



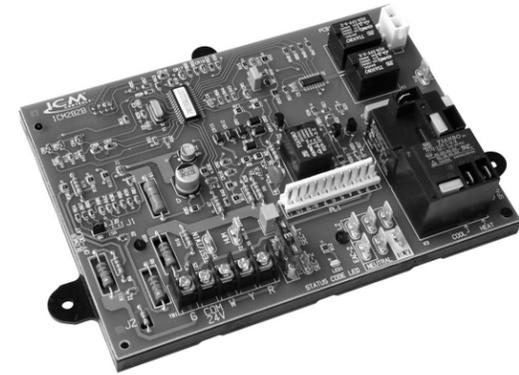
ICM282B

Fixed Speed Furnace Control Replacement Module

Replaces: Carrier CEBD431012-01A, CEPL1311012-01, HK42FZ004, HK42FZ007, HK42FZ008, HK42FZ009, HK42FZ011, HK42FZ013, HK42FZ016, HK42FZ034 AND 325878-751

INSTALLATION, OPERATION & APPLICATION GUIDE

For more information on our complete range of American-made products – plus wiring diagrams, troubleshooting tips and more, visit us at www.icmcontrols.com



INTRODUCTION

The ICM282B fixed speed furnace control replaces the following Carrier models: CEBD431012-01A, CEPL1311012-01, HK42FZ004, HK42FZ007, HK42FZ008, HK42FZ009, HK42FZ011, HK42FZ013, HK42FZ016, HK42FZ034 and 325878-751. The ICM282B has incorporated LED diagnostics to assist in troubleshooting.

FEATURES

- Controls gas valve, ignitor, blower motor, inducer, humidifier and air cleaner
- Microprocessor-based
- Designed for 100% gas shut off in case of ignition failure
- Twinning compatible with other ICM282B boards
- Reverse polarity protection
- Secondary brownout voltage protection
- Compatible with a 24 VAC standard thermostat
- Provides diagnostic LED to aid in troubleshooting

SPECIFICATIONS

- **Electrical Ratings:** 120VAC @ 60Hz
- **Ignitor:** 5A resistive @ 120 VAC
- **Cool Blower:** 13.8 FLA, 82.8 LRA @ 120 VAC
- **Heat Fan:** 13.8 FLA, 82.8 LRA @ 120VAC
- **Inducer Fan:** 1/10 Hp @ 120 VAC
- **Gas Valve:** 16VA pilot duty @ 24 VAC
- **Humidifier:** 1A resistive @ 120 VAC
- **Electric Air Cleaner:** 1A resistive @ 120 VAC

SAFETY CONDITIONS

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.

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 and 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 and electric supplies can result in explosion, fire, death, or personal 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).
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: Install the New Control

1. Ground yourself. When handling circuit board, hold it by the edges.
2. Insert tab(s) of board into the slots of the control box (if required).
3. Fasten circuit board with retaining screw(s). Install the included wiring harness adapter to the three connections of the existing furnace wiring harness.
 - A. The furnace harness 9-pin connector plugs into the mating 9-pin adapter harness connector.
 - B. The furnace harness 2-pin connector plugs into the mating 2-pin adapter harness connector.
 - C. The furnace harness 3-pin connector plugs into the mating 3-pin adapter harness connector.
4. Connect the other end of the included adapter harness to the new furnace control board.
 - A. The 11-pin connector connects to PL1 on the furnace control board.
 - B. The 2-pin connector (with 2-black wires) connects to PL2 on the furnace control board.
 - C. The (2) white wires connect to the 115-volt Neutral spade connections located in front of PL1 on the new furnace control board.
5. Connect the transformer to the new furnace control board.
 - A. Blue wire to SEC-2 terminal, located adjacent to the 3 amp fuse.
 - B. Red wire to SEC-1 terminal, located adjacent to the 3 amp fuse.
 - C. Black wire to PR-1 terminal, located adjacent to PL2.
 - D. White wire to one of the 115-volt Neutral spade connections located in front of PL1.

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. Status LED will flash code and will then turn ON the inducer motor.
 - B. Inducer motor will run for the entire component test.
 - C. Hot surface ignitor will turn ON for 15 secs.
 - D. Blower motor heat speed will turn ON for 10 secs.
 - E. Blower motor cool speed will turn ON for 10 secs.
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 microammeter 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: Systems Operation

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

6. Connect the black wire from the furnace auxiliary junction box to L1 on the new furnace control board (located on the blower enable relay).
7. Connect the white wire from the furnace auxiliary junction box to one of the 115-volt Neutral spade connections located in front of PL1.
8. Connect the blower motor leads to the new furnace control board.
 - A. Connect the white blower motor lead to the BLW connection within the group of 115-volt Neutral spade connections.
 - B. Connect the blower motor heat tap to the blower relay connection marked HEAT.
 - C. Connect the blower motor cool tap to the blower relay connection marked COOL.
 - D. Connect the remaining blower motor leads to SPARE-1 and SPARE-2.
9. Connect all accessory wires.
10. For 90% furnaces, reinstall the control box assembly to the blower deck using the screws previously removed from the blower deck.
11. Set blower off delay jumper located on the top-center portion of the control board. The factory default is set at 120 seconds.
12. Do not connect the thermostat wires to the control board until System Tests are complete.

TWINNING INSTRUCTIONS

A 3/16" quick connect terminal is provided on the ICM282B control board for communication between another ICM282B control board for furnace twinning.

To configure your control boards for twinning:

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.)

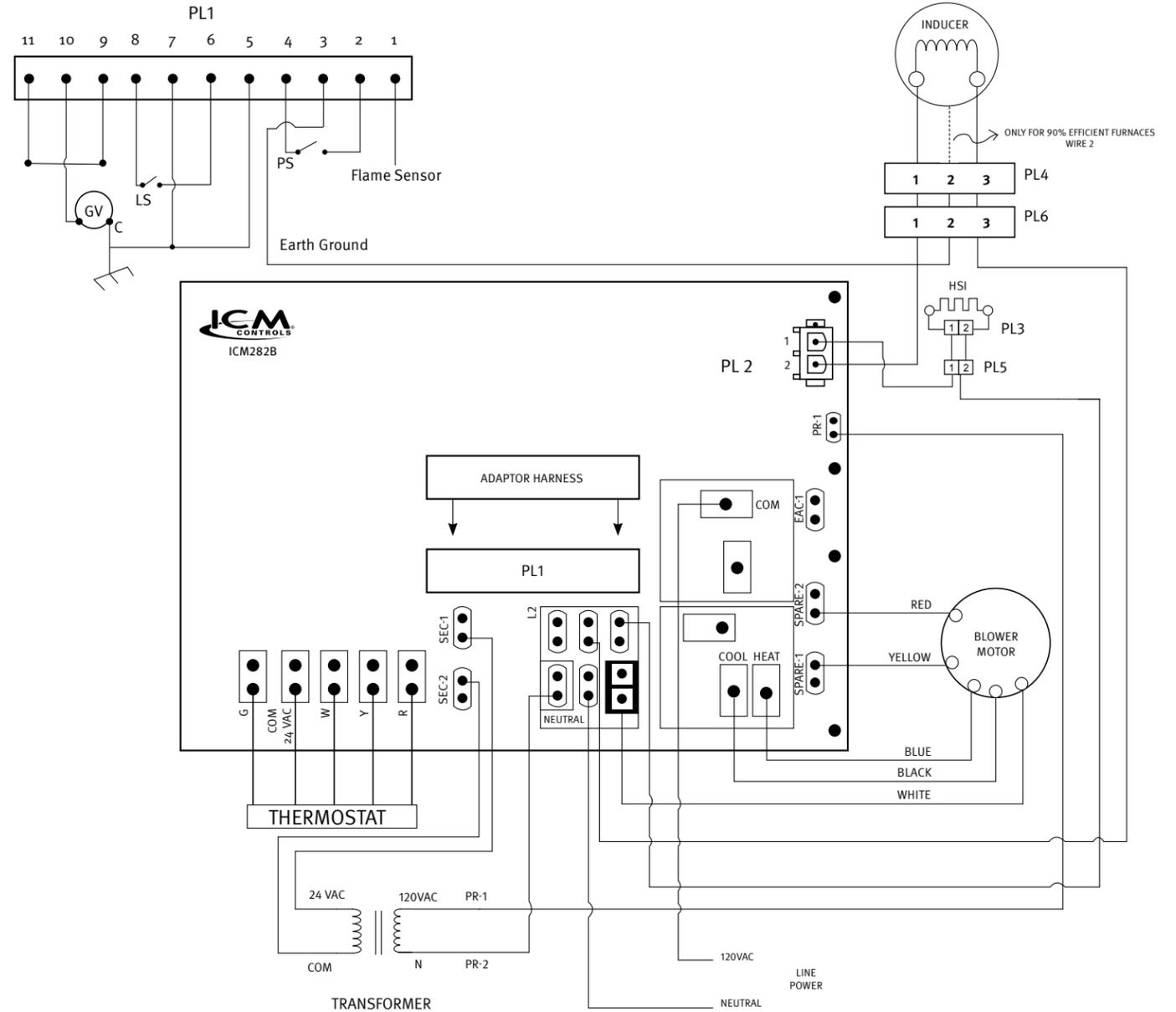
If the 24 VAC supplies to the control are in phase, both furnaces will turn the blower on and off synchronously and at the same speed. If the 24 VAC supplies are not in phase, then neither control will respond to the thermostat commands and the status LED will flash rapidly.

TROUBLESHOOTING ICM282B

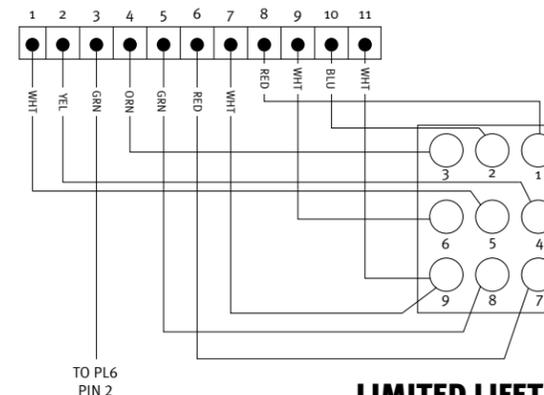
Each of the following status codes is a two digit number with the first digit determined by the number of short flashes and the second digit by the number of long flashes.

LED Code	Status	Troubleshooting
	Continuous Off	Check for 115 VAC at L1 and L2, and 24 VAC at sec-1 and sec-2.
	Continuous On	Control has 24V power.
	Rapid Flashing	Line voltage (115V) polarity reversed, or twinning problem.
1	Flash Brownout	Voltage at SEC1 and SEC2 is below 18 VAC
11	Component Test	Unit runs through a component self test, however, not every input and output is tested.
12	Blower on After Power Up (115VAC OR 24VAC)	Blower runs for 90 seconds if unit is powered up during a call for heat (R-W closed).
13	Limit or Flame Roll-Out Switch Lockout	Auto reset after 3 hour. For flame roll-out switch or fuse link (see status code #33)
14	Ignition Lockout	Lockout occurs after 4 tries. Control will auto-reset after 3 hours (see status code #34 below)
21	Gas Heating Lockout	Control will NOT auto reset. Check for: 1) a stuck gas valve relay on control, or 2) a miswire to gas valve circuit.
22	Abnormal Flame-Proving Signal	Flame is present while gas valve is de-energized. Inducer will run until fault is cleared. Check for 1) a stuck gas valve or 2) a leaky gas valve.
23	Pressure Switch Did Not Open	Check for 1) obstructed pressure tubing or 2) a defective pressure switch (stuck in closed position).
31	Pressure, Draft Safeguard, Auxiliary-Limit (when used), Or Blocked Vent Shutoff (when used) Switch did not Close or Reopen	If open longer than 5 minutes, the board will shut off the inducer for 15 minutes before retry. Check for: <ul style="list-style-type: none"> • Proper vent sizing and condensate pitch or sag • Defective inducer motor or start capacitor • Vent restriction or high winds • Defective pressure switch or connection. If it opens after trial for ignition period, blower will come on for 90 second recycle delay • Inadequate combustion air supply • Disconnected or obstructed pressure tubing • Low inducer voltage
33	Limit or Flame Roll-Out Switch is Open	If open longer than 3 minutes, code changes to #13. Check for: <ul style="list-style-type: none"> • Defective blower motor or start capacitor • Loose blower wheel • Inadequate combustion air supply • Flame roll-out switch or fuse link • Dirty filter or restricted duct system • Defective switch or connections • Open flame roll-out switch, or fuse link. Manual reset or replace.
34	Ignition Failure	Control will try three more times before a lockout #14 occurs. If flame signal is lost after trial for ignition period. Blower will come on for 90 second recycle delay. Check for: <ul style="list-style-type: none"> • Oxide buildup on flame sensor (clean with fine sandpaper) • Proper flame sense microamps (when the flame current falls to 0.5 microamps DC, the furnace control will lock out) • Green wire MUST be connected to furnace sheet metal • Inadequate flame carryover or rough ignition • Gas valve turned off • Manual shut-off valve • Low inlet gas pressure

CONNECTION AND WIRING DIAGRAM



PIN OUT FOR 9 PIN TO 11 PIN ADAPTOR HARNESS



LIMITED LIFETIME PROTECTION WARRANTY

For warranty information and registration, please go to www.icmcontrols.com and click on **Warranty Registration**.



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