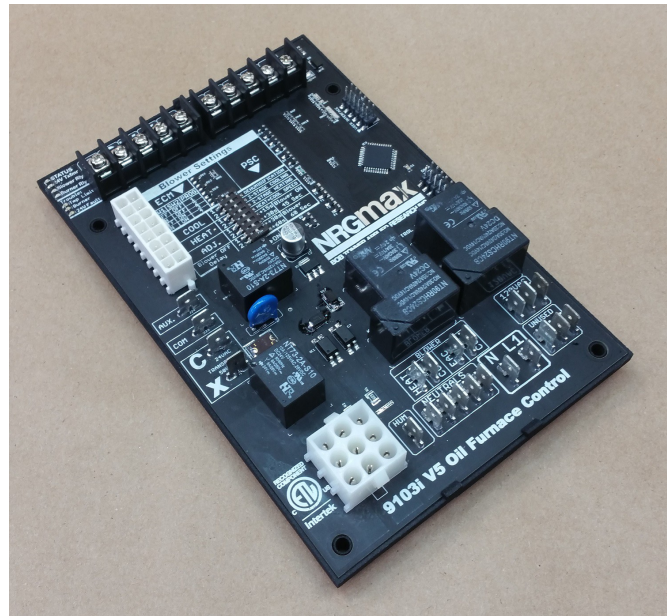


# 9103i Advanced Universal Oil Furnace Control



## OVERVIEW

The NRGmax 9103i is the only oil-furnace control you will ever need. It is a feature-rich control designed to meet the needs of modern energy-efficient oil furnaces while still offering backwards compatibility with legacy products.

Mounting in the industry-standard footprint with familiar layout and connections this high quality design meets the needs of an entire industry sector. It eliminates the need for additional controls to accommodate Euro-style burners, and offers an array of blower options to suit any requirement.

The control is suitable for use with PSC motors and ECM motors. ECM motors can be controlled in the common "thermostat-mode". PSC motors are controlled with traditional heavy-duty relay outputs.

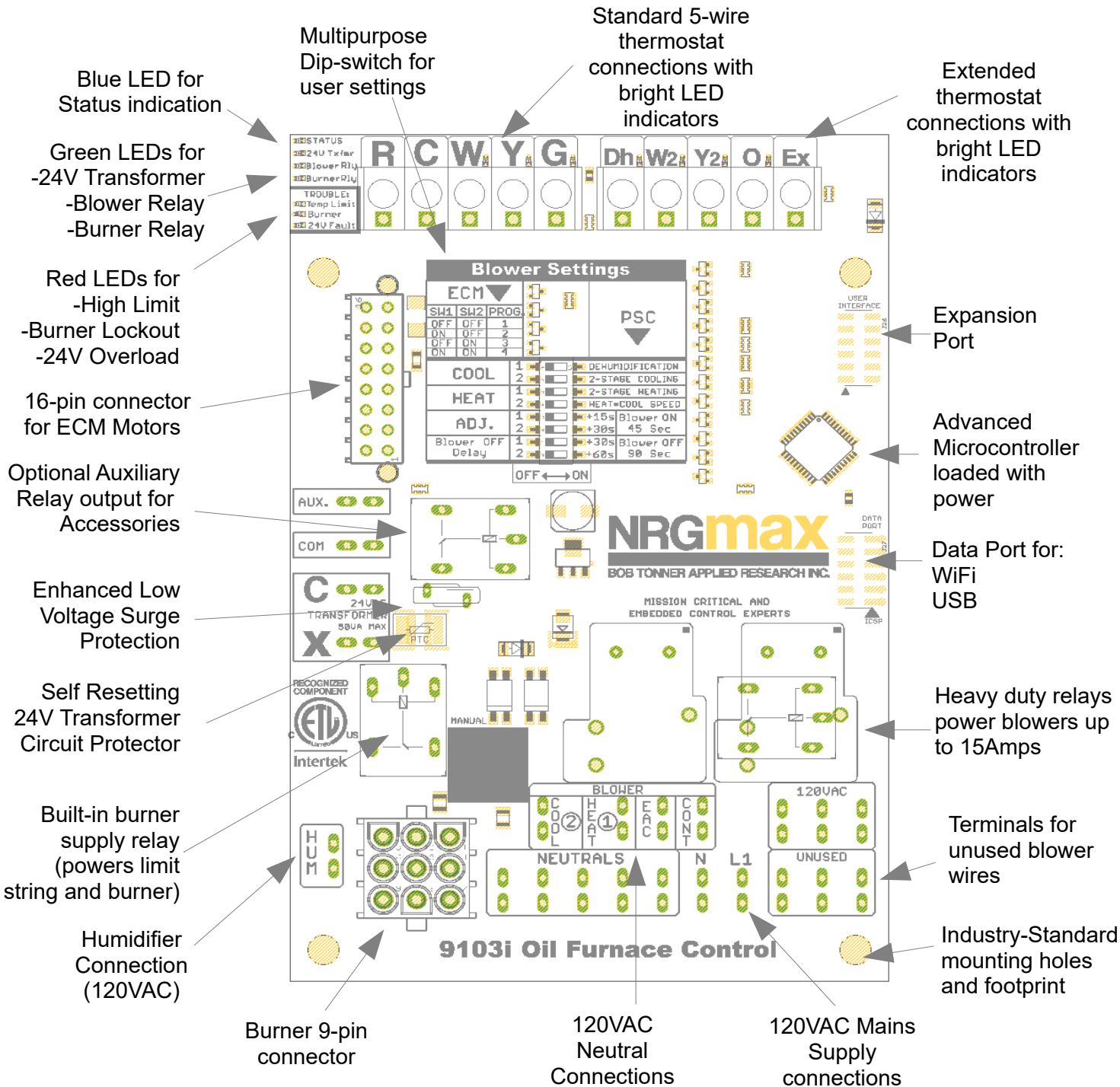
## OPTIONAL ADVANCED FEATURES

- Automatic dehumidification
- 2-Stage Heating
- 2-Stage Cooling
- Heat and Cool Blower Speeds set to High
- Data Port for:
  - Wifi Module
  - USB Smart Cable
  - Future Options
- Expansion Port
- Auxiliary Relay for Heating or Cooling accessories

## FEATURES

- Industry-standard footprint, mounting and connections
- compatible with American burners (Beckett, Carlin etc) as well as Riello Burners with no additional relays required
- Industry-standard 9-pin burner connection
- 120VAC Connections for:
  - Heat speed motor winding
  - Cool speed Motor winding
  - EAC
  - Humidifier
  - Continuous Fan
- 24VAC Thermostat Connections for:
  - 5-wire (R,C,W,Y,G), plus
  - W2 (Stage 2 Heating)
  - Y2 (Stage 2 cooling)
  - Ex (dummy connection)
  - O (Heat Pump reversing valve)
  - DH (Dehumidification)
- 16-pin connection to Industry-standard ECM Motors
- 7 LED Diagnostic Indicators
- 7 LED Thermostat signal indicators
- Solid-State resettable fuse for 50VA Transformer protection
- Double-sided Copper-clad PC board, soldered top and bottom for optimum strength and durability
- Multipurpose DIP-switch for field settings
- Rigid no-flex ABS mounting frame

# Features and Highlights



## SPECIFICATIONS

- **Electrical Ratings:**
  - Power Requirements:
    - Voltage: 24Vac, 50/60 Hz.
    - Current: 4 VA at 24 Vac.
    - PTC Fuse (resettable) trips at 4.5A
  - Contact Ratings:
    - Circulating Fan: 15A Full Load, 30A Locked Rotor at 115 Vac (includes optional EAC load).
    - Burner: 5.8 A Continuous Load (7.4A with interrupted ignition) including Humidifier load.
- **Settings: Standard Configuration**
  - **Heating:**
    - Blower On Delay: 45, 60, 75, 90 seconds, field-adjustable
    - Blower Off Delay: 90, 120, 150, 180 seconds, field-adjustable.
  - Timing Tolerance: less than 1 second
- **Environmental Ratings:**
  - Temperature: -40 to +150° F [-40° to +66° C].
  - Humidity: 95% maximum, non-condensing.

## LED Indicators:

- **Normal LED Indicators**
  - Thermostat Inputs: Amber LEDs indicate 24V signal present at terminal
  - Status: Blue LED pulses at various speeds to indicate operational state
  - 24V Transformer: Green LED indicates that 24V transformer is powered
  - Blower: Green LED indicates Blower Relay is energized
  - Burner: Green LED indicates Burner Relay is energized
- **Trouble LED Indicators:**
  - Limit: Red LED indicates that High Limit is Open
  - Burner: Red Led indicates that Burner is not detected
  - 24V O/L: Red LED indicates that an overload condition has caused the circuit protector to trip.

## Terminals and Connections:

### Low Voltage:

- 24VAC Thermostat:
  - R: 24VAC out to thermostat
  - C: 24Vac common
  - W: Call for heat (0.08A load)
  - Y: Cooling, Stage 1
  - G: Blower On
  - DH: Dehumidification
  - W2: Heating, Stage1
  - Y2: Cooling, Stage2
  - O: OEM Optional Input
  - Ex: Dummy terminal, no function
- CLASS 2 TRANSFORMER 50VA Max (overload

protected)

- X: 24VAC
- C 24VAC Common
- 16-PIN ECM Connector: Convenient interface between 10-position thermostat, DIP-switches and ECM motors.

### Line Voltage:

- Unused: No connection (3 terminals)
- L1: 120VAC 60Hz, 1ph, 15 A mp (Max) supply
- N: 120VAC Neutral supply
- Neutrals: Connection points for loads, tied internally to N (5 terminals)
- 120VAC: L1 supply to accessories, continuously powered (3 terminals)
- CONT: 120VAC to Continuous speed of blower. Normally energized, it is de-energized whenever Cool or Heat terminals are energized
- EAC: 120VAC to Electronic Air Cleaner. Energized along with Cool or Heat terminals
- HEAT (1): 120VAC 15A, 1HP blower speed.
- COOL (2) 120VAC 15A, 1HP blower speed
- H: 120VAC 1A to Humidifier. Powered through 120VAC Burner Relay

## Burner Connections: (9-PIN Connector) (MATES WITH TYCO PART #350720)

- 1) Safety Limit string (return)
- 2) 120VAC to Oil Burner (high-limit protected)
- 3) Burner T-T (internally connected to Pin 6)
- 4) Neutral (internally connected to Pin5 and N)
- 5) Neutral (internally connected to Pin 4 and N)
- 6) Burner T-T (internally connected to Pin 3)
- 7) Burner Motor (internally connected to Pin 8)
- 8) Burner Motor (internally connected to Pin 7)
- 9) 120VAC to Safety Limit string. Normally off, energized on call for heat by Relay K1

## DIP-SWITCH Settings:

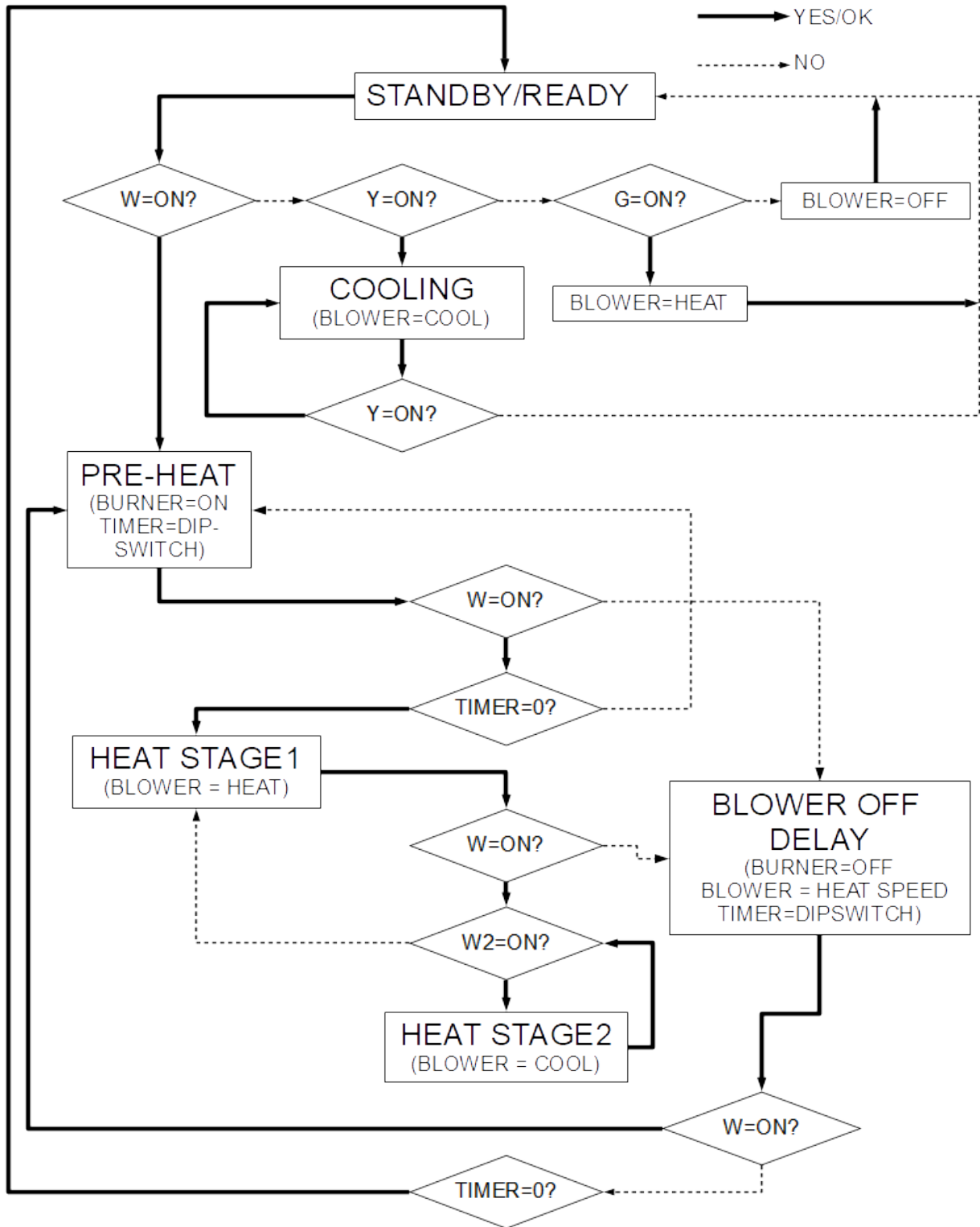
### PSC Blower Options:

1. **Dehumidification** (reduces blower speed during cooling to dehumidify the chilled air)
2. **2-stage Cooling** (control responds to Y2 input along with Y and changes blower speeds)
3. **Cool-Off Delay** (blower runs for an additional 45 seconds after Call for Cooling clears)
4. **Heat=Cool Speed** (when enabled, blower runs on high speed during Call for Heat)
5. Adds 15 Seconds **Blower ON** delay
6. Adds 30 Seconds **Blower ON** Delay
7. Adds 30 Seconds **Blower OFF** Delay
8. Adds 60 Seconds **Blower OFF** Delay

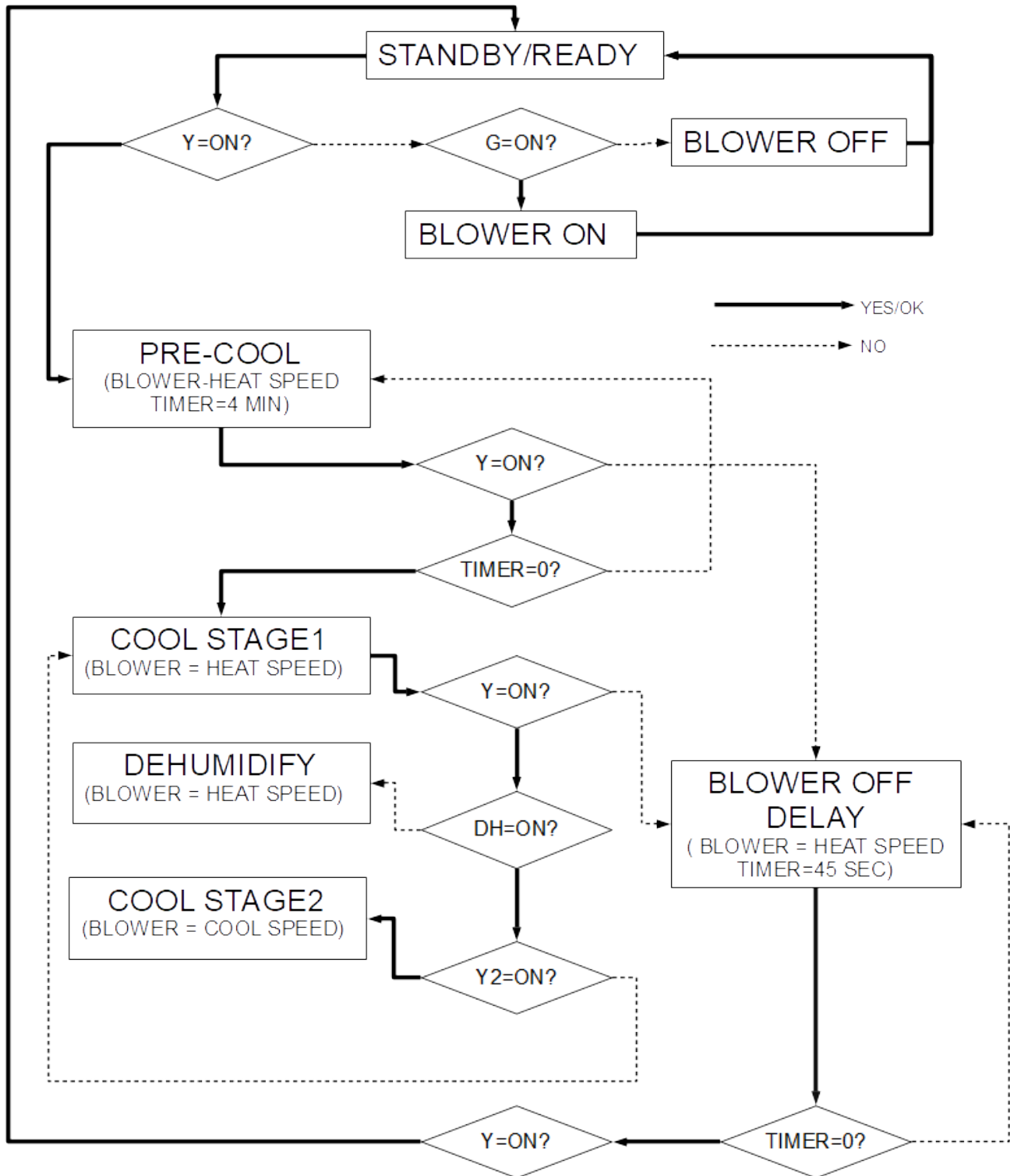
### ECM Blowers:

According to Blower and Furnace Manufacturer Specifications

# NORMAL OPERATION (No Options Enabled)



### COOLING: 2-Stage, Dehumidification, OFF-Delay Options Enabled



# INSTALLATION

## When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings and specifications given in the Instructions and on the product to assure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out the product operation as provided in these instructions.

## CAUTION

Disconnect power supply before wiring to prevent electrical shock or equipment damage.

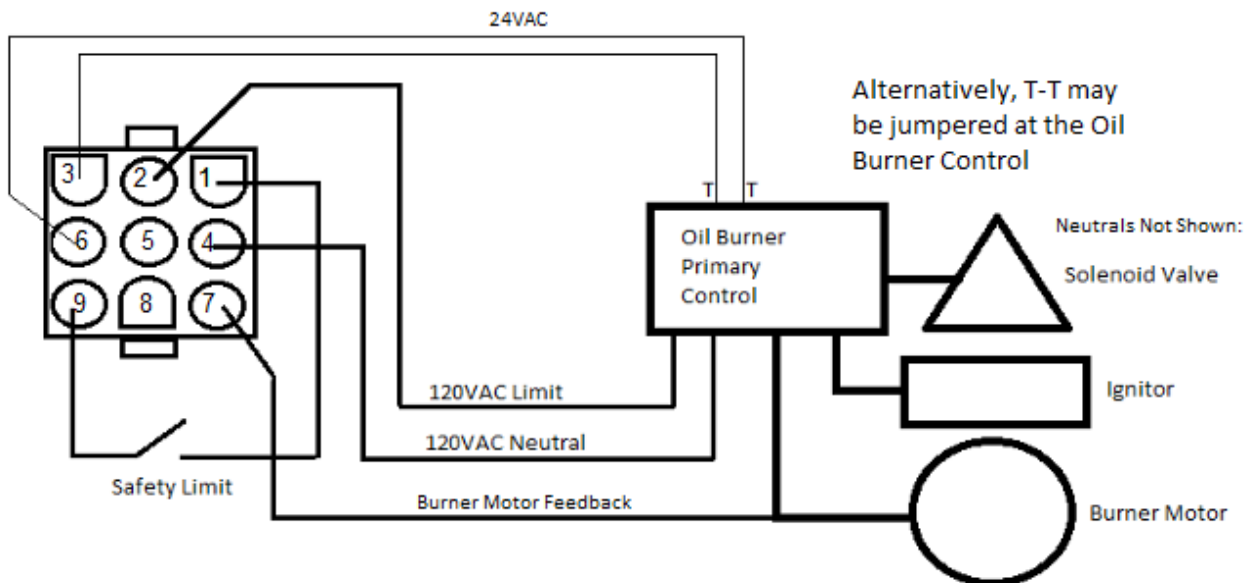
### Location and Mounting

The 9103i is mounted in the appliance wiring compartment using four No. 6 screws (obtained locally) through standoffs on the mounting frame.

### Wiring

All wiring must comply with local codes and ordinances.

**Disconnect power before making wiring connections**



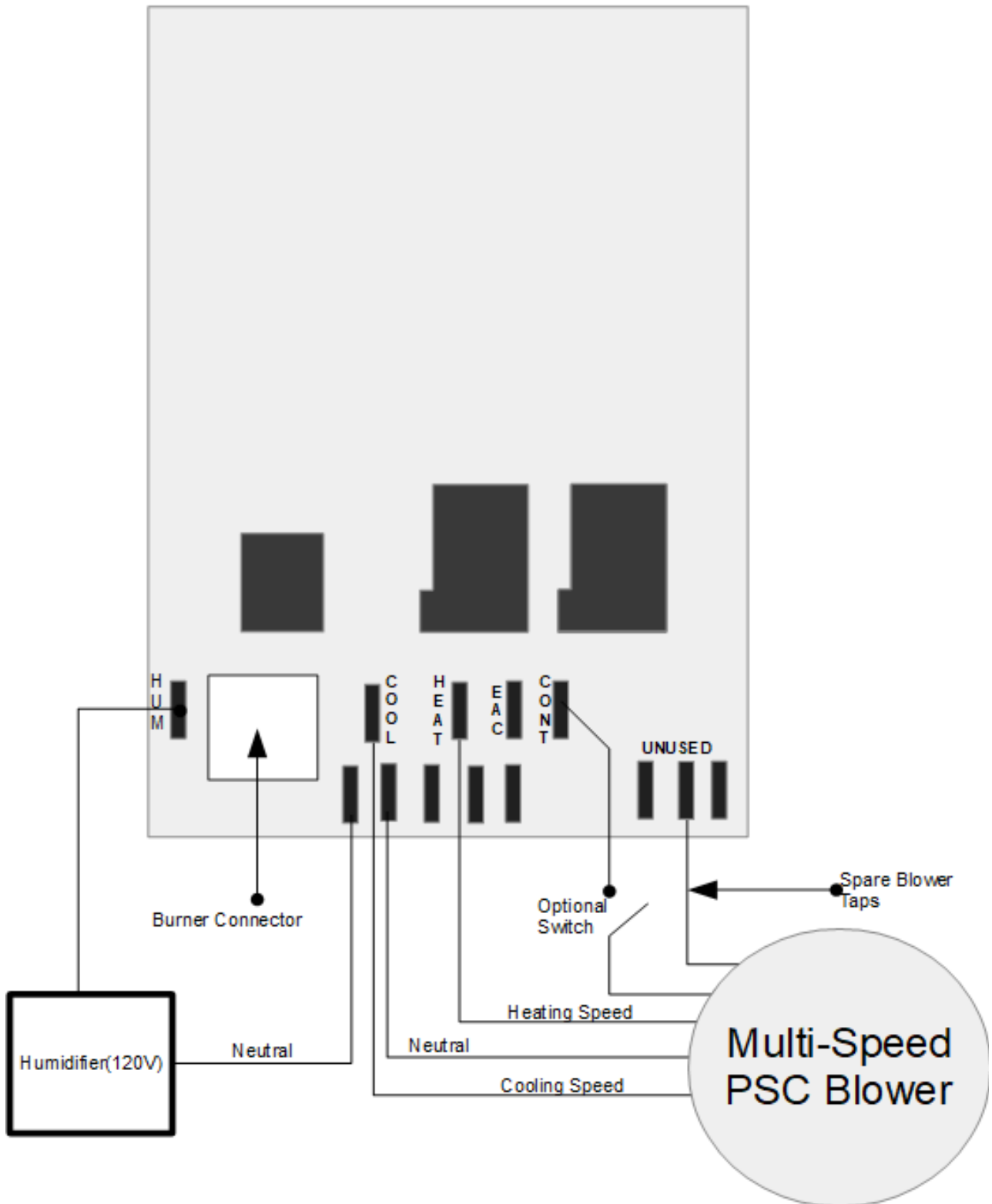
### 120VAC Oil Burner Wiring (Typical)

Note: The following pin pairs are internally connected:

- Pin1 and Pin 2
- Pin 4 and Pin 5
- Pin 3 and Pin 6
- Pin 7 and Pin 8

Pin 9 is controlled by 120VAC Relay

# PSC Blower Connections



# ECM Blower Connections

