

# ICM6502 Air Handling Controller



# **INSTALLATION, OPERATION & APPLICATION GUIDE**

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# **MODE OF OPERATION**

The **ICM6502** is a package unit heat pump control board designed to provide control of the compressor, reversing valve, auxiliary heat elements, the condenser and evaporator fans. The **ICM6502** also accepts inputs from a thermostat, indoor coil temperature sensor, outdoor coil temperature sensor, outdoor ambient temperature sensor, indoor room temperature sensor and a shutdown switch (front desk). The **ICM6502** provides compressor protection from short cycling with an anti-short cycle timer and provides low ambient lockout. A built in defrost cycle will protect the outdoor coil from freezing up when in heating mode.

**CAUTION!** Installation of the **ICM6502** shall be performed by trained technicians only. Adhere to all local and national electric codes. Disconnect all power to the system before making any connections.

# WIRING DIAGRAM



# REPLACES

SPECIFICATIONS

- Dimensions: 7.50" x 5.50"
- Operating temperature: -40°C to +70°C (-40°F to +158°F)
- Storage temperature: -40°C to +85°C (-40°F to +185°F)
- Mounting: Mount vertically in electrical enclosure within packaged heat pump unit using (x8) #6 sheet metal screws

#### **INPUTS:**

- L1 & L2: 240 VAC
- **R:** (24 VAC)
- C: (Com)
- **G:** Fan
- W1/Y: Compressor Heat/Cool 1st Stage
- W2: Auxiliary Heat 2nd Stage
- O: Reversing Valve
- FD: Front Desk Shutdown Switch
- RS: Indoor Room Sensor Switch
- Indoor: Indoor Coil Sensor
- Outdoor: Outdoor Coil Sensor
- Cooling Lockout: Outdoor Ambient Sensor

## **OUTPUTS:**

- Compressor (K5, K6): 10FLA @ 240 VAC
- Evap Low (K9): 2FLA @ 240 VAC
- Evap High (K11): 2FLA @ 240 VAC
- Heater1 (K1, K2): 21A resistive @ 240 VAC
- Heater2 (K3, K4): 21A resistive @ 240 VAC
- RV (K8): 5VA relay power rating @ 24 VAC for reversing valve
- C-FAN (K7): 24 VAC 1A pilot duty

## **OPERATIONS**

#### **POWER-UP SEQUENCE**

When power is first applied to the control, all the timers are reset. The control will execute a random start delay before allowing the outputs to be energized. An anti-short cycle delay will occur before allowing the compressor output to be energized.

#### **POWER INTERRUPTIONS**

The control will resume normal operation if the control voltage is interrupted for less than 100ms and the compressor is off. Power interruptions greater than 100ms will reset the control and the power up sequence will occur. Power interruptions greater than 40ms while the compressor is energized will de-energize the compressor and an antishort cycle delay will be executed.

#### ANTI SHORT CYCLE DELAY

A 6-minute anti-short cycle delay is executed every time the compressor de-energizes.

#### **RANDOM START DELAY**

Whenever the control voltage is interrupted for more than 100ms, a 10 to 60 second random start delay will be executed prior to energizing the outputs except for the reversing valve.

ClimaTek / First Company: CB1025, CB1026

TABLE OF OPERATIONS		
Function	Inputs	Operation
1ST Stage Heating	W1/Y active	Compressor, reversing valve, condenser fan energized.
	O active	High-speed evaporator energizes after 7 s.
	Remove W1/Y	Compressor, condenser fan, and evaporator will turn off.
2ND Stage heating	1st Stage Heating	After 15 s: Condenser and compressor shuts off, evaporator switches to low speed.
	Apply W2	
	Remove W2	
Defrost Lockout	1st or 2nd Stage Heating	Compressor and condenser de-energize, evaporator switches to low speed.
	Open OUTDOOR	If auxiliary heat is inactive: Heater 1 activates, Heater 2 activates after 15 s.
		A 6-hour timer begins in which the compressor and condenser fans will be locked out and auxiliary heat will energize whenever W1/Y or W2 are called.
Steady State Cooling	W1/Y active	Compressor and condenser energized. High-speed evaporator energizes after 7 s.
	O inactive	
	ASC timer inactive	
	Apply W2	Heater 1 energizes, Heater 2 energizes after 15 s.
		Compressor and condenser outputs will turn off. Evaporator will switch to low speed.
	Remove W2	Auxiliary heaters turn off, control returns to Steady State Cooling.
	Remove W1/Y	Compressor and condenser turn off. High-speed evaporator will turn off after 45 s.
Low Ambient Shutdown	Steady State Cooling	Compressor and condenser turn off. High-speed evaporator will turn off after 45 s.
	Apply INDOOR	
Low Ambient Cooling Lockout	Steady State Cooling	Control will continue operating for 10 min. Afterwards, if COOLING LOCKOUT is still active, Steady State
	Apply COOLING LOCKOUT	Cooling will be locked for 30 min while high-speed evaporator runs, after which Steady State Cooling returns.
Reversing Valve	O active	Reversing Valve output will be on regardless of other inputs.
	O inactive	Reversing Valve output will be off regardless of other inputs.
Continuous Fan	When no other thermostat inputs are present, apply G	Low-speed evaporator energizes.
Thermostat Call for Auxiliary Heat	W2 active	Auxiliary Heat Mode: Heater 1 and low-speed evaporator energize.
	W1/Y inactive	
	Remove W2	Heater 1 and low-speed evaporator turn off.
	W2 and W1/Y applied	Compressor and condenser turn off. Control will switch to auxiliary heat mode.
Low Room Ambient Auxiliary Heat	Close RS switch	Auxiliary Heat Mode: Heater 1 and low-speed evaporator energize.
		Heater 2 will energize after 15 s.
	Open RS switch	All outputs immediately shut off.
Front Desk Shutdown	Remove FD	All operations other than RS auxiliary heat suspended until FD is reapplied.
Thermostat Input	W1/Y active	Compressor and condenser locked out with only auxiliary heat operation allowed.
	W2 active	
Field Speedup Mode	0 inactive	Control enters Field Speedup Mode for 5 min. The following control timings will be reduced as follows:
	COOLING LOCKOUT closed	Random Start Delay: o s
	Apply R to W1/Y	Cooling Blower Off Delay: o s Auxiliary Heat Staging Delay: 1 s

