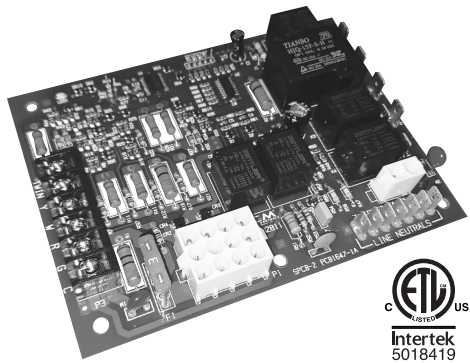




ICM2811

Integrated Furnace Control Board



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

Features

- Controls the gas valve, inducer draft motor, circulating blower and hot surface ignitor
- Monitors system pressure and limit switches
- Microprocessor based precision
- Twinning compatible with another ICM2811 Control Board
- Diagnostic LEDs aid in testing and troubleshooting

Replaces

Goodman: PCBBF110, PCBBF123, 0130F00005, PCBBF112, B18099-26, (PCBBF110S, PCBBF123S, 0130F00005S, PCBBF112S, B18099-26S)

White-Rodgers: 50A55-743, 50A55-289, 50T55-289

Specifications

- **Electrical Rating** @ 77°F (25°C)
- **Input Voltage:** 18-30 VAC, 60 Hz maximum
- **HSI Relay:** 6.0 amp @ 120 VAC, 60 Hz (resistive)
- **Inducer Relay:** 2.2 FLA–3.5 LRA @ 120 VAC
- **Blower Relay:** 14.5 FLA–25.0 LRA @ 120 VAC (2spd–H/C)
- **Gas Valve Relay:** 1.5 amp @ 25 VAC, 60 Hz 0.6 pf
- **Operating Temp Range:** -40° to 176°F (-40° to 80°C)
- **Humidity Range:** 5 to 95% relative humidity (non-condensing)

Introduction

The **ICM2811** is a form, fit, and functional replacement for the Goodman and White Rodgers boards shown in the cross reference section of this guide. The **ICM2811** is an automated gas ignition control board which monitors the ignition sequence including the combustion air blower, pressure switch, hot surface igniter, gas valve, flame sense, and circulating blower while maintaining full safety circuit monitoring including the high limit switch, roll out switch and auxiliary limit switch circuits. Onboard diagnostics will illuminate a flash code to help technicians properly diagnose issues quickly.

Mode of Operation

Upon a call for heat, the thermostat will energize the W terminal with 24 VAC. With the heat call in place, the inducer fan and humidifier (optional) will be energized thus closing a pressure safety switch. The control will enter a 15 second inducer pre-purge cycle. Upon verification of the pressure switch closure and completion of the 15 second inducer pre-purge, the hot surface igniter is energized. There is a 9 second igniter warm up period before energizing the gas valve. Once the gas valve is energized, gas flows into the burners where it is ignited by the hot surface igniter. Once the burners are on, the flame is sensed by a flame rectification circuit and flame sensor. There is a 4 second trial for ignition period where the control checks the flame signal and proves the flame. Once flame is proven, the hot surface igniter is turned off 1 second later and there will be a 30 second delay before energizing the main blower. When the call for heat ends, the gas valve is de-energized, burners go off, flame is proven lost and there is a fixed 15 second inducer post-purge to purge any residual exhaust gases from the system. Following the inducer post-purge the inducer and humidifier are turned off and subsequently the heat blower is turned off after the user selected post-purge delay time expires.

Upon a call for cooling, the Y terminal is energized with 24 VAC and a 5 second cool blower ON delay begins. After the ON delay expires, the EAC and cool blower outputs are energized. Once the call for cooling ends, there is a 45 second cooling blower post-purge OFF delay to purge the residual cool air from the ductwork. At the end of the OFF delay, the cool blower and EAC are turned off.

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 the used and new controls in separate containers before touching ungrounded objects.
6. ESD damage can also be prevented by using an ESD service kit.

Timing

Inducer Pre Purge	15 seconds
Igniter Warm Up	9 seconds
Trial for Ignition	4 seconds
Retries	2
Inducer Post Purge	15 seconds
Inducer Interpurge	30 seconds
Heat Blower ON Delay	30 seconds
Heat Blower OFF Delay	90/120/150/180 seconds
Cool Blower ON Delay	5 seconds
Cool Blower OFF Delay	45 seconds
Ignition Lock Out Reset	75 minutes
Self Healing Recovery	3 minutes

Flame Sense Troubleshooting Tips

Flame not established

1. If the flame is not established and proved during the 4 second initial sequence, there will be two more successive attempts allowed each having a 30 second inducer purge between attempts.
2. After three successive attempts, if flame is still not proven there will be a 1 hour and 15 minutes lock out before the system will try for ignition again.

Flame out

1. Flame out is considered when flame is lost during heating.
2. When a W signal is present and flame is not sensed, the gas valve will disengage until the next trial for ignition. The circulating blower and inducer will remain running.
3. If flame is not established in the 4 second initial trial, the control will continue with 2 additional trials for ignition
4. After three successive attempts, if flame is still not proven, there will be a 1 Hour 15 min lock out before the system will try for ignition again.

Flame out of sequence

1. Flame out of sequence represents a scenario when flame is sensed while W signal is not present.
2. Inducer and Blower motors will be engaged (if not already running) and keep running for as long as the fault condition is present.

Lockout Features

There is a 3 minute self-healing delay which occurs following a rollout or high limit switch recovery. Once the rollout and high limit switch have closed (recovered) and the delay has expired, the thermostat call will be enforced. However, if the high limit or rollout switch remain open; the fault condition and lockout will remain in place until the high limit and rollout safeties are restored.

If the pressure switch opens during pre- purge and remains open beyond the 15 second window, the control extends the inducer pre-purge time up to 5 minutes if necessary. However, if the pressure switch closes before the 5 minute extended pre-purge, the control will clear the fault and resume normal operation. If the pressure switch remains open for longer than 5 minutes, the control will enter a 75 minute system lockout. There will also be a 75 minute system lock out if the flame is not established and proved within 3 successive attempts.

Heating Blower Delay Options

To select different heat blower OFF delay options, move the jumper on J1 to the desired setting according to the Jumper position table below.

J1 Jumper Position	Time
1 & 2	180 seconds
2 & 3	150 seconds
3 & 4	120 seconds
4 & 5	90 seconds

Twinning

The **ICM2811** is twinning compatible with another **ICM2811** control board only. To enable twinning, connect the "TWIN" terminals together and ground the common of both 24 VAC transformers to earth ground. The controls are designed to turn on/off the blower simultaneously and at the same speed.

(NOTE: An external AC relay, whose coil is connected between R & W of the primary furnace and whose normally open contacts connect R & W of the secondary furnace, must be provided to cause both furnaces to heat). A common ground between the two furnaces is also required.

Remove Existing Control

CAUTION!

To service control, and prior to disconnection, label all wires.
Failure to do so may result in wiring errors which 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.
4. Remove furnace blower and control access doors.
5. Remove control box cover.

CAUTION!

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

6. Disconnect thermostat wires and humidifier wires (if equipped with a humidifier).
7. Disconnect line voltage, blower, electronic air cleaner wires (if equipped), and transformer wires.
8. Remove wiring harness from circuit board.
9. Remove screws or any other fasteners and old circuit board.
10. Examine control and control box to check for water stains.
11. 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.

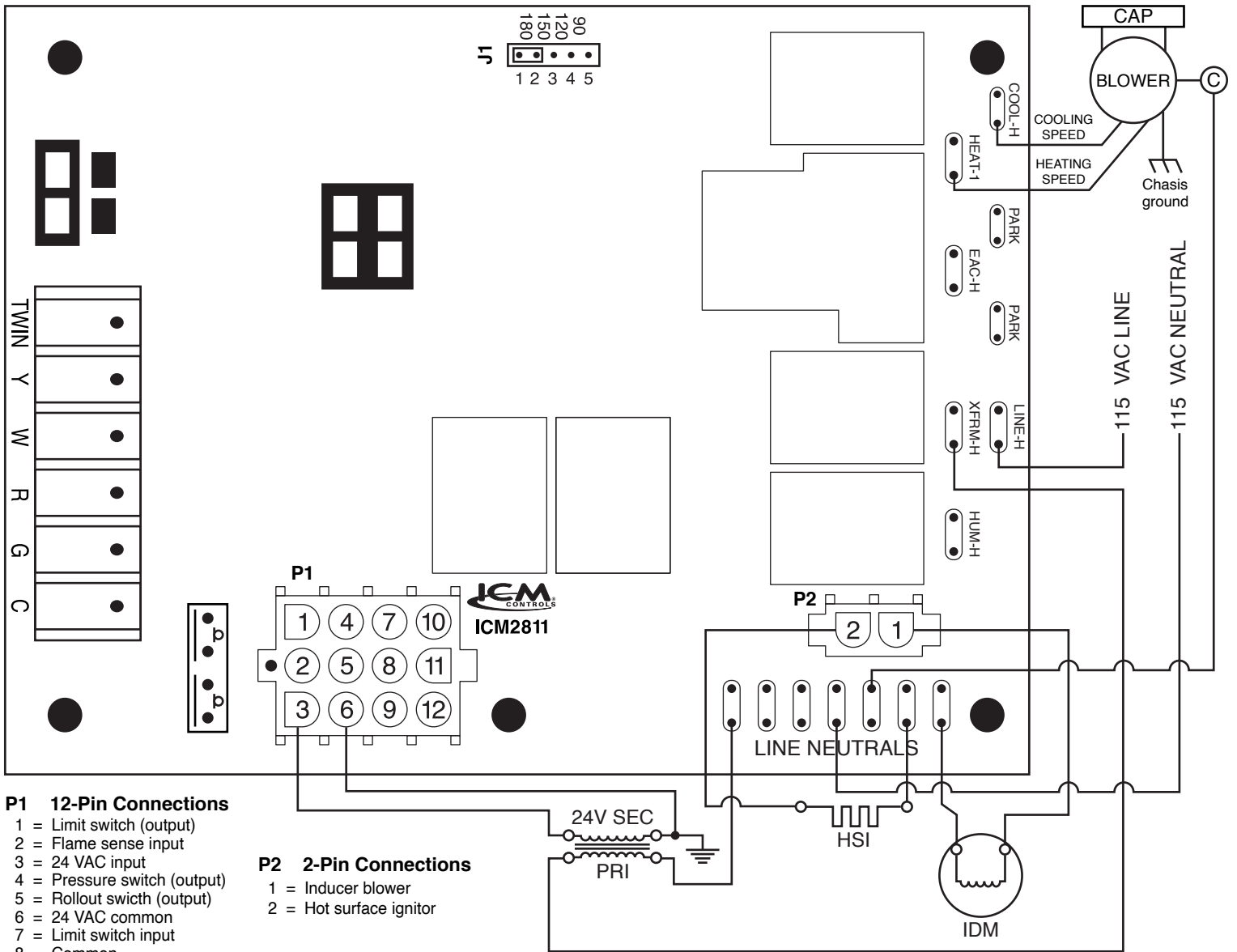
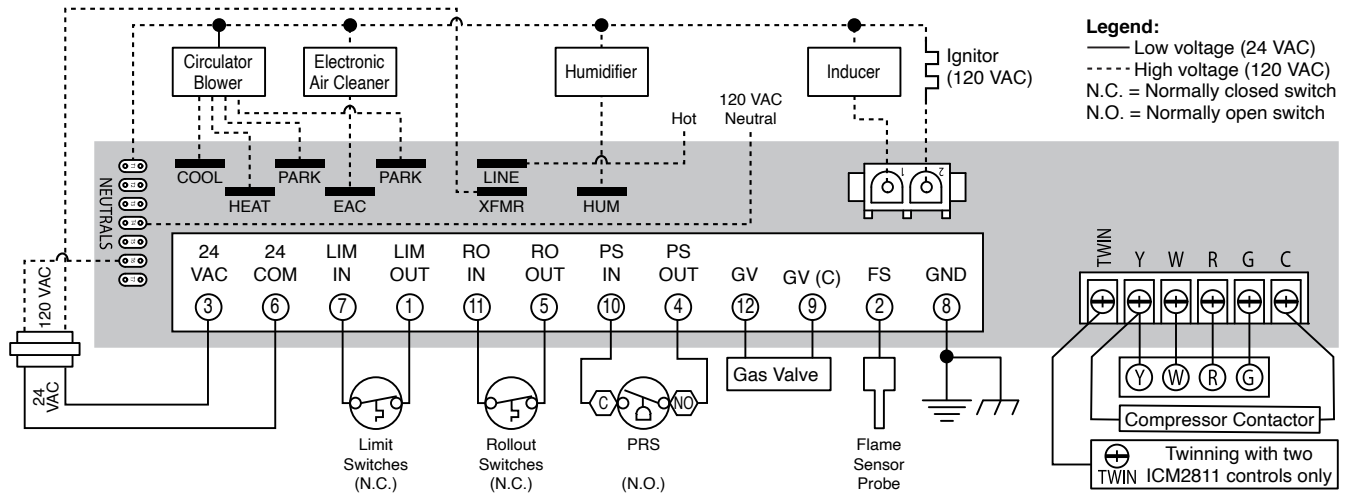
Install New Control

1. Ground yourself properly before installing the new **ICM2811** control board.
2. Mount the new control using any screws and fasteners previously removed.
3. Connect all line/low voltage, accessory, thermostat and ground wires.
4. Verify the sequence of operation.

LED Fault Codes

LED Status	Description	Trouble Shooting Tips
ON	Normal operation	
OFF	Control board failure	Check for proper input voltage and check the fuse; if not resolved replace control.
1	Ignition failure (soft lockout)	Clean or replace flame sensor, check igniter for proper operation & input voltage, check the transformer's common is grounded to earth ground.
2	Pressure switch stuck closed	Check for contaminated or defective pressure switch.
3	Pressure switch stuck open	Check for obstructed pressure switch tubing or defective pressure switch. Check for oxidation on terminals, broken wires, or defective inducer motor .
4	Limit switch fault	Checked for blocked airflow, blocked ductwork, and dirty filter. Check or replace high limit switch if defective.
5	Flame out of sequence	Check for intermittent or defective gas valve and check for dirty or defective flame sensor.
6	Roll out switch fault	Check for a cracked heat exchanger, defective rollout switch , broken wires on the roll out switch, or replace roll out switch if required.
7	Weak flame	Weak flame is caused by carbon build up on the flame sensor, poor grounds, or improper placement of flame sensor . Clean or replace flame sensor, reassure grounds, ensure flame sensor is fully enveloped in the flame.
8	Miswired gas valve	Check for shorted or mis-wired gas valve, check harness wires for any shorts or breaks, and check the pressure switch for proper operation.
9	Unused	N/A
10	Hot and neutral reversed	Check for proper polarity of incoming voltage on the primary and secondary of the transformer.
11	Brownout	A brownout fault indicates a low voltage condition. Check the voltage on the primary and secondary of the transformer and ensure there is no excessive load on the transformer.
12	Twinning fault	Ensure the common of both step down transformers are connected together and grounded to earth ground. Ensure there is a ground wire connecting the chassis of both furnaces. Verify there is a twinning wire connected from the twin terminal on furnace one to the twin terminal on furnace two.

Wiring Diagram

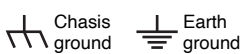


P1 12-Pin Connections

- 1 = Limit switch (output)
- 2 = Flame sense input
- 3 = 24 VAC input
- 4 = Pressure switch (output)
- 5 = Rollout switch (output)
- 6 = 24 VAC common
- 7 = Limit switch input
- 8 = Common
- 9 = Gas valve common
- 10 = Pressure switch (input)
- 11 = Rollout switch (input)
- 12 = Gas valve output

P2 2-Pin Connections

- 1 = Inducer blower
- 2 = Hot surface ignitor



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