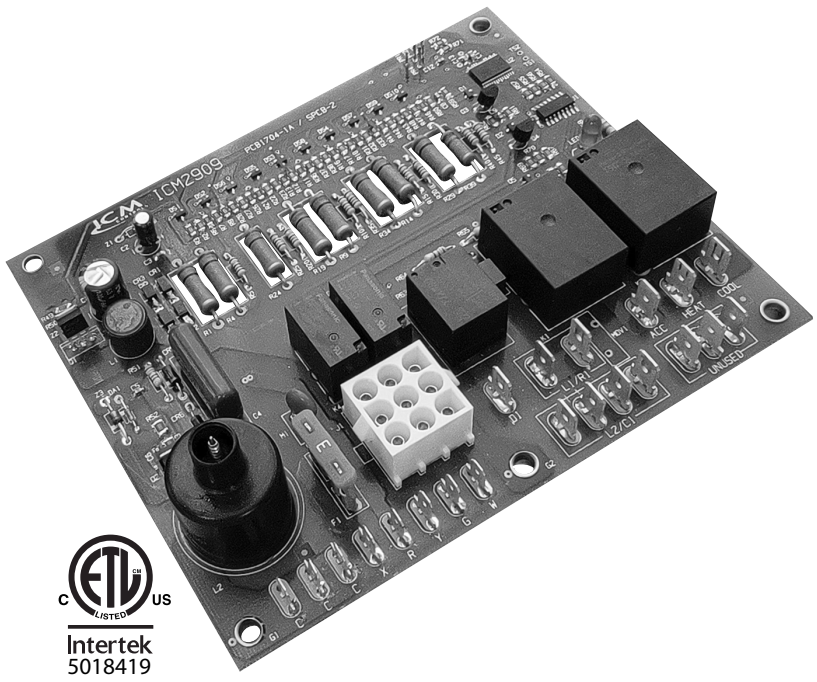
ICM2909
Direct Spark Ignition (DSI) control board



Intertek
5018419

Features

- ***Direct Spark Ignition (DSI) control board***
- ***Microprocessor-based***
- ***Monitors timing, trial for ignition, system switches, flame sensing and lockout.***
- ***100% lockout safety feature***
- ***Compatible with LP or Natural Gas***
- ***LED indication for status and fault codes to aid in troubleshooting***

Replaces

- **Rheem:** 62-23599(-01,-02,-03,-04,-05)

Specifications

Inputs
- **Line voltage:** 208-230 VAC, 50/60 Hz
- **Control voltage:** 18-30 VAC, 50/60 Hz
- **System switches:** Vent pressure, limit and MRLC (Manual Reset Limit Control)

Outputs
- **Heat N.C.:** 16FLA/36 LRA @ 277 VAC, 30K @ 85°C
- **Cool N.O.:** 15FLA/30 LRA @ 277 VAC, 100K @ 85°C
- **Inducer:** 4FLA/4LRA @ 240 VAC, 100K @ 70°C
- **Gas valve:** 2.3 A PILOT DUTY @ 240 VAC, 6K @ 75°C

Heat Operation
- **Pre-purge:** 15 seconds
- **Heat blower ON delay:** 30 seconds
- **Post-purge:** 5 seconds
- **Heat blower OFF delay:** 90 seconds
- **Ignition trial:** 7 seconds
- **Inter-purge (retrial):** 15 seconds
- **Ignition activation period:** 5 seconds
- **Flame establishing period:** 2 seconds
- **Flame failure response time:** 0.8 seconds (maximum)

Fan Operation
- **Heat blower ON delay:** 1 second
- **Heat blower OFF delay:** 1 second

Cooling Operation
- **Cool blower ON delay:** 1 second
- **Cool blower OFF delay:** 30 seconds

Lockout Timing
- **Auto reset lockout:** 60 minutes

Environmental
- **Operating temperature:** -40˚F to 175˚F (-40˚C to 80˚C)
- **Storage temperature: -**40˚F to 185˚F (-40˚C to 85˚C)
- **Humidity:** 5% - 95% R.H. (non-condensing) at +55˚C
- **Dimensions:** 6.60” x 5.75” x 2.25”

> > > CAUTION < < <

ELECTRICAL SHOCK HAZARD! ***Before installing this unit, turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position. Follow all Local, State and National Electrical Codes when installing this device.***

CAUTION! ***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 **ICM2909** DSI control replaces the following Rheem models: 62-23599(-01,-02,-03,-04,-05). The **ICM2909** has incorporated LED diagnostics to assist in troubleshooting. Fault code information can be found in this application guide. Please keep this application guide with the furnace installation manual for future reference.

Electrostatic Discharge (ESD) Precautions

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.

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

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

4. Remove the furnace blower and control access doors.
5. Disconnect the thermostat wires and humidifier wires (if equipped with a humidifier).
6. Disconnect the line voltage, blower, electronic air cleaner wires (if equipped) and transformer wires.
7. Remove screws and any other fasteners and the old circuit board.
8. Examine the control and the control box for water stains.
9. 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. When handling the circuit board; hold it by the edges.
2. Fasten the circuit board with the retaining screws.
3. Connect all line voltage, low voltage and accessory wires.
4. Verify the sequence of operation.

Sequence of Operation

When a W call is received from the thermostat; the control shall perform a hardware safety check before progressing with the heat sequence. If no issues are detected during the hardware safety check; the Inducer Draft motor is energized. The Vent Pressure switch closes. Ignition sequence begins; gas valve and spark are engaged, providing the system safety switches (Limit and MRLC) are closed. The Blower motor will engage at the **HEAT** speed **30 seconds** after flame is established and sensed. Once the W call has been satisfied; the Inducer motor turns off after 5 seconds and the blower motor turns off after **90 seconds**.

A G call from the thermostat will engage the blower motor without delay at the **HEAT** speed. It disengages without delay when the G call is removed.

A Y call from the thermostat will engage the blower motor without delay at the **COOL** speed. It disengages **30 seconds** after the Y call is satisfied.

Troubleshooting Tips

Flame not established
1. If flame is not established during the **7 second** initial sequence then the control will start the next trial for ignition in **60 seconds**.
2. There will be 2 more attempts to ignite, **60 seconds** apart before the respective fault code is triggered and ignition trials are stopped.
3. The gas valve is energized only during the ignition sequence of **7 seconds**.
4. The blower motor is off until **30 seconds** after flame is established.

Flame out
1. Flame out is considered when flame is lost during the heating cycle.
2. When a signal is present on W and flame is not sensed; the gas valve will disengage until the next trial for ignition
3. The inducer motor will continue running during flame out scenario and the blower motor will turn off after the **90 second** post purge.

Flame out of sequence
1. Flame out of sequence represents a scenario where flame is sensed while the W signal is not present.
2. Inducer and Blower motors will be engaged (if not already running) and will continue running for as long as the fault condition is present.
3. There is **60 minute** lockout before a W call can be executed or on power reset

ICM CONTROLS
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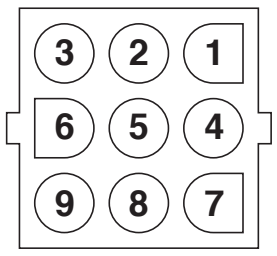
Molex Plug Pin Out

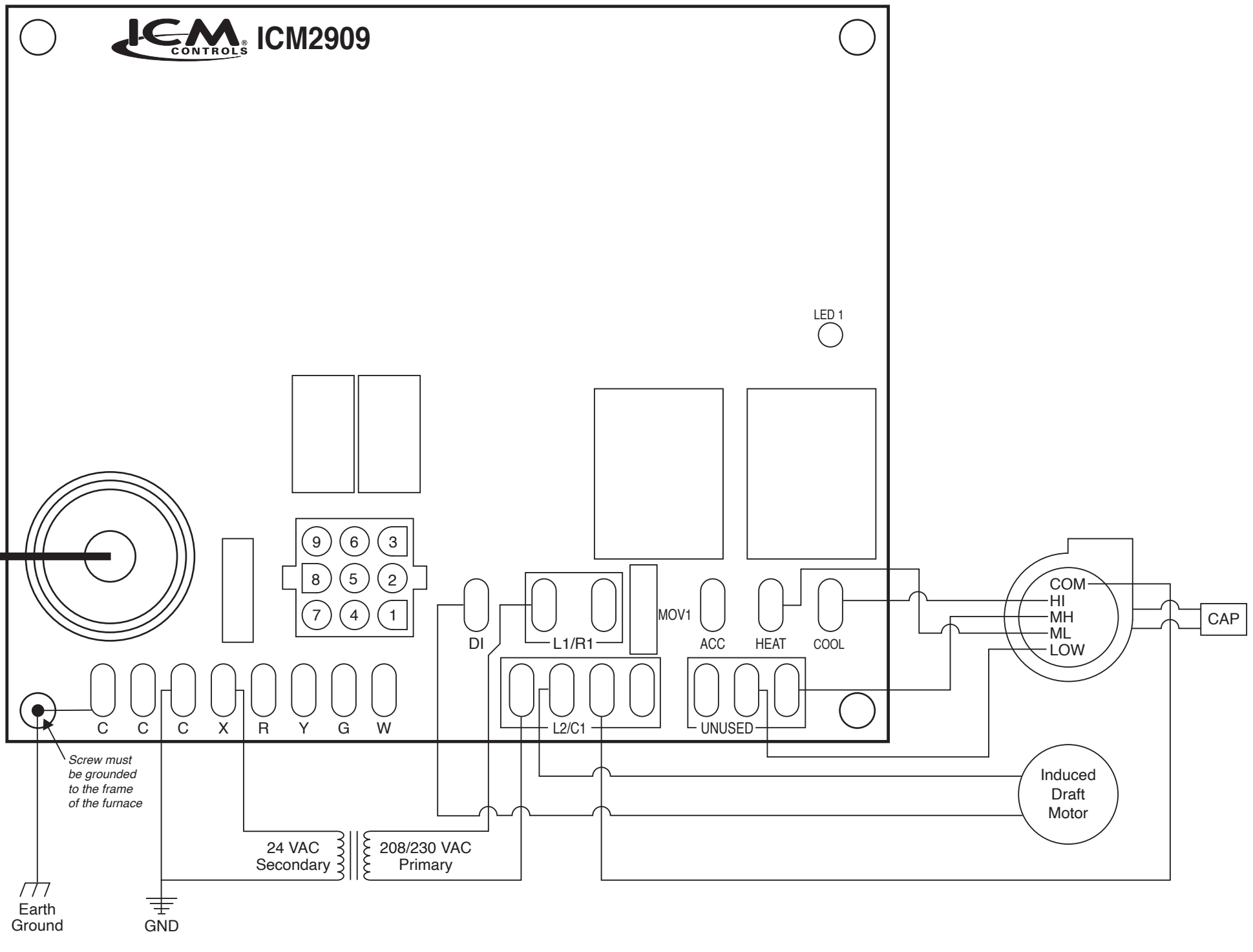


Pin 1 Limit switch input
Pin 2 24 VAC COM
Pin 3 Gas valve output
Pin 4 Limit switch output
Pin 5 Pressure switch input
Pin 6 Pressure switch output
Pin 7 MRLC (Manual Reset Limit Control) input
Pin 8 MRLC (Manual Reset Limit Control) output
Pin 9 Flame sense

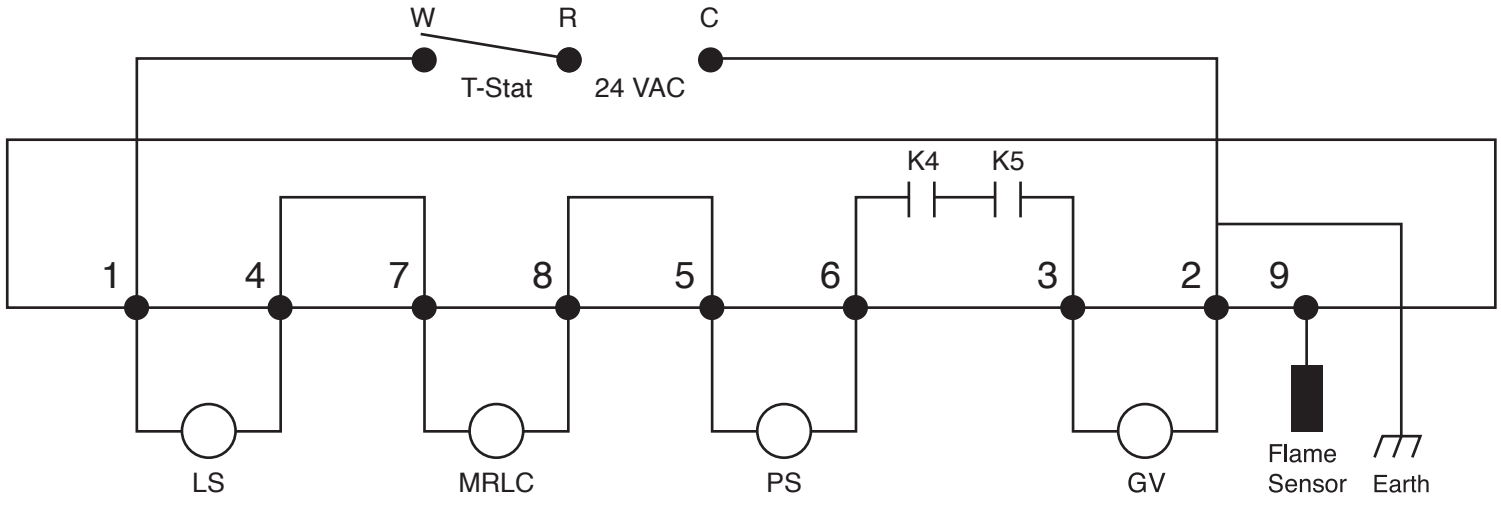
Fault Codes

Flashes	Fault Condition
ON	Normal operation
OFF	No power or incorrect gas valve wiring
1	Flame loss or ignition failure lockout
2	Pressure switch stuck open or stuck closed
3	Limit switch open
4	Flame detected with gas valve closed
5	MRLC (Manual Reset Limit Control) open
6	Internal Error

Wiring Diagram



Connection Diagram



LEGEND

ACC = Accessory
DI = Draft inducer
FS = Flame sensor
GND = Ground
GV = Gas valve
K4,K5 = Internal relays
LS = Limit switch
MRLS = Manual reset limit switch
PS = Vent pressure switch

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