

ICM2807

Fixed Speed Furnace Control Replacement Kit

Replaces: Carrier HK42FZ017

Features

- Controls gas valve, ignitor, blower motor, inducer, humidifier and air cleaner
- Microprocessor-based
- Designed for 100% gas shutoff in case of ignition failure
- Twinning compatible with other ICM2807 boards
- Reverse polarity protection
- Secondary brownout voltage protection
- Compatible with 24 VAC standard thermostat
- Provides diagnostic LED to aid in troubleshooting

Exclusive ICM Features

- Continuous Blower Speed Jumper**
The ICM2807 does not use the thermostat to adjust the continuous fan speed. Installer should use the on-board jumper to select the continuous fan speed. Move the jumper to the pins for the desired speed.
- Limit Switch Lockout Time**
The ICM2807 uses a patent-pending mathematical formula to determine the best limit switch lockout time based on operation history. There is no longer a fixed 3-hour lockout.
- Limit Switch Lockout After Power Interruption**
The ICM2807 uses innovative technology to keep limit switch in effect after a power interruption. This feature improves safety. When you cycle the power, the unit remains in limit switch lockout. To terminate the lockout, press the RESET button.
- Self-Diagnostics**
The ICM2807 uses a patent-pending algorithm to perform self-diagnostics. It records all problems since the last maintenance service call. All problems are stored according to severity and relevance. Press the "DIAGNOSIS" button to view the self-diagnostics codes. With this feature, ICM2807 doesn't blink the last fault code at the beginning of component self-test.

Safety Considerations

Only trained personnel should install or service heating equipment. When working with heating equipment, be sure to read and understand all precautions in the documentation, on labels, and on tags that accompany the equipment. Failure to follow all safety guidelines may result in damage to equipment, severe personal injury or death.

Introduction

The ICM2807 fixed speed furnace control replaces the following Carrier modules: HK42FZ005, HK42FZ010, HK42FZ015 and HK42FZ017. The ICM2807 has incorporated LED diagnostics to assist in troubleshooting. A fault code label is included in this package and must be installed on the furnace.

Electrostatic Discharge (ESD) Precautions

CAUTION!

Use caution when installing and servicing the furnace to avoid and control electrostatic discharge; ESD can impact electronic components. These precautions must be followed to prevent electrostatic discharge from hand tools & personnel. Following the precautions will protect the control from ESD by discharging static electricity buildup to ground.

1. Disconnect all power to the furnace. Do not touch the control or the wiring prior to discharging your body's electrostatic charge to ground.
2. To ground yourself, touch your hand and tools to a clean, metal (unpainted) furnace surface near the control board.
3. Service the furnace after touching the chassis. Your body will recharge with static electricity as you shuffle your feet or move around and you must reground yourself.
4. Reground yourself if you touch ungrounded items.
5. Before handling a new control, reground yourself; this will protect the control. Store used and new controls in separate containers before touching ungrounded objects.
6. ESD damage can also be prevented by using an ESD service kit.

Step 1: Remove Existing Control

CAUTION!

To service control, and prior to disconnection, label all wires. Failure to do so may result in wiring errors that can cause dangerous operation.

1. Turn thermostat to OFF position or set it to the lowest possible setting.
2. Turn OFF electrical supply to furnace.
3. Turn OFF gas supply to furnace.

CAUTION!

Failure to turn off gas & electric supplies can result in explosion/fire/death, or injury.

4. For 80% furnaces, remove control access and blower door; for 90% furnaces, remove outer door assembly and remove the two screws from blower access panel and set aside.
5. Disconnect thermostat wires and humidifier wires (if equipped with a humidifier). Label all wires before you disconnect them.
6. Disconnect line voltage, blower, electronic air cleaner wires (if equipped), and transformer wires.
7. For 80% furnaces, remove retaining screws and remove furnace control board from bracket; for 90% furnaces, remove two screws from blower deck that hold the control box assembly. Lower the control box assembly. Remove retaining screw(s) from board and remove board from control box assembly.
8. Remove wiring harness connectors from circuit board.
9. Examine control and control box to check for water stains.
10. Make repairs if any sources of water leakage are found. Be sure to check humidifiers, evaporator coils, and vent systems in the area of the control.

Step 2- Installing the New Furnace Control

1. Since the board is static sensitive be sure to ground yourself. If you cannot, hold the board by the edges of the plastic mounting frame.
2. Insert the board tabs into slots of the control box (if needed).
3. Install the furnace board retaining screw.
4. Install the wiring harness adapter to two connectors of the existing wiring harness:
 - a. The furnace harness 9 pin connector plugs into the mating 9 pin adapter harness connector.
 - b. The furnace harness 12 pin connector plugs into the mating 12 pin adapter harness connector.
5. The other end of the adapter harness connects to the new furnace board:
 - a. Connect the 12 pin connector to PL1 on the furnace board.
 - b. Connect the 3 pin connector with the two black wires and one red wire to PL2 on the furnace board.
 - c. Connect the two white wires to the 115 volt neutral quick-connect terminals, located next to PL1 .
6. The transformer is connected by:
 - a. Connect the blue wire to the SEC-2 terminal. The SEC-2 terminal is located near the 3 amp fuse.
 - b. Connect the red wire to the SEC-1 terminal. The SEC-1 terminal is located next to the SEC-2 terminal.
 - c. Connect the white wire to one of the 115 volt neutral quick-connect terminals located near PL1.
 - d. Connect the black wire to the PR-1 terminal which is located next to PL2.

7. Connect the white wire from the auxiliary furnace junction box to one of the 115 volt neutral quick-connect terminals located near PL1.
8. Connect the black wire from the auxiliary furnace junction box to L1 on the blower relay.
9. Connect the blower motor leads as follows:
 - a. Connect the blower motor high heat tap to the blower relay terminal labeled HI HEAT.
 - b. Connect the blower motor low heat tap to the blower relay terminal labeled LO HEAT.
 - c. Connect the blower motor cool tap to the blower relay terminal labeled COOL.
 - d. Connect the white blower motor lead to the BLW terminal within the group of 115 volt neutral quick-connect terminals. It is identified by the smaller sized terminal.
 - e. Connect any remaining blower motor leads to the SPARE-1 and SPARE-2 terminals.
10. Connect all of the accessory wires.
11. For 90% efficiency furnaces, re-install the control box assembly to the blower deck by installing the two screws previously removed.
12. Set the blower off delay by selecting appropriate switches. Use the table below to select a different delay from the factory setting of 120 seconds.
13. If a two-stage thermostat is being used place jumper of LHT in the ON position.
14. Install the kit wiring diagram near the furnace wiring diagram.
15. The thermostat wires should not be connected until the Start-up and System checks are completed.

Variable Speed Systems

Wiring for variable speed systems is as follows:

1. Connect the 6 pin connector that plugged into PL4 into PL3 on the new furnace board.
2. The DEHUM green wire from the variable speed motor connects to G IF it was connected to G on the old furnace board.
 - a. If it was, you will have to cut off the quick-connect terminal and strip the wire.
 - b. If it was not, the DEHUM green wire is most likely spliced to a thermostat wire that is connected to the DHUM terminal of the Thermidistat. DO NOT connect it to DHUM terminal on the new furnace board.
3. The two white wires that were connected to the HUM quick-connect terminal of the old furnace board need to be connected to the HUM quick-connect terminal on the new furnace board.

Blower OFF delay

90
120
150
180

Use table at left to select the Heat blower OFF delay. Factory sets at 120 seconds

Blower Speed

Cool
Hi
Low

Use table at left to select the continuous blower speed Fan. To change the speed motor, move the jumper to designed speed.

LHT

ON
OFF

For two-stage thermostat set the jumper at ON position.

System Tests

Step 1: Component Self Test

1. Begin component test sequence by ensuring that thermostat is turned to OFF position and thermostat wires are disconnected. Turn power ON and manually close the blower door switch. With a short piece of wire, briefly short TEST/TWIN terminal to Com/24V terminal. The component test sequence follows:
 - A. The High inducer blower turns on and stays on.
 - B. Hot surface ignitor turns on for 15 seconds and then it turns off.
 - C. Low Heat blower turns on for 15 seconds then it turns off.
 - D. High Heat blower turns on for 15 seconds then it turns off.
 - E. Cool blower turns on for 15 seconds then it turns off.
 - F. The inducer will switch from High speed to low speed for 10 seconds then it turns off.
2. Repair, replace, or service any failing components from the component self test. The gas valve is not energized during the self test.
3. Turn power OFF.
4. Release the blower door switch.
5. Connect thermostat wires.
6. Install blower door and access door.
7. Turn power ON.
8. Turn gas ON.

Step 2: Flame Sensor Operation

Connect a DC micro ammeter in series with flame sensor. Initiate a heat call. After burners ignite and stabilize, measure flame current. Nominal flame current is between 2.0 and 3.0 microamps DC. If flame current reading is less than 2.0 microamps DC, either replace or remove and clean flame sensor with a fine grade steel wool. When the flame current falls to 0.5 microamps DC, the furnace control will lock out.

Step 3: System Operation

1. Perform necessary safety checks. Consider flame safety, limit switch, and vent system.
2. Operate unit through a complete call for heat cycle. Verify system operates correctly.

Twining Instructions

A 3/16" quick connect terminal is provided on the ICM2807 control board for communication between another ICM2807 control board for furnace twining.

To configure your control boards for twining:

1. Install each control board according to the installation instructions.
2. Connect the TWIN terminals together.
3. Connect the 24 VAC common together. (A common ground between the two furnaces is also required.)

If the 24 VAC supplies to the control are in phase, both furnaces will turn the blower on and off synchronously and at the same speed. If the 24 VAC supplies are not in phase, then neither control will respond to the thermostat commands and the status LED will flash rapidly.