REZNOR®

MAPS® MAPS®dH™

Applies to: **MAPS®II Control Option D12A**

Application and Instructions for Field Adjustment of the Control (Model FX06) in Digital Control Option D12A, Space Control with Discharge Air Reset

Applies to Reznor MAPS®II Models RCA, RDA, RDCA, RDDA, RECA and REDA

Contents

Introduction

The microprocessor unit (Model FX06) in control Option D12A is custom programmed for the Reznor Modular Air Processing System (MAPS®II). Control features include:

- Custom 3-step control sequence of cooling, dehumidification (reheat), and heating
- 3:1 Gas heating turndown or 6:1 gas heating modulation control
- Fully integrated outdoor ambient lockouts based on outdoor dry bulb/dewpoint or enthalpy
- Alarm and equipment shutdown features
- Service/Commissioning Test Mode
- Integrated timer functions for cooling and heating

FX06

There are four buttons that can be used for adjusting setpoints, viewing unit status, and enabling unit test or shut down modes. (See page 3.) The controller display will indicate unit status (on, off, or alarm), discharge air temperature, outdoor air temperature, dewpoint, and enthalpy. When equipped with a wall-mounted sensor, space temperature will be displayed.

General Sequence of Operation

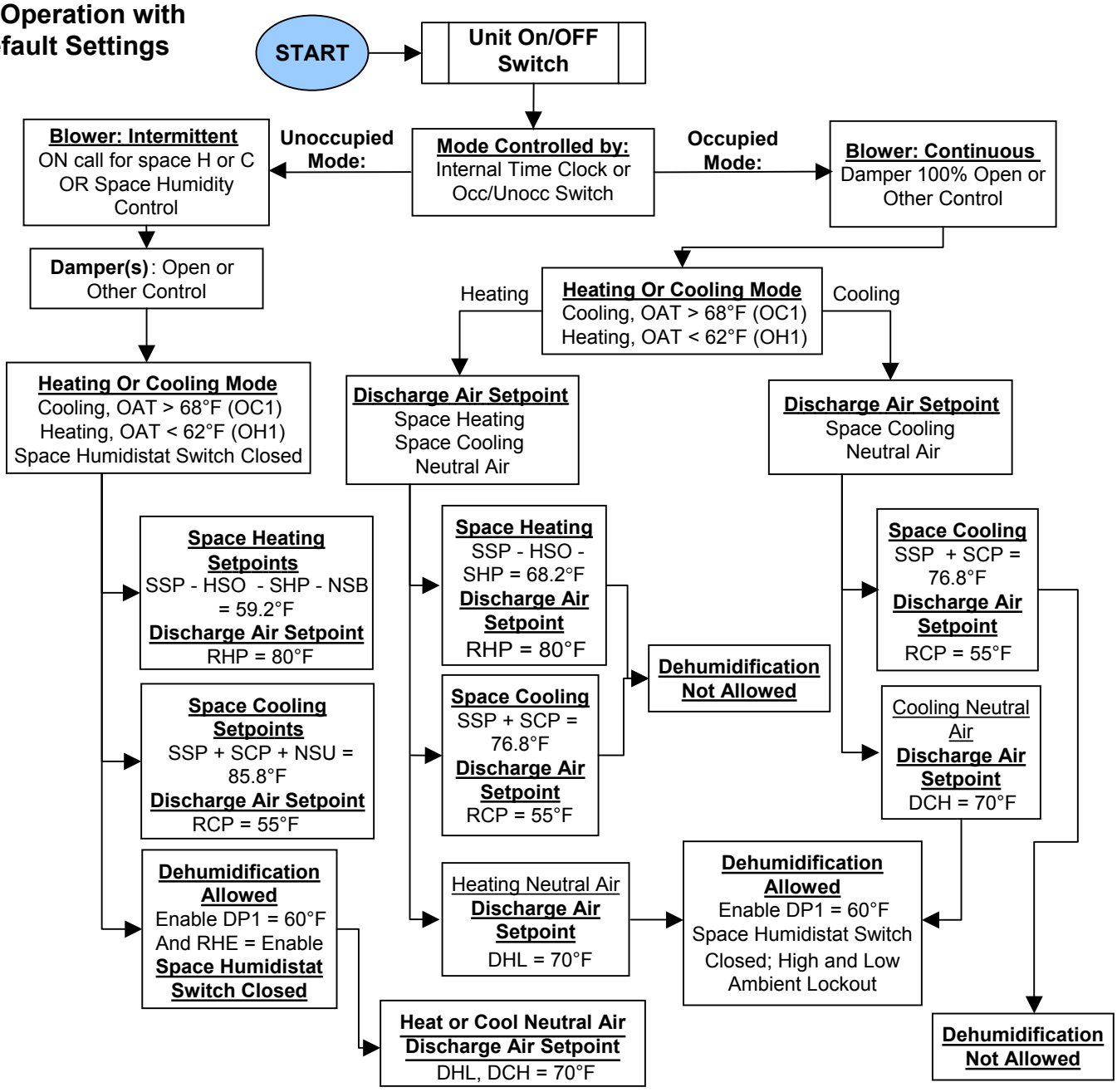
When the unit is called to operate, the main blower will run continuously in occupied mode and intermittently in unoccupied mode. The unit operates based on four **Discharge Air Temperature Setpoints** listed below.

1. Standard (Neutral) Heating Discharge Air Temperature Setpoint
2. Space Heating Discharge Air Temperature Setpoint
3. Standard (Neutral) Cooling Discharge Air Temperature Setpoint
4. Space Cooling Discharge Air Temperature Setpoint

The heating and cooling equipment will cycle to maintain the active discharge air temperature setpoint for occupied and unoccupied modes. Heating and cooling may be locked out of operation based upon outdoor air temperature and enthalpy conditions.

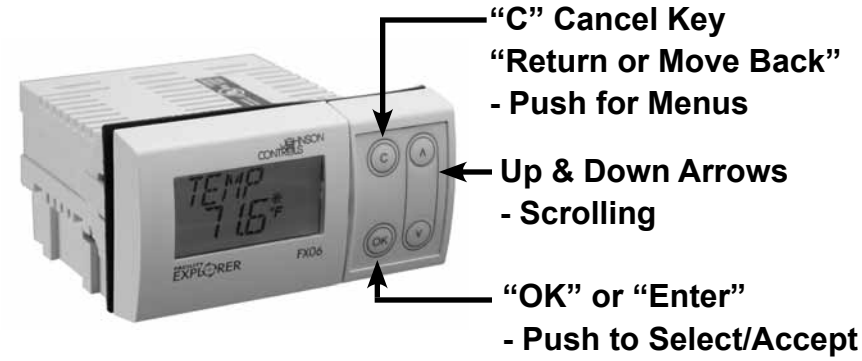
If equipped with reheat, the control will also activate the dehumidification circuit to maintain a neutral discharge air temperature setpoint and related dewpoint based upon outdoor air and space conditions.

FIGURE 1 - Sequence of Operation with Default Settings



FX06 Display

FIGURE 2A - FX06 Controller



Upon start-up or power on, the FX06 controller provides data from the home page variables. Pressing the up and down arrows will display one item from the home page menu.

» The control once powered up will operate based upon the time schedule or occupancy physical point state. Press and hold the "C" key to turn the controller OFF/ON.

» Pressing the "C" button, displays the menu pages. Use the "Up" or "Down" to move between menu selections. Press the "OK" button to view menu variables.

» Press the "OK" key to select a variable to change. Use the "up" or "down" button to change the values. Press the "OK" key again to accept the change or the "C" key to move back to previous level.

Menu Options	
Item	**Description**
Home Page	Unit ON/OFF Status
01	Unit Status & Modes
02	Temperature Setpoints
03	OA Reset Schedule
04	Commissioning Parameters
05	Sensor Calibration
06	Controller Setup: Time, Address, Date
07	Time Schedules
08	Alarm Events
See Variable list for location and functionality of all parameters. See pages 14-19.	

FX06 Display (cont'd)

FIGURE 2B - Optional Remote Medium User Interface, Option RB2A, P/N 223125

Display Lights	
Symbol and 1 - 8	
Unit ON/OFF	Alarm
Comp #1 ON	Reheat ON
Comp #2 ON	-
Stg #1 Heat ON	-
Stg #2 Heat ON	-

The remote user interface display mimics all menus and functions on the FX06 controller except the "Test Function".

The remote user interface display is a four-line, backlit unit requiring 24Vac/dc power and a two wire network connection between the unit controller and the display. The display receives all of its programming and functionality from the controller located in the unit. The display can be mounted 500 ft (152M) away from the controller. (Consult the factory for longer distances.) Refer to the wiring diagram for details.

Upon start-up or power on, the remote display provides data from the home page variables. Pressing the up and down arrows will display four lines of text, a single variable and data per line.

- » Pressing the "ESC" button displays the menu pages. Use the "left" or "right" arrows to move between menu pages. Press the "return" key to select a menu. The menu options are the same for the local and remote display.
- » Some menus have more than one page of data. You can use the left/right arrows to move between pages and use the up/down arrows to scroll between variable data.
- » Press the "OK" key to select a variable to change. Use the "up" or "down" button to change the values. Press the "OK" key again to accept the change or the "ESC" key to move back to previous level.
- » Pressing the ESC for 10 seconds will reset the FX06 controller which clears the alarms.

Installation Warnings and Notes

DANGER: Risk of Electrical Shock - To avoid possible electrical shock or equipment damage, disconnect power supply before making electrical connections.

IMPORTANT INSTALLATION NOTES

1) All Installations - The FX06 control is DC voltage. DC voltage wires must not be run in the same conduit as the 24V or line voltage wiring. Use of shielded cable wire is required for DC voltage. All field-installed DC sensor wiring must be in shielded cable.

2) Units equipped with HEAT (Models RDCA, RDDA, RECA, and REDA) - The discharge air sensor is factory wired in the low voltage control box. The installer must relocate the discharge air sensor to the supply ductwork for proper heating discharge air control. Center the sensor and sensor holder on the bottom or top of the supply duct or plenum. (See instructions on page 23.)

3) Installation with an optional communication card insert (Option BHB2 or BHB3) - Always remove controller power when installing or removing a communication card insert.

IMPORTANT: The Model FX06 controller is designed for use only as an operating control. Where an operating control failure would result in personal injury or loss of property, it is the responsibility of the installer to add devices (safety and/or limit controls) or systems (alarm and/or supervisory systems) that provide protection from or warning of control failure.

Unit Power and Blower Operation

General Operation

The unit is supplied with a disconnect switch. The FX06 controller also has an ON/OFF button (function key). When the FX06 (on/off) input (Point BI-3) is closed, the unit will operate in either occupied or unoccupied mode. When the occupied / unoccupied switch (Point BI-4) is closed, the unit will run in occupied mode; otherwise the unit operates in unoccupied mode.

Time Clock

An FX06 controller has a built-in real-time clock that supports all real-time functions including the display of time and date on the screen and the time stamping of each event. The unit will switch between occupied and unoccupied mode based upon a time of day schedule.

The unit will run in occupied mode when either BI-4 or the time clock calls for occupied mode. If both the internal time clock and external contacts are used, the physical input (point BI-4) will override the air handler to occupied mode if the physical point is closed. If the physical point is open, the internal time clock dictates the state.

Time Clock NOTE 1: Space sensor is required for unoccupied mode.

Time Clock NOTE 2: Make sure the BI-4 jumper is open when the internal time clock is used to avoid conflict of settings.

Occupied Mode

Blower operation is continuous in occupied mode. The FX06 contact BO-1 will close providing power for the outside air damper to open. If equipped with a 2-position damper, the outdoor air damper is electrically interlocked with the blower circuit. When the damper actuator opens to 80%, the blower is allowed to run. If power is lost, the mechanical spring will drive the damper closed.

If the unit is equipped with return air dampers, the blower control relay is not interlocked with the dampers.

Unoccupied Mode

The blower cycles ON/OFF with a call for either heating or cooling from the space sensor. Once the space heating or cooling unoccupied setpoints are satisfied, the blower will continue to run for 60 seconds, then shut OFF.

During the Unoccupied Cycle the space setpoints will increase as follows:

Space Cooling Setpoint (SSP) =
(SSP + SCP + NSU) = 75°F + 1.8 + 9°F = 85.8°F

Space Heating Setpoint =
(SSP - HSO - SHP - NSB) = 75°F - 5°F - 1.8 - 9°F = 59.2°F

(NSU and NSB default value = 9°F, adjustable from 0-35°F)

Unoccupied Override Mode

If the space override dial on the space sensor is turned during an unoccupied period, the air handling unit will operate in occupied mode for a period of four hours. (UOT = 240 minutes)

Heating and Cooling Control Modes

The unit operates based upon four **Discharge Air Temperature Setpoints**.

1. Standard (Neutral) Heating Discharge Air Setpoint
2. Space Heating Discharge Air Setpoint
3. Standard (Neutral) Cooling Discharge Air Setpoint
4. Space Cooling Discharge Air Setpoint

With the space sensor installed, the unit will operate to maintain the space heating and cooling setpoints as required. When the space temperature sensor is satisfied (or not installed), the unit will operate to maintain the standard (neutral) discharge air setpoint. The space cooling setpoint (SSP) default value is 75ºF. The space heating setpoint is a given differential (HSO) below the space cooling setpoint. The differential (HSO) can be adjusted from 1-30ºF. The default value of 5ºF makes the default heating setpoint 70ºF.

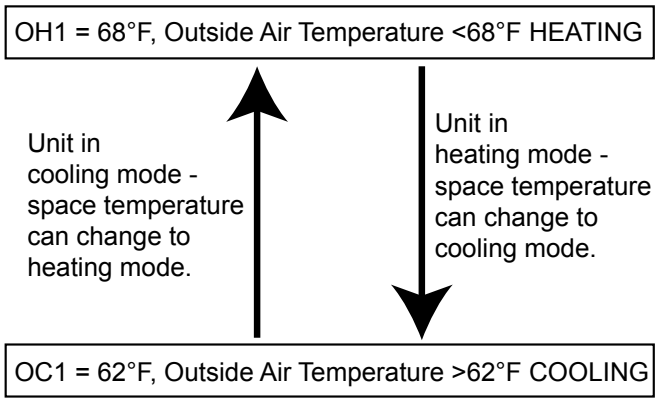
When the space temperature sensor is satisfied (or not installed), the unit will discharge standard (neutral) air. The default cooling mode setpoint (DCH) value is 70ºF. The default heating mode setpoint (DHL) is 70ºF. These setpoints can automatically be adjusted by a user defined reset schedule.

The heating or cooling mode is determined by outside air conditions and mode lockout values. If the outside air temperature value (Point AI-3) is greater than the cooling mode lockout value (OC1, default 68°F), the unit is in cooling mode. If the outside air temperature is lower then the heating mode lockout value (OH1, default 62°F), the unit is in heating mode (gas or electric).

Unit is in Cooling Mode when outside air temperature **rises** above OC1.

Unit is in Heating Mode when outside air temperature **falls** below OH1.

FIGURE 3 - Reverse Lockout Values to switch between heating and cooling based on space temperature (instead of outside air temperature).



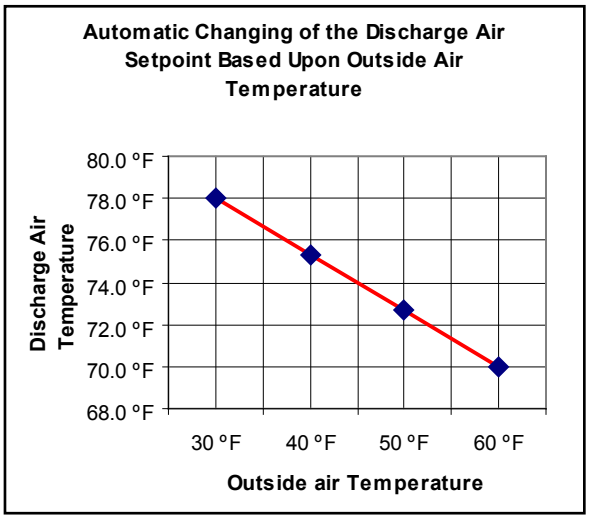
*If the lockout values are reversed as shown in **FIGURE 3** and a space sensor (CL67) is installed, the unit will switch between heating and cooling modes based upon space requirements. Example: If the outside air temperature rises from 50ºF to 65ºF, the unit will be in cooling mode. If the space sensor calls for heating when the outside air temperature is 65ºF, the unit will switch to heating mode. Once the space is satisfied, the unit will operate in heating mode for neutral air control. The unit will not switch to cooling mode until the space sensor calls for cooling.*

***NOTE:** If a space sensor is not installed, this function is not available.*

Heating Mode

When the unit is in heating mode, the unit will discharge air based upon the neutral air discharge heating setpoint point (DHL) or the room discharge air heating setpoint (RHP). If the space sensor is not installed, the unit will operate to provide neutral air only.

FIGURE 4 - Outside Air Reset (DHH) allows automatic changing of discharge air temperature based on outside air temperature.



Discharge Air Setpoint	Outside Air Temperature
DHL = 70ºF	OH2 = 60ºF
DHH = 55ºF	OH3 = 20ºF

Variable Name	Description	Default Value (Range)
DHL	**Standard (Neutral) Heating Discharge Air Temperature Setpoint (Primary Setpoint)** If the reset option is disabled, the DHL becomes the primary neutral air heating discharge air temperature setpoint. If the reset option is active, this is the lowest heating value based on outdoor air conditions. The discharge air temperature will not change to a lower value than DHL regardless of the outside air temperature.	70ºF (50 to 115ºF)
DHH	**Outdoor Reset Option – Duct Discharge Air Temperature Heating Setpoint** When used in conjunction with DHL, OH2 and OH3, the neutral discharge air heating setpoint will be adjusted based on the outdoor air temperature. If DHH is higher than DHL, the controller will reset the discharge air temperature setpoint from the low value of DHL to the high value of DHH as the outdoor air goes from the high value of OH2 to the low value of OH3. The default value disables this feature..	55°F (50 to 115ºF)
OH2	**Outdoor Reset Dry Bulb Heating – High Setting** The value of the outside air temperature corresponding to the DHL low heating setpoint value..	60ºF (20 to 70ºF)
OH3	**Outdoor Reset Dry Bulb Heating – Low Setting** The value of the outside air temperature corresponding to the DHH high heating setpoint value..	20ºF (-40 to 65ºF)
NOTE: Making the DHH value lower than the DHL value disables the reset functionality.		

Heating and Cooling Control Modes (cont'd)

Heating Mode (cont'd)

If a local space sensor is installed, the unit will change the neutral air discharge setpoint to the room discharge air heating setpoint (RHP) whenever the space requires heating. Whenever the space temperature is below the setpoint by a value greater than the space heating proportional band (SHP), then space heating is required. The SHP default value is 1.8º, adjustable from 1° to 8 º.

Example:

Space heating setpoint = (*SSP - HSO) = 75ºF - 5ºF = 70ºF*

Space heating proportional band (SHP) = 1.8ºF *(Range 1° to 8ºF)*

Space heating active [(SSP - HSO) - SHP]: 70ºF - 1.8ºF = 68.2ºF

Room discharge air temperature heating setpoint (RHP) = 80ºF

During the Unoccupied Cycle the space setpoints will change as follows:

Space Heating Setpoint =

(SSP - HSO - SHP - NSB) = 75°F - 5°F - 1.8 - 9°F = 59.2°F

(NSB default value = 9°F; adjustable from 0 to 35°F)

When the space temperature is more than SHP above the setpoint (70+1.8 = 71.8ºF), the unit will switch to neutral air control and space heating requirements will be OFF. The neutral discharge air control setpoint value will be the DHL value.

It may be useful to change the neutral air setpoint if the indoor ambient comfort conditions significantly change based upon outdoor air conditions. The discharge air setpoint can be set to automatically adjust between the DHL and the DHH values depending upon the outside air conditions.

Example: Elder care centers tend to require higher space temperatures during the winter season (example 78ºF). Therefore, when the outside air is 60ºF, the unit can deliver 70ºF neutral air. And, when the outside air temperature drops to 30ºF, the unit can provide 78ºF neutral air. The higher neutral air setpoint provides neutral air matching the space temperature, thus better comfort control.

Heat Staging - 3:1 Turndown, Option AG55

Upon a call for heat, to maintain the active discharge air setpoint, the unit will enable a stage when the discharge air temperature is more than 1/2 of the heating proportional band (HPP) below the setpoint. Default HPP value is 10ºF.

Example: Active setpoint = 70ºF. A stage is enabled when the discharge air temperature (DAT) is less then 65ºF. Likewise, if the discharge air temperature is above 75ºF, an active stage of heating is turned OFF.

If the discharge air temperature rises above 1/2 HPP value above the setpoint (70ºF + 5ºF = 75ºF) after initially starting, the 1st stage will remain ON for 180 seconds, then turn OFF.

After the first 180 seconds from the 1st stage activating, if the discharge air temperature does not increase above 1/2 of the band (HPP), the controller will turn on the 2nd stage. The 2nd stage closes (DO-3), and the 1st stage (DO-2) remains ON for 20 seconds. The system uses the 1st stage to ignite the 2nd stage and vice versa. After twenty seconds, stage 1 will turn OFF.

The 2nd stage has a minimum run time of 100 seconds. If the discharge air temperature is still less than 1/2 of HPP after 100 seconds, then the system will activate the 3rd stage. Stage 3 heating is stage 1 and 2 combined (DO-2 and DO-3 closed), providing 100% heating.

If the discharge air temperature increases above 75ºF, then the stages start turning OFF in the reverse sequence. If the DAT remains between the propor-

tional band (HPP = 10, 65ºF to 75ºF), the unit will not add or subtract a stage of heating. Stage 3 does not have a minimum run time.

For 6:1 modulating gas heat, Option AG57, the same sequence applies with the following addition. When the unit is in any stage of heating other than OFF, the gas modulating value will vary from 100% open to 50% open based upon the heating discharge air proportional band (HPP).

Example: If the discharge air temperature (DAT) is 4.9ºF above the setpoint, AO-1 output will provide 50% gas. If the DAT is 4.9ºF below the setpoint, the gas valve will modulate to provide 100% gas. When heating is not required, the analog output will be 10V, 50% open. (The gas valve converts the control signal voltage: 10V - 0V = signal at the valve = 3 VDC = 100% open, 7 VDC = 50% open).

Heating Mode Lockout

If the Discharge Air Temperature (Point AI-4), does not rise above LSP (36ºF) in 600 seconds after blower enables, the unit will shut down. Upon a rise in discharge air temperature (LSP + 30ºF = 66ºF), the unit is enabled. Three consecutive lockouts within one hour will result in a continuous lockout state (24 VAC power must be cycled to reset the controller). If the Outdoor Air Temperature sensor fails, the blower will operate without cooling, reheat, or heating equipment active. If the Outdoor Air Temperature rises above the OH1 heating lockout (62ºF), the heating equipment will be turned OFF after the minimum run time.

Cooling Mode

When the unit is in cooling mode, the unit will discharge air based upon the neutral air cooling setpoint point (DCH) and the room discharge air cooling setpoint (RCP). If the space sensor is not installed, the unit will operate to provide neutral air only.

If a space sensor is installed, the unit will change from the neutral discharge air temperature setpoint to the room discharge air heating setpoint (RCP) value whenever the space requires cooling. Whenever the space temperature is above the setpoint by a value greater than the space cooling proportional band (SCP), the space will call for space cooling to be ON. The SCP default value is 1.8º.

Example:

Space cooling setpoint SSP = 75°F (Default)

Space cooling proportional band (SCP) = 1.8ºF (adjustable 1 to 8ºF)

Space cooling active above: (SSP + SCP) = 75ºF + 1.8ºF = 76.8ºF

Space cooling discharge air setpoint (RCP) = 55ºF

During the Unoccupied Cycle the space setpoints will increase as follows:

Space Cooling Setpoint = (SSP + SCP + NSU) = 75°F + 1.8°F + 9°F = 85.8°F

(NSU default value = 9°F, adjustable from 0-35°F)

When the space temperature is more than SCP below the setpoint (75 - 1.8 = 73.2ºF), the unit will switch to neutral air control. The control setpoint value will be the DCH value.

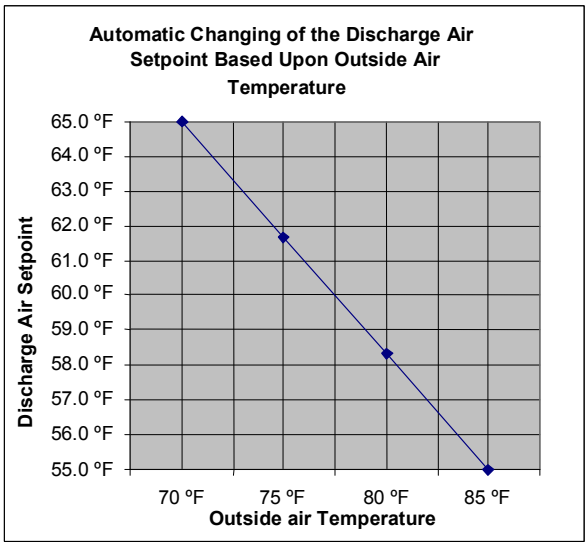
The neutral air setpoint can be automatically adjusted based on outside air values. The discharge air setpoint will float between the DCL value and the DCH value depending upon the outside air conditions. In low humidity applications where the unit may serve other mechanical equipment directly, it may be beneficial to automatically adjust the setpoint to minimize the use of mechanical equipment. **NOTE: This function is not recommended for humidity sensitive applications.**

Heating and Cooling Control Modes (cont'd)

Cooling Mode (cont'd)

FIGURE 5 - Outside Air Reset (DCL) allows automatic changing of discharge air temperature based on outside air temperature.

Discharge Air Setpoint	Outside Air Temperature
DCL = 80°F	OC2 = 75°F
DCH = 70°F	OC3 = 60°F



Variable Name	Description	Default Value (Range)
DCH	**Standard Discharge Air Setpoint (Primary Setpoint)** DCH is the value of the discharge air cooling setpoint when the outside air temperature is at its coldest value to allow minimum cooling. The discharge air temperature will not change to a higher value than DCH regardless of the outside air temperature. If the reset option is disabled, the DCH becomes the primary neutral air cooling discharge air setpoint.	70ºF (50° to 115ºF)
DCL	**Outside Air Reset Option** The value of the neutral discharge air cooling setpoint when the outside air temperature is at its warmest value to allow maximum cooling. The discharge air temperature will not change to a lower value than DCL regardless of the outside air temperature. The default value disables reset functionality	80ºF (50° to 115ºF)
OC2	**Outdoor Reset Dry Bulb Cooling – High Setting** The value of the outside air temperature corresponding to the DCL coldest cooling setpoint..	75ºF (70° to 130ºF)
OC3	**Outdoor Reset Dry Bulb Cooling – Low Setting** The value of the outside air temperature corresponding to the DCH warmest cooling setpoint.	60ºF (58° to 85ºF)
NOTE: Making the DCL value higher than the DCH value disables the reset functionality.		

Cooling Staging

Upon a call for cooling mode to maintain the active discharge air setpoint, the unit will enable a stage when the discharge air temperature is more than 1/2 of the cooling proportional band (CPP) above the setpoint. (Default CPP value is 10ºF.)

> **Example:** Active setpoint = 70ºF. The 1st stage enables when the discharge air temperature is greater than 75ºF. Likewise if the discharge air temperature is below 65ºF, an active stage of cooling is turned OFF.

The system has intra-stage time delays of 4.5 minutes. Thus, compressors have a minimum ON and OFF time of 4.5 minutes. After the first stage has been turned ON and the discharge air temperature is still 5ºF greater than the setpoint (½ CPP) and 4.5 minutes has passed, the unit will turn on stage 2 cooling. Because the unit has 33%, 66%, and 100% staging, compressor 1 will turn OFF and compressor 2 will turn ON.

If after 4.5 minutes the same condition exists, stage 3 will be active and both compressors 1 and 2 will be ON. If the discharge air temperature value is within the cooling proportional band (CPP is 65ºF to 75ºF), the active stage will remain ON. If the DAT falls 5ºF below the setpoint, the staging control will act in reverse, turning OFF stages.

Cooling Mode Lockout

The unit is equipped with a manual reset high pressure switch and an auto-reset low pressure switch for each compressor circuit. If any pressure switch trips, that particular mechanical cooling circuit is disabled. Each circuit on the evaporator coil has an auto-reset froststat which will disable the cooling circuit if the temperature drops below 36ºF.

To reduce compressor cycling, the compressors are enabled to run based upon outdoor dry bulb temperature and enthalpy settings. No mechanical cooling is allowed to operate if the outside air temperature is below the cooling mode lockout (OC1). Default OC1 setting is 68ºF; adjustable range is 58° to 130ºF. If the compressors are enabled and the temperature falls below the OC1 setting, the minimum run time will keep the compressors ON. **ALL** compressors will immediately turn OFF after the current minimum run time expires; the unit does not stage down.

If the unit is equipped with an outdoor air humidity sensor (Point AI-2), the compressors are locked out until the outside air enthalpy value rises above the lockout settings

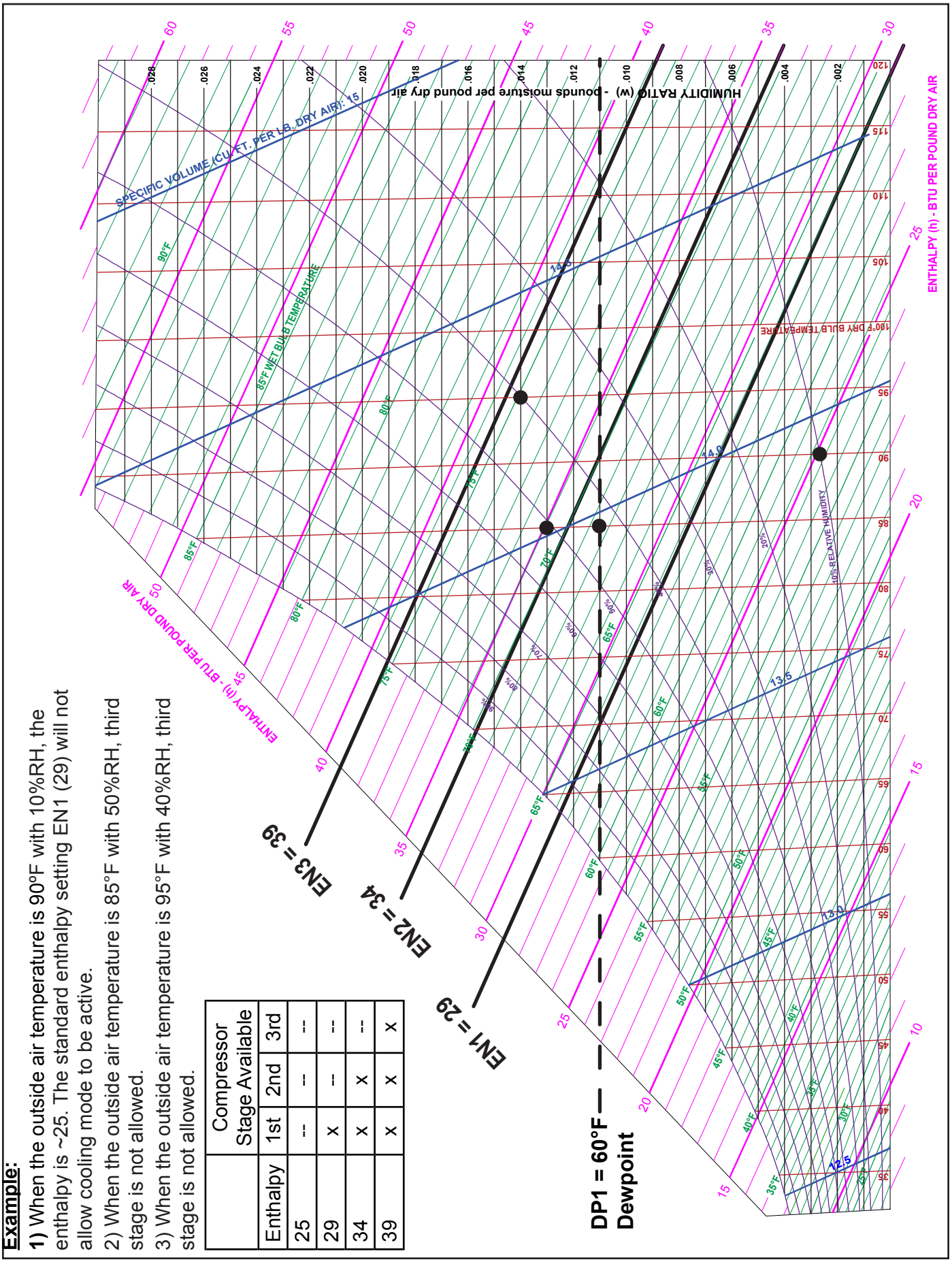
- Stage 1 compressor is locked out when the outdoor air enthalpy is below EN1 settings.
- Stage 2 compressor is locked out when the outdoor air enthalpy is below EN2 setting.
- Stage 3 compressors are locked out when the outdoor air enthalpy is below EN3 settings.

Dehumidification (Reheat)

Reheat control is enabled based on the outdoor dewpoint temperature setpoint (DP1). If the outside air dewpoint is above the setpoint (DP1 = 60ºF), BO-4 will be ON activating the reheat system. The reheat circuit adds 7 to 17°F to the discharge air temperature after it leaves the main cooling section of the unit. The reheat control output will be OFF based upon any of the following conditions:

1. The space temperature sensor calls for the unit to provide space cooling. In this mode the reheat is OFF. Once space cooling (SSP) is satisfied, reheat can restart.
2. The unit is equipped with a space humidistat with setpoint control. If the humidistat is not calling for dehumidification, thus the switch is open to BI-2, the reheat circuit is OFF.
3. If the outdoor air temperature is below the low ambient lockout (ROL), the reheat circuit will be OFF. The ROL default value is 65ºF.
4. If the outdoor air temperature is above the high ambient lockout (ROH), the reheat circuit will be OFF. The ROH default value is 120ºF.
5. If the unit is in unoccupied mode and the (RHE) reheat value is NO, reheat is not allowed in the unoccupied mode. If the RHE default value is YES, reheat is allowed in the unoccupied mode based upon space humidistat. If a space humidistat is not installed, the contact is wired closed thus allowing reheat in the unoccupied mode.
6. If the outdoor air temperature sensor fails, cooling, reheat, and heating equipment are not allowed to operate.

FIGURE 6 - Optional humidity transmitter measures outdoor air humidity and controls compressor operation based on enthalpy settings EN1, EN2, EN3



Example:

1) When the outside air temperature is 90°F with 10%RH, the enthalpy is ~25. The standard enthalpy setting EN1 (29) will not allow cooling mode to be active.

2) When the outside air temperature is 85°F with 50%RH, third stage is not allowed.

3) When the outside air temperature is 95°F with 40%RH, third stage is not allowed.

	Compressor Stage Available		
Enthalpy	1st	2nd	3rd
25	--	--	--
29	x	--	--
34	x	x	--
39	x	x	x

Dehumidification (Reheat) (cont'd)

Control Adjustment Guidelines for a Reheat System

NOTE: Does not apply to Option AU25 reheat.

The discharge air temperature can be adjusted when the reheat point is ON. When reheat is ON, the discharge air temperature can be reset as follows.

DCH = DCH + RSP

NOTE: If outdoor reset is used, DCL must replace DCH.

NOTE: It is important that RSP be used when the DCH value is lower than 65°F. Because the reheat system adds 7 to 17°F of reheat, a DCH setpoint of 55°F must discharge 40°F from the main coil to maintain a 55°F setpoint value. This low discharge temperature may damage the unit.

There are many ways to combine settings based on each application. The type of reheat application will determine the setting for **DCH** and **RSP**. The typical application requires RSP to be 0°F when DCH is 70°F. The unit will discharge a dewpoint of 52 to 55°F at 70°F discharge air temperature.

EXAMPLE 1) Neutral Air Application (corridor or kitchen makeup air)

Since the unit reheat override is based primarily on space temperature, the reheat override parameter ROH will be adjusted outside of operating range. Below are the proposed settings:

DP1 = 58; reheat enabled above 58°F dewpoint

ROL = 58; reheat compressor locked out below 58°F dry bulb

OC1 = 65; cooling compressors locked out below 65°F (Assumes reheat pump alone is adequate.)

EN1 = 29; 1st stage cooling compressor enabled above 29 btu/lb

OH1 = 70; Heating locked out above 70°F ambient

DCH = 70; cooling duct discharge air setpoint with RSP = 0 (use DCL with outdoor reset)

RSP = 0; Regardless of ambient dewpoint, the duct discharge air temperature setting is 70°F.

ROH = 115; High ambient reheat override is set where reheat is not disabled

RCP = 55; if the space temperature exceeds the cooling setpoint, reheat is disabled and discharge air is supplied at 55°F.

EXAMPLE 2) Neutral Air Application (Space Temperature Override – RH input Jumpered and Reheat Override)

If space sensible loads increase with outdoor ambient dry bulb, it may be preferred to override reheat mode by using the **ROH** reheat override in conjunction with space temperature override. Below are the proposed settings:

DP1 = 58; reheat enabled above 58°F dewpoint

ROL = 58; reheat compressor locked out below 58°F dry bulb

OC1 = 68; cooling compressors locked out below 68°F (Assumes reheat pump alone is adequate.)

EN1 = 29; 1st stage cooling compressor enabled above 29 btu/lb

OH1 = 72; Heating locked out above 72°F ambient

DCH = 62; cooling duct discharge air with reheat overrides (use DCL with outdoor reset)

RSP = 8; The duct discharge air temperature setting with reheat is 70°F (62 + 8).

ROH = 92; Reheat mode is disabled over 92°F ambient dry bulb with a supply air temperature of 62°F.

RCP = 55; if the space temperature exceeds the cooling setpoint, reheat is disabled and discharge air is supplied at 55°F.

In this mode, if the dewpoint is below 58°F, the unit will discharge 62°F air to the space in neutral air mode. If the dewpoint rises above 58°F, the unit will discharge 70°F air to the space in neutral air mode. If the space requires cooling, the unit will discharge 55°F air to the space until the space setpoint is satisfied.

NOTE: If AU25 option is installed, reheat is available only when the first stage compressor is running. Option AU25 cannot enable a compressor.

Menu Pages

To access Menu Pages, press the “C” Key, and choose Menu #1 - Unit Status.

Menu 01	Unit Status and Modes	
Display Name	**Control Variable Description**	**Reading or Status**
SPCT or RM-T	Space Temperature Value from Sensor (Option CL67) “--” if not installed	XXX.X°F
DAT	Discharge Air Temperature	XXX.X°F
OAT	Outside Air Temperature	XXX.X°F
Enth	Outside Air Enthalpy Value (BTU/LBS)	XXX.X
DP	Outside Air Dewpoint Temperature	XXX.X°F
OA HUM PERC	Outside Air Relative Humidity Percent	XXX.X%
DA WHSP	The active discharge air heating setpoint for the given conditions	Status only
DA WCSP	The active discharge air cooling setpoint for the given conditions	Status only
MODE	The active stages of cooling or heating the controller has requested. Cooling Stage 1 = CLG1, CLG2, CLG3; Heating = HGT1, HGT2, HTG3; Reheat	Status only
OCC STATUS	Current Unit Mode - Occupied or Unoccupied	Status only
OCC OVRD STAT	**Temporary Occupied Override -** When the wall switch occupied button is pushed, the unit switches from unoccupied mode to occupied mode for the given time	Status only
SHUTDOWN	**Normal Operation or Shutdown** - When the remote ON/OFF contact closure is open, the unit will be OFF (SHUTDOWN). If the contact closure is closed, the unit will follow its sequence of operation.	Status only
DA CNTRL MODE	**Active Discharge Air Control Mode** - Neutral Air Heating (DAH), Neutral Air Cooling (DAC); Room Air Cooling (RMC), Room Air Heating (RMH)	Status only
RM WHSP	**Active Space Heating Setpoint** - Displays the active setpoint determined by occupied or unoccupied mode.	XXX.X°F
RM WCSP	**Active Space Cooling Setpoint** - Displays the active setpoint determined by occupied or unoccupied mode.	XXX.X°F
HTG OUTPUT PCT	**Percentage of Heating Output** - Displays the percentage of heating output from 0-100%.	0-100%

FX06 Commissioning Parameters Level

Menu 02	Setpoint Page		
Display Name	**Temperature Setpoints**	**Default Value**	**Range**
SSPHI	The maximum value that the space setpoint dial can be set	78°F	60° to 80°F
SSPLO	The minimum value that the space setpoint dial can be set	72°F	60° to 80°F
SSP	**Space Cooling Temperature Setpoint (SSP)** This is a setpoint from the space sensor (Option CL67) above which the unit will begin to initiate space cooling. As the space temperature increases above this value, the space cooling discharge air setpoint will become active (RCP). The range of the dial is governed by the high (SSPHI) and low (SSPLO) values above.	Status Only	
HSO	**Space Heating Setpoint Offset** This value is subtracted from the SSP value to calculate the space heating setpoint. (Example: SSP – HSO = 75° – 5° = 70°.) As the space temperature drops below 70°F, the space heating discharge air setpoint will become active (RHP).	5°F	1° to 30°F
DP1	**Reheat Enabled Setpoint – Ambient Dewpoint** At dewpoints below this value, reheat will not be enabled	60°F	52° to 80°F
DCH	**Standard (Neutral) Cooling Discharge Air Temperature Setpoint (Primary Setpoint)** If the reset option is disabled, the DCH becomes the primary neutral air cooling discharge air temperature setpoint. If the reset option is active, this is the maximum cooling value based on outdoor air conditions. The discharge air temperature will not change to a higher value than DCH regardless of the outside air temperature..	70° F	50° to 115°F
DHL	**Standard (Neutral) Heating Discharge Air Temperature Setpoint (Primary Setpoint)** . If the reset option is disabled, the DHL becomes the primary neutral air heating discharge air temperature setpoint. If the reset option is active, this is the lowest heating value based on outdoor air conditions. The discharge air temperature will not change to a lower value than DHL regardless of the outside air temperature.	70°F	50° to 115°F
RCP	**Room (space) Discharge Air Cooling Temperature Setpoint** When a space temperature sensor is installed and the temperature in the space increases above the space cooling setpoint (SSP) through the space cooling prop band (SCP), the RCP value will become the active discharge air setpoint. The value of RCP will only be used by the unit if a space temperature sensor is used.	55°F	50° to 115°F
RHP	**Room Discharge Air Temperature Heating Setpoint** When the temperature in the space decreases below the space heating setpoint (SSP-HSO) through the space heating prop band (SHP), the RHP value will become the active discharge air setpoint. This value will only be used by the unit if a space temperature sensor is installed.	80°F	50° to 115°F

FX06 Commissioning Parameters Level (cont'd)

Menu 03	OA Reset Page		
Display Name	**Control Variable Description**	**Default Value**	**Range**
DCL	**Outside Air Reset Option** The value of the neutral discharge air cooling setpoint when the outside air temperature is at its warmest value to allow maximum cooling. The discharge air temperature will not change to a higher value than DCL regardless of the outside air temperature. The default value disables reset functionality.	80°F	50° - 115°F
DCH	**Standard (Neutral) Cooling Discharge Air Temperature Setpoint (Primary Setpoint)** If the reset option is disabled, the DCH becomes the primary neutral air cooling discharge air temperature setpoint. If the reset option is active, this is the maximum cooling value based on outdoor air conditions. The discharge air temperature will not change to a higher value than DCH regardless of the outside air temperature.	70° F	50° - 115°F
DHL	**Standard (Neutral) Heating Discharge Air Temperature Setpoint (Primary Setpoint)** If the reset option is disabled, the DHL becomes the primary neutral air heating discharge air temperature setpoint. If the reset option is active, this is the lowest heating value based on outdoor air conditions. The discharge air temperature will not change to a lower value than DHL regardless of the outside air temperature.	70° F	50° to 115°F
DHH	**Outdoor Reset Option – Duct Discharge Air Temperature Heating Setpoint** When used in conjunction with DHL, OH2 and OH3, the neutral discharge air heating setpoint will be adjusted based on the outdoor air temperature. If DHH is higher than DHL, the controller will reset the discharge air temperature setpoint from the low value of DHL to the high value of DHH as the outdoor air goes from the high value of OH2 to the low value of OH3. The default value disables this feature.	55°F	50°to115°F
OH2	**Outdoor Reset Dry Bulb Heating – High Setting** The value of the outside air temperature corresponding to the DHL low heating setpoint value.	60ºF	20° to 70ºF
OH3	**Outdoor Reset Dry Bulb Heating – Low Setting** The value of the outside air temperature corresponding to the DHH high heating setpoint value.	20ºF	-40° to 65ºF
OC2	**Outdoor Reset Dry Bulb Cooling – High Setting** The value of the outside air temperature corresponding to the DCL coldest cooling setpoint.	75°F	70° to 130°F
OC3	**Outdoor Reset Dry Bulb Cooling – Low Setting** The value of the outside air temperature corresponding to the DCH warmest cooling setpoint.	60°F	58° to 85°F

Menu 04	Commissioning Parameters		
Display Name	**Control Variable Description**	**Default Value**	**Range**
SCP	**Space Cooling Proportional Band** This value determines when the unit switches between space cooling and neutral air control. When the space temperature rises or falls greater than this amount, the unit switches states. **Example**: SSP + SCP = 75° + 1.8° = 76.8°, space cooling mode. **Example:** SSP - SCP = 75° - 1.8° = 73.2°, neutral air cooling mode.	1.8°F	1° to 8°F
SHP	**Space Heating Proportional Band** This value determines when the unit switches between space heating and neutral air control. When the space temperature rises or falls greater than this amount, the unit switches states. **Example**: (SSP - HSO) + SHP = 70° + 1.8° = 71.8°, neutral air heating mode. **Example:** (SSP - HSO) - SHP = 70° - 1.8° = 68.2°, space heating mode.	1.8°F	1° to 8°F
CPP	**CPP - Cooling Discharge Air Prop Band** The value of CPP is divided in half around the value of DCH (duct discharge cooling setpoint). When the discharge air temperature goes above DCH + 1/2 CPP, a stage of cooling is activated. When the discharge air temperature goes below DCH – 1/2 CPP value, a stage of cooling is deactivated.	10.0°F	2° to 40°F
HPP	**Heating Discharge Air Proportional Band** The value of HPP is divided in half around the value of DHL (duct discharge heating setpoint). When the discharge air temperature goes below DHL + 1/2 HPP, a stage of heating is activated. When the discharge air temperature goes below DHL - 1/2 HPP value, a stage of heating is deactivated.	10°F	4° to 30°F
ICT	**Heating Integration Constant** This adjustable parameter defines the integration time used with proportional-integral (PI) control of discharge air.	0	0 to 999 seconds
HDB	**Space Heating Dead Band** The space heating dead band is a value around the heating setpoint at which nothing will occur -- hence “dead band”. For instance, if the space heating setpoint is 70°F and the Space Heating Dead Band has a value of 2°, then the temperature in the space drops below 70° (SSP - HSP - 1/2 HDB) to 67.2° before the unit will switch to space heating control. Likewise, a value of 72.8° will switch back to neutral air heating control.	0	0 to 4
OC1	**Cooling Mode Lockout – Ambient Dry Bulb** If the outdoor air temperature is less than the value of OC1, cooling mode will be disabled. When the outside air temperature rises above OC1, the unit will be in cooling mode.	68°F	58° to 130°F
OH1	**Heating Mode Lockout - Ambient Dry Bulb** If the outside air temperature is greater than the value of OH1, heating mode is disabled. When the outside air falls below OH1, the unit will be in heating mode.	62°F	52° to 80°
DP1	**Reheat Enabled Setpoint – Ambient Dewpoint** At dewpoints below this value, reheat will not be enabled..	60°F	52° to 80°F
ROL	**Low Ambient Reheat Override – Dry Bulb** If the outdoor air temperature is below this setpoint, the reheat will not be enabled.	65°F	54° to 75°F
ROH	**High Ambient Heat Override – Dry Bulb** If the outdoor air temperature is above this setpoint, the reheat will not be enabled.	120°F	60° to 120°F
LSP	**Low Limit Freeze Protection Setpoint** If the discharge air temperature sensor senses discharge air temperature below the value of LSP for 600 seconds, the blower will be disabled and the outside air damper will close. The control will reset when the discharge air sensor senses discharge air 30° above the value of LSP. If this sequence occurs three times within one hour, the control will go to continuous lockout.	36°F	-40° to +40°F

continued

FX06 Commissioning Parameters Level (cont'd)

Menu 04 (cont'd) Commissioning Parameters (cont'd)

Display Name	Control Variable Description	Default Value	Range
EN1	**1st Stage Enthalpy Cooling Reference Lockout** If the outdoor enthalpy is below this value, cooling mode is not allowed. Above this value, 1st stage cooling is allowed.	29	15 to 40
EN2	**2nd Stage Enthalpy Cooling Lockout** Provides an enthalpy differential to the EN1 setting (add this differential to the EN1 value). If outdoor enthalpy is below this value, the 2nd or 3rd stage cooling control is not allowed	5	0 to 20
EN3	**3rd Stage Enthalpy Cooling Lockout** EN3 provides an enthalpy differential to the EN2 setting (add this differential to the EN2 value). If outdoor enthalpy is below this value, the 3rd stage of cooling is not allowed.	5	0 - 20
NSU	**Night Setup - Cooling** This value is added to the space cooling setpoint (SSP) for unoccupied periods. If the cooling setpoint (SSP) is 75° during the occupied mode, and NSU is 9, then during unoccupied modes, the cooling setpoint will be 84°F (75 + 9).	9	0 - 35
NSB	**Night Set Back – Heating** This value is the amount subtracted from the space heating setpoint in the unoccupied mode. Example: SSP - HSO - NSB ~ 75 - 5 - 9 = 61°F, which is the space heating setpoint in the unoccupied mode.	-9	-35 to 0
RCP	**Room (space) Discharge Air Cooling Temperature Setpoint** When the space temperature sensor is installed and the temperature in the space increases above the space cooling setpoint (SSP) through the space cooling prop band (SCP), the RCP value will become the active discharge air setpoint. The value of RCP will be used by the unit only if a space temperature sensor is used.	55°F	50° to 115°F
RHP	**Room (space) Discharge Air Heating Temperature Setpoint** When the space temperature sensor is installed and the temperature in the space falls below the space heating setpoint (SSP - HSO) by a difference of the space heating prop band (SHP), the RHP value will become the active discharge air setpoint. The value of RHP will only be used by the unit if a space temperature sensor is installed.	80	45 to 120
RSP	**Reheat Setpoint Offset** If the unit is equipped with reheat and conditions are such that reheat is being called for, the neutral air cooling setpoint value will increase by RSP amount. This value should not be used unless the neutral air discharge air temperature setpoint (DCH) is lower than 65°F.	0	0 to 30
UOT	**Temporary Occupied Button Timer** Amount of time the system will remain in occupied mode when the occupancy override button is pressed with the system in an occupied condition.	240	0 to 240
HHR	**Humidity High Range** This allows adjustment of the humidity sensor range. The default is 5 for a 0-5v sensor. Adjusting this value to 10 will allow a 0-10v humidity sensor to be used.	5	0 to 10

Menu 05 Sensor Calibration

(DO NOT change these default values unless advised by the factory.)

Display Name	Control Variable Description	Default Value	Range
RMTO	**Space Temperature Sensor Calibration** Allows a small sensor offset when space wires add significant resistance. Used to offset wire resistance..	-1.1	-20 to 20
DAO	**Discharge Air Temperature Sensor Calibration** Allows a small sensor offset when space wires add significant resistance. Used to offset wire resistance.	-1.1	-20 to 20

Menu 06	Controller Set-up		
Display Name	**Control Variable Description**	**Default Value**	**Range**
UNIT OF MEASURE	Degree F or Degree C	°F	-
N2 ADDRESS	Network Communication Address	255	0 to 255
YEAR	4 digit Year code	-	
MONTH	2 Digit Month code	-	01 to 12
DAY OF MONTH	2 digit day code	-	01 to 31
HOUR	24 hour time code	-	1 to 24
MINUTE	Standard Minute code	-	01 to 60
HTG POLARITY	Setting the Parameter allows the 0-100% analog heating output to be direct acting or reverse acting. The default setting is reverse acting.	REV	REV or DIR
HTGOUTLOWLIMIT	Low limit for the heating output. This value should not be changed.	25	0 to 30
HTGOUTHIGHLIMIT	HIgh limit for the heating output.	70 (gas heat) 100 (electric heat)	60 to 100

There is a 10-day battery backup to maintain the clock time during brief power outages. If the power is off for greater than ten days, the time and date must be reset.

Menu 07	**Schedule** (See paragraph below.)		
Display Name	**Control Variable Description**	**Default Value**	**Range**
--01--	Occupancy Schedule 1	-	00:00 to 24:00
--02--	Occupancy Schedule 2	-	00:00 to 24:00
--03--	Occupancy Schedule 3	-	00:00 to 24:00
--04--	Occupancy Schedule 4	-	00:00 to 24:00
--05--	Occupancy Schedule 5	-	00:00 to 24:00
--06--	Occupancy Schedule 6	-	00:00 to 24:00
--07--	Occupancy Schedule 7	-	00:00 to 24:00
--08--	Occupancy Schedule 8	-	00:00 to 24:00
--09--	Occupancy Schedule 9	-	00:00 to 24:00
--10--	Occupancy Schedule 10	-	00:00 to 24:00
--11-	Occupancy Schedule 11	-	00:00 to 24:00
--12--	Occupancy Schedule 12	-	00:00 to 24:00
--13--	Occupancy Schedule 13	-	00:00 to 24:00
--14--	Occupancy Schedule 14	-	00:00 to 24:00
--15--	Occupancy Schedule 15	-	00:00 to 24:00
--16--	Occupancy Schedule 16	-	00:00 to 24:00
--17--	Occupancy Schedule 17	-	00:00 to 24:00
--18--	Occupancy Schedule 18	-	00:00 to 24:00
--19--	Occupancy Schedule 19	-	00:00 to 24:00
--20--	Occupancy Schedule 20	-	00:00 to 24:00
--21--	Occupancy Schedule 21	-	00:00 to 24:00

Time Schedule

If no schedule is provided, the unit will run in occupied mode. The schedule is a given time start / stop time assigned to any day of a seven day week. (The holiday is not used)

To access the schedule from the controller display, press the “C” key until the display shows “menu” in small letters. Press the up/down arrows until you reach Menu 07 with a scrolling “schedule” message.

Press the “OK” key to select the schedule menu

FX06 Commissioning Parameters Level (cont'd)

Time Schedule (cont'd)

At this point, choose from the 1-21 time schedules. Each time schedule has a single starting and stopping time using standard 24 hour and 60 minute time increments. This time can be individually assigned to any day of a 7-day week plus a holiday.

1. Press the up/down arrows until you reach the time schedule that you want to view/set. Press "OK" to enter that time schedule.
2. Press the up/down arrows to view the settings. The unit scrolls from start time; end time; sun-sat; holiday.
3. At any point, press the "OK" key to select an item to be changed. Use the up/down arrow to change the value. Press "OK" to accept the value. When assigning a time to a day, the display will show the day with or without an asterisk next to it (MON*, TUE, WED*….). Days with an asterisk have been assigned to use the given start stop.

   Upon selecting a value, the screen will show a start time or "FROM" time. Press OK to change that time. Press the up/down arrow to move to the end time or "TO" time. To change the time, press the OK button. The hours will flash as the up/down arrows change the hour settings; press OK to accept the hour setting. The unit will then allow the minutes to be changed. The minutes will flash as they are changed.

Menu 08 — **Events**

Display Name	Control Variable Description	Default Value	Range
Event Summary	Shows all current Alarms		
Event History	Stores alarms that are no longer active		

Alarm Displays

When an alarm is triggered, one of the following codes will flash on the FX06 display window.

AP	Air Proving
FS	Low Limit Freeze Protection Lockout
ST	Discharge Air Temperature Sensor Failure
OT	Outdoor Air Temperature Sensor Failure
EE	FX06 Controller Low Voltage Lockout
Phase Loss Switch (optional) - Nothing Displayed (Lockout)	

AP – Air Proving - When the blower is called to be ON (point BO-1), the blower starts, and the blower status switch must close proving blower operation. If the blowers status does not show blower operation within 180 seconds, the unit shuts down. The unit must be restarted by cycling power to the FX06 controller or opening/closing the "Unit ON/OFF" switch (point BI-3).

During normal operation after initial blower startup, if the blower status input shows open for more than three seconds, the unit will shut down cooling and heating equipment. If the AP input continues to remain open for an additional 180 seconds, the blower is shutdown, and the FX06 controller will be in lockout mode. The controller can be reset by cycling power to the FX06 controller or toggling the BI-3 system on/off switch. If the blower status switch is made before the unit reaches lockout mode, cooling and heating operation will restart.

Troubleshooting - A flashing AP is caused due to an open circuit on Terminals 48 and 46. Check the air proving switch to ensure it is operational (be sure the blower cabinet door is closed). If equipped with an Option BF15 phase loss monitor (in the high voltage box), check the indicator light. The green light indicates the unit is in phase. Red light indicates out of phase. Recycle power to the unit to clear out the alarm.

FS – Low Limit Freeze Protection Lockout - When the blower is called to be ON and the discharge air temperature is below the low limit freeze setpoint (LSP = 36°F) for 600 seconds, the unit is shutdown (blower OFF). The display will flash "FS". When the discharge air rises above the low limit freeze setpoint plus 30°F, the low limit freeze lockout is disabled, allowing the unit to operate. Three (3) consecutive lockouts within one hour will result in a continuous lockout state. The FX06 power must be cycled before operation can continue. Toggling the BI-3 input will **not** reset the unit.

Troubleshooting - A flashing FS indicates the unit has encountered a low discharge air temperature (below 36°F) for over 7 minutes. Investigate the heating system and recycle the power to clear out the alarm. Verify that the gas valve is open and the heating board is operational.

Sensor Failures (flashing "OT" or "ST") - If a temperature sensor value reads (999) or open circuit, the sensor is in a failed condition.
If the discharge air dry bulb sensor fails, the controller will lock out the unit. No mechanical equipment will be allowed to run. The display will flash "**ST**". Installing or replacing the sensor will allow immediate restarting of the equipment.

A failed outdoor air sensor (flashing "**OT"**) will lock out cooling mode and heating operation. However, the blower will continue to operate.

Troubleshooting - A flashing **ST** means the discharge air sensor may not be connected (check for two white wires on terminals 54 and 57). To check the sensor for failure, remove the two wires and check resistance against temperature (See chart on page 23). Make sure that the sensor is properly located in the ductwork.

A flashing **"ot"** means the outdoor air sensor may not be connected or has failed. Check terminals 54 and 56 and sensor operation.

"EE" – Controller Low Voltage Lockout - If the FX06 controller power drops below the minimum level, the display will read EE, and all controller functions will be OFF. The controller will restart when power level returns to normal.

Phase Loss Switch - No Display (Lockout) - (Option BF14 or BF15 is required.) - If the phase monitor detects a poor power condition, the phase loss switch will cut power to the control circuit. The phase loss switch will automatically reset when the poor power condition is no longer detected.

Test Mode Keys

To force the unit into a test mode, at the home page, press both the up and down arrows for 2 seconds. The display will scroll "unit test." If no other action is taken the unit will cycle through the outputs in one minute intervals.

1. Blower ON
2. Blower plus 1st stage Heating ON (display HTGSTG 1)
3. Blower plus ALL Heating ON (display HTGSTG 2)
4. Blower plus reheat pump ON (display Reheat Compressor)
5. Blower plus 1st stage compressor ON (display CLGSTG 1)
6. Blower plus 2nd stage compressor ON (display CLGSTG 2)

Using the following keys will change

1. Press the "Up" for 1 second to Extend Test Mode (15 minutes).
2. Press the "Down" key for 1 second to cancel the test mode.
3. Press the "OK" key for 1 second to manual Jump test mode.
4. Pressing the "C" will take you out of the menu but the unit will remain in test mode.

Sensor Data and Application

Optional Space (Wall-Mounted) Sensors

Communication Space Temperature Sensor - The wall mounted sensor should be located on an interior wall (avoid direct placement in the sun) with the wall opening insulated to prevent cold drafts. Locate the sensor where it will sample representative space air.

FIGURE 7 - Optional Wall-Mount Space Air Sensor, Option CL67, P/N 222052

The optional space sensor with set-point adjust uses communication to transfer the data back to the unit controller. The sensor requires 24VAC power and two wire communication. See the unit wiring diagram for wiring details.

The unit displays the current space temperature. When the dial is turned, the space cooling setpoint (SSP) will be displayed. The user can turn the dial to adjust the space cooling setpoint. The space heating setpoint is a given differential below the cooling setpoint. See variable HSO for details.

Room RH Input with Reheat Mode - Since reheat is already enabled based on outdoor dewpoint, a room RH control is typically not required for units that condition 100% outside air. A wall mounted RH control (**FIGURE 8**) is typically specified when internal latent loads vary considerably, the rooftop is applied with return air, or an unoccupied space RH control is desired. When applied with an RH input, reheat is enabled if space RH is above setpoint and the space cooling load is satisfied. During unoccupied mode, a rise in room RH will enable the dehumidification and reheat circuit. If there is no call for space cooling, only the reheat pump is enabled (cooling compressors are locked out).

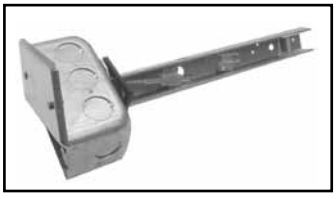
FIGURE 8 - Wall-Mounted Dehumidistat, Option CL47, P/N 177231

Discharge/Duct Sensor

All systems have a discharge air sensor. The discharge sensor element on cooling only or cooling with reheat systems (Models RCA/RDA) is attached to the discharge opening of the system. On systems with a heat section (Models RDCA/RDDA/RECA/REDA) or Models RCA and RDA with Option DU1, the sensor is temporarily installed for heater startup but must be relocated to the ductwork .

When installed in the ductwork the sensor must be housed in a mixing tube which is attached to a 2x4 electrical box. The assembled parts (See **FIGURE 9A**) are shipped in the control compartment. Read the instructions below and follow carefully to relocate the discharge air temperature sensor.

FIGURE 9A - Discharge Air Sensor, P/N 206112, and Holder, P/N 115850, for Ductwork Installation

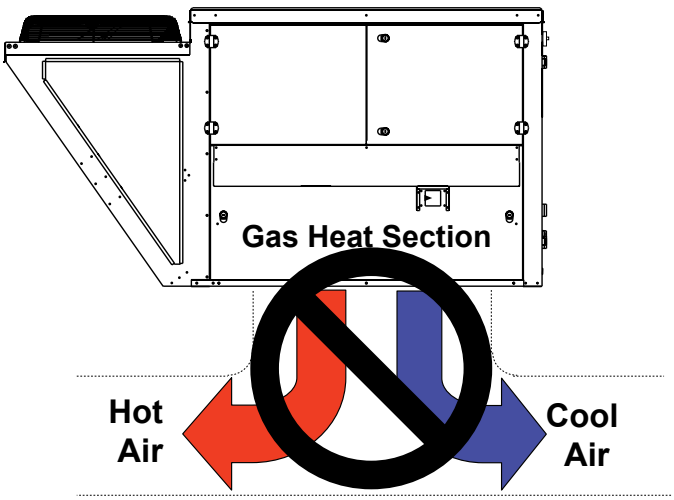


Discharge Air Temperature Sensor Location - Apply to all Models RDCA/RDDA/RECA/REDA and Models RCA/RDA with Option DU1

Placement of the discharge air sensor in the ductwork is critical to the correct operation of a MAPS II system in both the cooling and heating modes.

Due to the split burner and dual heat exchanger features of the gas heat section, duct configuration and sensor location are extremely important in the heating mode with a gas heat section. The gas heat section of the MAPS II unit is designed to conserve fuel by only firing a portion of the burner or one of the dual heat exchangers as required to supply the demand for heat. Improperly locating the sensor can result in poor control of discharge temperature.

FIGURE 9B - On units with a gas heat section, avoid an immediate "T" in the discharge duct



If the unit is installed in a system with immediate "T" configuration leaving the discharge, the 1/3 – 2/3 burner design may allow stratification of the air. The result is hot air only moving down one segment of the duct while cool air moves down the other segment. Avoid this application. If this application is not avoidable, provide air mixing devices or the necessary duct length before the "T" for mixing of the discharge air.

Sensor Data for Johnson A99 Series Temperature Sensors - Resistance vs Temperature (applies to both discharge and outside air sensor)

°F	°C	Ohms
-40	-40	613
-31	-35	640
-22	-30	668
-13	-25	697
-4	-20	727
5	-15	758
14	-10	789
23	-5	822
32	-0	855
41	5	889
50	10	924
59	15	960
68	20	997
77	25	1035
86	30	1074
95	35	1113
104	40	1153
113	45	1195
122	50	1237
131	50	1279
140	60	1323
149	65	1368
158	70	1413
167	75	1459
176	80	1506
185	85	1554
194	90	1602
203	95	1652
212	100	1702
221	105	1753
230	110	1804
239	115	1856
248	120	1908

Instructions for Installing Sensor in Discharge Duct

1. Determine the appropriate distance from the unit. Be sure there is sufficient distance from the outlet to have a good mixture of discharge air temperature. According to the latest edition of AMCA Standard 201, in straight ducts, the air is typically well mixed a minimum of five equivalent duct diameters from the discharge of the unit with equivalent duct diameter defined as equal to the square root of 4AB/3.14. "A" and "B" are the duct cross-sectional dimensions.
   Example: Supply ductwork cross-sectional dimension is 24" x 12" (610mm x 305mm).

$$5 \times \sqrt{\frac{4 \times 12 \times 24}{3.14}} = 96" \qquad 5 \times \sqrt{\frac{4 \times 305 \times 610}{3.14}} = 2435mm$$

   Locate the sensor a minimum of 96" (2435mm) from the outlet of the unit.
   Important NOTES: If the length of the discharge duct is less than 12 ft (3.7M), a mixing vane is recommended for mixing the discharge air.
   Do not mount the sensor in the ductwork after a split in the supply as that will cause loss of control in the duct that does not house the sensor.
2. **Determine the location and orientation of the sensor holder assembly.** The position of the sensor holder in the duct is also important.
   In horizontal ductwork, locate the sensor assembly in the top, middle of the duct with the sensor holder extending vertically down into the center of the airstream.
   In vertical ductwork, locate the sensor assembly in the middle of the side of the duct that corresponds with the top middle of the discharge outlet. The sensor holder will extend horizontally into the center of the airstream.
   Push the sensing element into the clip attached to the inside of the sensor holder. Turn the metal holder so that the element will be shielded from

Sensor Data and Application (cont'd)

Maximum Sensor Wire Length for less than 1°F Error

Wire Gauge	Maximum Sensor Wire Length	
AWG	Feet	Meters
14	800	244
16	500	152
18	310	94
20	200	61
22	124	38

NOTE: Wire supplied with the sensor is 22 AWG.

direct airflow and will sense the temperature in the airstream as it flows through the holes in the sensor holder.

At the location selected, mark the diamond-shaped hole required for the sensor holder. Cut the hole no larger than required for the holder, approximately 1" x 1" (25mm x 25mm).

In the electrical box portion of the sensor holder, determine where the sensor wire should come through the box and remove the knockout at that location.

3. **Attach the sensor holder assembly.** Slide the sensor holder into the opening in the ductwork. Using four field-provided No. 6 sheetmetal screws, attach the box to the ductwork. Attach a field-supplied cable connector to the box, run the sensor wire out, and attach the cover to the box.
4. **Run the sensor wire to the unit.** Digital control inputs are low-current, resistance-based signals. The manufacturer recommends for optimum temperature control performance that the analog and digital inputs (zone sensors, discharge air sensors, etc.) that are connected to the FX06 controller be routed to the unit in one of the following manners:
   - In separate field-supplied conduits, isolated from 24VAC controls and line voltage power to the unit,

   OR
   - If the FX06 wires are to be run in the same field-supplied conduit as the 24 VAC control wiring, the FX06 wiring must be completed using shielded cable and bundled separately from 24 VAC control wiring. The shield must be drained at the unit and taped on the opposite end.

Outside Air Sensors

FIGURE 10A - Outside Air Dry Bulb Sensor, P/N 206112

FIGURE 10B - Outside Air Relative Humidity Transmitter, Option DT5, P/N 206081

Outside Air Dry Bulb Sensor and Dewpoint or Enthalpy Permissive Control

The outside air sensor (**P/N 206112**) for the FX06 is the same as the discharge sensor. The Johnson A99 Series Temperature Sensor Chart on page 23 applies to both the discharge and outside air sensors.

If the application uses mixed air (return and outside air), the outside air temperature sensor and optional humidity transmitter (**FIGURE 10B**) must be mounted together to sense outdoor air conditions. Verify that factory mounted positions provide acceptable performance.

Sensor Accuracy and Outside Air Changeover Differential

Dry bulb sensor accuracy is within 1°F between 5° and 167°F. Outside air dewpoint is calculated based on a humidity transmitter **(FIGURE 10B)** input. Accuracy is rated as follows:

Humidity transmitter ± 3% RH for 20 to 80% RH at 77°F and ±5% RH for 10 to 20% and 80 to 90% RH at 77°F. The dewpoint calculation is within 1% error at sea level. Hysteresis and the rate of moisture change also have an impact on sensor accuracy. Prolonged periods of high humidity (above 95% RH) can affect sensor accuracy (the bias is towards a higher RH reading than actual). *The calculated outdoor dewpoint should be verified on an annual basis to ensure proper changeover operation.*

Wall-Mounted Sensor and Communication Wire Installation

Before connecting or disconnecting any wires, ensure that all power supplies have been switched off and all wires are potential-free to prevent equipment damage and avoid electric shock.

IMPORTANT: The FX06 control wiring control inputs are low-current, resistance-based signals. The control manufacturer recommends for optimum temperature control performance that the analog and digital inputs (space sensor,

discharge air sensors, etc.) that are connected to the FX06 controller be routed to the unit in one of the following manners:

• In separate conduits, isolated from 24VAC controls and line voltage power to the unit.

OR

• If the FX06 wires are to be run in the same conduit as the 24VAC control wiring, the FX06 wiring must be completed using shielded cable and bundled separately from 24VAC control wiring. The shield must be drained at the unit and taped on the opposite end.

Control Wiring

Wiring terminations in space sensor, Option CL67 (**FIGURE 7**), are made at the terminal blocks in the base of the module. Those terminal blocks will accept up to 1.5 mm^2 (AWG 16) wires. To access the terminals, remove the cover from the base of the module by inserting a pointed tool into the small hole at the center top of the cover. While pressing down gently, pry the cover away from the base. As the two parts separate, remove the tool and continue to pull the cover away from the base until the cover is free.

All wiring to the module is at extra low (safe) voltage and must be separated from line voltage wiring. All field-installed DC sensor wiring must be in shielded cable. Do not run wiring close to transformers or high frequency generating equipment such as a lighting ballast.

Complete and verify all wiring connections before applying power to the controller connected to the module. Under the lateral cover on the space sensor, service connector pins provide for serial connection if the optional serial card (N2Open or LON) is inserted in the FX06 controller and properly connected to the room command module pins 10, 11, and 12.

Physical Point List

When the FX06 controller is “on” and operational, the FX06 controller will operate the Reznor MAPS air handling equipment based upon the following physical points list and D12A control sequence.

Controller Physical Points List						
Point Description	**AI**	**AO**	**BI**	**BO**	**Elec Component**	**Comment**
Occupied Override Switch (BI-1)			√		CL67 Push button	The wall-mounted temperature sensor with override push button.
Relative Humidity Switch (BI-2)			√		CL 47 Humidistat	
On/Off Switch (BI-3)			√		External dry contact	Factory jumper wire installed
Occupied Switch (BI-4)			√		External dry contact	
Air Proving (BI-5)			√		Differential Pressure Switch	
Outdoor Air Humidity (AI-2)	√				Humidity Sensor	0-5V = 0-100% RH
Outdoor Air Temperature (AI-3)	√				A99 Thermistor	Resistance = –40 to 100°C
Discharge Air Temperature (AI-4)	√				A99 Thermistor	
Modulating Gas Valve (AO-1)		√			Gas Valve / SCR Power Controller	0-10V = 100-0% open converted at valve to 3V- 7V ~ 100%-50% open
Fan Start/Stop (Damper) (BO-1)				√	Relay	OA Damper Interlock to Fan
1st Stage Heating (On/Off) (BO-2)				√	Relay	Triac outputs to mechanical relays
2nd Stage Heating (On/Off) (BO-3)				√	Relay	
Reheat (BO-4)				√	Contactor	
1st Stage Cooling (BO-5)				√	Contactor	
2nd Stage Cooling (BO-6)				√	Contactor	
NOTE: AI = Analog Input, AO = Analog Output, BI = Binary Input, BO = Binary Output.						

BAS Card Options

Note: Option CL47 (**FIGURE 8**, page 20) room dehumidistat is a mechanical control. Room Rh is not available as a BAS point. For return air applications (with return air dampers), there is no BAS output to override motorized damper operation during unoccupied mode.

Lon Card, Option BHB3

The LON Serial Card is a plug-in card that allows the FX06 control to be connected to a LON network. The connection to the network is made by means of the 3 pins on the plug-in connector. **P/N for Option BHB3 with software is 223121.**

The network cable must be laid along a low voltage cable path. It must be placed at least 12” (30 cm) from cables carrying high voltages or currents (>230V or >30A). If strong interference fields are expected, the cable must be located at the greatest distance possible from the source. The TP/FT-10 network is designed to support free topology wiring, and will accommodate bus, star, loop or any combination of these topologies. FTT-10A transceivers can be located at any point along the network wiring.

LON network: Doubly-Terminated Bus Topology; Free topology (single terminator required).

Cable Type	Length with FFT-10 devices	
	Bus topology	Free topology
Belden 85102	8858 ft (2700m)	1640 ft (500m)
Belden 8471	8858 ft (2700m)	1640 ft (500m)
Level IV 22 AWG	4593 ft (1400m)	1312 ft (400m)

Power link topology supported.

Pin	Twisted pair
1	NET A
2	NET B
3	COM

Nodes: 64 (if repeaters are not used), FTT-10 nodes only.

Lon Network Points List

Network Variables:

Name	Direction	SNVT Type	Unit of measure	COV apply to NVO	RCVHRTBT apply to NVI	Index	SISD
nviRequest	Input	92 - obj_request			False	0	@0|1
nvoStatus	Output	93 - obj_status		False		1	@0|2
nvoFileDirectory	Output	114 - address	#	False		2	@0|8
nviUnitEnable	Input	95 - switch			False	3	@1|1
nvoTempOccupiedStatus	Output	22 - lev_disc		False		4	@1|2
nvoSpaceTemp	Output	105 - temp_p	°F	False		5	@1|3
nvoDewPoint	Output	105 - temp_p	°F	False		6	@1|4
nvoEnthalpy	Output	51 - count_f	#	False		7	@1|5
nvoClgTimerStatus	Output	22 - lev_disc		False		8	@1|6
nvoRH_Status	Output	22 - lev_disc		False		9	@1|7
nvoTimeclockStatus	Output	22 - lev_disc		False		10	@1|8
nvoOA_Humidity	Output	81 - lev_percent	%	False		11	@1|9
nvoOA_Temperature	Output	105 - temp_p	°F	False		12	@1|10
nvoDA_Temperature	Output	105 - temp_p	°F	False		13	@1|11
nviUnitShutdown	Input	22 - lev_disc			False	14	@1|12
nvoWHSP	Output	105 - temp_p	°F	False		15	@1|13
nvoWCSP	Output	105 - temp_p	°F	False		16	@1|14
nvoRm_Clg_SP	Output	105 - temp_p	°F	False		17	@1|15
nvoRm_Htg_SP	Output	105 - temp_p	°F	False		18	@1|16
nvoRoomHumiditySwitch	Output	22 - lev_disc		False		19	@1|17
nvoOn_OffInputSwitch	Output	22 - lev_disc		False		20	@1|18
nvoOcc_UnoccSwitch	Output	22 - lev_disc		False		21	@1|19
nvoAirProvingSwitch	Output	22 - lev_disc		False		22	@1|20
nvoFan_DamperStatus	Output	22 - lev_disc		False		23	@1|21
nvoHtgStg1Status	Output	22 - lev_disc		False		24	@1|22
nvoHtgStg2Status	Output	22 - lev_disc		False		25	@1|23
nvoClgStg1Status	Output	22 - lev_disc		False		26	@1|24
nvoClgStg2Status	Output	22 - lev_disc		False		27	@1|25
nvoSpaceClgSetpt	Output	105 - temp_p	°F	False		28	@1|26
nviUnitOccupied	Input	95 - switch			False	29	@1|27
nvoHtgOutput	Output	81 - lev_percent	%	False		30	@1|28
nviHtgOffsetSetpt	Input	51 - count_f	#		False	31	@1|29
nviDaClgSetpt	Input	105 - temp_p	°F		False	32	@1|30
nviDaHtgSetpt	Input	105 - temp_p	°F		False	33	@1|31
nviReHtDpSetpt	Input	105 - temp_p	°F		False	34	@1|32

Configuration Parameters:

Name	Default value	SNVT Type	Unit of measure	Index	SISD
cpSendHeartBeat	30	107 - time_sec	s	0	0,,0\x80,49,2,1
cpSpaceTmpOffset	-0.6	147 - temp_diff_p	°F [dif]	1	1,1,6\x80,1,2,1
cpDATmpOffset	-0.6	147 - temp_diff_p	°F [dif]	2	1,1,6\x80,2,2,1
cpOccOvrdTimeMn	240	123 - time_min	min	3	1,1,6\x80,3,2,1
cpHSPOffset	2.8	147 - temp_diff_p	°F [dif]	4	1,1,6\x80,4,2,1
cpDaHtgDb	0	147 - temp_diff_p	°F [dif]	5	1,1,6\x80,5,2,1
cpNightSetup	5	147 - temp_diff_p	°F [dif]	6	1,1,6\x80,6,2,1
cpNightSetback	-5	147 - temp_diff_p	°F [dif]	7	1,1,6\x80,7,2,1
cpZoneClgPb	1	147 - temp_diff_p	°F [dif]	8	1,1,6\x80,8,2,1
cpZoneHtgPb	1	147 - temp_diff_p	°F [dif]	9	1,1,6\x80,9,2,1
cpOaHtgLow	-6.67	105 - temp_p	°F	10	1,1,6\x80,10,2,1
cpOaHtgHigh	15.56	105 - temp_p	°F	11	1,1,6\x80,11,2,1
cpOaClgLow	15.56	105 - temp_p	°F	12	1,1,6\x80,12,2,1
cpOaClgHigh	23.9	105 - temp_p	°F	13	1,1,6\x80,13,2,1
cpRmDaClgSp	12.8	105 - temp_p	°F	14	1,1,6\x80,14,2,1
cpDAClgHigh	21.1	105 - temp_p	°F	15	1,1,6\x80,15,2,1
cpDaClgLow	26.67	105 - temp_p	°F	16	1,1,6\x80,16,2,1
cpDaHtgLow	21.1	105 - temp_p	°F	17	1,1,6\x80,17,2,1
cpDaHtgHigh	12.8	105 - temp_p	°F	18	1,1,6\x80,18,2,1
cpCalcBtu	7.68	51 - count_f	#	19	1,1,6\x80,19,4,1
cpClgOaSetpt	20	105 - temp_p	°F	20	1,1,6\x80,20,2,1
cpReheatDpSetpt	15.56	105 - temp_p	°F	21	1,1,6\x80,21,2,1
cpHtgOaSetpt	16.67	105 - temp_p	°F	22	1,1,6\x80,22,2,1
cpReheatSetptLoLow	18.33	105 - temp_p	°F	23	1,1,6\x80,23,2,1
cpReheatSetptHiLow	48.9	105 - temp_p	°F	24	1,1,6\x80,24,2,1
cpEnthalpySp	29	51 - count_f	#	25	1,1,6\x80,25,4,1
cpEnthalpy2Diff	5	51 - count_f	#	26	1,1,6\x80,26,4,1
cpEnthalpy3Diff	5	51 - count_f	#	27	1,1,6\x80,27,4,1
cpRhtSpOffset	0	147 - temp_diff_p	°F [dif]	28	1,1,6\x80,28,2,1
cpLowLimSetpt	2.2	105 - temp_p	°F	29	1,1,6\x80,29,2,1
cpDaPropBand	5.56	147 - temp_diff_p	°F [dif]	30	1,1,6\x80,30,2,1
cpDaDeadBand	0	147 - temp_diff_p	°F [dif]	31	1,1,6\x80,31,2,1
cpDaIntTime	0	107 - time_sec	s	32	1,1,6\x80,32,2,1
cpDaLowSatTime	60	107 - time_sec	s	33	1,1,6\x80,33,2,1
cpDaHighLimit	70	81 - lev_percent	%	34	1,1,6\x80,34,2,1
cpDaLowLimit	25	81 - lev_percent	%	35	1,1,6\x80,35,2,1
cpDaClgPropBand	5.56	147 - temp_diff_p	°F [dif]	36	1,1,6\x80,36,2,1
cpClgLowLimSp	9.44	105 - temp_p	°F	37	1,1,6\x80,37,2,1
cpClgBoost	-1.67	147 - temp_diff_p	°F [dif]	38	1,1,6\x80,38,2,1
cpHtgBoost	2.2	147 - temp_diff_p	°F [dif]	39	1,1,6\x80,39,2,1
cpRmDaHtgSp	26.67	105 - temp_p	°F	40	1,1,6\x80,40,2,1
cpWrmupTmMin	15	123 - time_min	min	41	1,1,6\x80,41,2,1
cpUncRhtEna	1, LOG_ON	10149 - UNVT_logic		42	1,1,6\x80,42,1,1
cpAlarmReset	0, LOG_OFF	10149 - UNVT_logic		43	1,1,6\x80,43,1,1
cpnciOnOffSched	-	40060 - UNVT_OnOffSched		44	1,1,6\x80,44,126,1
cpNoModHeat	0, LOG_OFF	10149 - UNVT_logic		45	1,1,6\x80,45,1,1
cpSpaceSetptHighLimit	25.56	105 - temp_p	°F	46	1,1,6\x80,46,2,1
cpSpaceSetptLowLimit	22.2	105 - temp_p	°F	47	1,1,6\x80,47,2,1
cpHeatPolarity	1, Reverse	5019 - Polarity_t		48	1,1,6\x80,48,1,1
cpHum_Hi_Range	5	51 - count_f	#	49	1,1,6\x80,49,4,1

N2 Open Card, Option BHB2

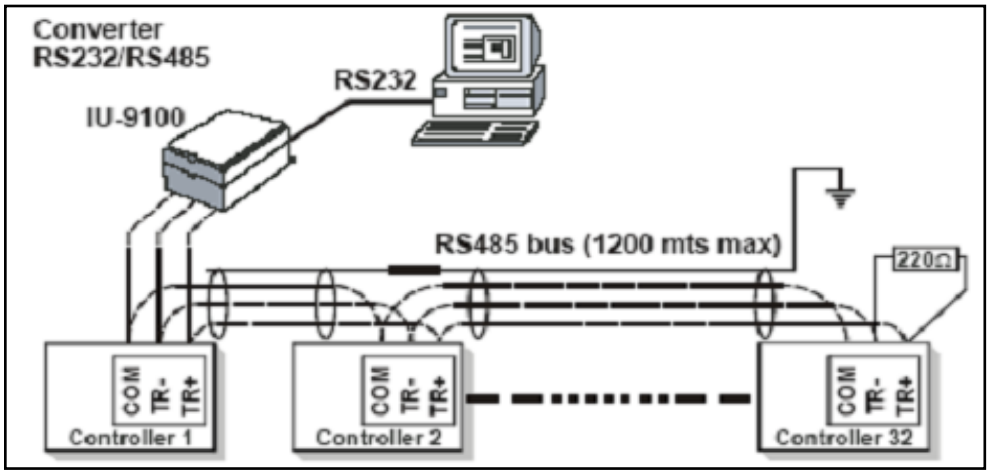
Pin	RS485
1	COM
2	RT-
3	RT+

The N2Open serial card is a plug-in, optional card that allows the controllers of the FX06 line to be connected in a N2Open serial network through the RS485 standard. The connection to the network is made by means of the 3 pins on the plug-in connector. **The P/N for N2 Open Card for FX06 Control, Option BHB2, is 206077.**

The network cable must be laid along a low voltage cable path. It must be placed at least at 12” (30 cm) from cables carrying high voltages or currents (>230V or >30A). If strong interference fields are expected, the cable must be located at the greatest distance possible from the source. The communication line must be laid out on the multi-drop line principle, i.e. from one controller to the next until the last controller has been connected. The line must be terminated at both ends with a 220 Ohm resistor between RT+ and RT-.

N2 Open Card, Option BHB2

RS485 line: maximum length without repeater: 3937 ft (1200 M), AWG26 twisted pair with shield.
RS232C line: maximum length: 33 ft (10 m)
Devices: maximum of 32 per 3937 ft (1200 m) bus segment



N2 Network Points List

N2Open View

Point Type	Point Address	Direction	Long name	Short name	Default value	Unit of measure
ADF	1	Output	SpaceTemp	OSPCTSpa	-	°F
ADF	2	Output	DewPoint	ODWPDewP	-	°F
ADF	3	Output	Enthalpy	ONTHEnth	-	#
ADF	4	Output	OA_Humidity	O_HMDOA_	-	%
ADF	5	Output	OA_Temperature	O_TMPRTR	-	°F
ADF	6	Output	DA_Temperature	OD_TMPRT	-	°F
ADF	7	Output	WHSP	OWHSP	-	°F
ADF	8	Output	WCSP	OWCSP	-	°F
ADF	9	Output	Rm_Clg_SP	ORM_CLG_	-	°F
ADF	10	Output	Rm_Htg_SP	ORM_HTG_	-	°F
ADF	11	Output	SpaceClgSetpt	OSPCCLGS	-	°F
ADF	12	Output	HtgOutput	OHTGTPHt	-	%
ADF	13	Input	nviSpcSetptLL	ISPCSTPT	-	°F
ADF	14	Input	nviSpcSetptHL	ISADF_13	-	°F
ADF	15	Input	nviHtgOffset	IHTGFFST	-	#
ADF	16	Input	nviDAHtgSetpt	IDHTGSTP	-	°F
ADF	17	Input	nviDAClgSetpt	IDCLGSTP	-	°F
ADF	18	Input	FloatZero	PFLTZFlo	0.000000	#
ADF	19	Input	FloatOneHundred	PFLTNHND	100.000000	#
ADF	20	Input	SpaceTmpOffset	PSPCTMPF	0.0	°F [dif]
ADF	21	Input	DATmpOffset	PDTMPFFS	-1.1	°F [dif]
ADF	22	Input	HSPOffset	PHSPFFST	5.0	°F [dif]
ADF	23	Input	DaHtgDb	PDaHtgDb	0.0	°F [dif]
ADF	24	Input	NightSetup	PNGHTSTP	9.0	°F [dif]
ADF	25	Input	NightSetback	PNGHTSTB	-9.0	°F [dif]
ADF	26	Input	ZoneClgPb	PZNCLGPB	1.8	°F [dif]
ADF	27	Input	ZoneHtgPb	PZNHTGPB	1.8	°F [dif]
ADF	28	Input	OaHtgLow	POaHtgLo	20.0	°F
ADF	29	Input	OaHtgHigh	PHTGHOaH	60.0	°F
ADF	30	Input	OaClgLow	POaClgLo	60.0	°F
ADF	31	Input	OaClgHigh	PCLGHOaC	75.0	°F
ADF	32	Input	RmDaClgSp	PRMDCLGS	55.0	°F
ADF	33	Input	DAClgHigh	PDCLGHGH	70.0	°F
ADF	34	Input	DaClgLow	PDCLGLDa	80.0	°F
ADF	35	Input	DaHtgLow	PDHTGLDa	70.0	°F
ADF	36	Input	DaHtgHigh	PDHTGHGH	55.0	°F
ADF	37	Input	CalcBtu	PCalcBtu	7.680000	#

Points List Notes:

*When applied with N2open systems, the BD points are multistage and mapped as an Msi point.

Room Discharge air heating setpoint = Supply air temperature to offset heating losses in the space

Room Discharge Air Cooling Setpoint = Supply air temperature to offset heat gains in the space

Duct Discharge Air Cooling Setpoint = Supply air value when there is no call for cooling from the space (typically equals the space temperature)

Duct Discharge Air Heating Setpoint = Supply air value when there is no call for heat from the space (typically equals the space temperature)

ADF	38	Input	ClgOaSetpt	PCLGSTPT	68.0	°F
ADF	39	Input	ReheatDpSetpt	PRHTDPST	60.0	°F
ADF	40	Input	HtgOaSetpt	PHTGSTPT	62.0	°F
ADF	41	Input	ReheatSetptLoLow	PRHTSTPT	65.0	°F
ADF	42	Input	ReheatSetptHiLow	PRADF_41	120.0	°F
ADF	43	Input	EnthalpySp	PNTHLPYS	29.000000	#
ADF	44	Input	Enthalpy2Diff	PNTHLPY2	5.000000	#
ADF	45	Input	Enthalpy3Diff	PNTHLPY3	5.000000	#
ADF	46	Input	RhtSpOffset	PRHTSPFF	0.0	°F [dif]
ADF	47	Input	nciFloat15	PFloat15	0.0	°F [dif]
ADF	48	Input	LowLimSetpt	PLWLMSTP	36.0	°F
ADF	49	Input	DaPropBand	PDPRPBND	10.0	°F [dif]
ADF	50	Input	DaDeadBand	PDDDBDaD	0.0	°F [dif]
ADF	51	Input	DaIntTime	PDNTTDaI	0.0	s
ADF	52	Input	DaLowSatTime	PDLWSTTM	60.0	s
ADF	53	Input	DaHighLimit	PDHGHLMT	70.00	%
ADF	54	Input	DaLowLimit	PDLWLMDa	25.00	%
ADF	55	Input	DaClgPropBand	PDCLGPRP	10.0	°F [dif]
ADF	56	Input	ClgLowLimSp	PCLGLWLM	49.0	°F
ADF	57	Input	ClgBoost	PCLGBClg	-3.0	°F [dif]
ADF	58	Input	HtgBoost	PHTGBHtg	4.0	°F [dif]
ADF	59	Input	RmDaHtgSp	PRMDHTGS	80.0	°F
ADF	60	Input	nciFloat14	PFloat14	5.000000	#
ADF	61	Input	SpaceSetptHighLimit	PSPCSTPT	78.0	°F
ADF	62	Input	SpaceSetptLowLimit	PSADF_61	72.0	°F
ADF	63	Input	Hum_Hi_Range	PHM_H_RN	5.000000	#
ADI	1	Input	OccOvrdTimeMn	PCCVRDTM	240	min
ADI	2	Input	WrmupTmMin	PWRMPTMM	15	min
BD	1	Input	UnitEnable.State	INTNBL.S	-	
BD	2	Output	TempOccupiedStatus	OTMPCCPD	-	
BD	3	Output	ClgTimerStatus	OCLGTMRS	-	
BD	4	Output	RH_Status	ORH_STTS	-	
BD	5	Output	TimeclockStatus	OTMCLCKS	-	
BD	6	Input	UnitShutdown	INTSHTDW	-	
BD	7	Output	State	OState	-	
BD	8	Output	RoomState	ORMSTRoo	-	
BD	9	Output	Occupied	OCCOccup	-	
BD	10	Output	RoomHumiditySwitch	ORMHMDTY	-	
BD	11	Output	On_OffInputSwitch	ON_FFNPT	-	
BD	12	Output	Occ_UnoccSwitch	OCC_NCCS	-	
BD	13	Output	AirProvingSwitch	ORPRVNGS	-	
BD	14	Output	Fan_DamperStatus	OFN_DMPR	-	
BD	15	Output	HtgStg1Status	OHTGSTG1	-	
BD	16	Output	HtgStg2Status	OHTGSTG2	-	
BD	17	Output	ClgStg1Status	OCLGSTG1	-	
BD	18	Output	ClgStg2Status	OCLGSTG2	-	
BD	19	Input	UnitOccupied.State	INTCCPD.	-	
BD	20	Output	RemoteOnOffStat	ORMTNFFS	-	
BD	21	Input	TestStart	PTSTSTRT	0, LOG_OFF	
BD	22	Input	TestKill	PTSTKTes	0, LOG_OFF	
BD	23	Input	TestExtend	PTSTXTND	0, LOG_OFF	
BD	24	Input	ManualJump	PMNLJMan	0, LOG_OFF	
BD	25	Input	UncRhtEna	PNCRHTNU	1, LOG_ON	
BD	26	Input	AlarmReset	PLRMRSAl	0, LOG_OFF	
BD	27	Input	NoModHeat	PNMDHNoM	0, LOG_OFF	
BD	28	Input	HeatPolarity	PHTPLRTY	1, Reverse	

WORKSHEET for FX06 Commissioning Parameters Level

Display Name	Control Variable Description	Default Value	Field Value
Menu 02 - Setpoint Page			
SSPHI	The maximum value that the space setpoint dial can be set	78°F	
SSPLO	The minimum value that the space setpoint dial can be set	72°F	
SSP	**Space Cooling Temperature Setpoint (status only)**	Status Only	
HSO	**Space Heating Setpoint Offset**	5°F	
DP1	**Reheat Enabled Setpoint – Ambient Dewpoint**	60°F	
DCH	**Standard Cooling (Neutral) Discharge Air Temperature Setpoint (Primary Setpoint)**	70° F	
DHL	**Standard (Neutral) Heating Discharge Air Temperature Setpoint (Primary Setpoint)**	70°F	
RCP	**Room (space) Discharge Air Cooling Temperature Setpoint**	55°F	
RHP	**Room Discharge Air Temperature Heating Setpoint**	80°F	
Menu 03 - OA Reset Page			
DCL	**Outside Air Reset Option**	80°F	
DCH	**Standard (Neutral) Cooling Discharge Air Temperature Setpoint (Primary Setpoint)**	70° F	
DHL	**Standard (Neutral) Heating Discharge Air Temperature Setpoint (Primary Setpoint)**.	70° F	
DHH	**Outdoor Reset Option – Duct Discharge Air Temperature Heating Setpoint**.	55°F	
OH2	**Outdoor Reset Dry Bulb Heating – High Setting**	60ºF	
OH3	**Outdoor Reset Dry Bulb Heating – Low Setting**.	20ºF	
OC2	**Outdoor Reset Dry Bulb Cooling – High Setting**	75°F	
OC3	**Outdoor Reset Dry Bulb Cooling – Low Setting**	60°F	
Menu 04 - Commissioning Page			
SCP	**Space Cooling Proportional Band**	1.8°F	
SHP	**Space Heating Proportional Band** .	1.8°F	
CPP	**Cooling Discharge Air Prop Band**	10°F	
HPP	**Heating Discharge Air Proportional Band**.	10°F	
ICT	**Heating Integration Constant**	0	
HDB	**Space Heating Dead Band**	0°F	
OC1	**Cooling Mode Lockout – Ambient Dry Bulb**	68°F	
OH1	**Heating Mode Lockout - Ambient Dry Bulb**	62°F	
DP1	**Reheat Enabled Setpoint – Ambient Dewpoint**	60°F	

Display Name	Control Variable Description	Default Value	Field Value
Menu 04 - Commissioning Page (cont'd)			
ROL	**Low Ambient Reheat Override – Dry Bulb**	65°F	
ROH	**High Ambient Heat Override – Dry Bulb**	120°F	
LSP	**Low Limit Freeze Protection Setpoint**	36°F	
EN1	**1st Stage Enthalpy Cooling Reference Lockout**.	29	
EN2	**2nd Stage Enthalpy Cooling Lockout**	5	
EN3	**3rd Stage Enthalpy Cooling Lockout**	5	
NSU	**Night Setup - Cooling**	9°	
NSB	**Night Set Back – Heating**	-9	
RCP	**Room (space) Discharge Air Cooling Temperature Setpoint**	55°F	
RHP	**Room (space) Discharge Air Heating Temperature Setpoint**	80°F	
RSP	**Reheat Setpoint Offset**.	0°F	
UOT	**Temporary Occupied Button Timer**	240	
HHR	**Humidity High Range**	5	

Menu 05 - Calibration Page (DO NOT change these default values unless advised by the factory.)			
Display Name	**Control Variable Description**	**Default Value**	**Field Value**
RMTO	**Space Temperature Sensor Calibration**.	-1.1	
DAO	**Discharge Air Temperature Sensor Calibration**	-1.1	

Menu 06 - Set-up Parameters Page			
Display Name	**Control Variable Description**	**Default Value**	**Field Value**
UNIT OF MEASURE	Degree F or Degree C	°F	
N2 ADDRESS	Network Communication Address	255	
YEAR	4 digit Year code		
MONTH	2 Digit Month code	-	
DAY OF MONTH	2 digit day code	-	
HOUR	24 hour time code	-	
MINUTE	Standard Minute code	-	
HTG POLARITY	Setting the Parameter allows the 0-100% analog heating output to be direct acting or reverse acting. The default setting for a MAPS II unit is reverse acting..	REV	
HTGOUTFLOWLIMIT	Low limit for the heating output. **This value should not be changed.**	25	
HTGOUTHIGHLIMIT	High limit for the heating output. **This variable should not be changed.**	70 - gas heat 100 - electric heat	

Index

www.ReznorHVAC.com;(800) 695-1901

05/14 (Serial No. Date Code BNE) Form CP-MAPS-D12A with FX06 (Version A.3)