Model 122 RCN
PTAC/PTHP/FAN COIL CONTROL NODE OPERATION
September 26, 2005

OUTPUTS

G1 = FAN 1 **G2** = FAN 2 **G3** = FAN 3
O = Rev Valve **W** = HEAT **Y** = COMPRESSOR

Operating Modes (See Logic Tables 1 – 5):

1. **PTAC (Standard)**[*] — Fan will Speed-Hunt[†] in AUTO. Fan speed 1[*], 2 or 3 may be selected to run the fan continuously at that speed. **'Y'** terminal drives compressor. 3-minute short-cycle delay active on **'Y'** terminal[*].
2. **PTAC (Energy Saver)** — Fan will Speed-Hunt[†] in AUTO. Fan runs only when heating or cooling. Manually selecting fan speed 1[*], 2 or 3 will cycle the fan with each call for heating or cooling at that speed. **'Y'** terminal drives compressor. 3-minute short-cycle delay active on **'Y'** terminal.
3. **PTHP (Heat Pump)** — Fan will Speed-Hunt[†] in AUTO. Fan speed 1[*], 2 or 3 may be selected to run the fan continuously at that speed. **'Y'** terminal drives compressor, **'O'** terminal drives reversing valve. 3-minute short-cycle delay active on **'Y'** terminal[*].
4. **FAN COIL (Without Flow Valve)** — Fan will Speed-Hunt[†] in AUTO. Fan runs only when heating or cooling. Manually selecting fan speed 1[*], 2 or 3 will cycle the fan with each call for heating or cooling at that speed.
5. **FAN COIL (With Flow Valves)** — Fan will Speed-Hunt[†] in AUTO. Fan speed 1[*], 2 or 3 may be selected to run the fan continuously at that speed. Use **'Y'** terminal to drive the cooling valve.

COOLING:
If Temperature is ≥1 °F above setpoint, **'Y'** is active. **'O'** terminal is active only in heat pump mode. (NOTE: In FAN COIL mode, **'Y'** is used to operate the cooling flow valve.)

HEATING:
If Temperature is ≥1 °F below setpoint, **'W'** is active.

HEAT PUMP:
The **'Y'** terminal is active in both heating and cooling, **'O'** is used to operate the reversing valve. (NOTE: In heat pump mode **'W'** is active if temperature falls ≥4 °F below setpoint.)

SHORT CYCLE DELAY:
'Y' terminal remains off / delays 3-minutes from last cooling (or heating cycle in heat pump mode) and upon power-up*. This can be changed to zero delay in Configuration Setup. (See Configuration Page 2 below.)

CONFIGURATION SETUP:

The 122 control node may require configuration changes before first operation depending on your application. Five configuration pages (Page 1 - 5) guide the user to: 1. Setup Operation Logic, 2. Set Compressor Short-cycle delay for output line '**Y**' ON or OFF, 3. Set Fan Speed outputs, 4. Set Occupancy Mode and 5. Set Occupancy Timeout Delay. These configuration pages define LED indicators and give operational descriptions and factory default settings. Selections are indicated through the FLASH-COUNT of LED's D3 and D4. (Refer to Figure 1.) D4 flashes 1 to 5 times to indicate the property table, D3 flashes as many as 6 times to indicate the specific operational logic or 'property' selected.

Referring to Figure 1, PB3 (Reset/Link button) switches the unit into or out of 'configuration' state, PB1 (Mode) selects which page 1, 2, 3, 4 or 5 is indicated by D4 FLASH-COUNT and PB2 (CLEAR) selects configuration as indicated by D3 FLASH-COUNT. **Pressing PB2 changes configuration of the RCN.** To review or change the configuration, refer to the configuration pages below for descriptions and perform the following:

1. If any device such as an occupancy sensor or door switch is wired to the J1 terminals, pull the terminal block off of the board before proceeding.
2. Press and hold PB3 until LED indicator lamps D4 & D3 flash alternately. (*NOTE: At any time during the setup process PB3 can be pressed again to return to normal operation.*)

[*] Factory default setting.
[†] Fan Speed-Hunt is a Fan Auto function that automatically sets the fan speed based on departure from the setpoint temperature. E.g., 1º from setpoint = Fan 1, 2º from setpoint = Fan 2, 3º from setpoint = Fan 3.

3. D4 will flash once indicating Page 1, Operating Mode configuration, followed by D3 flashing 1 to 6 times indicating the specific configuration in page 1 that is currently active. (*NOTE: D4 and D3 will flash repeatedly to indicate the page and the configuration.*) Pressing PB2 will advance the configuration value by one. Press PB2 until the FLASH-COUNT corresponds to the desired configuration. (*Refer to Page 1 Table.*)
4. Press PB1 to advance to Page 2, Short-cycle configuration, as indicated by D4 flashing 2 times, followed by D3 flashing 1 or 2 times. Since there are only two choices, PB2 will toggle between them. Press PB2 until the FLASH-COUNT corresponds to the desired configuration.
5. Press PB1 to advance to Page 3, Fan Speed configuration, as indicated by D4 flashing 3 times followed by D3 flashing 1, 2 or 3 times. Pressing PB2 will advance the configuration by one. Press PB2 until the FLASH-COUNT corresponds to the desired configuration.
6. Press PB1 to advance to Page 4, Occupancy Mode configuration, as indicated by D4 flashing 4 times followed by D3 flashing 1, 2 or 3 times. Pressing PB2 will advance the configuration value by one. Press PB2 until the FLASH-COUNT corresponds to the desired configuration.
7. Press PB1 to advance to Page 5, Occupancy Timeout Delay configuration, as indicated by D4 flashing 5 times followed by D3 flashing 1 to 6 times. Pressing PB2 will advance the configuration value by one. Press PB2 until the FLASH-COUNT corresponds to the desired configuration.
8. Press PB3 to return to normal control node operation. Re-connect terminal block J1 if it was removed.

NOTE: At this time the node is running in the configuration last indicated by D4 and D3 in each of the configuration property tables.

	Mode Configuration Page			
		D4	**D3**	
	CONFIGURATION	**FLASH COUNT**	**FLASH COUNT**	**DESCRIPTION**
1	PTAC (Factory Default)	1	1	Fan will speed-hunt* in AUTO. Fan speed 1, 2 or 3 may be selected to run the fan continuously. (SEE LOGIC TABLE 4.)
2	PTAC (ENERGY SAVER)	1	2	Fan will speed-hunt* in AUTO. Fan speed 1, 2 or 3 may be selected to cycle the fan with each call for heating or cooling at that speed. (SEE LOGIC TABLE 5.)
3	PTHP (HEAT PUMP)	1	3	Fan will speed-hunt* in AUTO. Fan speed 1, 2 or 3 may be selected to run the fan continuously. (SEE LOGIC TABLE 6.)
4	FAN COIL (NO FLOW VALVE)	1	4	Fan will speed-hunt* in AUTO. Fan speed 1, 2 or 3 may be selected to cycle the fan with each call for heating or cooling at that speed. (SEE LOGIC TABLE 7.)
5	FAN COIL (FLOW VALVE)	1	5	Fan will speed-hunt* in AUTO. Fan speed 1, 2 or 3 may be selected to run the fan continuously at that speed. (SEE LOGIC TABLE 8.)

Configuration Page 1

	Short- Cycle Conflguratlon Page			
		D4	**D3**	
	CONFIGURATION	**FLASH COUNT**	**FLASH COUNT**	**DESCRIPTION**
1	Short Cycle Active (Factory Default)	2	1	Y (Compressor) control line is held off for 3-minutes after a compressor run cycle or upon power up.
2	Short Cycle In-active	2	2	Y (Compressor) control line is allowed to energize immediately after a compressor run cycle or upon power up.

Configuration Page 2

	Fan Speed Conflguratlon Page			
		D4	D3	
	CONFIGURATION	**FLASH COUNT**	**FLASH COUNT**	**DESCRIPTION**
1	Fan Speed 1 (Factory Default)	3	1	Fan will speed-hunt* in AUTO. Fan speed 1, 2 or 3 may be selected to run the fan continuously. (SEE TABLE 3.)
2	Fan Speed 1 & 2 Enabled	3	2	Fan will speed-hunt* in AUTO. Fan speed 1, 2 or 3 may be selected to cycle the fan with each call for heating or cooling at that speed. (SEE TABLE 4.)
3	Fan Speed 1, 2 & 3 Enabled	3	3	Fan will speed-hunt* in AUTO. Fan speed 1, 2 or 3 may be selected to run the fan continuously. (SEE TABLE 5.)

Configuration Page 3

	Occupancy Mode Conflguratlon Page			
		D4	D3	
	CONFIGURATION	**FLASH COUNT**	**FLASH COUNT**	**DESCRIPTION**
1	Disabled (Factory Default)	4	1	System does not respond to unoccupied status conditions.
2	Occupancy by Sensor or Thermostat Key Press Activity	4	2	System recognizes occupancy by contact closure on Input #1 and by thermostat key press activity. Defaults to unoccupied status upon power up reset.
3	Occupancy by Thermostat Key Press Activity Only	4	3	System recognizes occupancy by thermostat key press activity only. Defaults to occupied status upon power up reset.

NOTE: D3 will flash when the node goes into the unoccupied state.

Configuration Page 4

	Occupancy Tlmeout Configuration Page			
		D4	D3	
	CONFIGURATION	**FLASH COUNT**	**FLASH COUNT**	**DESCRIPTION**
1	2 Minute Delay	5	1	System responds to an unoccupied status conditions within 2-minutes.
2	1 Hour Delay	5	2	System responds to an unoccupied status 1-hour after condition is sensed.
3	4 Hour Delay	5	3	System responds to an unoccupied status 4-housr after condition is sensed.
4	8 Hour Delay	5	4	System responds to an unoccupied status 8-hours after condition is sensed.
5	16 Hour Delay	5	5	System responds to an unoccupied status 16-hours after condition is sensed.
6	24 Hour Delay (Factory Default)	5	6	System responds to an unoccupied status 24-hours after condition is sensed.

Configuration Page 5

		PTAC Mode (Standard)				
	Output	**Off**	**Cooling Fan Auto**	**Cooling Fan 1, 2 or 3**	**Heating Fan Auto**	**Heating Fan 1, 2 or 3**
CONTROL OUTPUTS TABLE	**G1 FAN 1**	CONTINUOUS FAN ALLOWED	ON ≥ 1° / OFF < .5°	CONTINUOUS FAN	ON ≥ 1° / OFF <0.5°	CONTINUOUS FAN
	G2 FAN 2	CONTINUOUS FAN ALLOWED	ON ≥ 2° / OFF < .5°	CONTINUOUS FAN	ON ≥ 2° / OFF < .5°	CONTINUOUS FAN
	G3 FAN 3	CONTINUOUS FAN ALLOWED	ON ≥ 3° / OFF < .5°	CONTINUOUS FAN	ON ≥ 3° / OFF < .5°	CONTINUOUS FAN
	O (REV VALVE)	OFF	OFF	OFF	OFF	OFF
	W (HTG)	OFF	OFF	OFF	ON ≥ 1° / OFF < .5°	ON ≥ 1° / OFF < .5°
	Y (COMP)	OFF	*ON ≥ 1° / OFF < .5°	*ON ≥ 1° / OFF < .5°	OFF	OFF

* **COMP** (**'Y'** Terminal) short-cycle delay = 3-minutes.
NOTE: LED lamp D5 will stay **ON** during the short-cycle delay period.

Logic Table 1

		PTAC Mode (Energy Saver)				
	Output	**Off**	**Cooling Fan Auto**	**Cooling Fan 1, 2 or 3**	**Heating Fan Auto**	**Heating Fan 1, 2 or 3**
CONTROL OUTPUTS TABLE	**G1 FAN 1**	OFF	ON ≥ 1° / OFF < .5°	ON ≥ 1° / OFF <.5°	ON ≥ 1° / OFF <0.5°	ON ≥ 1° / OFF < .5°
	G2 FAN 2	OFF	ON ≥ 2° / OFF < .5°	ON ≥ 1° / OFF < .5°	ON ≥ 2° / OFF < .5°	ON ≥ 1° / OFF < .5°
	G3 FAN 3	OFF	ON ≥ 3° / OFF < .5°	ON ≥ 1° / OFF < .5°	ON ≥ 3° / OFF < .5°	ON ≥ 1° / OFF < .5°
	O (REV VALVE)	OFF	OFF	OFF	OFF	OFF
	W (HTG)	OFF	OFF	OFF	ON ≥ 1° / OFF < .5°	ON ≥ 1° / OFF < .5°
	Y (COMP)	OFF	*ON ≥ 1° / OFF < .5°	*ON ≥ 1° / OFF < .5°	OFF	OFF

* **COMP** (**'Y'** Terminal) short-cycle delay = 3-minutes.
NOTE: LED lamp D5 will stay **ON** during the short-cycle delay period.

Logic Table 2

* Factory default setting.

		P T H P M o d e (Heat Pump)				
	Output	**Off**	**Cooling Fan Auto**	**Cooling Fan 1, 2 or 3**	**Heating Fan Auto**	**Heating Fan 1, 2 or 3**
CONTROL OUTPUTS TABLE	**G1 FAN 1**	CONTINUOUS FAN ALLOWED	ON ≥ 1° / OFF < .5°	CONTINUOUS FAN	ON ≥ 1° / OFF <0.5°	CONTINUOUS FAN
	G2 FAN 2	CONTINUOUS FAN ALLOWED	ON ≥ 2° / OFF < .5°	CONTINUOUS FAN	ON ≥ 2° / OFF < .5°	CONTINUOUS FAN
	G3 FAN 3	CONTINUOUS FAN ALLOWED	ON ≥ 3° / OFF < .5°	CONTINUOUS FAN	ON ≥ 3° / OFF < .5°	CONTINUOUS FAN
	O (REV VALVE)	OFF	ON	ON	OFF	OFF
	W (HTG)	OFF	OFF	OFF	ON ≥ 4° / OFF < .5°	ON ≥ 4° / OFF < .5°
	Y (COMP)	OFF	*ON ≥ 1° / OFF < .5°	*ON ≥ 1° / OFF < .5°	*ON ≥ 1° / OFF < .5°	*ON ≥ 1° / OFF < .5°

* **COMP** (**'Y'** Terminal) short-cycle delay = 3-minutes.
REV VALVE (**'O'** Terminal) active in cooling.
NOTE: LED lamp D5 will stay **ON** during the short-cycle delay period.

Logic Table 3

		F a n C o i l M o d e (without Valves)				
	Output	**Off**	**Cooling Fan Auto**	**Cooling Fan 1, 2 or 3**	**Heating Fan Auto**	**Heating Fan 1, 2 or 3**
CONTROL OUTPUTS TABLE	**G1 FAN 1**	OFF	ON ≥ 1° / OFF < .5°	ON ≥ 1° / OFF <.5°	ON ≥ 1° / OFF <0.5°	ON ≥ 1° / OFF < .5°
	G2 FAN 2	OFF	ON ≥ 2° / OFF < .5°	ON ≥ 1° / OFF < .5°	ON ≥ 2° / OFF < .5°	ON ≥ 1° / OFF < .5°
	G3 FAN 3	OFF	ON ≥ 3° / OFF < .5°	ON ≥ 1° / OFF < .5°	ON ≥ 3° / OFF < .5°	ON ≥ 1° / OFF < .5°
	O (REV VALVE)	OFF	OFF	OFF	OFF	OFF
	W (HTG)	OFF	OFF	OFF	ON ≥ 1° / OFF < .5°	ON ≥ 1° / OFF < .5°
	Y (COMP)	OFF	*ON ≥ 1° / OFF < .5°	*ON ≥ 1° / OFF < .5°	OFF	OFF

Logic Table 4

* Factory default setting.

		Fan Coil Mode (with Valves)				
	Output	**Off**	**Cooling Fan Auto**	**Cooling Fan 1, 2 or 3**	**Heating Fan Auto**	**Heating Fan 1, 2 or 3**
CONTROL OUTPUTS TABLE	**G1 FAN 1**	CONTINUOUS FAN ALLOWED	ON ≥ 1° / OFF < .5°	CONTINUOUS FAN	ON ≥ 1° / OFF <0.5°	CONTINUOUS FAN
	G2 FAN 2	CONTINUOUS FAN ALLOWED	ON ≥ 2° / OFF < .5°	CONTINUOUS FAN	ON ≥ 2° / OFF < .5°	CONTINUOUS FAN
	G3 FAN 3	CONTINUOUS FAN ALLOWED	ON ≥ 3° / OFF < .5°	CONTINUOUS FAN	ON ≥ 3° / OFF < .5°	CONTINUOUS FAN
	O (REV VALVE)	OFF	OFF	OFF	OFF	OFF
	W (HTG)	OFF	OFF	OFF	ON ≥ 1° / OFF < .5°	ON ≥ 1° / OFF < .5°
	Y (COMP)	OFF	*ON ≥ 1° / OFF < .5°	*ON ≥ 1° / OFF < .5°	OFF	OFF

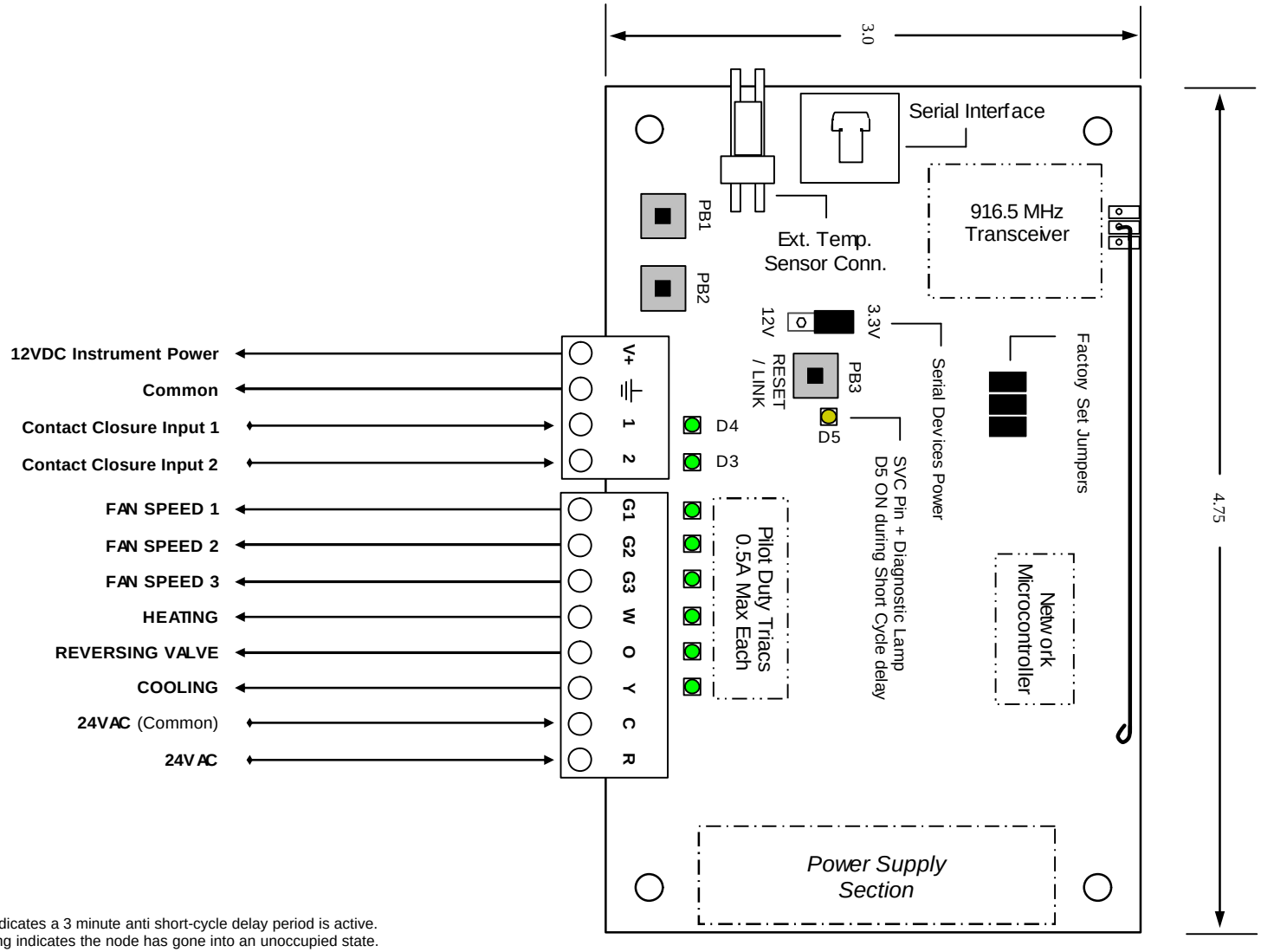
COMP (**'Y'** Terminal) used for cooling valve – No short-cycle delay.

Logic Table 5

IMPORTANT NOTES:

*1.) The model 122 control node factory defaults to fan speed 1. If your application requires 2 or 3 fan speeds, be sure to select the number needed as described in the Fan Speed Configuration table above. Otherwise, the system will only energize **G1**. Fan speed hunt and manually selecting higher fan speeds at the thermostat will not cause **G2** or **G3** to energize..*

2.) If an occupancy method is enabled (see Occupancy Mode Configuration) D3 will flash, indicating that the node has gone into the unoccupied state.



NOTES:
1.) D5 ON indicates a 3 minute anti short-cycle delay period is active.
2.) D3 flashing indicates the node has gone into an unoccupied state.
3.) Output 1—6 switches 24vac (R terminal potential) @ 0.50 amps each max.
4.) This device should be powered with a Class 2, U.L. listed transformer.
5.) Wiring should conform to all national and local electrical codes.
6.) See setup table and configuration instructions in manual.

Figure 1