits, optic-couplers, in the V.S. Motor.



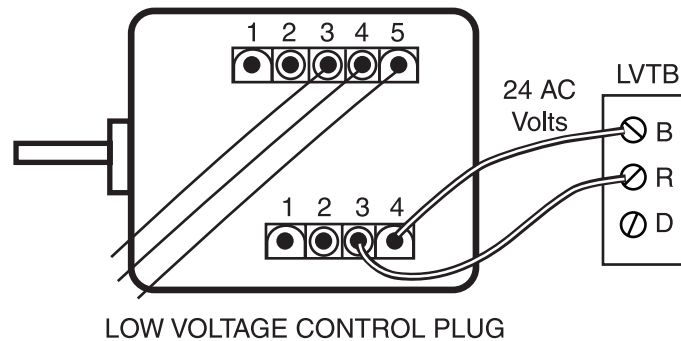
Single phase 120 or 240 volts AC power is applied to the motor module and is NOT turned on or off by the IFC or AHC. The V.S. Motor module converts the AC power to DC power. Some of the DC voltage is reduced to power the microprocessor inside the V.S. Motor module. A communication fault will appear if line voltage is removed from the V.S. Motor module and the IFC or AHC system is then repowered. When blower operation is called for, the V.S. Motor module turns the DC power on and off to each leg of its three phase motor in a rotating manner. The V.S. Motor module will increase voltage and number of Hertz it applies to its three phase motor to increase its speed, or decrease the voltage and Hertz to slow it down. The V.S. Motor module monitors the motor's RPM and power and compares this information to its programmed information. If the RPM and power do not align with the programmed information, the V.S. Motor module will change its output voltage and Hertz to bring the air-flow back in line with its program.

INDOOR SERIAL PORT VARIABLE SPEED BLOWER MOTOR TEST

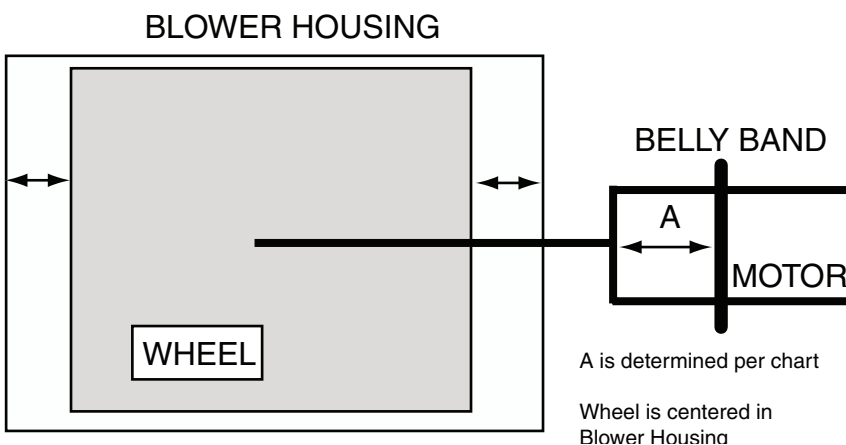
Jumper 24Volts A.C. in to the blower motor low voltage plug pin # 3 and pin # 4. The blower motor should start to run after a short delay. The blower motor should run at 75 % of it's programmed torque. Does the blower motor run?

YES : Repair or replace the blower low voltage harness.

NO: Replace the blower motor.



DISTANCE FROM BELLY BAND TO SHAFT FACE OF MOTOR FOR MINIMUM VIBRATION



Model Number	"A" (inches)
*UD2B060	2.2
*UD2B080	2.2
*UD2C080	1.75
*UD2B100	1.75
*UD2C100	2.96
*UD2D120	2.2
*UD2D140	2.2
*DD2B060	2.2
*DD2B080	2.2
*DD2C100	2.2
*DD2D120	2.2
FOR FACTORY OEM MOTORS	
* May be "A" or "T"	

Troubleshooting Flowchart Index

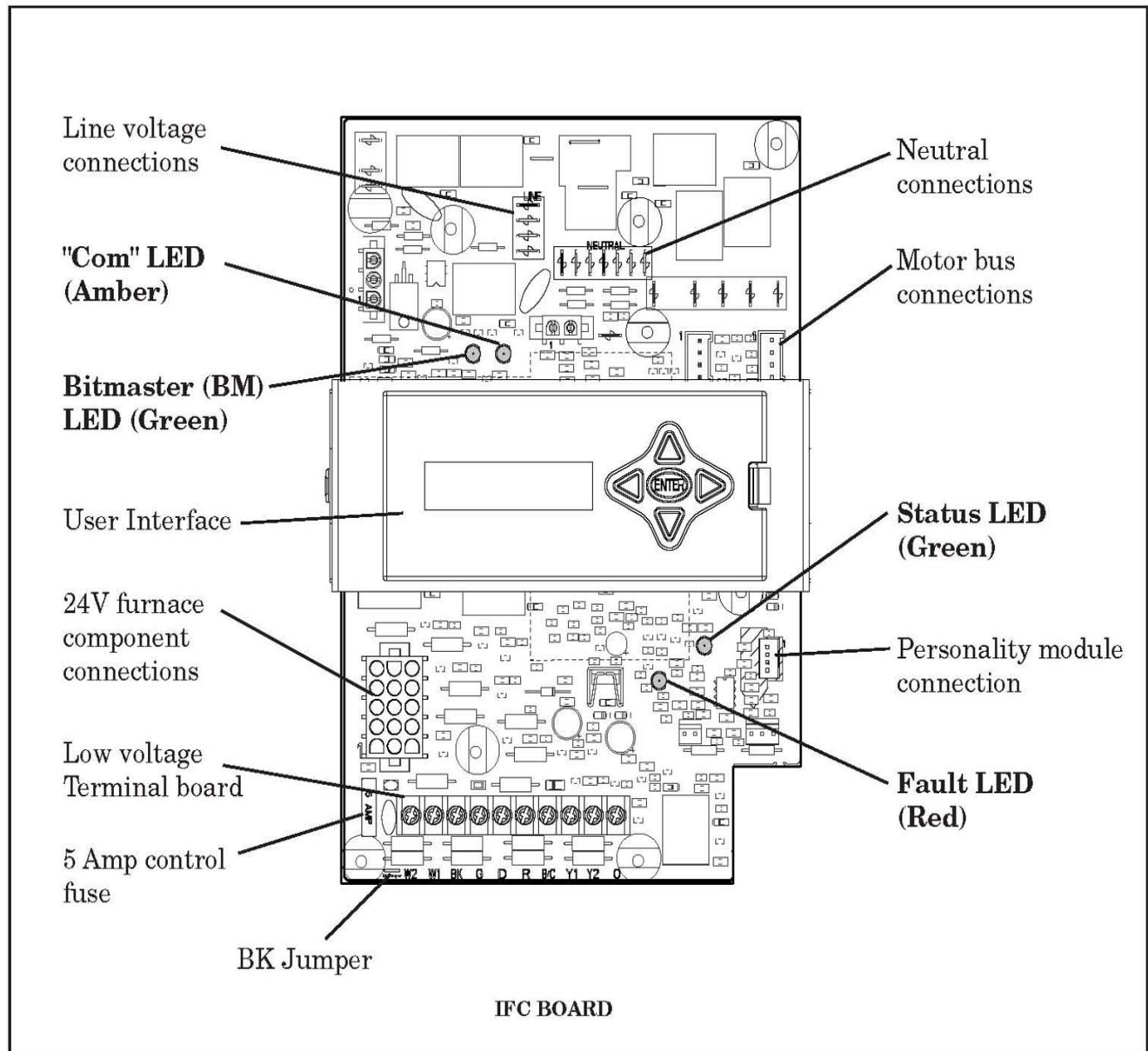
- 35) IFC Component Layout
- 36) LED Flash Codes
- 37) Getting started
- 38) 2 Flash Troubleshooting Retry and Recycle Lockout
- 39) Ignitor Positioning
- 40) 3 Flash Troubleshooting Pressure Switch Errors
- 41) 4 Flash Troubleshooting High Limit and Auxiliary Limit
- 42) 4 Flash Troubleshooting Roll Out Limit
- 43) 5 Flash Troubleshooting Flame Error
- 44) 6 Flash Troubleshooting Polarity and Ground Errors
- 45) 6 Flash Troubleshooting Ignitor and Triac Errors
- 46) 7 Flash Troubleshooting External Gas Valve Circuit Error
- 47) 8 Flash Troubleshooting Low Flame Sense Error
- 48) 10 Flash Troubleshooting Blower Comm and System Comm Errors
- 49) 10 Flash Troubleshooting No System Clock and 24V Comm Mismatch Errors

The following pages include troubleshooting flowcharts in reference to the 80% 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.

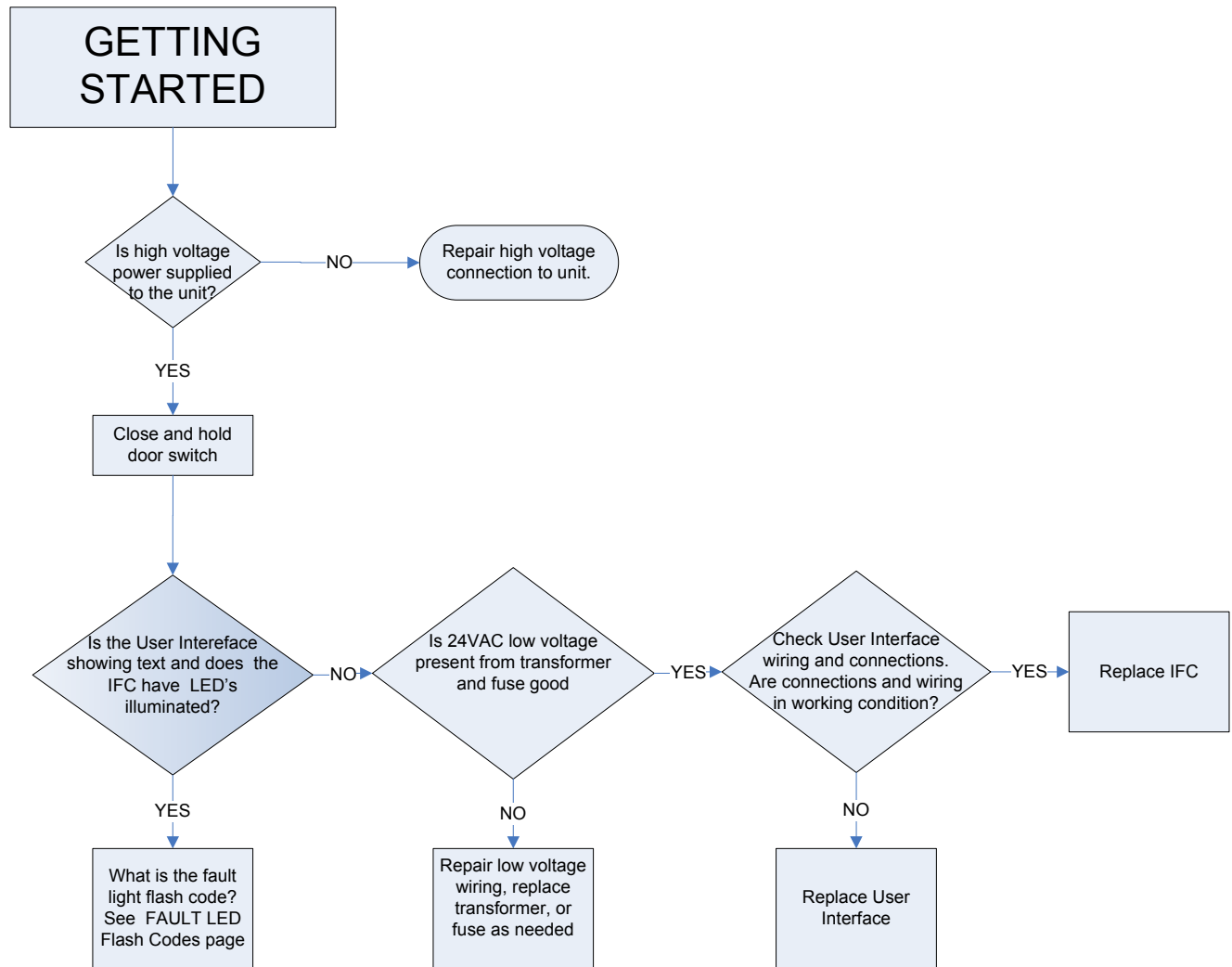
Only qualified technicians should attempt to install, troubleshoot, or repair this appliance. Failure to follow all cautions and/or warnings could result in personal or property damage; including death.

Integrated Furnace Control (IFC) Component Layout



Fault LED Flash Codes Definitions

<u>RED LED FLASH</u>	<u>ERROR</u>
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 Sense (Less than 1 dc micro-amp)
10	Communication 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)



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

Service Facts

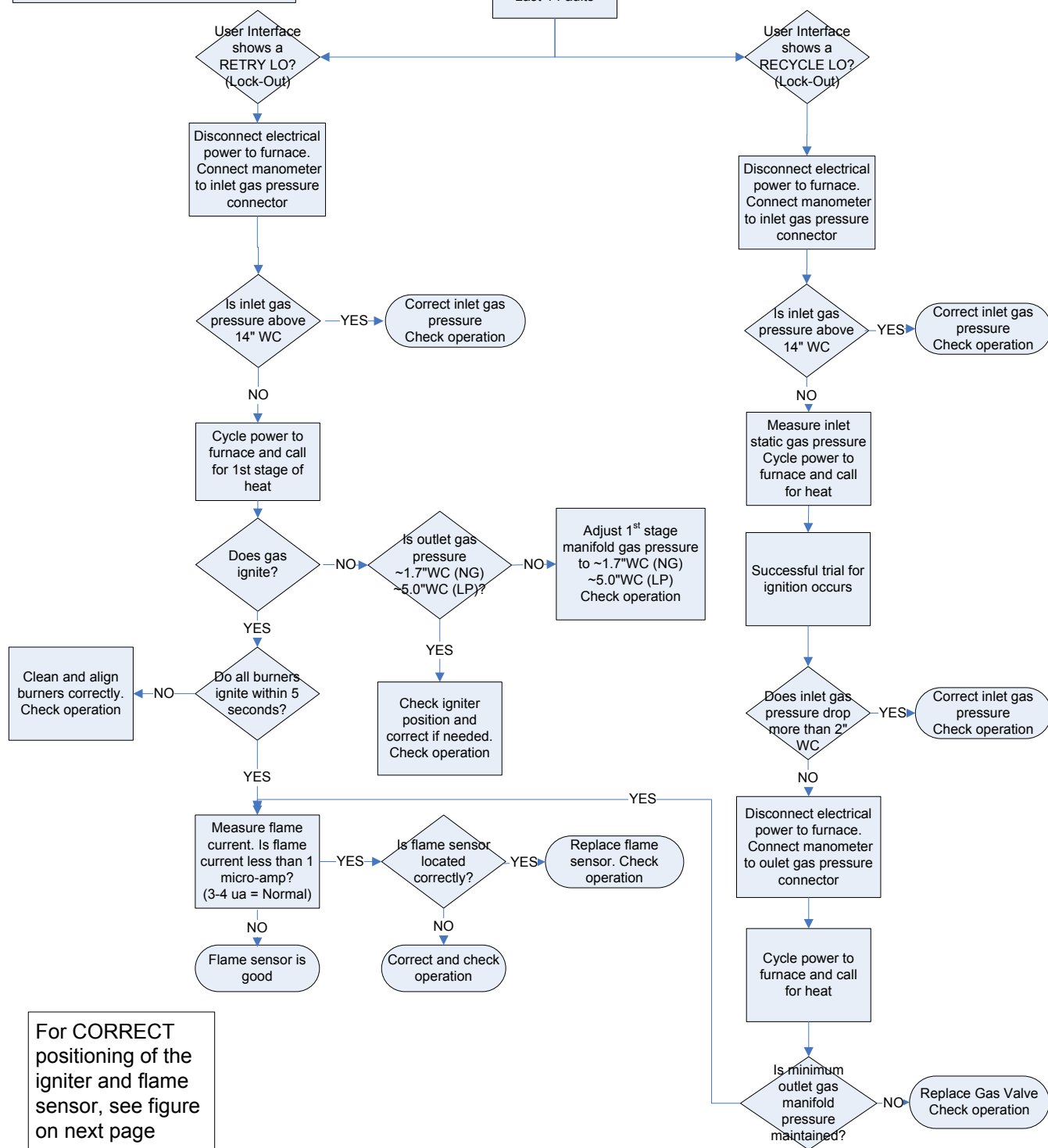
DEFINITION

RETRY LO = 3 unsuccessful tries for ignition within a single call for heat
Flame has never been sensed

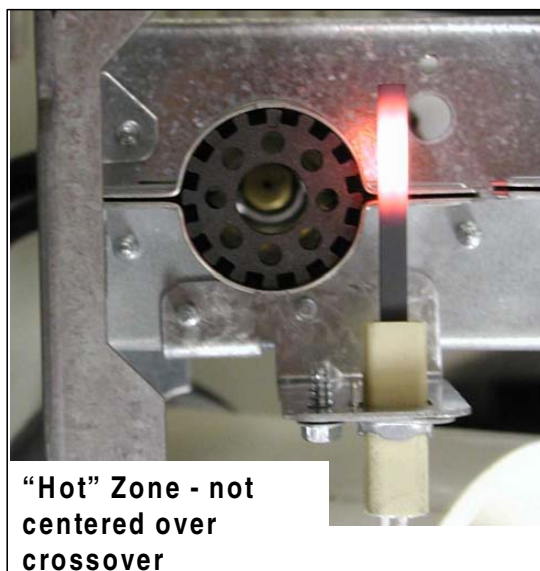
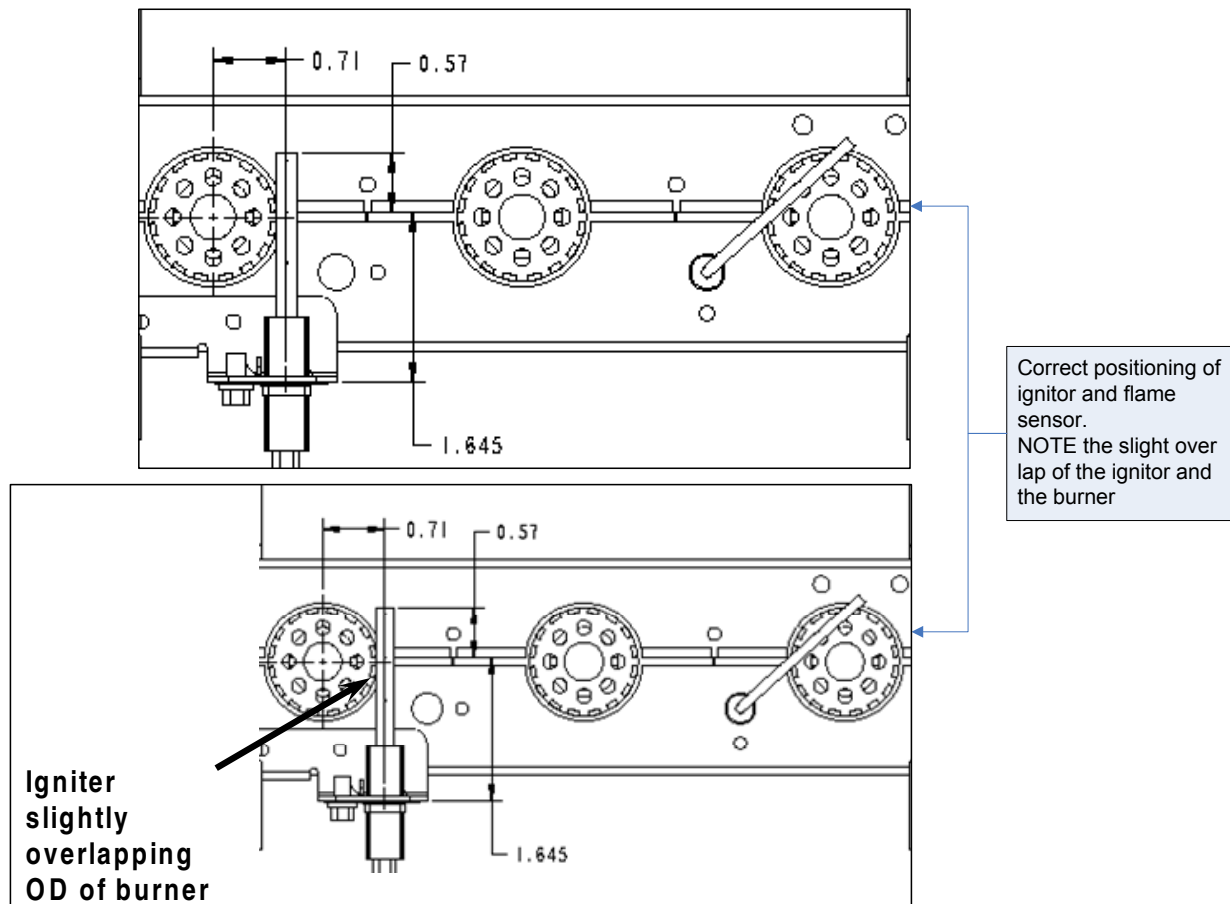
RECYCLE LO = 10 recycles within a single call for heat.
Flame is sensed & then lost

2 Flash Fault LED

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



Ignitor Positioning



INCORRECT positioning of ignitor.

HOT ZONE must be centered over the cross-over

Ignitor not overlapping burner (see above)

DEFINITION

An error has occurred with either PS1 or PS2.

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 to pressure switches is correct per wiring diagram

NOTE #1

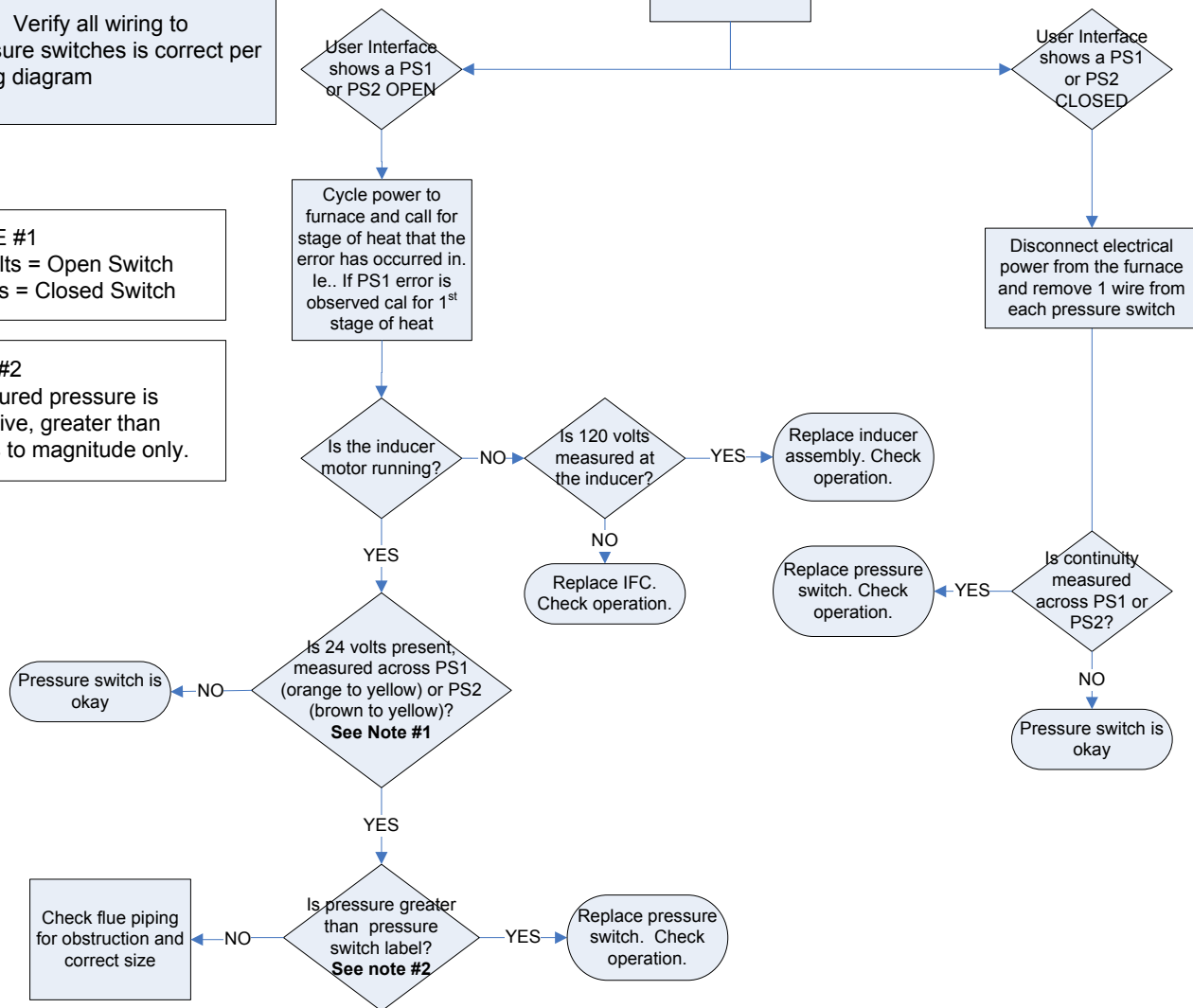
24 volts = Open Switch
0 volts = Closed Switch

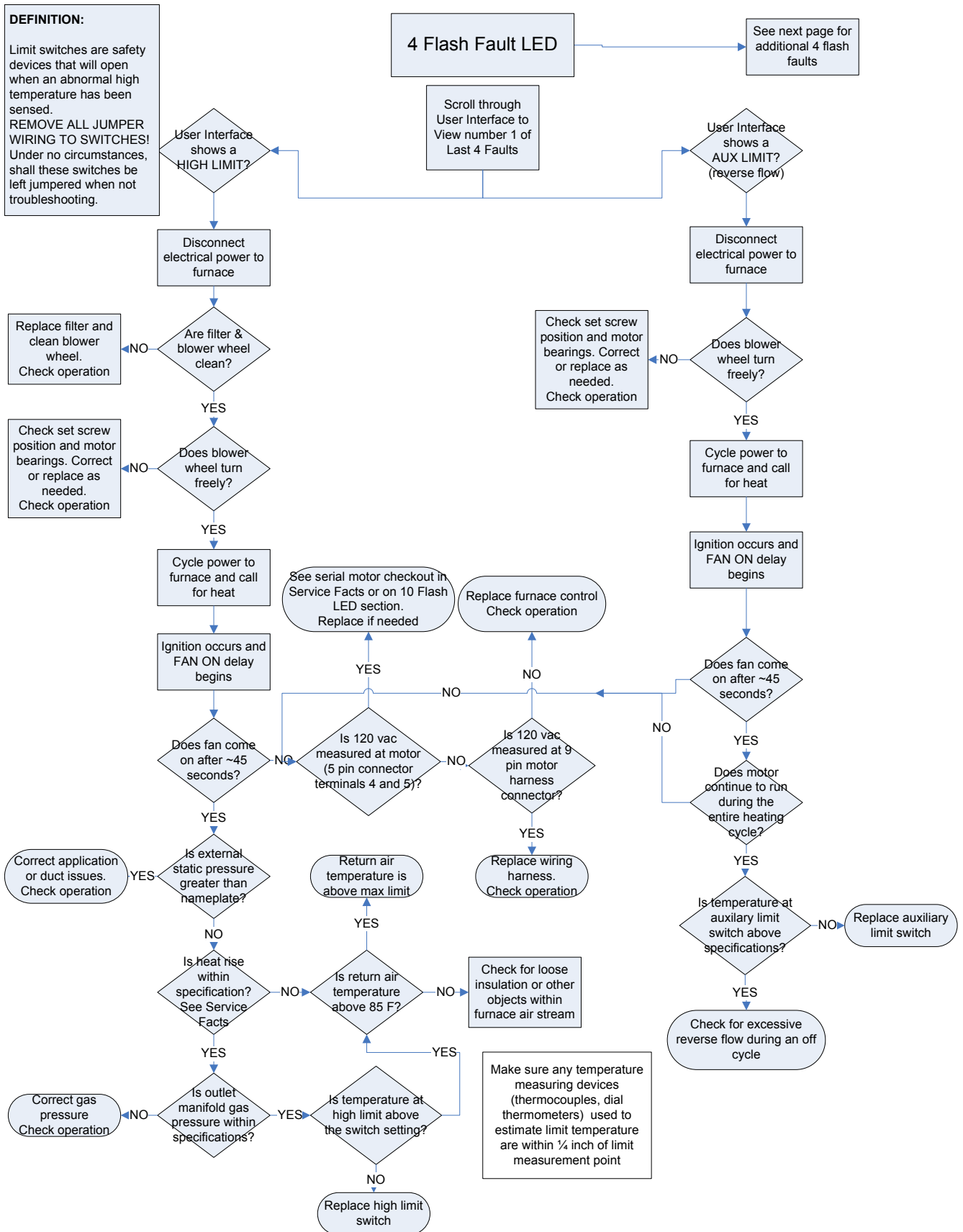
Note #2

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

3 Flash Fault LED

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



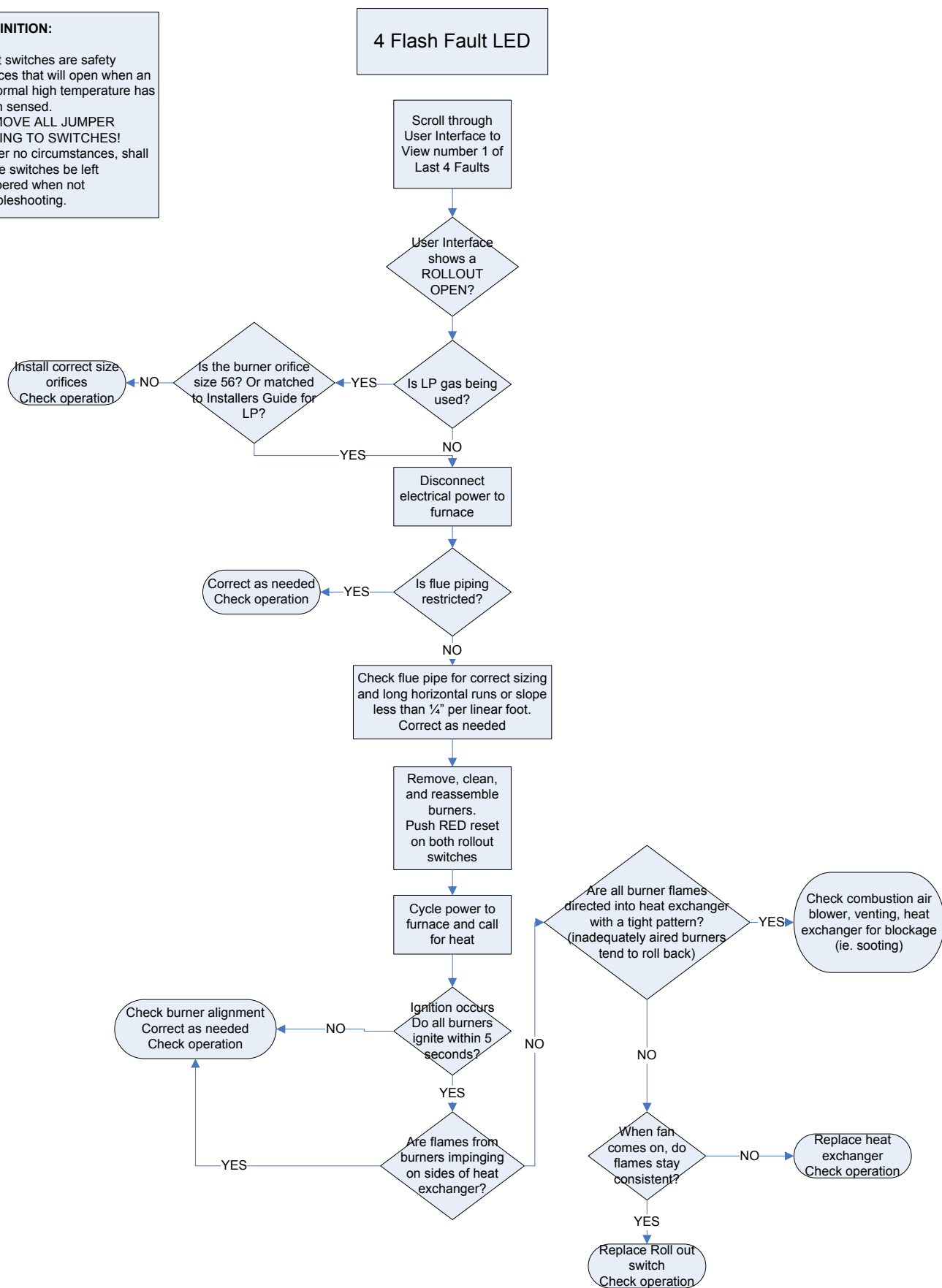


DEFINITION:

Limit switches are safety devices that will open when an abnormal high temperature has been sensed.

REMOVE ALL JUMPER WIRING TO SWITCHES!

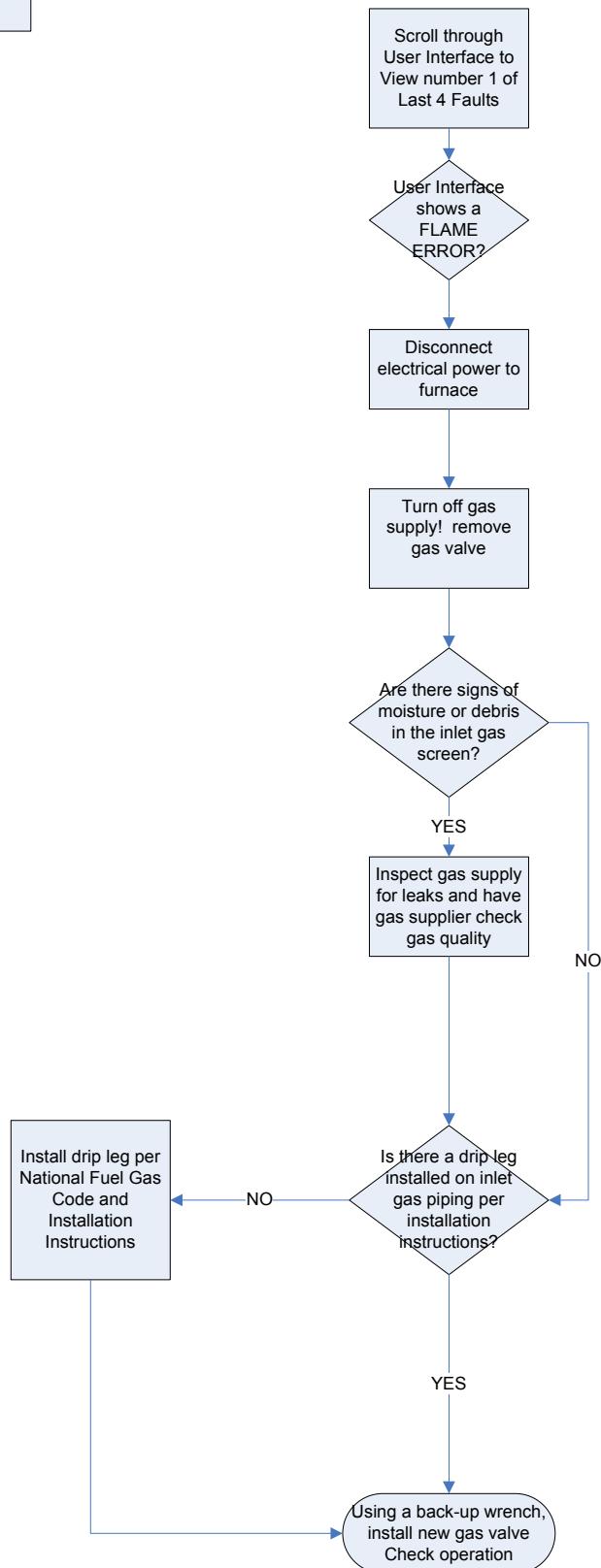
Under no circumstances, shall these switches be left jumpered when not troubleshooting.



DEFINITION:

Flame is sensed when it should not be sensed.

5 Flash Fault LED

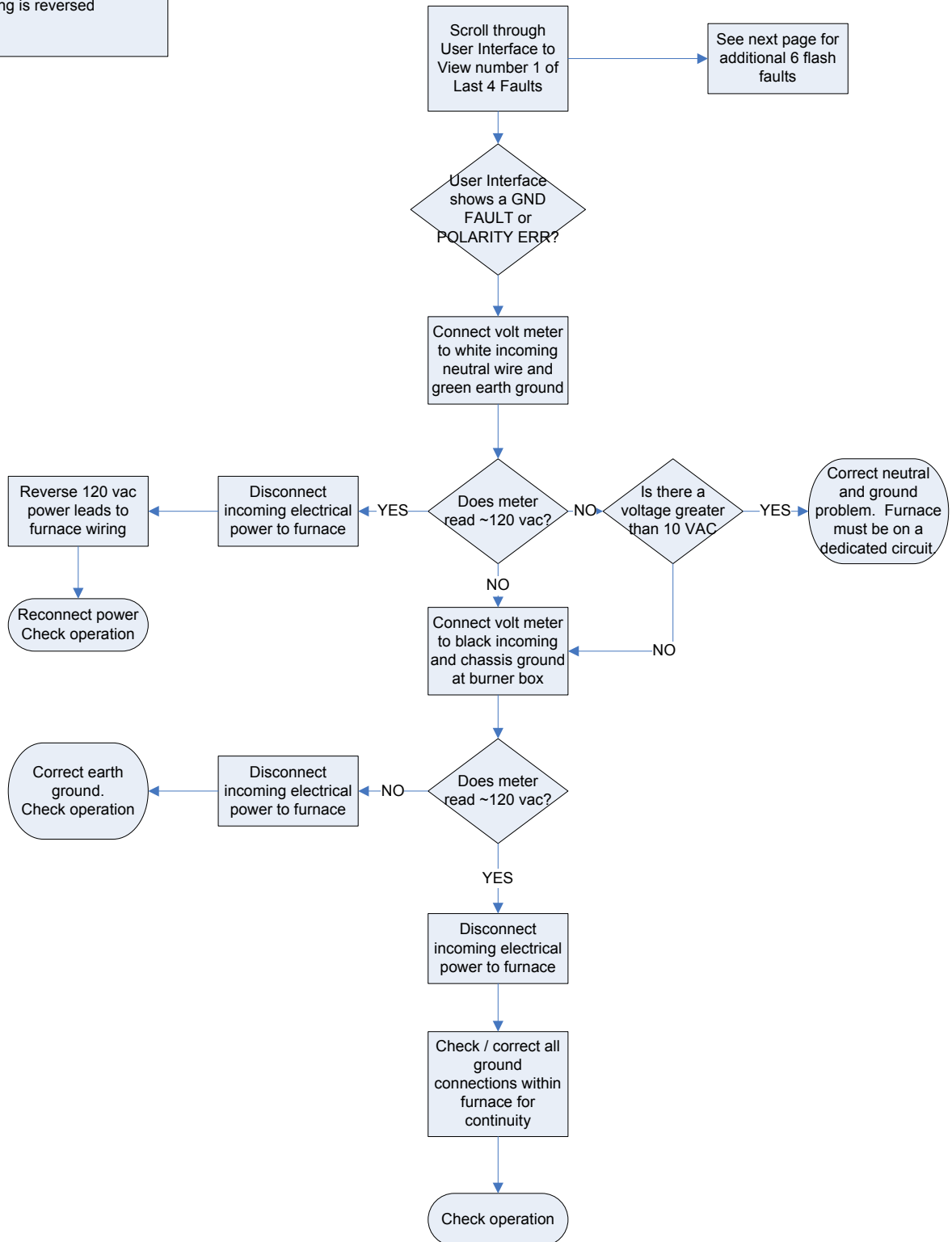


DEFINITION:

GND ERR - Incoming or chassis ground connection is not sensed

POLARITY ERR – Incoming high voltage wiring is reversed

6 Flash Fault LED



DEFINITION:

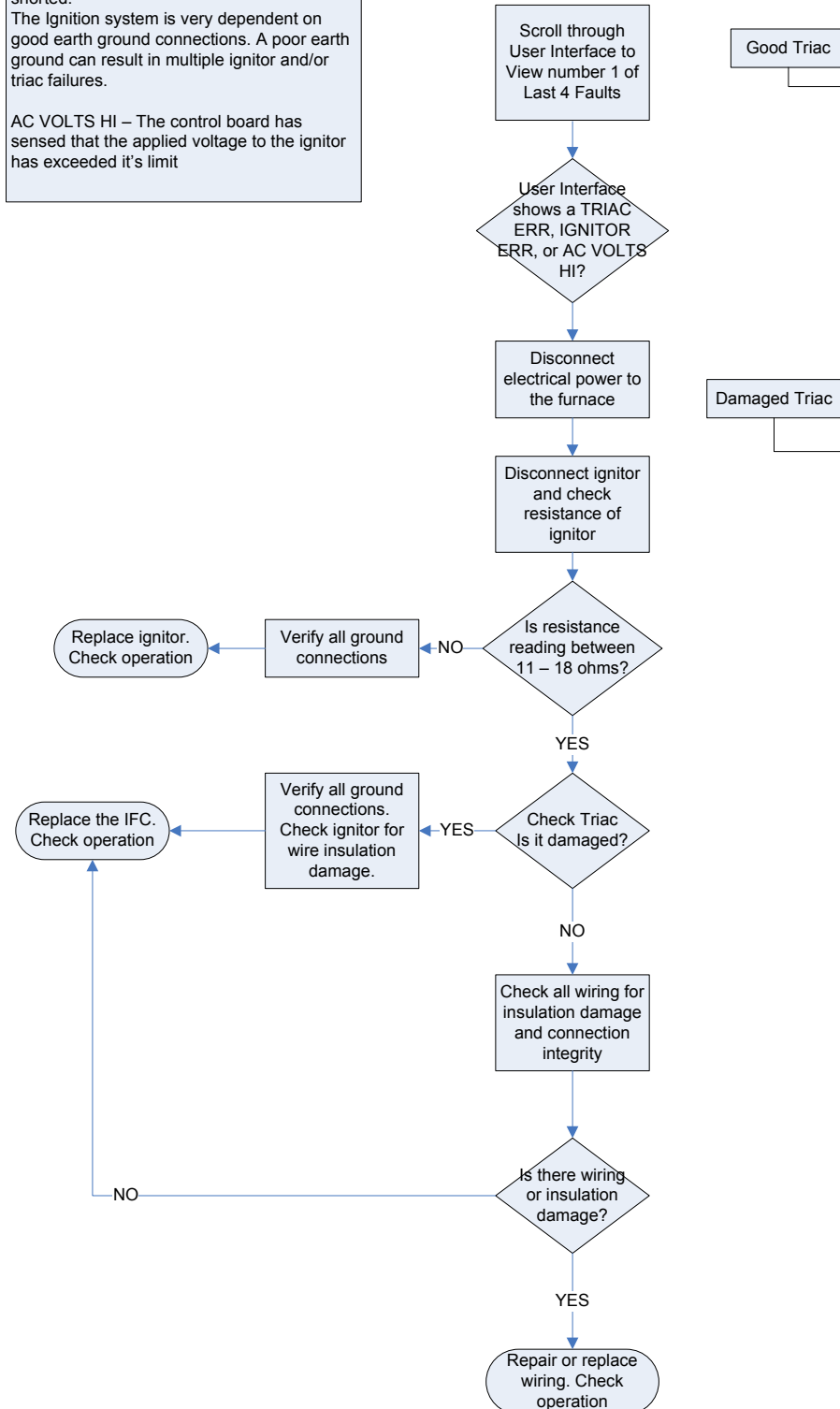
TRIAC ERR – The triac reduces voltage applied to the ignitor. A voltage error has been sensed

IGNITOR ERR – The control board has sensed that the ignitor circuit is open or shorted.

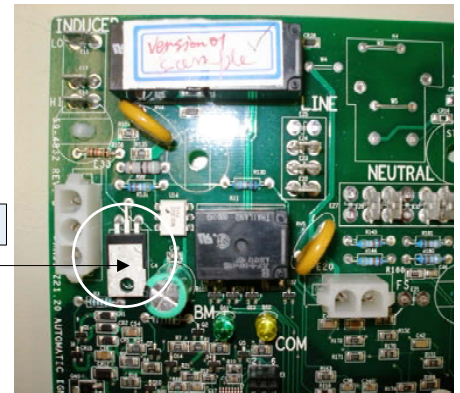
The Ignition system is very dependent on good earth ground connections. A poor earth ground can result in multiple ignitor and/or triac failures.

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

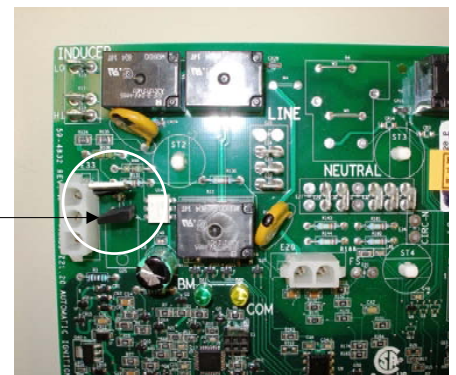
6 Flash Fault LED



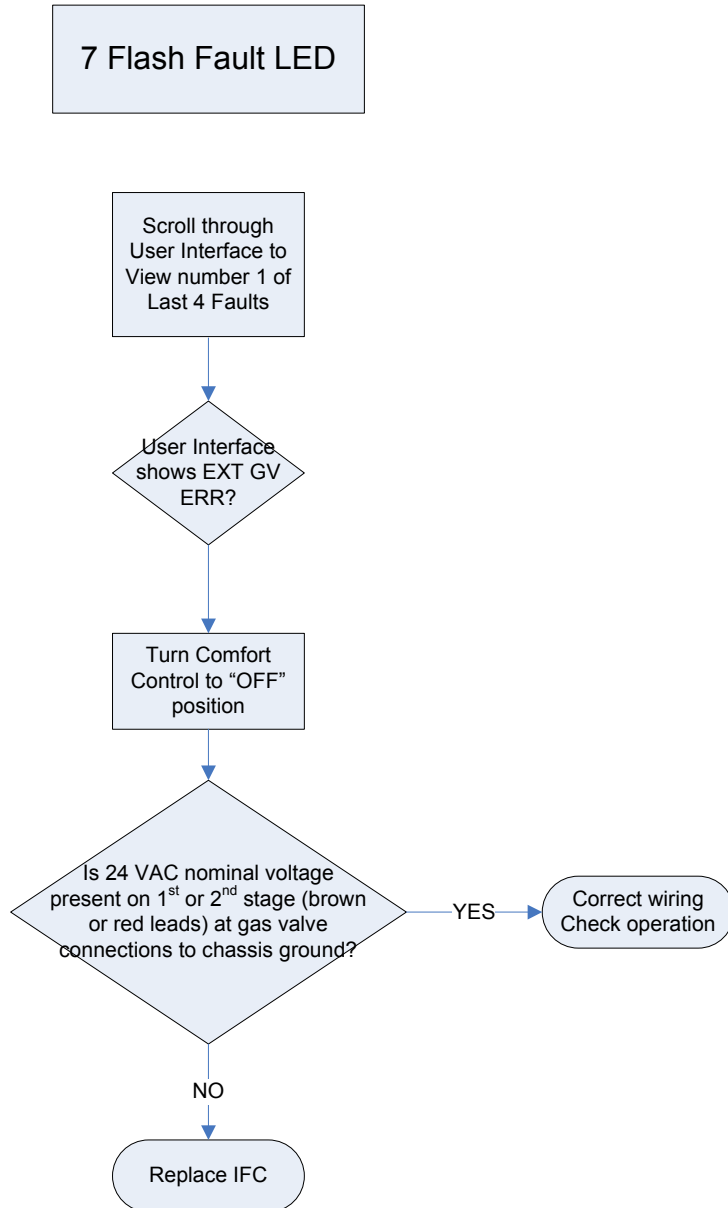
Good Triac



Damaged Triac

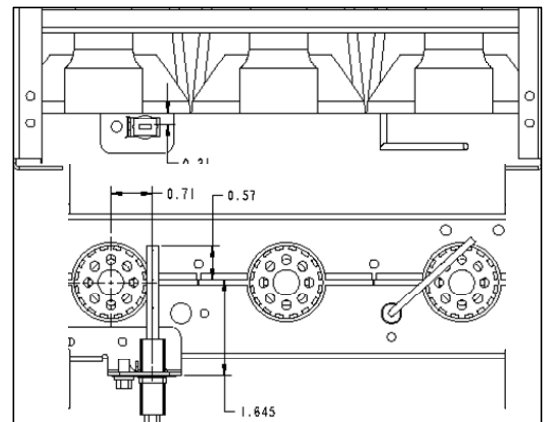
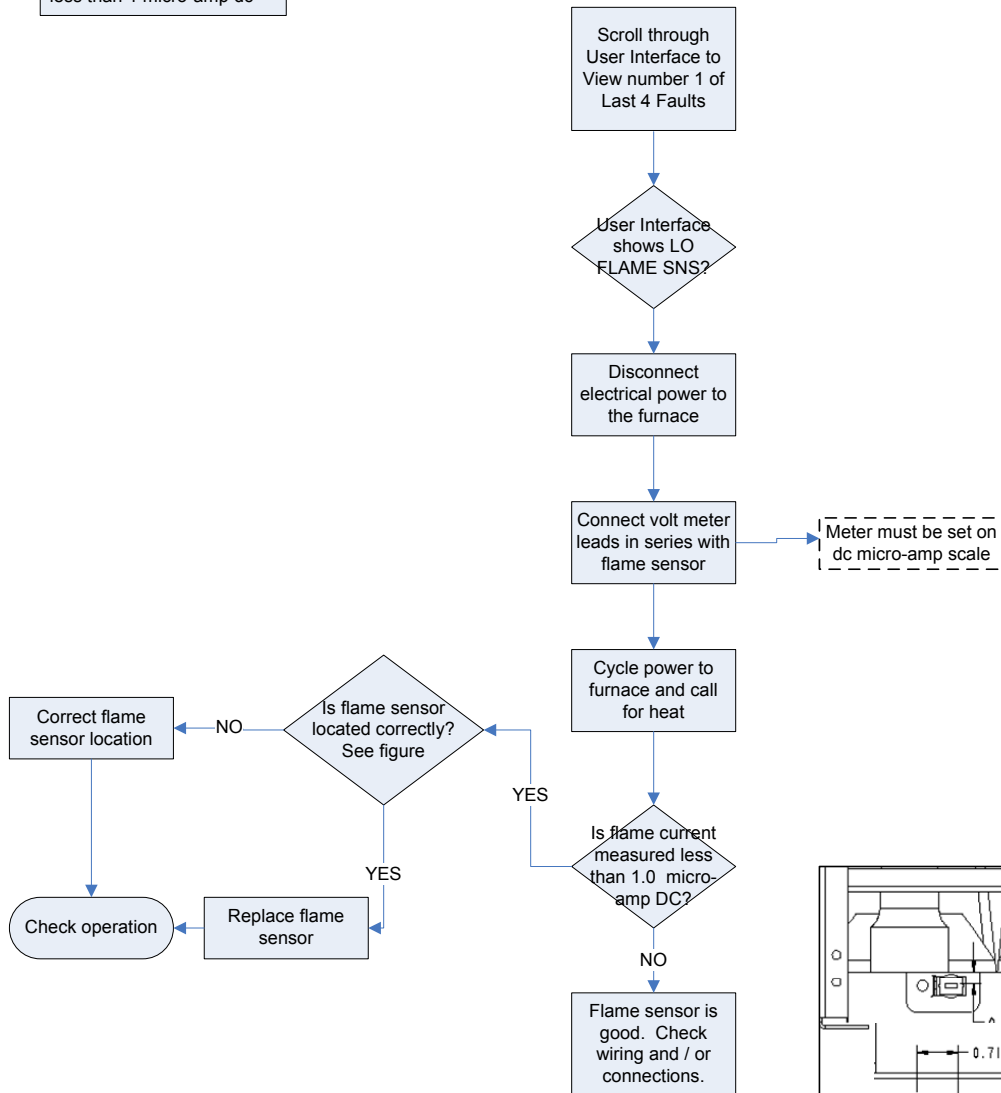


DEFINITION: External Gas Valve Circuit Error (24 volts is present when it should not be present)



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

8 Flash Fault LED



Service Facts

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

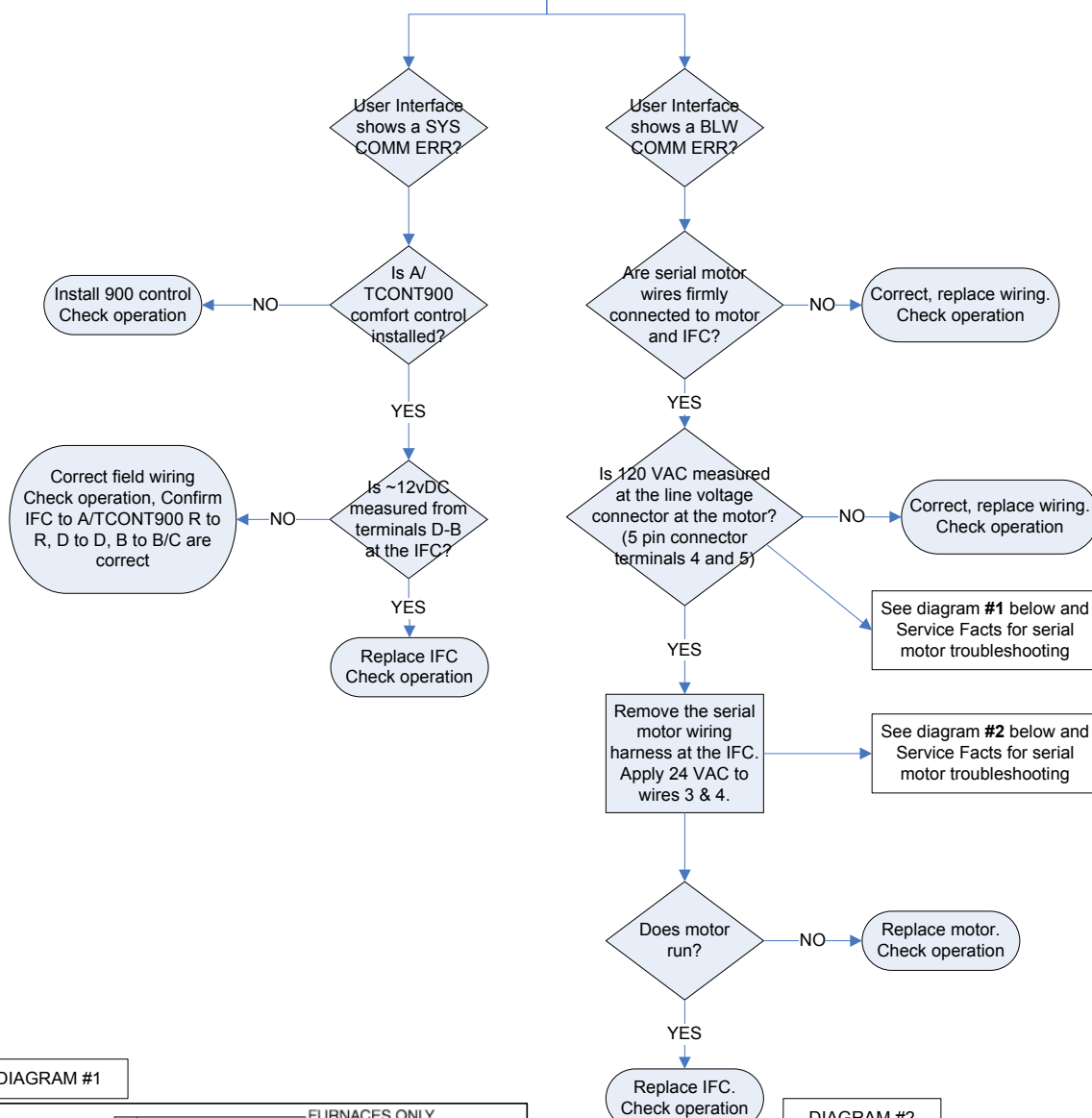


DIAGRAM #1

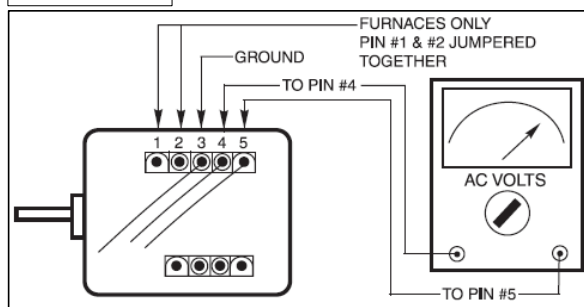
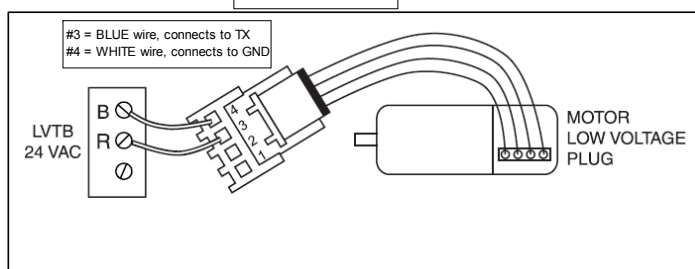
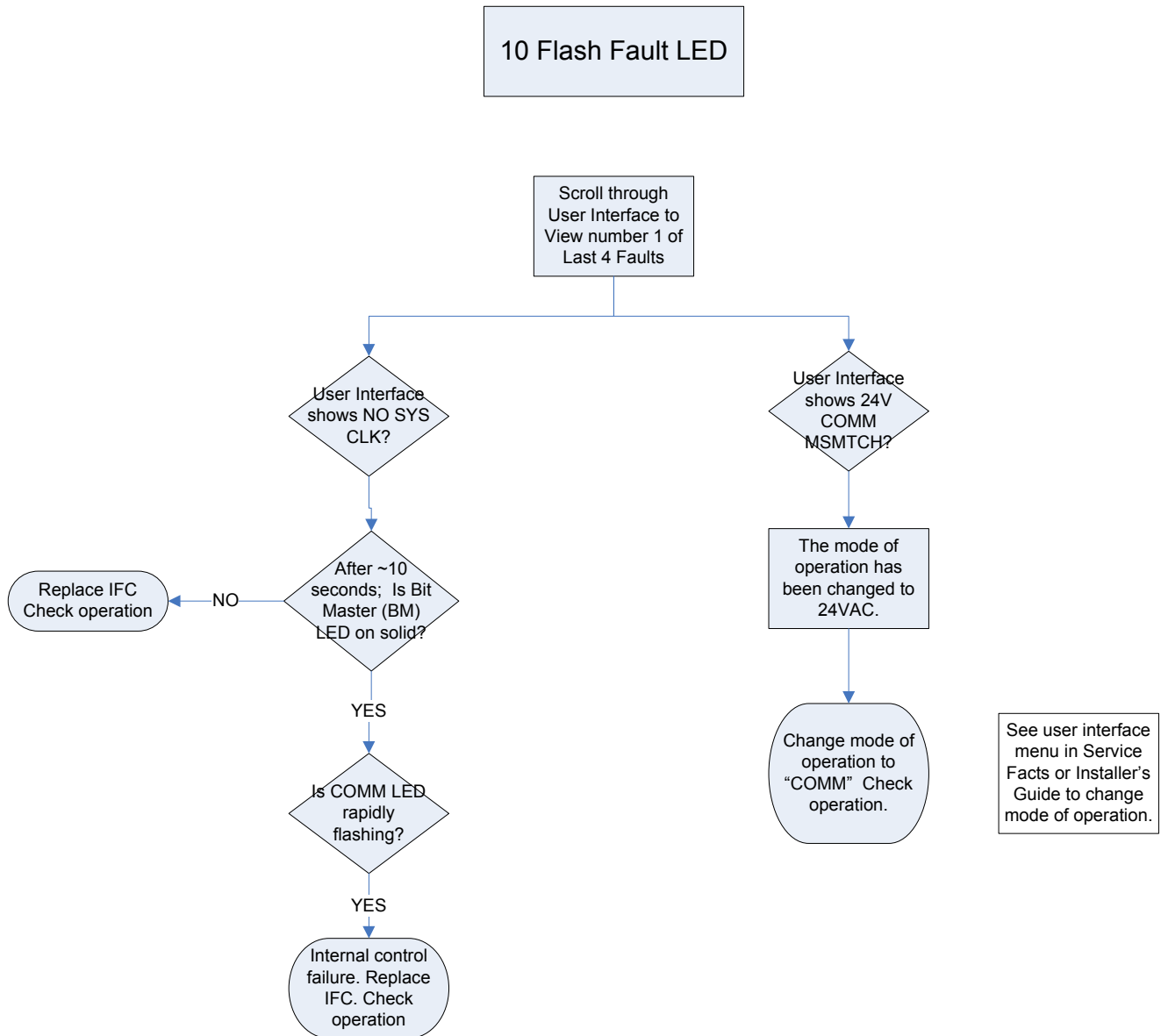


DIAGRAM #2





Trane
6200 Troup Highway
Tyler, TX 75707

*For more information contact
your local dealer (distributor)*

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