



X330961P07

SERVICE INSTALLER'S GUIDE

ALL phases of this installation must comply with
NATIONAL, STATE AND LOCAL CODES

Library	_____
Product Section	_____
Product	_____
Model	_____
Literature Type	_____
Sequence	_____
Date	_____
File No.	_____
Supersedes	_____

Radiant Sense To Flame Sense Conversion: KIT09660

IMPORTANT—This Document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

Radiant Sense to Flame Sense Conversion: **KIT09660**

⚠ WARNING

DISCONNECT POWER TO THE UNIT BEFORE REMOVING THE BLOWER DOOR. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN PERSONAL INJURY FROM MOVING PARTS.

This kit is designed to convert any known Radiant Sense (R.S.) Ignition System Furnace to a Flame Sense Ignition System. A Flame Sense IFC is included in this kit. Any of the following IFC's may be used with this conversion kit:

W-R Model	RPS Part. No.
50A50 - 471	CNT1848
50A50 - 472	CNT1849
50A50 - 473	CNT2182
50A50 - 474	CNT2183
50A55 - 480	CNT03606
50A50 - 571	CNT2181
50A55 - 486	CNT03797 (Universal Replacement Part)

KIT Contents:

- (1) 11 wire Harness Asm.
- (1) 4 wire Harness Asm.
- (1) Installation Instructions (Dwg. No. X330961P07)
- (1) Flame Sensor (SEN0491)
- (8) Wire Tie Wraps
- (1) Wire Tie Wrap (with mounting tab)
- (1) Bag Asm with 3 Screws ((two) 1/4" Hex #8 x 7/8" and (one) 1/4" Hex #8 x 3/8")
- (1) Wiring Diagram (for Upflow Furnaces) (Dwg. No. D330962P04)
- (1) Wiring Diagram (for Downflow Furnaces) (Dwg. No. D330963P04)
- (1) Label - Warning (for new Replacement Parts not on FUPS) (Dwg. No. A330964P04)
- (1) Integrated Furnace Control (IFC) (See Above list of authorized controls.)
- (1) Gas Valve Connection Block (Replacement (A341043P01)
- (1) Jumper Wire (WH/4) (A341768P01, W72593-G)
- (1) Jumper Wire (BK/4) (A341768P02, W72594-G)
- (2) Spare Jumper Wire (WH) (A341768P03, W72595-G)

⚠ WARNING

THE CABINET MUST HAVE AN UNINTERRUPTED OR UNBROKEN GROUND ACCORDING TO NATIONAL ELECTRICAL CODE, ANSI/NFPA 70 - "LATEST EDITION" AND CANADIAN ELECTRICAL CODE, CSA C22.1 OR LOCAL CODES TO MINIMIZE PERSONAL INJURY IF AN ELECTRICAL FAULT SHOULD OCCUR. A FAILURE TO FOLLOW THIS WARNING COULD RESULT IN AN ELECTRICAL SHOCK, FIRE, INJURY, OR DEATH.

1. DISCONNECT POWER TO FURNACE. Remove top and bottom Doors on furnace.
2. Note wire color of HEAT terminal on R.S. IFC.: _____ (RED, YELLOW or BLUE)
3. Note Wire Colors on existing thermostat wiring on R.S. IFC
Thermostat Connections:
C _____ Y* _____ G _____ W _____ R _____
(* On 50A50-102 R.S. IFC only.) Disconnect Thermostat wires from the R.S. IFC
4. Unplug existing Male 12 pin Amp Connector from R.S. IFC. Disconnect ALL 120V Hot and Neutral wires on left side of existing R.S. IFC. Cut and remove any wire tie wraps to facilitate disconnecting of these wires.
5. Remove RD/4 & BL/4 wires from existing R.S. IFC TH & TR terminals (on bottom of IFC) and from the Transformer located on the metal Control Box Mounting Bracket. Discard both wires.
6. Remove and discard the existing R.S. IFC from the furnace.
7. Disconnect all White wires from Radiant Sense Switch on bottom of Manifold Asm. Most models have 3 wires (WH/2, WH/3 & WH/7). TUE***A***A0 models have 2 wires (WH/2 & WH/3).
8. (REFER TO FIGURE No. 1)
Remove (or cut) WH/3 wire from existing 12 pin Amp Connector (pin 12) on existing Furnace Wire Harness.
Remove (or cut) WH/2 wire from existing 12 pin Amp Connector (pin 8) on existing Furnace Wire Harness.
Remove (or cut) WH/7 wire from existing 12 pin Amp Connector (pin 4) on existing Furnace Wire Harness (WH/7 not present on TUE***A***A0 models).
9. Remove all 3 (or 2) WH/* wires from the furnace.
10. Remove the OR/1 wire from the Pressure Switch N/C terminal.

(Continued from section 10)

Note:

This wire is not present on newer Radiant Sense models. It will not be required after conversion.

11. Remove (or cut) OR/1 wire (if it exists) from the existing Male 12 pin Amp Connector (pin 10) on existing Furnace Wire Harness. (REFER TO FIGURE No. 1)

12. Unplug existing 2 pin Amp Connector on Vent Motor.

13. Unplug existing 2 pin Amp Connector to the Ignitor.

14. Cut any wire tie wraps from wiring bundle on left side of cabinet and on manifold pipe in front of the Main Burners. Tie Wraps are included in this kit to redress wire bundles at a later time.

15. Remove and discard BK/6 and WH/6 Vent Motor wires from the Furnace.

16. Remove and discard BK/5 and WH/5 Ignitor wires from the Furnace.

17. Install new IFC (provided with this kit) with two long screws provided in kit. Install Warning Label (A330964) on Mounting platform just below IFC Thermostat connection terminals.

18. Connect BK/4 wire from Transformer to Hot 120VAC XFMR terminal on new IFC. Jumper wire included to extend wire length (A341768P02).

19. Connect WH/4 wire from Transformer to Neutral 120VAC XFMR terminal on new IFC. Jumper wire included to extend wire length (A341768P01).

20. Connect BK/1 wire from Door Switch to Hot 120VAC LINE terminal on new IFC.

21. Connect WH/1 wire from Furnace Junction Box to Neutral 120VAC LINE terminal on new IFC.

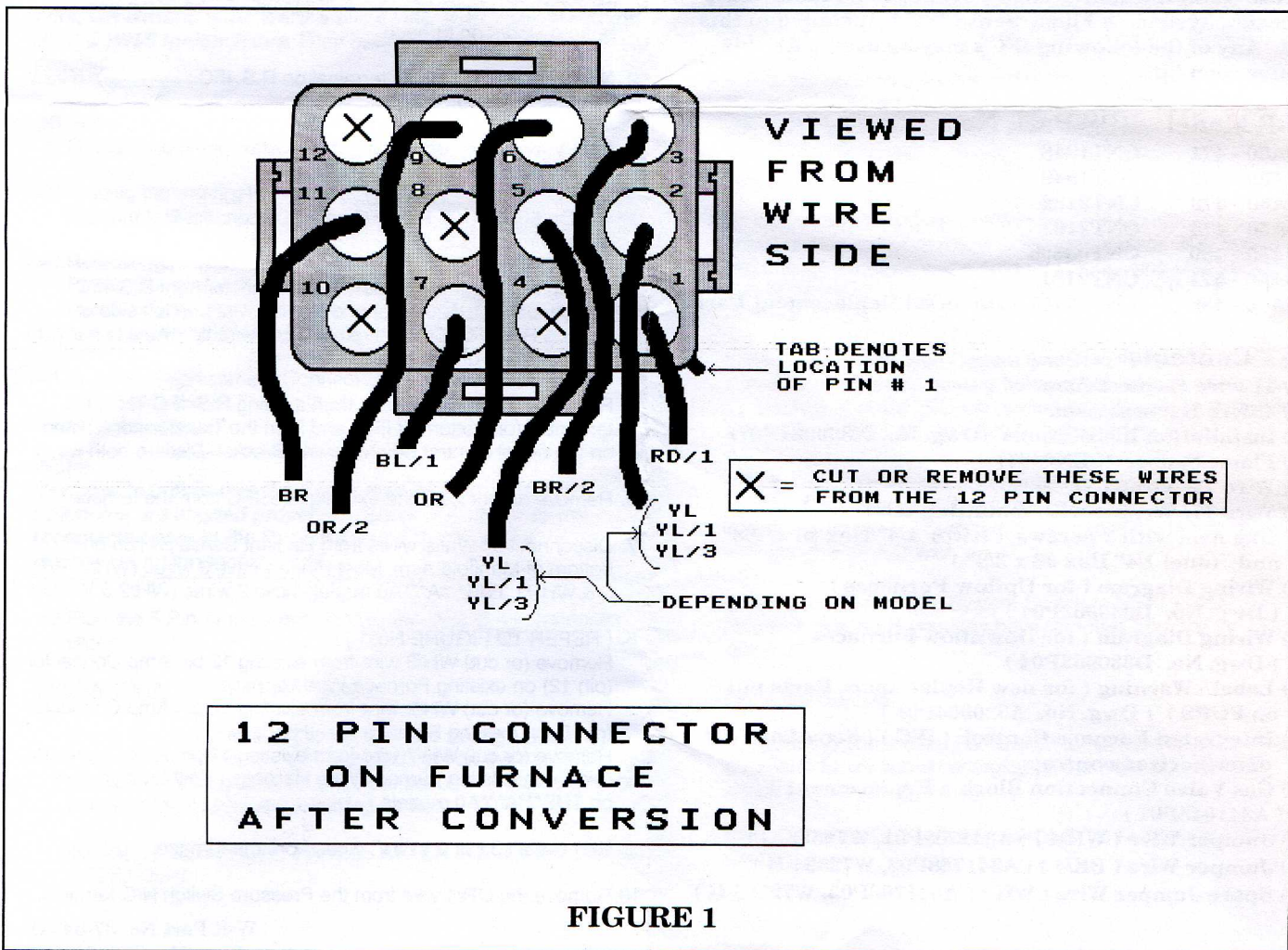
22. Connect WH Circulator Motor lead to Neutral 120VAC CIR (CIRC) terminal on new IFC.

23. Connect BK Circulator Motor lead to Hot 120VAC COOL terminal on new IFC.

24. Connect Motor lead (noted in Step 2) to Hot 120VAC HEAT terminal on new IFC. Refer to Wiring Diagram for Factory Speed Tap Selection if color of lead is unknown.

25. Connect remaining 2 motor leads (may be Red, Yellow, or Blue) to either PARK terminal on new IFC.

26. Plug 4 pin Amp Connector Harness (provided in this kit) into the 4 pin receptacle on left side of new IFC. It is polarized to fit one way. **Do Not Force.** Route both 2 pin Amp Connectors in this Harness Asm. behind motor leads on IFC, through the Rubber Grommet (on the Blower Deck) into the Burner Compartment.



27. Route the Male 2 pin Amp Connector (with BK/6 & WH/6 wires) along the left side of the Burner compartment (behind the gas supply pipe on Upflow models) and plug it into the Vent Motor Connector. Any extra wire is to be located nearest to the new IFC. It will be looped and tied later.
28. Route the Female 2 pin Amp Connector (with BK/5 & WH/5) along the left side of the Burner Compartment (behind the gas supply pipe on Downflow models), then across the front of the Manifold Pipe and plug it into the Ignitor Connector. Any extra wire is to be located nearest to the new IFC. It will be looped and tied later.
29. Plug Male 12 pin Amp Connector on (11 wire Harness included in this kit) into new IFC. It is polarized to fit one way. Do Not Force.
30. Connect BL & RD leads from Male 12 pin Amp Connector (TR pin 6 & TH pin 3) to either of the the Furnace Transformer's 3/16" wide terminals. Polarity at Transformer does not matter unless the Furnace has been "Field Twinned" with another furnace. Insure that "Twinned" furnaces have both transformers in phase (less than 10 VAC between the "R" terminals on the furnaces) or damage to a transformer or other device may occur.
31. Plug Female 12 pin Amp Connector (on kit's 11 wire harness) into the existing Male 12 pin Amp Connector (on Furnace).
32. Route GR wire (GND pin 8) and thin WH wire (FP pin 2) through Rubber Grommet on Blower Deck into the Burner Compartment.

33. (REFER TO FIGURE NO. 2)
Temporarily remove the Vent Motor Ground Screw on left side of Burner Manifold Asm. below Roll Out Switch (Fuselink). Add the GR wire (from Kit Harness) to the GR wire on the Vent Motor) and reattach to chassis ground using the same Ground Screw. Any extra wire is to be located nearest to the new IFC. It will be looped and tied later.
34. (REFER TO FIGURE No. 2)
Install Flame Sensor (included in this kit) (Rod first) into the existing 1/2 " dia. hole on the bottom / left of the Burner Support Bracket located on bottom of the Manifold Asm. Orient the Sensor mounting bracket to align the mounting holes and attach using #8 x 3/8" screw provided in kit.

⚠ WARNING

If two existing screw holes are located next to the 3/8" dia. Sensor mounting hole at 6 & 1 O'clock : USE THE 6 O'CLOCK POSITION ONLY. This will locate the Sensor Rod across the burner face of the No. 1 Main Burner. Any other orientation of the Sensor Rod will not allow proper operation of the furnace.

35. (REFER TO FIGURE No. 2)
Connect thin WH wire from Male 12 pin Amp Connector (on 11 wire harness - pin 2 FP) to 1/4" wide terminal on Flame Sensor. Route this wire along the Manifold Pipe (along with the BK/5 & WH/5 Ignitor wires). Use at least 2 Wire Tie Wraps to attach wire bundle to the Manifold Pipe. Any extra wire is to be located nearest to the new IFC. It will be looped and tied later.

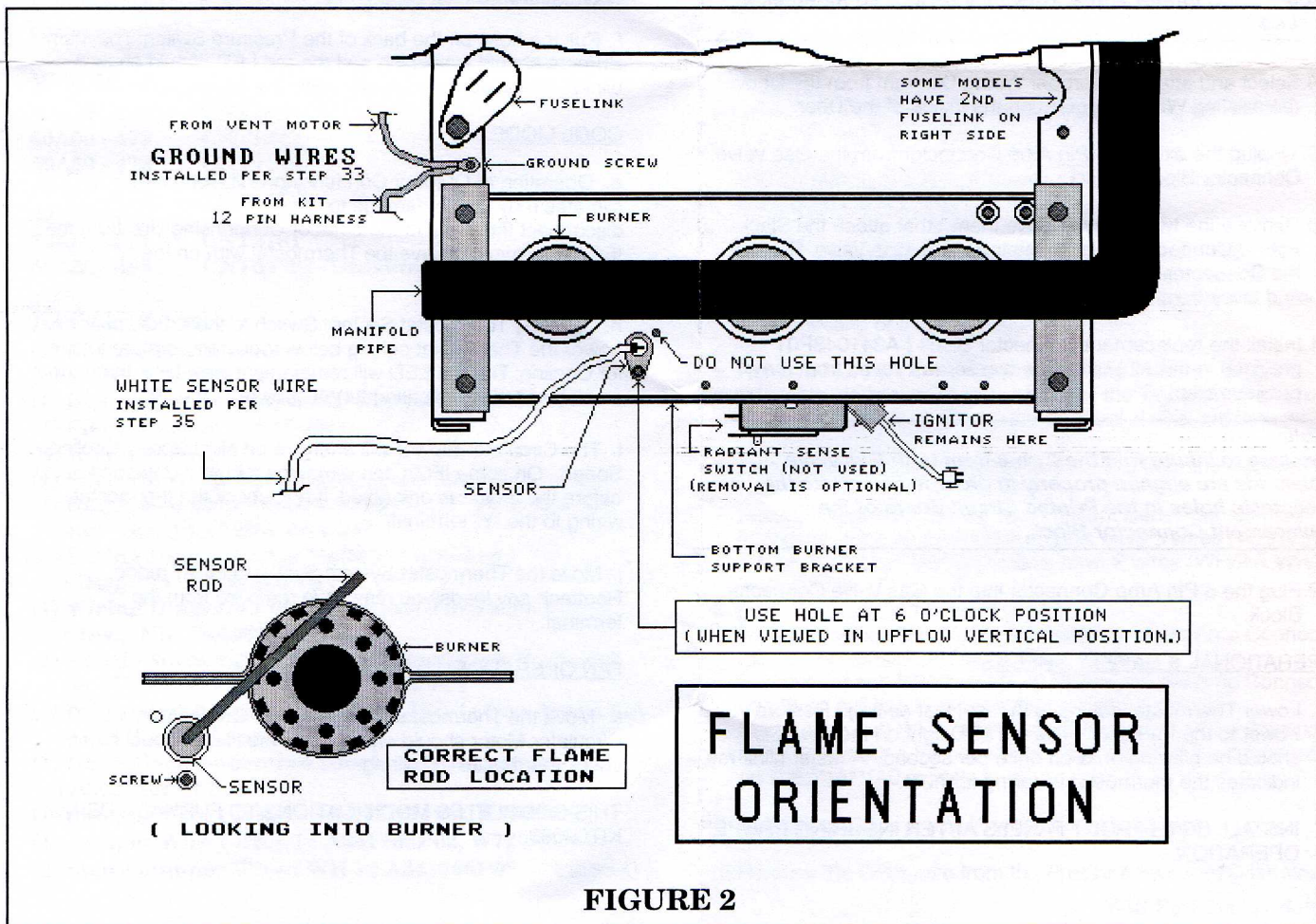


FIGURE 2

36. Reconnect thermostat leads to LVTB screws. On some models with factory provided 1/4 Q/A terminals, it will be necessary to cut and strip these wires. Refer to notes in Step 3. *Note that thermostat terminals are not in the same order (left to right) as on the old IFC.*

CAUTION

For proper Cooling operation it is necessary to connect the "Y" terminal on the thermostat to the "Y" terminal on the new IFC.

If the old IFC had Cooling connections to the "G" terminal, these connections must now be made on the "Y" terminal. The Fan Switch (Auto / Manual) on the thermostat will energize the Circulator Motor on the Heat Speed when "G" terminal is energized on the new IFC. The "Y" terminal on the new IFC must be energized to operate the Circulator Motor on High Speed for Cooling.

Refer to Instructions on the new IFC label to accomplish Cool Off Fan Delay if desired.

37. Tie Wrap the wire bundle along the left side of the Burner Compartment. A special Tie Wrap is provided in this kit to attach this bundle to the Junction Box Cover.

Note:

Any wires that are too long are to be looped and tie wrapped as near to the new IFC as practical. Insure that any looped wires do not come in contact with any hot surfaces in the furnace. Wires that may need to be looped are WH Sensor Wire; GR Ground Wire; BK/6 & WH/6 Vent Motor Wires and the BK/5 & WH/5 Ignitor Wires. They may be looped together, if desired.

38. Select and attach the proper Wiring Diagram from the kit over the existing Wiring Diagram on the inside of the Door.

39. Unplug the existing 5 Pin Amp Connector from the Gas Valve Connector Block.

40. Remove the two screws (Save them) that attach the Black Plastic Connector Block to the top of the Gas Valve. Remove the Connector Block from the Gas Valve by pulling it straight up and away from the Gas Valve Body and discard it.

41. Install the replacement Connector Block (A341043P01 provided in this kit) using the two screws saved from the previous step.

Note:

Use care to insure that the 2 pins from both Gas Valve Solenoids are aligned properly in order to insert into the receptacle holes in the Printed Circuit Board of the replacement Connector Block.

42. Plug the 5 Pin Amp Connector into the Gas Valve Connector Block.

OPERATIONAL & SAFETY CHECKS

Lower Thermostat setting to lowest Heat setting. Restore Power to the Furnace. The red LED light on the new IFC should be blinking on & off once per second. A faster blink rate indicates the thermostat is calling for heat.

INSTALL BOTH FRONT PANELS AFTER INSURING PROPER OPERATION.

HEAT MODE:

a. Raise the thermostat Heat setting until the red LED indicates a call for heat (Fast blink). Any other blinking pattern of 2 to 5 flashes then a pause indicates a problem with the furnace.

b. The Vent Motor will be energized. The Pressure switch will signal the IFC to energize the Ignitor. The Ignitor will start to glow after approx. 8 seconds of operation. The Ignitor will be energized for approx. 17 seconds. If the Ignitor does not glow, check the red LED blink rate:

3 blinks = Pressure Switch / Vent Motor problem.

4 blinks = Limit Switch, Reverse Flow Switch or Roll Out Switch (Fuselink) is open.

Fast blink with no Ignitor glow = Possible Bad Ignitor.

c. At the end of the 17 second Ignitor Warm-up period the Gas Valve will open for at least 4 seconds. The Main Burners should light. If the burners light, then go off in approx. 4 seconds there is a problem with polarity of the 120VAC field wiring to the furnace or a problem with the Flame Sensor rod / circuit.

d. Approx. 45 seconds after the Main Burners lit, the Circulator Blower will be energized on the Heat speed.

SAFETY CHECKS:

(with Furnace operating and firing normally.)

e. Pull a yellow wire off of the rollout or Limit Switch. The Main Burners should extinguish and the red LED should show 4 blinks. Reattach the wire and allow the furnace to restart.

f. Pull the hose off the back of the Pressure Switch. The Main Burners should extinguish and the red LED should show 3 blinks. Reattach the hose and allow the furnace to restart.

COOL MODE:

g. Operation of Outdoor Condensing Unit Compressor in Cold climates may cause damage to the compressor. If in doubt, disconnect the wires to the outdoor Condensing Unit from the IFC "Y" terminal. Leave the Thermostat wire on the "Y" terminal.

h. Move the Thermostat System Switch to the COOL position. Lower the Thermostat setting below room temperature to call for Cooling. The red LED will remain on a slow blink throughout a call for cooling indicating 24VAC power to the IFC.

i. The Circulator Blower will energize on High Speed Cooling Speed. On some IFC's, there may be a built in 2 second delay before the motor is energized. If not, check the thermostat wiring to the "Y" terminal.

j. Move the Thermostat System Switch to HEAT mode. Reattach any leads you may have removed from the "Y" terminal.

FAN OPERATION:

k. Move the Thermostat Fan Switch to "On" (or Manual). The Circulator Motor should energize on the Heat Speed. If not, check thermostat "G" wiring.

THIS COMPLETES MODIFICATIONS TO FURNACE USING KIT09660.

SERVICE INSTALLER'S GUIDE

ALL phases of this installation must comply with
NATIONAL, STATE AND LOCAL CODES

UNIVERSAL REPLACEMENT IFC

Model: **CNT03797**

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UNIVERSAL REPLACEMENT IFC: CNT03797

Trane Drawing no. D341235P04,
White Rodgers Part No.: 50A55-486
Description : SiC / Bareboard with cover

INSTRUCTIONS:

Use these instructions when replacing the following
Integrated Furnace Controls (IFC):

White Rodgers Part No.	Trane Drawing No.	Description	Replacement Part No.
50A50-474	D330934P01	SiC / white box	CNT02183
50A50-473	D330930P01	SiC / white box	CNT02182
50A50-571	D330927P01	SiC / gray box	CNT02181
50A55-474	D341235P01	SiC / bareboard	CNT02891
50A55-480	D341235P02	SiC / bareboard with cover	CNT03606
50A55-571	D341122P01	SiC / bareboard	CNT02789

⚠ WARNING: Disconnect power to the unit before removing the blower door. Failure to follow this warning could result in personal injury from moving parts.

⚠ WARNING: The cabinet must have an uninterrupted or unbroken ground according to National Electrical Code, ANSI/NFPA 70 - "latest edition" and Canadian Electrical Code, CSA C22.1 or local codes to minimize personal injury if an electrical fault should occur. A failure to follow this warning could result in an electrical shock, fire, injury, or

⚠ CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

REMOVAL:

- Turn the thermostat to the off position.
- Disconnect all electrical power and shut off the gas supply to the furnace.

- Remove the burner assembly and blower door.
- Disconnect all the wires from the IFC and remove the IFC from the unit.

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

INSTALLATION:

- Attach the IFC to the platform using self tapping screws (#8-18x1") or plastic standoffs.
- Reconnect the wires to the IFC. Additional jumper wires are included in the kit if the original wires do not reach the IFC. Refer to the wiring diagram on the blower door for proper connection of the wires.
- Install the burner and blower doors.
- Reconnect all electrical power and turn on the gas supply to the unit.
- Verify proper operation after servicing.
- Turn the thermostat to the on position.
- Initiate a call for heat by placing the thermostat in the heating mode and raising the thermostat heating setpoint 5 degrees above the room temperature.
- Observe the furnace: If properly wired, a normal start-up sequence should be observed:
 - The red LED on the IFC should start a fast flash sequence.
 - The draft inducer should energize, then the igniter should start to glow.
 - After the igniter heat up time has expired, the gas valve should be energized - listen for the "click".
 - The gas will then ignite.
 - after 45 seconds, the main blower will turn on.
 - After successful operation, set the thermostat back to the proper set point.
- Refer to the integrated furnace control error flash codes to resolve furnace related issues: (See Page 2).

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

W-R Part No. 37-6491A
Dwg. No. X342093 P01
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SiC - IFC ERROR CODES

INTEGRATED FURNACE CONTROL ERROR FLASH CODES	
Flashing Slow ---	Normal - No call for Heat
Flashing Fast ---	Normal - Call for Heat
Continuous ON ---	Replace IFC
Continuous OFF ---	Check Power
2 Flashes ---	System Lockout (Retries or Recycles exceeded)
3 Flashes ---	Draft Pressure Error - Possible problems: a) Venting problem b) Pressure switch problem c) Inducer problem
4 Flashes ---	Open Temperature Limit Circuit
5 Flashes ---	Flame sensed when no flame should be present
6 Flashes ---	115 volt AC power reversed, poor grounding or system voltage too low
7 Flashes ---	Gas valve circuit error
8 Flashes ---	Low flame sense signal

NOTICE

THIS UNIT HAS BEEN CONVERTED TO A
FLAME SENSE IGNITION SYSTEM USING
KIT 5216. REPLACEMENT PARTS ARE:

INTERGRATED FURNACE
CONTROL - CNT03606
FLAME SENSOR - SEN0491

156-6650

A330964P03