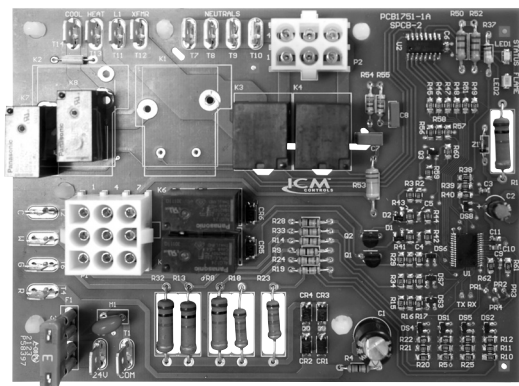




INSTALLATION, OPERATION & APPLICATION GUIDE

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 function of an ECM (**electronically commutated**) motor, gas valve, ignitor, and flame sensor.
- Continuously monitors all system safety's including high temperature limit, pressure switch and auxiliary rollout switch.
- Detects and communicates faults using diagnostic LEDs to aid troubleshooting.
- Employs timed safety lockouts when necessary.

REPLACES

- Nordyne:** 1021575R

SPECIFICATIONS

Input:

- Line Voltage: 120VAC
- Control Voltage: 18-30VAC
- Frequency: 60Hz and 50Hz
- Fuse Rating: 3 A

Output:

- ECM Output Relay:
 - Heat N.O. – 1A max @ 24 VAC
 - Cool N.C. – 1A max @ 24 VAC
- Inducer – 1/100 HP (0.69A) @ 120VAC
- HSI – 6.0A Resistive @ 120 VAC
- Gas valve – 0.5A @ 24 VAC

Environmental:

- Operating Temperature: -40° to 80°C
- Storage Temperature: -40° to 85°C
- Humidity: 5% - 95% R.H. (non-condensing) at +55°C
- Flame spread: UL # MH 15387 VOL. 1, SEC.10

Dimensions:

- Dimensions: 5.75" L x 4.3" W x 0.50" D

INTRODUCTION

The ICM2820 furnace control board will control the functions of the furnace including the induced draft blower, circulator blower, gas valve, ignitor, and flame sensor based on inputs from a thermostat and various sensors in the furnace. The ICM2820 control will also detect faults and communicate the faults while in service and display the faults through its on-board LED as well as employ a timed safety lock-out when the conditions warrant.

OPERATIONAL SEQUENCE

The thermostat calls for heat by energizing the "W" terminal. The control energizes the induced draft motor and waits for the pressure switch to close and runs the inducer for a 45 second prepurge time.

After the inducer pre-purge, the control energizes the Hot Surface Ignitor. After the Hot Surface Ignitor warm up period, the control energizes the main gas valve. Once the burner lights, flame must be proven by the flame sensor and the Hot Surface Ignitor turns off. Once the flame is proven, the control begins a 30 second On-delay then energizes the main blower at the HEAT speed.

When the thermostat demand for heat is satisfied, the control de-energizes the gas valves. The inducer output remains on for a 30 second post-purge period. The indoor blower motor is de-energized after a 120 second blower off delay.

ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS

Use caution when installing and servicing the furnace board to avoid and control electrostatic discharge, which can negatively impact electronic components. Following the precautions will protect the control from ESD by safely discharging static electricity buildup to ground.

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

REMOVING 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. (Pour entretenir le contrôle et avant la déconnexion, étiquetez tous les fils. Ne pas le faire peut entraîner des erreurs de câblage pouvant entraîner un fonctionnement dangereux.)*

1. Turn thermostat to OFF position or set to 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. (Le fait de ne pas couper les alimentations en gaz et en électricité peut entraîner une explosion, un incendie, la mort ou des blessures.)*

6. Disconnect thermostat wires and humidifier wires (if applicable).
7. Disconnect line voltage, blower, electronic air cleaner wires (if applicable), 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 around the control.

TIMING SPECIFICATION

DELAY	DURATION (SEC)
Heat Operation	
Inducer ON delay	1
Gas Valve ON delay	30
HSI ON delay	45
ECM Heat blower ON delay	25
ECM Heat blower OFF delay	120
Ignition Trial	5
Ignition Activation	30
Inter-Purge Retrial	45
Flame Establishing	2
Flame Failure	0.8 (max)
Fan Operation	
ECM Cool Blower ON	1
ECM Cool Blower OFF	40
Auto reset lockout	60 minutes

INSTALLING NEW CONTROL

1. **GROUND YOURSELF.** When handling the circuit board, hold it by the edges.
2. Mount and fasten the circuit board using the retaining screws.
3. Connect all line voltage, low voltage, and accessory wires.
4. Verify the sequence of operation.

LOCKOUT FEATURES

If the pressure switch is observed to be stuck closed during the Hardware Safety Check, the red Status LED will blink a 3-flash code and the inducer blower will remain off until the pressure switch opens.

If the limit switch opens during a heat call, the heat sequence will be terminated. The red Status LED will indicate a 1-flash code and the inducer blower and heat blower will turn on if not on already, remaining energized until the limit switch closes, and the fault case removed. If this occurs, the status LED will return to display normal operation, the inducer will turn off within 1 second, the heat blower after 120 seconds, and the heat sequence will restart.

If the gas valve is sensed open during a fan call, a heat call, or in off mode, the inducer will be de-energized after 10 seconds, and the control will enter a 1-hour lockout.

FLAME SENSE TROUBLESHOOTING

Flame Not Established

1. If the flame is not detected during the 5-second ignition activation period, the ignitor will de-energize within the next 2 seconds. After 45 seconds, the control will retry the activation. After five consecutive failed ignition attempts, the inducer will be de-energized within 30 seconds.
2. Following the above, the control will enter a 1-hour lockout. This lockout can be removed prematurely by removing the heat call for 2 seconds or removing power between R and C for 2 seconds.

Flame Out

1. If flame is detected then lost during heat mode, the gas valve will be de-energized within 1 second. The heat blower and inducer motors will remain on while the heat sequence is restarted after a 45 seconds delay.
2. If flame loss is recorded five times in a single heat call, the inducer will be de-energized within 15 seconds, the heat blower after 120 seconds, and the control will lockout for 1 hour. The red status LED will show a 4-flash code.

Flame Out Of Sequence

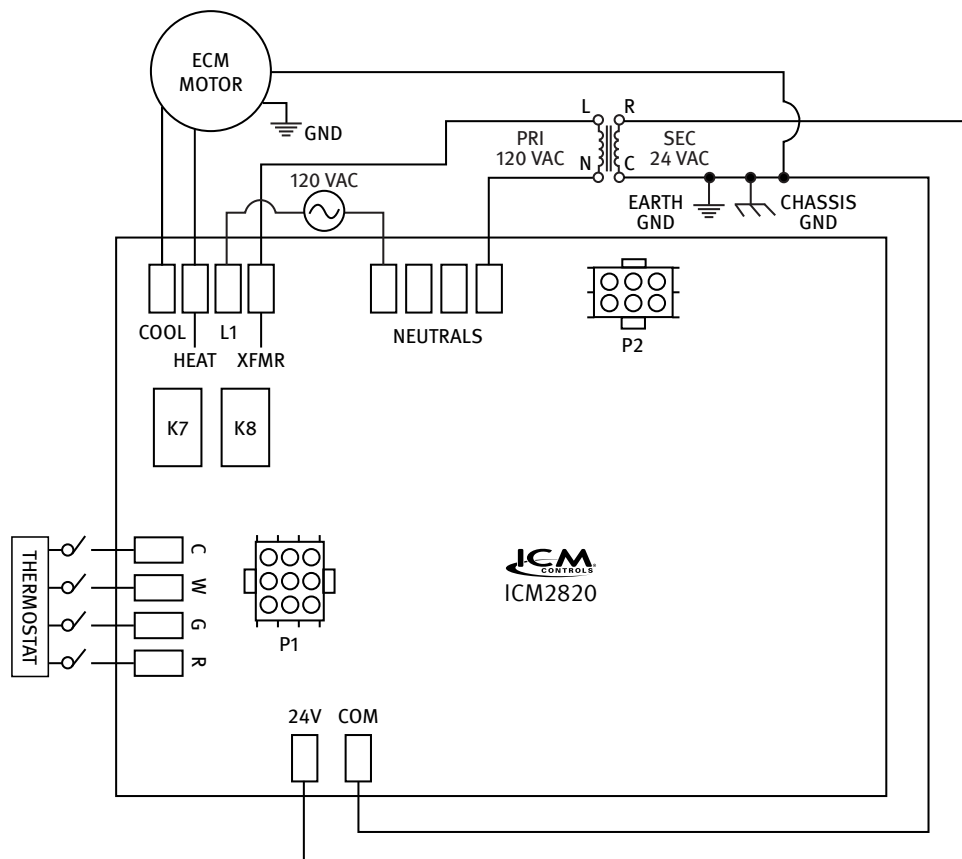
1. If flame is sensed when not called for, the inducer and heat blower motors will be energized until the fault condition is removed. The control will enter a 1-hour lockout, and the yellow status LED will flash rapidly.

LED FAULT CODES

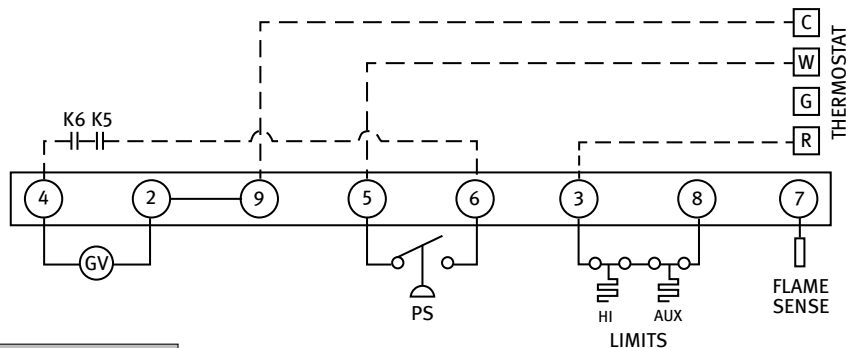
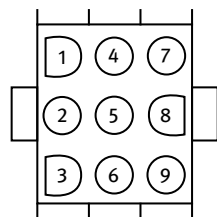
FAULT CODE (# BLINKS)	FAULT CONDITION	TROUBLESHOOTING
Red LED		
Steady ON	Control OK in standby, heat or fan modes	N/A
Steady OFF	Mis-wired gas valve	Check proper input voltage and fuse; if unresolved, replace control. Check for shorted or mis-wired gas valve, check pressure switch for proper operation. Or Check for defective gas valve.
1	Limit switch open	Check for proper polarity of incoming voltage on the primary and secondary terminals on the transformer.
2	Pressure switch stuck open	Check for blocked airflow, ductwork, or dirty filter. Replace limit switch if defective.
3	Pressure switch stuck close	Check for obstructed or defective pressure switch and tubing: oxidation on terminals, broken wires, defective inducer motor, etc.
4	Lockout due to failed ignition	Check for contaminated or defective pressure switch.
5	Hot and Neutral reverse	Clean or replace flame sensor, check input voltage and proper operation of ignitor. Check that common of the transformer is grounded to earth.
6	Flame present with gas off	Check for proper polarity of incoming voltage on the primary and secondary terminals on the transformer.
7	Input signals fail low or high	Check for dirty/defective flame sensor.
Yellow LED		
Steady ON	Flame is sensed	N/A
Rapid	Flame lockout	Clean or replace flame sensor
Flash	Flame is weak	Clean or replace flame sensor

Flash rate is 0.25 seconds ON and 0.4 seconds OFF, with a 2.0 seconds pause between codes.

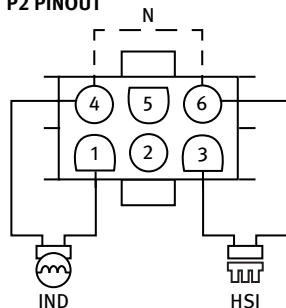
WIRING DIAGRAM



P1 PINOUT



P2 PINOUT



PIN CONNECTIONS

P1

- 1 – NC
- 2 – 24 VAC Comm
- 3 – Limit Switch (R input)
- 4 – Gas Valve Output
- 5 – Pressure Switch (W input)
- 6 – Pressure Switch
- 7 – Flame Sense
- 8 – Limit Switch
- 9 – 24 VAC Comm

P2

- 1 – HSI Output
2 – NC
3 – Neutral
4 – Inducer Blower Output
5 – Neutral
6 – Neutral

LEGEND

- Aux – Auxiliary Limit Switch
Com – Common
GV – Gas Valve
GND – Ground
HI – High Temp Limit Switch
HSI – Hot Surface Ignitor
IND – Inducer
K5, K6 – Gas Valve Relays
L1 – Line 1
N – Neutral
NC – No Connection
PRI – Transformer Primary
PS – Pressure Switch
SEC – Transformer Secondary
XFMR – Transformer

LIMITED LIFETIME PROTECTION WARRANTY

Review enclosed warranty information for full details & registration information

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



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