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## Introduction

This manual provides operating information about the Microtech 4 Lite controller as pertains to PreciseLine light air handler models. For installation and/or maintenance procedures, see Daikin Applied IM 1267.

### **WARNING**

Only qualified personnel should install, operate and service the equipment and that improper adjustment of settings and operation by an unqualified person could result in property damage, injury, or death.

## Unit Description

A typical unit will range between three sizing categories, as shown in the following figures. These figures are for general information only. See the project's certified submittals for actual specific dimensions and locations.

*Figure 1: Typical Size 006-020 Units (Horizontal)*



*Figure 2: Typical Size 006-020 Units (Vertical)*



*Figure 3: Typical Size 030-050 Units (Horizontal)*



*Figure 4: Typical Size 030-050 Units (Vertical)*



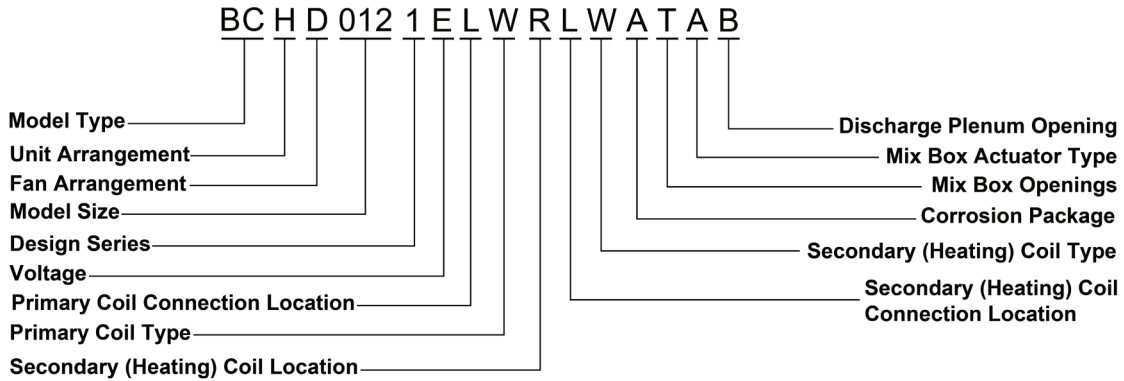
*Figure 5: Typical Size 060-100 Units*



## Menu Description Tables Glossary

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View Status	<a href="#">page 42</a>

# Nomenclature



Category	Code	Description
Model Type	BC	PreciseLine Air Handler
Unit Arrangement	H	Horizontal
	V	Vertical
	A	AVD / Compact Vertical (Sizes 006-020)
Fan Arrangement	D	Draw Thru
	E	Draw Thru Plenum Fan, End Discharge
	U	Draw Thru Plenum Fan, Up Discharge
Model Size	006	Nominal 600 CFM
	008	Nominal 800 CFM
	010	Nominal 1,000 CFM
	012	Nominal 1,200 CFM
	016	Nominal 1,600 CFM
	018	Nominal 1,800 CFM
	020	Nominal 2,000 CFM
	030	Nominal 3,000 CFM
	040	Nominal 4,000 CFM
	050	Nominal 5,000 CFM
	060	Nominal 6,000 CFM
080	Nominal 8,000 CFM	
100	Nominal 10,000 CFM	
Design Series	1	1st Vintage
Voltage	A	115/60/1
	E	208/60/1
	G	460/60/1
	K	230/60/1
	P	277/60/1
	D	208/60/3
	L	230/60/3
	T	460/60/3
W	575/60/3	
Primary Coil Connection Location	L	Left Hand (Air back of the head)
	R	Right Hand (Air back of the head)
	C	Center

Category	Code	Description
Primary Coil Type	W	Water / Glycol
	D	DX / 410A
	V	VRV
Secondary (Heating) Coil Location	P	Preheat
	R	Reheat
	Y	None
Secondary (Heating) Coil Connection Location	L	Left Hand (Air back of the head)
	R	Right Hand (Air back of the head)
	Y	None
Secondary (Heating) Coil Type	C	Center
	W	Hot Water / Glycol
	Y	None
Corrosion Package	S	Steam
	A	(Coil Casing) Stainless / (Fin Coating) None / (Drip Pan Corrosion Pkg.) Stainless
	Y	(Coil Casing) Galvanized / (Fin Coating) None / (Drip Pan Corrosion Pkg.) Galvanized
Mix Box Openings	T	Top + Rear
	B	Bottom + Rear
	Y	None
Mix Box Actuator Type	T	ON/OFF
	A	0-10V M
	M	Manual
	Y	None
Discharge Plenum Opening	B	Bottom
	T	Top
	E	End
	Y	None - No Discharge Plenum
	R	Right Hand (Air back of the heat)
	L	Left Hand (Air back of the head)
	F	Field Cut-Out (Has a Plenum)

**NOTE:** Not all code options shown.

# MicroTech® 4 Lite Portable Interface Fundamentals

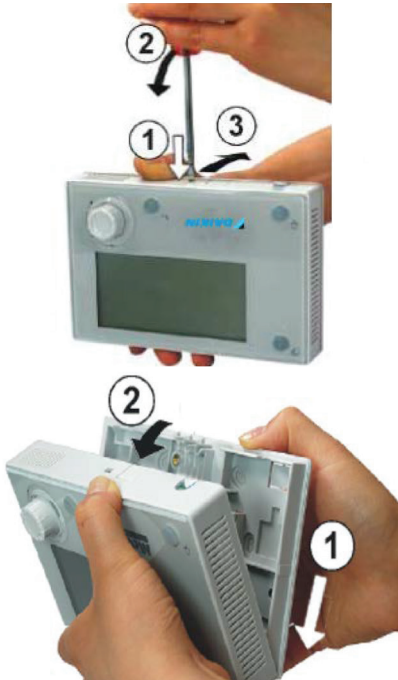
**⚠ WARNING**

**Electric shock hazard. Can cause personal injury, death, or property damage.**

This equipment must be properly grounded. Connections and service to the MicroTech 4 Lite unit controller must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

1. Remove plastic cover (Figure 6) to access the RJ45 connection.
2. Mount the portable interface. The portable interface has magnets for mounting to metallic surfaces.

Figure 6: Removing the Cover



## Direct Connection

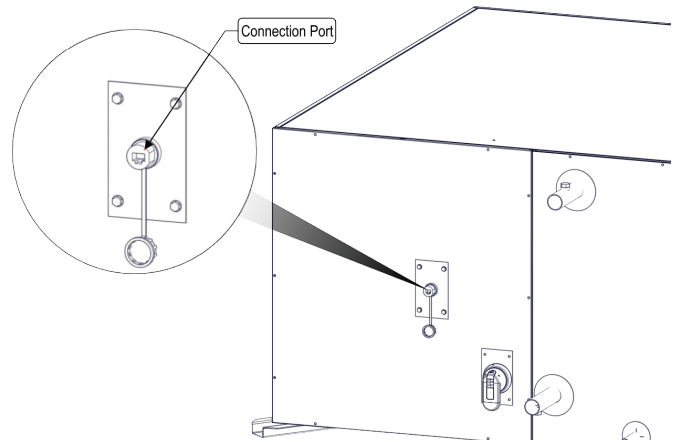
The portable interface can be wired directly to a single MicroTech 4 Lite unit controller over a standard RJ45 (Ethernet) connection.

1. Locate the external RJ45 plug shown in Figure 7
2. Follow Figure 7 for connection details. Note the distance limitations provided.

Interface Details for RJ45 Connector:

- Bus connection - RJ45 Interface
- Max length of shielded cable: 164 ft (50 m)
- Max length of unshielded cable: 9.8 ft (3 m)
- Cable type: standard Ethernet cable

Figure 7: Connection Port (Size 030 Shown)



## Using the Portable Interface

### Hardware Features

The portable interface keypad/display consists of an 8-line by 30 character display, a “push and roll” navigation wheel, and three buttons: Alarm, Home (Menu), and Back (Figure 8).

- Turn the navigation wheel clockwise (right) or counterclockwise (left) to navigate between lines on a screen and also to increase and decrease changeable values when editing. Press down on the wheel to use it as an Enter button.
- Press the Back button to display the previous page.
- Press the Home button to return to the main screen from the current page.
- Press the Alarm button to view the Alarm Lists menu.

### Keypad/Display Features

The first line on each page includes the page title and the line number to which the cursor is currently “pointing.” The line numbers are X/Y to indicate line number X of a total of Y lines for that page. The left most position of the title line includes an “up” arrow to indicate there are pages “above” the currently displayed items, a “down” arrow to indicate there are pages “below” the currently displayed items or an “up/down” arrow to indicate there are pages “above and below” the currently displayed page. Each line on a page can contain status-only information or include changeable data fields. When a line contains status-only information and the cursor is on that line, all but the value field of that line is highlighted - meaning the text is white with a black box around it. When the line contains a changeable value and the cursor is at that line, the entire line is highlighted.

Each line on a page may also be defined as a “jump” line, meaning pushing the navigation wheel will cause a “jump” to a new page. An arrow is displayed to the far right of the line to indicate it is a “jump” line and the entire line is highlighted when the cursor is on that line.

**NOTE:** Only menus and items that are applicable to the specific unit configuration are displayed.



**Figure 8: Portable Interface Main Features**



## Keypad/Display Functions

The keypad/display information is organized into a series of menus or menu groups designed to allow navigation through unit operating parameters and editing access to customize unit performance.

Passwords control access to service technician level and field engineering level parameters.

Advanced menus include the most advanced items such as "unit configuration" and service related parameters. These generally do not require changes unless there is a fundamental change to (or a problem with) unit operation.

**NOTE:** Only menus and items that are applicable to the specific unit configuration are displayed.

## Passwords

When the keypad/display is first accessed, the Home Key is pressed, the Back Key is pressed multiple times, or if the keypad/display has been idle for the Password Timeout timer (default 10 minutes), the display will show a "main" page where the user can enter a password or continue without entering a password.

Various menu functions are accessible or inaccessible, depending on the access level of the user, and the password they enter, if any. There are four access levels, including no password, Level 2, Level 4, and Level 6, with Level 2 having the highest level of access. Without entering a password, the user has read-only access to current basic menu items including Quick Menu, Alarm Lists, and About This AHU menus. Alarms can be acknowledged at this level. Entering the Level 6 password (5321) allows access to basic menu items plus the View Status menu group. Entering the Level 4 password (2526) allows similar access as Level 6 with the addition of the Commission Unit and Service Menu groups. Entering the Level 2 password (6363) allows similar access as Level 4 with the addition of the Manual Control and Unit Maintenance menus, plus Advanced Menus accessible through the Service Menu.

The password field initially has a value \*\*\*\* where each \* represents an adjustable numeric field. These values can be changed by entering the Edit Mode.

Entering an invalid password has the same effect as continuing without entering a password.

Once a valid password has been entered, the selected access is maintained until either the password timer expires or a different password is entered. The default value for this password timer is 10 minutes and may be changed in the Advanced Timers menu (Advanced Menus).

## Navigation Mode

In the Navigation Mode, values which can be edited are indicated by the entire line being highlighted (black box with white text). Values which are "read only", displayed for information only, will have only the parameter name highlighted.

When the navigation wheel is turned clockwise, the cursor moves to the next line (down) on the page. When the wheel is turned counter-clockwise the cursor moves to the previous line (up) on the page. The faster the wheel is turned the faster the cursor moves.

When the Back Button is pressed the display reverts back to the previously displayed page. If the Back button is repeatedly pressed the display continues to revert one page back along the current navigation path until the "main menu" is reached.

When the Menu (Home) Button is pressed the display reverts to the "main page."

When the Alarm Button is depressed, the Alarm Lists menu is displayed. Repeated pressing of the Alarm Button toggles between active alarms and the alarm history.

## Edit Mode

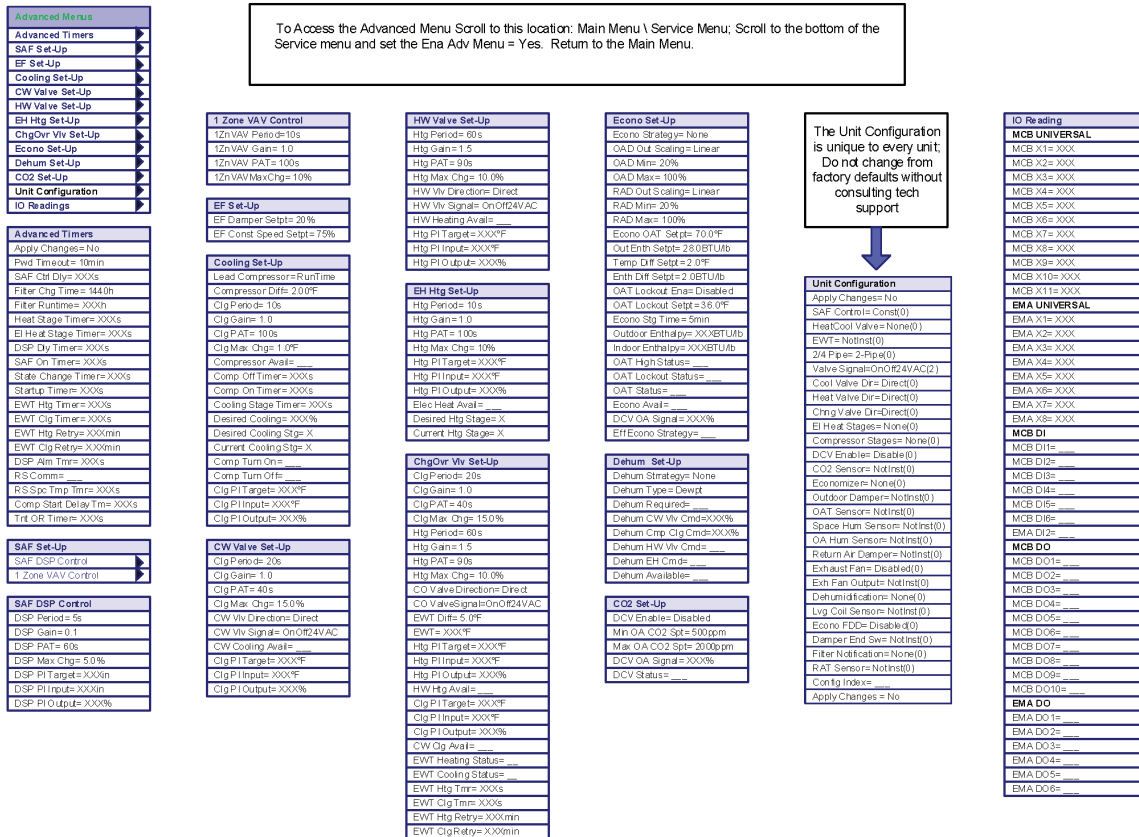
The Editing Mode is entered by pressing the navigation wheel while the cursor is pointing to a line containing an editable field. Once in the edit mode pressing the wheel again causes the editable field to be highlighted. Turning the navigation wheel clockwise or counter-clockwise will either increase or decrease the value in the selected field, respectively.

The faster the wheel is turned the faster the value is incremented. Pressing the wheel will save the new value and return the display to the navigation mode. Pressing the back button will exit the editing mode without saving the change.

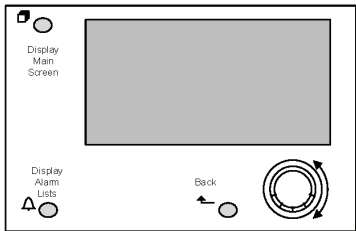




Figure 10: Advanced Menus Keypad Navigation



This navigation map represents all possible menus and menu items. Not all menus and items shown here will appear on the HMI display depending upon the specific unit configuration. Those that do not appear are not applicable to this unit.



Enter (Press Wheel)

Turn Wheel To Scroll Up and Down Menu or To Change Values

# Field Control Wiring

**DANGER**

LOCKOUT/TAGOUT all power sources prior to wiring or servicing the unit. Electrical shock hazard may cause injury, death, or property damage. Connect only low voltage NEC Class II circuits to terminal blocks TB2, TB4, and TB12. Reinstall and secure all protective front panels when the wiring installation is complete.

PreciseLine units are available with several control schemes which may require low voltage field wiring. Use the Unit Specific Electrical Schematics to determine which control connections will be required for installation. Check unit specific electrical documentation in the door of the control panel. [Table 1](#) shows the possible field connections that can be made.

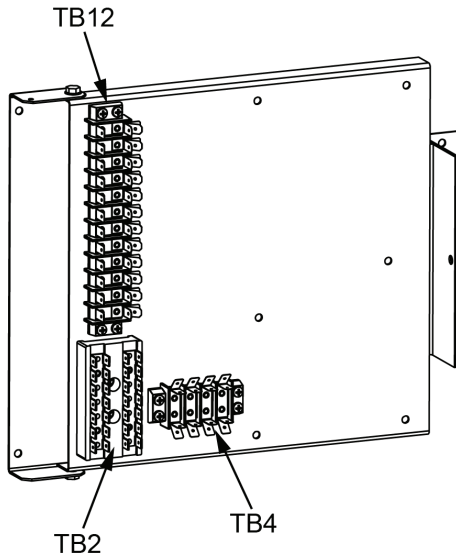
**Table 1: Potential Field Connections and Locations (Sizes 006-050)**

	Label	Description	Signal
TB12	T1	Freezestat	24VAC Contact Closure
	T2	Condensate Overflow	Discrete Contact Closure
	T3	Space Humidity Sensor	0-10 VDC Input
	T4	Compressor 2	24VAC Output
	T5	Discharge Air Temperature	Thermistor Input
	T6	Airflow Switch	24VAC Contact Closure
	T7	Entering Water Temp / Leaving Coil Temp	Thermistor Input
	T8	Duct Static Pressure	0-10 VDC Input
	T9	Duct Static Pressure Power	24 VDC Supply
	T10	Emergency Stop	Discrete Contact Closure
	T11	Remote Space Sensor (CE-)	Remote Space Sensor Communications (CE-)
	T12	Remote Space Sensor (CE+)	Remote Space Sensor Communications (CE+)
TB4	T1	Supply Fan Signal	0-10 VDC Output
	T2	Compressor 1 or Valve 1	24VAC Output / 0-10 VDC Output
	T3	Electric Heat or Valve 2	24VAC Output / 0-10 VDC Output
	T4	Outside Air Damper	0-10 VDC Output
TB2	24+	Supply Voltage	24VAC Output Supply
	Common	Supply Voltage Common	Ground

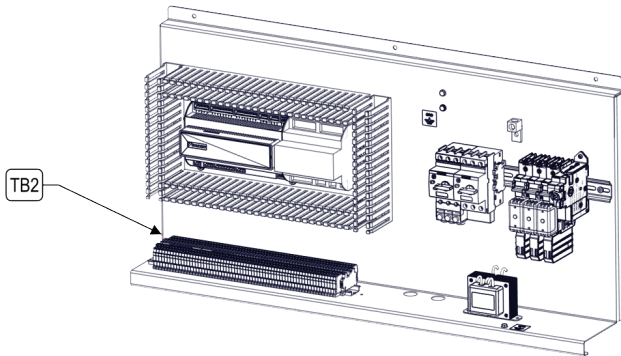
**Table 2: Potential Field Connections and Locations (Sizes 060-100)**

	Label	Description	Signal
TB2	24+	Supply Voltage	24VAC Output Supply
	N24	Supply Voltage Common	Ground
	236	Sensor Common	Sensor Common
	+24V	Sensor Power MCB	24VDC Supply MCB
	+24V-A	Sensor Power EXP-A	24VDC Supply EXP-A
	202	Condensate Overflow Switch	Discrete Contact Closure
	208	Outdoor Air Humidity	0-10VDC Input
	208E	Space Humidity Sensor	0-10VDC Input
	208G	Return Air Humidity Sensor	0-10VDC Input
	210	Remote Space Sensor (CE-)	Remote Space Sensor Communications (CE-)
	212	Remote Space Sensor (CE+)	Remote Space Sensor Communications (CE+)
	213	Space CO2	0-10VDC Input
	220	Freeze Stat	24VAC Contact Closure
	222	SCR Electric Heat/ Modulating Hot Water Valve Output	0-10VDC Output
	222C	Electric Heat Stage 1	24VAC Output
	223	Electric Heat Stage 2	24VAC Output
	224	Electric Heat Stage 3	24VAC Output
	225	Electric Heat Stage 4	24VAC Output
	228C	Hot Water Valve On Off	24VAC Output
	232A	Dirty Filter Switch	Discrete Contact Closure
	247	Leaving Coil Temp	Thermistor Input
	249	Compressor 1/Chilled Water Valve On Off	24VAC Output
	251	Compressor 2	24VAC Output
	254	Compressor 3	24VAC Output
	256	Compressor 4	24VAC Output
	262	Expansion Board Common	Ground
	267	Supply Fan Signal	0-10VDC Output
	275	Exhaust Fan Signal	0-10VDC Output
	277	Outdoor Air Damper	0-10VDC Output
	281	Discharge Air Temp	Thermistor Input
	282	Return Air Temp	Thermistor Input
	297	Outdoor Air Temp	Thermistor Input
	299	Emergency Stop	Discrete Contact Closure
2120	Air Flow Switch	24VAC Contact Closure	
2124	Duct Static Pressure	0-10VDC Input	
2130	Damper End Switch	Discrete Contact Closure	
2133	Return Air Damper	0-10VDC Output	
2140	VAV Box Output	24VAC Output	
2150	Modulating Chilled Water Valve	0-10VDC Output	

**Figure 11: Terminal Block Layout (Sizes 006-050)**



**Figure 12: Terminal Block Layout (Sizes 060-100)**



## Micro Tech 4 Lite Field Installed Sensors

The Micro Tech 4 Lite unit controller can be connected to a variety of field installed sensors.


- Integrated Thermostat - Daikin Applied PN: 910392744
- Space/Duct Humidity Sensor - Daikin Applied PN: 910392826
- Wall Mounted CO2 Sensor - Daikin Applied PN: 107287012
- Duct Mounted CO2 Sensor - Daikin Applied PN: 910111672
- Duct Static Pressure - Daikin Applied PN: 910236931
- Airflow Status - Daikin Applied PN: 910270652
- OA Temperature - Daikin Applied PN: 910236951
- OA Temp/Humidity Combo - Daikin Applied PN: 910236923
- Leaving Coil Temperature - Daikin Applied PN: 099483400
- Entering Water Temp - Daikin Applied PN: 107201601

PreciseLine units operate with 115V and 24V control circuit power. All field control wiring connections are made at the class II terminal blocks TB2, TB4, and TB12 which is located in the Low Voltage Control Panel, shown in [Figure 64](#) and [Figure 65](#).

**NOTE:** The installation of all field wiring, must comply with all applicable local codes and ordinances. The warranty may be limited or certain aspects excluded if the field wiring is not in accordance with these standards.

If a single conduit containing 24V and 115V wiring is run above the roofline between units, consider the 24V wiring within as an NEC Class I wiring system.

# Manual Control

 **WARNING**

Only qualified personnel should install, operate and service the equipment and that improper adjustment of settings and operation by an unqualified person could result in property damage, injury, or death.

Manual Control mode is used to temporarily command specific components to operate.

If Manual Control Mode is set to "Enable" and no modifications have been made to any of the override parameters for 30 minutes, the Manual Control Mode will be set to "Normal".

When the Manual Control Mode changes from "Enable" to "Normal", all of the Override parameters will return to their default values. The Override parameters will no longer dictate the functionality of the controller outputs, and the unit will return to the Off state based on the Control Mode.

If the Manual Control Mode is set to "Enable" and the Control Mode changes from "Off" to anything else, the Manual Control Mode will change to "Normal" and the unit will momentarily transition to the Off state and then resume normal operation based on the Control Mode.

If Electric Heat is selected in the unit configuration, the Supply Air Fan Capacity Command (SAF Cap Cmd) must be set above 5.0 VCD before the following parameters can be commanded "On" to prevent the unit from over-heating due to no airflow:

- Heating Valve/SCR Heat
- Heating Stage 1
- Heating Stage 2
- Heating Stage 3
- Heating Stage 4

**NOTE:** Manual operation is not intended for extended operation beyond troubleshooting or initial start-up.

## Manual Control Mode

The Control Mode must be set to "Off" before entering the Manual Control mode.

Manual Control is designed to temporarily allow the technician to control the unit as desired for Start-up or troubleshooting.

There are four Manual Control Modes:

### 1. Normal

When Manual Control is enabled and Manual Control Mode is set to Normal, all parameters in [Table 3](#) can be set by the technician.

### 2. Cooling

When Manual Control is disabled and Manual Control Mode is set to Cooling, the unit will attempt to operate to maximum cooling capacity. The unit will adhere to normal operating sequences and alarm responses.

### 3. Heating

When Manual Control is disabled and Manual Control Mode is set to Heating, the unit will attempt to operate

to maximum heating capacity. The unit will adhere to normal operating sequences and alarm responses.

### 4. Dehumidification

When Manual Control is disabled and Manual Control Mode is set to Dehum, the unit will attempt to operate in dehumidification mode. The unit will adhere to normal operating sequences and alarm responses.

Changing the Manual Control Mode to anything but "Normal" will reset Manual Control to "Normal".

Manual Control Mode will time out after 30 minutes of inactivity.

When Manual Control Mode is not set to "Normal" the timers in [Table 3](#) will set to the associated fixed value.

When Manual Control Mode is set to "Heating" the unit will attempt to go to full heating capacity, regardless of the control conditions, following the normal unit sequence of operations and adhering to alarms, using the abbreviated timers from [Table 3](#).

When Manual Control Mode is set to "Cooling" the unit will attempt to go to full cooling capacity, regardless of the actual control conditions, following the normal unit sequence of operations and adhering to alarms, using the abbreviated timers from [Table 3](#).

When Manual Control Mode is set to "Dehumidification" the unit will attempt to go to dehumidification mode, regardless of the actual control conditions, following the normal unit sequence of operations and adhering to alarms, using the abbreviated timers from [Table 3](#). If the Manual Control Mode is changed from anything other than "Normal" back to "Normal", the unit will return to the Off state following normal sequence of operations, using the abbreviated timers.

If Manual Control Mode is not "Normal" and the Control Mode changes from "Off" to anything else, the Manual Control Mode will change to "Normal" and the unit will momentarily transition to the Off state and then resume normal operation based on the Control Mode.

If Manual Control Mode is not "Normal" and no modifications have been made to Manual Control Mode for 30 minutes, the Manual Control Mode will be set to "Normal".

## Manual Control

**Table 3: Main Menu \ Manual Control**

Menu Display Name	Default	Range	Description
Ctrl Mode=	Off	AUTO	Cntrl Mode is an adjustable item which sets the occupancy mode of the unit. The unit can be Heat Only, CoolOnly, Fan Only, Automatic, or Off.
		HEAT	
		COOL,	
		FAN_ONLY	
		OFF	
Manual Ctrl=	Normal	NORMAL,	Manual Ctrl is an adjustable item that allows the unit to enter manual control.
		ENABLED	
Manual Control Mode=	NORMAL	NORMAL,	Manual Control Moder is an adjustable item that allows the unit to manually place the unit in a specified operating mode.
		HEAT,	
		COOL,	
		DEHUMID	
Manual State=	NORMAL	NORMAL,	Manual State is a status only item that indicates if the unit is in a manual control state.
		HEAT,	
		COOL,	
		DEHUMID	
SAF Cap Cmd=	0VDC	0-10VDC	SAF Cap Cmd is an adjustable item that manually drive the supply fan to a capacity.
EF Cap Cmd=	0VDC	0-10VDC	EF Cap Cmd is an adjustable item that manually drive the exhaust fan to a capacity.
OADamper Pos=	0VDC	0-10VDC	OADamper Pos an adjustable item that manually drive the outdoor air damper to a position.
RADamper Pos=	0VDC	0-10VDC	RADamper Pos an adjustable item that manually drive the return air damper to a position.
Compressor 1=	Off	Off	Compressor 1 is an adjustable item that manually turns on the Compressor 1 output.
		On	
Compressor 2=	Off	Off	Compressor 2 is an adjustable item that manually turns on the Compressor 2 output.
		On	
Compressor 3=	Off	Off	Compressor 3 is an adjustable item that manually turns on the Compressor 3 output.
		On	
Compressor 4=	Off	Off	Compressor 4 is an adjustable item that manually turns on the Compressor 4 output.
		On	
CW Valve=	0VDC	0-10VDC	CW Valve is an adjustable item that manually sets the Modulating Chilled Water Valve output capacity.
CW Valve=	Off	Off	CW Valve is an adjustable item that manually sets the two position Chilled Water Valve output.
		On	
Htg Valve=	0VDC	0-10VDC	Htg Valve is an adjustable item that manually sets the Modulating Hot Water Valve output capacity.
Htg Valve=	Off	Off	Htg Valve is an adjustable item that manually sets the two position Hot Water Valve output.
		On	
SCR Capacity=	0VDC	0-10VDC	SCR Capacity is an adjustable item that manually sets the SCR Electric Heat output capacity.
Htg Stg 1=	Off	Off	Htg Stg 1 is an adjustable item that manually turns on the Electric Heat Stage 1 output.
		On	

Menu Display Name	Default	Range	Description
Htg Stg 2=	Off	Off On	Htg Stg 2 is an adjustable item that manually turns on the Electric Heat Stage 2 output.
Htg Stg 3=	Off	Off On	Htg Stg 3 is an adjustable item that manually turns on the Electric Heat Stage 3 output.
Htg Stg 4=	Off	Off On	Htg Stg 4 is an adjustable item that manually turns on the Electric Heat Stage 4 output.
CW/HW CO Valve=	0VDC	0-10VDC	CW/HW CO Valve is an adjustable item that manually sets the Modulating Changeover Valve output capacity.
CW/HW CO Valve=	OFF	OFF, ON	CW/HW CO Valve is an adjustable item that manually sets the two position Changeover Valve output.
VAV Box=	DISABLE	DISABLE, ENABLE	VAV Box is an adjustable item that manually turns on the VAV Box output.



# Quick Menu

Items in the Quick Menu contain basic unit operating status and control set point parameters. The items shown in the Quick Menu are Read Only if a valid password has not been entered. The following are brief descriptions of the Quick Menu items. No password is required to view the Quick Menu.

## Quick Menu

**Table 4: Main Menu \ Quick Menu**

Menu Display Name	Default	Range	Description
Unit State=	-	OFF	Unit State is a status only item which indicates the state of unit operation in which the unit is currently operating. The unit can be in any of the operating states shown.
		HEAT	
		COOL	
		ECONO	
		ECONO_COOL	
		DEHUMID	
		FAN_ONLY	
Ctrl Mode=	Off	AUTO	Cntrl Mode is an adjustable item which sets the control mode of the unit. The unit can be Heat Only, CoolOnly, Fan Only, Automatic, or Off.
HEAT			
COOL			
FAN_ONLY			
OFF			
Occ Mode=	Auto/Net	OCCUPIED	Occ Mode is an adjustable item which sets the occupancy mode of the unit.
		UNOCCUPIED	
		BYPASS	
		STANDBY	
CW Valve Pos=	-	0-100%	CW Valve Pos is a status only item which indicates the percentage that the modulating chilled water valve is currently open.
CW Valve Pos=	Off	INACTIVE	CW Valve Pos is a status only item which indicates if the two position chilled water valve is currently open.
		ACTIVE	
Comp Stg 1 =	Off	INACTIVE	Comp Stg 1 is a status only item which indicates if the compressor stage 1 output is currently energized.
		ACTIVE	
Comp Stg 2 =	Off	INACTIVE	Comp Stg 2 is a status only item which indicates if the compressor stage 2 output is currently energized.
		ACTIVE	
Comp Stg 3 =	Off	INACTIVE	Comp Stg 3 is a status only item which indicates if the compressor stage 3 output is currently energized.
		ACTIVE	
Comp Stg 4 =	Off	INACTIVE	Comp Stg 4 is a status only item which indicates if the compressor stage 4 output is currently energized.
		ACTIVE	
OAD Positon=	-	0-100%	OAD Position is a status only item which indicates the percentage that the outdoor air damper is currently open.
HW Valve Pos=	-	0-100%	HW Valve Pos is a status only item which indicates the percentage that the modulating hot water valve is currently open.
HW Valve Pos=	-	INACTIVE	HW Valve Pos is a status only item which indicates if the two position hot water valve is currently open.
		ACTIVE	

Menu Display Name	Default	Range	Description
SCR Output=	-	0-100%	SCR Output is a status only item which indicates the percentage that the SCR electric heat output is currently commanded.
Stage 1 Heat=	-	INACTIVE	Stage 1 Heat is a status only item which indicates if the Electric Heat Stage 1 output is currently energized.
		ACTIVE	
Stage 2 Heat=	-	INACTIVE	Stage 2 Heat is a status only item which indicates if the Electric Heat Stage 2 output is currently energized.
		ACTIVE	
Stage 3 Heat=	-	INACTIVE	Stage 3 Heat is a status only item which indicates if the Electric Heat Stage 3 output is currently energized.
		ACTIVE	
Stage 4 Heat=	-	INACTIVE	Stage 4 Heat is a status only item which indicates if the Electric Heat Stage 4 output is currently energized.
		ACTIVE	
Control Temp=	-	-40-212 °F	Control Temp is a status only item which displays the current value of the "Control Temperature." The "Control Temperature" is defined as the temperature input selected by the Control Temperature Source parameter. For example, if the Control Temperature Source parameter is set to "Return," then the control temperature parameter reads the same value as the Return Air parameter.
EffSpace=	-	-40-212 °F	EffSpaceT is a status only item which displays the current temperature reading from an optional space temperature sensor.
Return Temp=	-	-40-212 °F	Return Temp is a status only item which displays the current temperature reading from an optional return air temperature sensor.
Active Htg Spt=	-	50-95 °F	Active Htg Spt is a status only item which indicates the current active heating setpoint.
Active Clg Spt=	-	50-95 °F	Active Clg Spt is a status only item which indicates the current active cooling setpoint.
Occ Clg Spt=	75.0 °F	0.0-100.0 °F	Occ Clg Spt is an adjustable item which affects the temperature at which the unit will go into the cooling mode of operation.
Occ Htg Spt=	70.0 °F	0.0-100.0 °F	Occ Htg Spt is an adjustable item which affects the temperature at which the unit will go into the heating mode of operation.
Sen Clg Spt=	-	-	SenClg Spt is a value set by the optional remote integrate thermostat which affects the temperature at which the unit will go into the cooling mode of operation.
Sen Htg Spt=	-	-	Sen Htg Spt is a value set by the optional remote integrate thermostat which affects the temperature at which the unit will go into the heating mode of operation.
Disch Air=	-	-50.0-250.0 °F	Disch Air is a status only item which displays the current temperature reading from the unit's discharge air temperature sensor (DAT).
DAT Clg Spt=	55.0 °F	40.0-100.0 °F	DAT Clg Spt is a status only item which indicates the temperature that the DAT should be maintained at when it is in the cooling mode of operation. Once a valid password has been entered this item becomes an adjustable item.
DAT Htg Spt=	80.0 °F	40.0-140.0 °F	DAT Htg Spt is a status only item which indicates the temperature that the DAT should be maintained at when in the heating mode of operation. Once a valid password has been entered this item becomes an adjustable item.
Unocc Clg Spt=	85.0 °F	40.0-100.0 °F	Unocc Clg Spt is an adjustable item which sets the control temperature above which the unit starts up and provides unoccupied cooling (night setback) during unoccupied periods.
Unocc Htg Spt=	60.0 °F	40.0-100.0 °F	Unocc Htg Spt is an adjustable item which sets the control temperature below which the unit starts up and provides unoccupied heating (night setup) during unoccupied periods.

Menu Display Name	Default	Range	Description
StdBy Clg Spt=	77.0 °F	50 to 95 °F	Stdby Clg Spt is a status only item which indicates the temperature in which the unit will go into the cooling mode of operation in the standby occupancy state. Once a valid password has been entered this item becomes an adjustable item.
StdBy Hlg Spt=	66.0 °F	50 to 95 °F	Stdby Hlg Spt is a status only item which indicates the temperature in which the unit will go into the heating mode of operation in the standby occupancy state. Once a valid password has been entered this item becomes an adjustable item.
SAF Capacity=	-	0-100%	SAF Capacity is a status only item which indicates the current capacity of the supply air fan.
SAF DuctPress=	-	0.0-5.0 in	SAF DuctPress is a status only item which displays the current supply duct static pressure reading.
SAF DSP Spt=	1.0in	0.2-4.0 in	SAF DSP Spt is a status only item which displays the current supply fan duct static pressure setpoint. Once a valid password has been entered this item becomes an adjustable item.
EF Capacity=	-	0-100%	EF Capacity is a status only item indicated the curent capacity of the return/exhaust fans.
CO2 PPM=	-	0-3000 ppm	
OA Temp=	-	-40.0-212.0 °F	OA Temp is a status only item which displays the current temperature reading from the unit mounted Outdoor air temperature sensor. This sensor is standard on all units.
OA Rel Hum=	-	0-100%	OA Rel Hum is a status only item that indicates the current outdoor air relative humidity reading.
Space Rel Hum =	-	0-100%	Space Rel Hum is a status only item that indicates the current space relative humidity reading.
Space Dew Point =	-	0-100 °F	Space Dew Point is a status only item that indicates the current calculate space dewpoint.
Control Temp Src=	SPACE	SPACE	Control Temp Src is an adjustable item that selects the control temperature source from either a space, return air sensor, or the average temperature using both sensor inputs.
		RETURN	
		AVERAGE	
Room Sensor On/Off=	On	OFF	Room Sensor On/Off is a value set by the optional remote integrate thermostat which enables or disables unit operation.
		ON	
RSSysModeStat=	AUTO	AUTO	RSSysModeStat is a value set by the optional remote integrate thermostat which affects the operational mode of the unit. The unit can be Heat Only, Cool Only, Fan Only, or Automatic.
		HEAT	
		COOL	
		FAN_ONLY	

# Commission Unit

## Unit Set-Up

General unit set-up configurations are used to adjust the Micro Tech 4 Lite controllers: Units of Measure, Unit Name, and Control Temperature Source.

## Unit Name

The unit name will display as "PL AHU".

## Control Temperature Source

Control Temperature Source selects what temperature reading is used to change the unit between heating, cooling, and fan only modes. This can be set to the space temperature, return air temperature (if equipped), or an average of the space and return air temperature values.

## Enable the Unit

### Control Mode

The unit can be set to run in five control modes:

1. **OFF**  
The unit is disabled.
2. **HEAT**  
Heating functions will operate to maintain the the heating set points. Cooling, economizer, and dehumidification are disabled.
3. **COOL**  
Cooling functions will operate to maintain the the cooling set points. Heating is disabled.
4. **AUTO**  
All modes of operation are enabled. The unit will automatically switch between heating and cooling modes as necessary.
5. **FAN ONLY**  
The circulating fans are allowed to operate. All heating and cooling functions are disabled.

## Occupancy Mode

Occupancy mode determines unit functionality based on the current unit setting. The setting can be any of the following:

1. **Occupied**  
The unit operates normally, providing heating, cooling, dehumidification, and ventilation as required to maintain the occupied setpoints.
2. **Unoccupied**  
The unit operates normally, providing heating, cooling, and dehumidification as required to maintain the unoccupied setpoints. The outdoor air damper remains closed during unoccupied mode, thus ventilation and ecocooling are not functional.
3. **Bypass**  
The unit operates normally, providing heating, cooling, dehumidification, and ventilation as required to maintain the occupied setpoints for the duration of the bypass timer.
4. **Standby**  
The unit operates normally, providing heating, cooling, dehumidification, and ventilation as required to maintain the standby setpoints.
5. **Auto**  
The unit is allowed to automatically shift between occupancy modes in accordance with schedule priorities.

## Determining Occupancy Source

The unit's occupancy mode setting can be driven by a number of sources. The priority of the sources is the following:

1. Network Override Command
2. HMI Keypad Input
3. Tenant Override (Thermostat)
4. Network Schedule
5. Internal Schedule

The override setting at the highest priority will be the effective setting for the unit. A "Null" or "Auto" selection will pass control to the next highest priority source.

**Table 5: Occupancy Source Table**

Network Manual Occupancy	Keypad Manual Occupancy	Tenant Override Input	Network Occupancy Scheduler	Internal Occupancy Scheduler	Effective Occupancy
OCCUPIED	NA	NA	NA	NA	OCCUPIED
UNOCCUPIED	NA	NA	NA	NA	UNOCCUPIED
BYPASS	NA	NA	OCCUPIED	NA	OCCUPIED
			UNOCCUPIED	NA	BYPASS
			STANDBY	NA	BYPASS
			NULL	Occ	OCCUPIED
				Unocc	BYPASS
NULL	NULL	BYPASS			
STANDBY	NA	NA	NA	NA	STANDBY
NULL	OCCUPIED	NA	NA	NA	OCCUPIED
NULL	UNOCCUPIED	NA	NA	NA	UNOCCUPIED
NULL	BYPASS	NA	OCCUPIED	NA	OCCUPIED
			UNOCCUPIED	NA	BYPASS
			STANDBY	NA	BYPASS
			NULL	Occ	OCCUPIED
				Unocc	BYPASS
NULL	NULL	BYPASS			
NULL	STANDBY	NA	NA	NA	STANDBY
NULL	AUTO	INACTIVE	OCCUPIED	NA	OCCUPIED
			UNOCCUPIED	NA	UNOCCUPIED
			STANDBY	NA	STANDBY
			NULL	Occ	OCCUPIED
				Unocc	UNOCCUPIED
NULL	NULL	OCCUPIED			
NULL	AUTO	ACTIVE	OCCUPIED	NA	OCCUPIED
			UNOCCUPIED	NA	BYPASS
			STANDBY	NA	BYPASS
			NULL	Occ	OCCUPIED
				Unocc	BYPASS
NULL	NULL	OCCUPIED			
NULL	AUTO	ACTIVE	NULL	NULL	OCCUPIED

## Dirty Filter Notification

The MicroTech 4 Lite controller is programmed to provide a notification to change air filters. This notification can be configured to be based on supply fan runtime, a dirty filter switch input, or a combination of the two. This configuration is selected using the Filter Change Strategy parameter.

The polarity of the dirty filter switch input can be selected using the Filter Change Signal and Filter Change Status parameters.

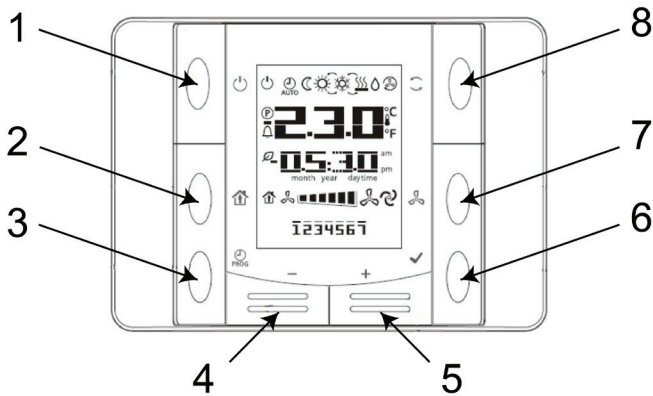
**NOTE:** If the Filter Change Signal parameter is Normally Open and there is no device connected to the dirty filter switch input (TB2, 232A), this will disable the dirty filter switch input.

## Remote Integrated Thermostat Operation

The remote integrated thermostat is an optional accessory that can be mounted in the space to adjust temperature settings and parameters.

For more technical information on the thermostat, consult Daikin Applied IM 1366.

**Figure 13: Thermostat Display**



**Table 6: Thermostat Buttons**

Number	Name	Function
1	ON/OFF	Power on or power off
2	Presence	Enter or exit a programmed presence mode.
3	Program	Time Scheduler. Pressing this button adjusts date/time setting, while holding it allows schedule programming.
4	Minus	Setpoint adjustment. Each operation of the Minus (-) button reduces the setpoint by 0.1 °C/0.5 °F or 0.5 °C/1.0 °F which is defined in controller's setting.
5	Plus	Setpoint adjustment, each operation of the Plus (+) button increases the set point by 0.1 °C/0.5 °F or 0.5 °C/1.0 °F which is defined in controller's setting.
6	OK	Confirms date/time and scheduler settings.
7	Fan	Fan speed adjustment. The fan speed is set up in grades by the controller. By pressing the Fan button, the grades can be selected clockwise in a cyclical way. The current grade selected manually is indicated by the highlighted bar on the display.
8	Mode	Energy mode selection. The 3 energy modes are Auto, Comfort and Economy. By pressing the Mode button, the user can switch HMI-SG between the 3 modes in a cyclical way. The current mode manually selected is indicated by relevant symbol on the display.

## Unit Set-Up

**Table 7: Main Menu \ Commission Unit \ Unit Set-Up**

Menu Display Name	Default	Range	Description
Eng Units=	English	SI	Eng Units is an adjustable item to indicate if the unit is to display English or Metric units of measure.
		English	
Control Temp Src=	SPACE	SPACE	Control Temp Src is an adjustable item that selects the control temperature source from either a space, return air sensor, or the average temperature using both sensor inputs.
		RETURN	
		AVERAGE	

## Timer Settings

**Table 8: Main Menu \ Commission Unit \ Timer Settings**

Menu Display Name	Default	Range	Description
Clg Stg Time=	0	0-600 Seconds	Clg Stg Time is an adjustable item which sets the minimum amount of time between bringing on/off stages of cooling.
Htg Stg Time=	0	0-600 Seconds	Htg Stg Time is an adjustable item which sets the minimum amount of time between bringing on/off stages of heating.
Tnt Ovrdr Incr=	120	0-480 Minutes	Tnt Ovrdr Incr is an adjustable item that sets the amount of time the unit will be in the bypass mode when initiated by a tenant override input.
DSP Start Delay=	30	5-120 Seconds	DSP Start Delay is an adjustable item which sets the minimum amount of time after the VAV box output has been energized before the supply fan will be enabled. This applies to units where the SAF Control is DSP.
DSP Control Delay=	120	5-240 Seconds	DSP Start Delay is an adjustable item which sets the minimum amount of time after the supply fan has been enabled, that it will run at minimum speed before DSP control is commenced.
Comp Start Delay=	360	360-420 Seconds	Comp Start Delay is an adjustable item which sets the minimum amount of time after initial power up that the compressor must remain off. If this value is at the default of 360 and additional random value of 1-60 seconds will be added to this delay to prevent multiple units from turning on their compressors at the same time.
Comp Min Ena=	DISABLE	DISABLE	Comp Min Ena is an adjustable item which enables or disables minimum compressor on/off timers.
		ENABLE	
Comp Min On=	180	60-600 Seconds	Comp Min On is an adjustable item which sets the minimum amount of time a compressor output must be on before it can be turned off.
Comp Min Off=	360	300-600 Seconds	Comp Min Off is an adjustable item which sets the minimum amount of time a compressor output must be off before it can be turned back on.
Cond Delay=	60	0-120 Seconds	Cond Delay is an adjustable item which sets the amount of time the condensate overflow input must be active before a condensate overflow alarm will be triggered. This is to prevent nuisance indications of condensate.
EWT Retry=	120	10-600 Minutes	EWT Retry is an adjustable item which sets the amount of time that must pass after the entering water has been deemed inadequate for a mode of operation, before the controller will retry operation in that mode. This applies to 2 pipe chilled water/hot water changeover units only.
EWT Sample=	120	60-600 Seconds	EWT Sample is an adjustable item which sets the amount of maximum amount of time that the controller will sample the entering water temperature to determine if it is adequate for the desired mode of operation. This applies to 2 pipe chilled water/hot water changeover units only.



## Supply Air Fan Set-Up Menu

For more details on Supply Air Fan control and setup, refer to "Supply Air Fan" on page 34.

**Table 9: Main Menu \ Commission Unit \ SAF Setup**

Menu Display Name	Default	Range	Description
<b>DSP CONTROL</b>			
SAF DuctPress=	-	0.0-5.0 in	SAF Duct Press is a status only item that indicates the current value for the duct static pressure sensor.
SAF DSP Spt=	1.0 in	0.2-4.0 in	SAF DuctSP Spt is an adjustable item which sets the supply fan duct static pressure setpoint. The SAF is modulated with a PI_Loop to maintain this setpoint.
SAF DSP DB=	0.25 in	0-2.0 in	SAF DSP DB is an adjustable item which sets a dead band around the DuctSP Spt. No Duct static pressure control action is taken when the current duct static pressure input is within this deadband.
Min Cap=	20%	20-100%	Min Cap is an adjustable item which sets the minimum output value when the supply fan is operating.
Max Cap=	100%	20-100%	Max Cap is an adjustable item which sets the maximum output value when the supply fan is operating.
DSP High Alarm =	4.5 IWC	2.0-5.0 IWC	DSP High Alarm is an adjustable item which sets the measured DSP value above which will trigger a DSP High Alarm.
DSP Error =	60 Seconds	60-360 Seconds	DSP Error is an adjustable item which sets the amount of time the measured DSP value must be above the DSP High Alarm value before a DSP High Alarm is triggered.
Fan Min Elect=	60%	60%-100%	Fan Min Elect is an adjustable item which sets the minimum output value of the supply fan as a percentage of the electric heat capacity.
Air Flow Proving=	Uninstall	Uninstall Install	Air Flow Proving is an adjustable item which configures the controller to expect an input from an airflow proving switch.
Air Flow Delay=	10 Seconds	10-240 Seconds	Air Flow Delay is an adjustable item which sets the amount of time the supply air fan must be running before the application checks the status of the air flow proving switch input.
<b>1 ZONE VAV CONTROL</b>			
Control Temp=	-	-40-212 °F	Control Temp is a status only item which displays the current value of the "Control Temperature." The "Control Temperature" is defined as the temperature input selected by the Control Temperature Source parameter.
Occ Clg Spt=	75 °F	50-95 °F	Occ Clg Spt is a status only item which indicates the temperature in which the unit will go into the cooling mode of operation. Once a valid password has been entered this item becomes an adjustable item.
Occ Htg Spt=	70 °F	50-95 °F	Occ Htg Spt is a status only item which indicates the temperature in which the unit will go into the heating mode of operation. Once a valid password has been entered this item becomes an adjustable item.
Occ DB =	0.0 °F	0.0-5.0 °F	Occ DB is an adjustable item which sets a dead band around the Occ Cooling and Heating Setpoint parameter. For example, if the Occ Cooling Setpoint parameter is set to 75°F and the Occ DB parameter is set to 2°F the dead band around the setpoint would be from 76.0°F to 74.0°F.
Min Cap=	20%	20-100%	Min Cap is an adjustable item which sets the minimum output value when the supply fan is operating.
Max Cap=	100%	20-100%	Max Cap is an adjustable item which sets the maximum output value when the supply fan is operating.
Fan Cycling=	ON	ON CYCLE	Fan Cycling is an adjustable item which configures the supply fan to be always on, or to cycle off when there's no demand, when the Occupancy is occupied or bypass.

Menu Display Name	Default	Range	Description
Fan Min Elect=	60%	60%-100%	Fan Min Elect is an adjustable item which sets the minimum output value of the supply fan as a percentage of the electric heat capacity.
Air Flow Proving=	Uninstall	Uninstall	Air Flow Proving is an adjustable item which configures the controller to expect an input from an airflow proving switch
		Install	
Air Flow Delay=	10 Seconds	10-240 Seconds	Air Flow Delay is an adjustable item which sets the amount of time the supply air fan must be running before the controller checks the status of the air flow proving switch input.
<b>CAV Control</b>			
CAV Cap=	75%	20-100%	CAV Cap is an adjustable item which sets the supply air fan capacity when the supply fan is operating in any mode other than dehumidification.
Min Cap=	20%	20-100%	Min Cap is an adjustable item which sets the minimum output value when the supply fan is operating.
Max Cap=	100%	20-100%	Max Cap is an adjustable item which sets the maximum output value when the supply fan is operating.
Dehumid Cap=	50%	20-100%	Dehumid Cap is an adjustable item which sets the supply air fan capacity when the supply fan is operating in dehumidification.
Fan Cycling=			Fan Cycling is an adjustable item which configures the supply fan to be always on, or to cycle off when there's no demand, when the Occupancy is occupied or bypass.
Fan Min Elect=			Fan Min Elect is an adjustable item which sets the minimum supply air fan capacity as a percentage of the total electric heat output when any amount of electric heat is being provided.
Air Flow Proving=	Uninstall	Uninstall	DSP High Alarm is an adjustable item which configures the application to expect an input from an airflow proving switch.
		Install	
Air Flow Delay=	10 Seconds	10-240 Seconds	Air Flow Delay is an adjustable item which sets the amount of time the supply air fan must be running before the application checks the status of the air flow proving switch input.

## Exhaust Fan Set-Up Menu

For more details on Exhaust Fan control and setup, refer to "Exhaust Fan" on page 34.

**Table 10: Main Menu \ Commission Unit \ EF Set-Up**

Menu Display Name	Default	Range	Description
EF Ctrl=	Disabled	Disabled	EF Ctrl is an adjustable item which configures exhaust fan speed control.
		Tracking	
		Const_Speed	
Min EF Cap=	-	0-100%	Min EF Cap is an adjustable item which sets the minimum output value when the exhaust fan is operating and EF Ctrl is Tracking.
Max EF Cap=	100%	0-100%	Max EF Cap is an adjustable item which sets the maximum output value when the exhaust fan is operating and EF Ctrl is Tracking.

## Cooling Setup

**Table 11: Main Menu \ Commission Unit \ Cooling Set-Up**

Menu Display Name	Default	Range	Description
CW Valve Pos=	-	0%-100%	CW Valve Pos is a status only item which indicates the percentage that the modulating chilled water valve is currently open.
ChgOvr Valve Pos=	-	0-100%	ChgOvr Valve Pos is a status only item which indicates the percentage that the modulating changeover water valve is currently open.
CW Valve Pos=	-	INACTIVE	CW Valve Pos is a status only item which indicates the condition of the two position chilled water valve output.
		ACTIVE	
ChgOvr Valve Pos=	-	INACTIVE	ChgOvr Valve Pos is a status only item which indicates the condition of the two position changeover valve output.
		ACTIVE	
Comp Stg 1 =	-	INACTIVE	Comp Stg 1 is a status only item which indicates the condition of the compressor stage 1 output.
		ACTIVE	
Comp Stg 2 =	-	INACTIVE	Comp Stg 2 is a status only item which indicates the condition of the compressor stage 2 output.
		ACTIVE	
Comp Stg 3 =	-	INACTIVE	Comp Stg 3 is a status only item which indicates the condition of the compressor stage 3 output.
		ACTIVE	
Comp Stg 4 =	-	INACTIVE	Comp Stg 4 is a status only item which indicates the condition of the compressor stage 4 output.
		ACTIVE	
Control Temp=	-	-40-212 °F	Control Temp is a status only item which displays the current value of the "Control Temperature." The "Control Temperature" is defined as the temperature input selected by the Control Temperature Source parameter.
Occ Clg Spt=	75.0 °F	50-95 °F	Occ Clg Spt is an adjustable item which affects the temperature at which the unit will go into the cooling mode of operation.
Occ Diff	1 °F	1-5 °F	Occ Diff is an adjustable item which affects the temperature at which the unit will exit the cooling or heating mode of operation when Occupancy is occupied, bypass, or standby. This value will be subtracted from the cooling setpoint or added to the heating setpoint to determine when to exit the mode.
Disch Air=	-	-40-212 °F	Disch Air is a status only item which displays the current temperature reading from the unit's discharge air temperature sensor (DAT).
DAT Clg Spt=	55.0 °F	45-75 °F	DAT Clg Spt is an adjustable item which sets the temperature that the DAT should be maintained at when it is in the cooling mode of operation. This point is only available on units that use discharge air temperature control.
DAT Clg DB=	1.0 °F	1.0-10.0 °F	DAT Clg DB is an adjustable item which sets a dead band around the DAT Clg Spt parameter. For example, if the DAT Clg Spt parameter is set to 55°F and the DAT Clg DB parameter is set to 1°F the dead band around the setpoint would be from 55.5°F to 54.5°F.
EffSpaceT=	-	-40-212 °F	EffSpaceT is a status only item which displays the current space temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the integrated thermostat.
Return Temp=	-	-40-212 °F	Return Air is a status only item which displays the current temperature reading from the unit's return air temperature sensor (RAT).
Unocc Clg Spt=	85.0 °F	40.0-100.0 °F	Unocc Clg Spt is an adjustable item which sets the control temperature below which the unit starts up and provides unoccupied cooling (night setback) during unoccupied periods.

Menu Display Name	Default	Range	Description
Unocc Diff=	2 °F	1-10 °F	Unocc Diff is an adjustable item which affects the temperature at which the unit will exit the cooling or heating mode of operation when Occupancy is unoccupied. This value will be subtracted from the cooling setpoint or added to the heating setpoint to determine when to exit the mode.
StdBy Clg Spt=	77 °F	50 to 95 °F	Stdby Clg Spt is a status only item which indicates the temperature in which the unit will go into the cooling mode of operation in the standby occupancy state. Once a valid password has been entered this item becomes an adjustable item.
Clg Stg Time=	0 Seconds	0-600 Seconds	Clg Stg Time is an adjustable item which sets the minimum amount of time between bringing on/off stages of cooling.
Clg Stg Timer=	0 Seconds	0-600 Seconds	Clg Stg Timer is a status only item which displays the amount of time remaining before the heating stage timer expires.
OA Temp=	-	-40-212 °F	OA Temp is a status only item which displays the current temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the outdoor air temperature sensor.
Clg Lo OAT Lk=	36 °F	25-60 °F	Clg Stg Time is an adjustable item which sets the outdoor air temperature below which the outdoor air damper will be closed if OAT Lockout Ena is Enabled.

## Dehumidification Setup

**Table 12: Main Menu \ View Status \ Dehum Set-up**

Menu Display Name	Default	Range	Description
Dehum Method=	DEWPT	REL_HUM	Dehum Method is an adjustable item which configures dehumidification will be enabled based on a space relative humidity setpoint or a space dewpoint setpoint.
		DEWPT	
Dehum Control=	NONE	NONE	Dehum Control is an adjustable item which configures the controller to use active, passive, or no dehumidification.
		PASSIVE	
		ACTIVE	
Rel Hum=	-	0-100%	Rel Hum is a status only item that indicates the current space relative humidity value being used by the controller. This will be the network supplied relative humidity if available or the input from the space relative humidity sensor.
Hum Spt=	60%	20-100%	Hum Spt Spt is an adjustable item which indicates the space relative humidity above which the unit will go into the dehumidification mode of operation, if available.
Hum Diff=	5%	1-10%	Hum Spt Spt is an adjustable item which sets the differential below the Hum Spt where the controller will disable dehumidification.
Dewpoint =	-	0-100 °F	Dewpoint is a status only item that indicates the current calculate space relative dewpoint value being used by the controller.
Dewpnt Spt=	55 °F	45-70 °F	Dewpnt Spt is an adjustable item which indicates the space dewpoint setpoint above which the unit will go into the dehumidification mode of operation, if available.
Dewpnt Diff=	2 °F	1-10 °F	Dewpnt Diff is an adjustable item which sets the differential below the Dewpnt Spt where the controller will disable dehumidification.
LCT Setpoint=	55.0 °F	45-70 °F	LCT Setpoint is an adjustable item which is used to set the leaving coil temperature setpoint the compressors control to maintain during dehumidification operation.
DAT Clg Spt=	55.0 °F	45-75 °F	DAT Clg Spt is an adjustable item which sets the temperature that the DAT should be maintained at when it is in the cooling mode of operation. This point is only available on units that use discharge air temperature control

Menu Display Name	Default	Range	Description
DAT Clg DB=	1.0 °F	1.0-10.0 °F	DAT Clg DB is an adjustable item which sets a dead band around the LCT Setpoint parameter. For example, if the LCT Setpoint parameter is set to 55°F and the DAT Htg DB parameter is set to 1°F the dead band around the setpoint would be from 55.5°F to 54.5°F.
DAT Htg DB=	1.0 °F	1.0-10.0 °F	DAT Htg DB is an adjustable item which sets a dead band around the Dehum DAT Sp parameter. For example, if the Dehum Spt parameter is set to 70°F and the DAT Htg DB parameter is set to 1°F the dead band around the setpoint would be from 70.5°F to 74.5°F.
Dehum DAT Sp=	70.0 °F	55.0-80.0 °F	Dehum DAT Sp is an adjustable item which sets the temperature that the DAT should be maintained at when it is in the dehumidification mode of operation

## Heating Set-Up Menu

**Table 13: Main Menu \ Commission Unit \ Heating Set-Up**

Menu Display Name	Default	Range	Description
Control Temp=	-	-40-212 °F	Control Temp is a status only item which displays the current value of the "Control Temperature." The "Control Temperature" is defined as the temperature input selected by the Control Temperature Source parameter.
HW Valve Pos=	-	0-100%	HW Valve Pos is a status only item which indicates the percentage that the hot water valve is currently open
HW Valve Pos=	-	INACTIVE ACTIVE	HW Valve Pos is a status only item which indicates the condition of the two position hot water valve output.
Htg Stg 1 =	-	INACTIVE ACTIVE	Htg Stg 1 is a status only item which indicates the condition of the electric heat stage 1 output.
Htg Stg 2 =	-	INACTIVE ACTIVE	Htg Stg 2 is a status only item which indicates the condition of the electric heat stage 2 output.
Htg Stg 3 =	-	INACTIVE ACTIVE	Htg Stg 3 is a status only item which indicates the condition of the electric heat stage 3 output.
Htg Stg 4 =	-	INACTIVE ACTIVE	Htg Stg 4 is a status only item which indicates the condition of the electric heat stage 4 output.
SCR Output=	-	0-100%	SCR Output is a status only item which indicates the current capacity of the SCR electric heater.
Occ Htg Spt=	70.0 °F	0.0-100.0 °F	Occ Htg Spt is an adjustable item which affects the temperature at which the unit will go into the heating mode of operation.
Occ Diff=	1 °F	1-5 °F	Occ Diff is an adjustable item which affects the temperature at which the unit will exit the cooling or heating mode of operation when Occupancy is occupied, bypass, or standby. This value will be subtracted from the cooling setpoint or added to the heating setpoint to determine when to exit the mode.
Disch Air=	-	-40F to 212 °F	Disch Air is a status only item which displays the current temperature reading from the unit's discharge air temperature sensor (DAT).
DAT Htg Spt=	80 °F	75-120 °F	DAT Htg Spt is an adjustable item which sets the temperature that the DAT should be maintained at when it is in the heating mode of operation. This point is only available on units that use discharge air temperature control.
Vlv Htg DB=	1.0 °F	1.0-10.0 °F	Vlv Htg DB is an adjustable item which sets a dead band around the DAT Htg Spt parameter. For example, if the DAT Htg Spt parameter is set to 80°F and the Vlv Htg DB parameter is set to 1°F the dead band around the setpoint would be from 80.5°F to 79.5°F.

Menu Display Name	Default	Range	Description
EI Htg DB=	1.0 °F	1.0-10.0 °F	EI Htg DB is an adjustable item which sets a dead band around the DAT Htg Spt parameter. For example, if the DAT Htg Spt parameter is set to 80°F and the EI Htg DB parameter is set to 1°F the dead band around the setpoint would be from 80.5°F to 79.5°F.
EffSpaceT=	-	-40-212 °F	EffSpaceT is a status only item which displays the current space temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the integrated thermostat.
Return Temp=	-	-40-212 °F	Return Air is a status only item which displays the current temperature reading from the unit's return air temperature sensor (RAT).
Unocc Htg Spt=	60 °F	50-95 °F	Unocc Htg Spt is an adjustable item which sets the control temperature below which the unit starts up and provides unoccupied heating (night setup) during unoccupied periods.
Unocc Diff=	2 °F	0-10 °F	Unocc Diff is an adjustable item which affects the temperature at which the unit will exit the cooling or heating mode of operation when Occupancy is unoccupied. This value will be subtracted from the cooling setpoint or added to the heating setpoint to determine when to exit the mode.
StdBy Hlg Spt=	66.0 °F	50 to 95 °F	Stdby Hlg Spt is a status only item which indicates the temperature in which the unit will go into the heating mode of operation in the standby occupancy state. Once a valid password has been entered this item becomes an adjustable item.
Htg Stg Time=	0 Seconds	0-600 Seconds	Htg Stg Time is an adjustable item which sets the minimum amount of time between bringing on/off stages of heating.
Htg Stg Timer=	0 Seconds	0-600 Seconds	Htg Stg Timer is a status only item which displays the amount of time remaining before the heating stage timer expires.
OA Temp=	-	-40-212 °F	OA Temp is a status only item which displays the current temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the outdoor air temperature sensor.

## OA Damper Set-Up

**Table 14: Main Menu \ Commission Unit \ OA Damper Set-Up**

Menu Display Name	Default	Range	Description
OAD Positon=	-	0-100%	OAD Position is a status only item which displays the current OAD position.
Min OA Pos=	20%	0-100%	Min OA Pos is an adjustable item which indicates the minimum position of the outdoor damper while the fan is running. The actual OAD damper position will vary between this value and the Max OA Pos depending on economizer and DCV requirements.
Max OA Pos=	100%	0-100%	Max OA Pos is an adjustable item which indicates the maximum position of the outdoor damper while the fan is running. The actual OAD damper position will vary between this value and the Min OA Pos depending on economizer and DCV requirements.



## Econo Set-Up Menu

**Table 15: Main Menu \ Commission Unit \ Econo Set-Up Menu**

Menu Display Name	Default	Range	Description
Control Temp=	-	-40-212 °F	Control Temp is a status only item which displays the current value of the "Control Temperature." The "Control Temperature" is defined as the temperature input selected by the Control Temperature Source parameter.
Occ Clg Spt=	75 °F	50 to 95 °F	Occ Clg Spt is an adjustable item which affects the temperature at which the unit will go into the cooling mode of operation.
Occ Diff=	1 °F	1-5 °F	Occ Diff is an adjustable item which affects the temperature at which the unit will exit the cooling or heating mode of operation when Occupancy is occupied, bypass, or standby. This value will be subtracted from the cooling setpoint or added to the heating setpoint to determine when to exit the mode.
Disch Air=	-	-40 to 212 °F	Disch Air is a status only item which displays the current temperature reading from the unit's discharge air temperature sensor (DAT).
EffSpaceT=	-	-40-212 °F	EffSpaceT is a status only item which displays the current space temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the integrated thermostat.
Return Temp=	-	-40-212 °F	Return Air is a status only item which displays the current temperature reading from the unit's optional return air temperature sensor (RAT).
OA Temp=	-	-40-212 °F	OA Temp is a status only item which displays the current temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the outdoor air temperature sensor.
Max OAT Lmt=	75.0 °F	50.0-100.0 °F	Max OAT Lmt is an adjustable item which sets the maximum outdoor air temperature for the applicable climate zone above which economizer should not be enabled.
Min OAT Lmt=	70.0 °F	50.0-100.0 °F	Min OAT Lmt is an adjustable item which sets the minimum outdoor air temperature for the applicable climate zone below which economizer should be enabled.
Cal State=	-	NoCAL	Cal State is a status only item which indicates the results of calibration process.
		Cal	
		Pass	
		Fail	
Calibrate OAD=	NO	NO	Calibrate OAD is an adjustable item used to initiate the calibration function that captures the command position at which the outdoor damper position end switches open and close at the closed and open ends of the damper modulation range.
		YES	
Pos Sw Open=	100%	0-100%	PosSwOpen is an item that indicates the captured command position at which the outdoor damper position end switch closes at the open end of the damper modulation range. This parameter can also be manually adjusted.
Max Sw Diff=	1%	0-50%	Max Sw Diff is an item that indicates the captured switch differential at the open (maximum) end of the damper modulation. This parameter can also be manually adjusted.
Pos Sw Close=	0%	0-100%	PosSwClose is an item that indicates the captured command position at which the outdoor damper position end switch closes at the closed end of the damper modulation range. This parameter can also be manually adjusted.
Min Sw Diff=	1%	0-50%	Min SW Diff is an item that indicates the captured switch differential at the closed (minimum) end of the damper modulation. This parameter can also be manually adjusted.



Menu Display Name	Default	Range	Description
OAD Sw Status=	-	OPEN	OAD Sw Status is a status only item that indicates the current condition of the damper end switch position input (Open/Closed).
		CLOSED	
Calibration Status=	OFF	OFF	Calibration Status is a status only item that indicates the current step of the OAD end switch calibration process.
		INCR_OPEN	
		DECR_CLOSE	
		INCR_OPEN_DIFF INCR_100PCT	
		DECR_OPEN	
		INCR_CLOSED	
		DECR_OPEN_ DIFF	
DECR_0PCT			
OAD Position Cal=	-	0-100%	OAD Position Cal is a status only item that indicates the OA damper position being commanded as part of the end switch calibration process.
Econ Src=	NONE	NONE	Econ Src is an adjustable item which sets the strategy that will be used to determine if the outdoor air is suitable for economizing.
		OAT	
		ENTHALPY_OUT	
		TEMP_DIFF	
		ENTHALPY_DIFF	
OARelHum=	-	0-100%	OARelHum is a status only item which indicates the current outdoor relative humidity value being used by the controller. This will be the network supplied relative humidity if available or the input from the outdoor relative humidity sensor.
OAEnthalpy=	-	-200 to 200 BTU/lb	OAEnthalpy is a status only item which indicates the current calculated space enthalpy.
RARelHum=	-	0-100%	RARelHum is a status only item which indicates the current outdoor relative humidity value being used by the controller. This will be the network supplied relative humidity if available or the input from the return relative humidity sensor.
SpaceDwpnt=	-	0-100 °F	SpaceDwPnt is a status only item which indicates the current calculated space dewpoint.
SpaceRel Hum=	-	0-100%	RARelHum is a status only item which indicates the current outdoor relative humidity value being used by the controller. This will be the network supplied relative humidity if available or the input from the return relative humidity sensor.
SpaceEnthalpy=	-	-200 to 200 BTU/lb	SpaceEnthalpy is a status only item which indicates the current calculated space enthalpy.

## Air Filter Set-Up

**Table 16: Main Menu \ Commission Unit \ Air Filter Set-Up**

Menu Display Name	Default	Range	
Filter Chg Strategy=	NONE	NONE	Filter Chg Strategy is an adjustable item which selects if and when a dirty filter warning will be indicated.
		RUNTIME	
		BINARY_INPUT	
		BOTH	
Filter Chg Time=	1440 Hours	360 – 4320 Hours	Filter Chg Time is an adjustable item which sets the incremental supply fan run hours that must occur before a dirty filter warning will be indicated when the Filter Chg Strategy is BINARY_INPUT or BOTH.
Filter Chg Sig=	NORM_CLOSED	NORM_OPEN	Filter Chg Sig is an adjustable item which selects if the dirty filter binary input is expecting a normally open, or normally closed signal. If nothing is wired to the binary input and NORM_OPEN is selected, this feature is effectively disabled.
		NORM_CLOSED	
Filter Chg Status=	-	OPEN	Filter Chg Status is a status only item that indicates the current condition of the dirty filter switch input.
		CLOSED	
Filter Status=	-	GOOD	Filter Status is a status only item that indicates the current calculated condition of the air filter based on the Filter Chg Strategy parameter criteria.
		DIRTY	

# View Status

## Scheduling

The unit can be scheduled for operation by using the following three methods:

- Unit internal time scheduling functions
- External time clock function
- Network time scheduling function

Provided the unit is not locally or remotely disabled, the unit operates when any of these scheduling functions is calling for occupied operation. Conversely, the unit enters the unoccupied mode when all of these scheduling functions are calling for unoccupied operation. Therefore, any unused scheduling functions should be set for continuous unoccupied operation.

The next four sections: "Date and Time," "Internal Daily Scheduling," "Holiday Scheduling," and "One Event Scheduling" describe functions related to the internal unit scheduling functions. These are followed by a section describing the optimal start function which can be used with internal scheduling and network scheduling. This is followed by two sections that describe the external time scheduling and network time scheduling functions.

## Date and Time

The controller uses the Date and Time to execute its internal scheduling functions. The current Time and Date will not be lost if the unit is turned off for up to forty-eight hours. The Time and Date are set from the keypad. The Time of day can be set by entering the hour (00-23), minute (00-59), and second (00-59) into three fields of the Current Time. Note that Micro Tech 4 Lite uses "military" time. The current Date can be set by entering the day (00-31), month (01- 12) and year (1999-2155) into the three fields of the Current Date.

## Internal Daily Scheduling

An Internal Daily Schedule provides one start time and one stop time for each of the seven days of the week and for holidays. When the Occ Mode= parameter is set to "Auto/Net", and the unit is not disabled for other reasons, it starts and stops according to the controller internal schedule.

## Holiday Scheduling

The operator may select the days when start and stop times for holidays are used by selecting a start date and an end date for up to ten periods during the year using the Holiday Scheduling feature. Whenever a holiday period occurs, the controller uses the Holiday Schedule start and stop time for the period. For example, assume that Christmas Eve occurs on a Thursday. The building is shut down on both Christmas Eve and Christmas Day, but operates normally on the weekend. This holiday period would be scheduled by setting the Holiday Schedule to the default "no schedule" values "HH:MM-HH:MM" and setting the Holiday Period to "12/24/19 - 12/25/19

## One Event Scheduling

One Event Scheduling is provided so that the operating period for a unique day can be scheduled without affecting the regular internal daily and holiday schedules. A start date/time and an end date/time can be set. The unit can be scheduled to operate during a specified period by using this feature. During the day's period defined by the One Event Beginning Date and One Event Ending Date parameters, the unit starts up and runs continuously from the time period defined by the One Event Beginning Time until the One Event Ending Time, regardless of internal daily or holiday schedules.

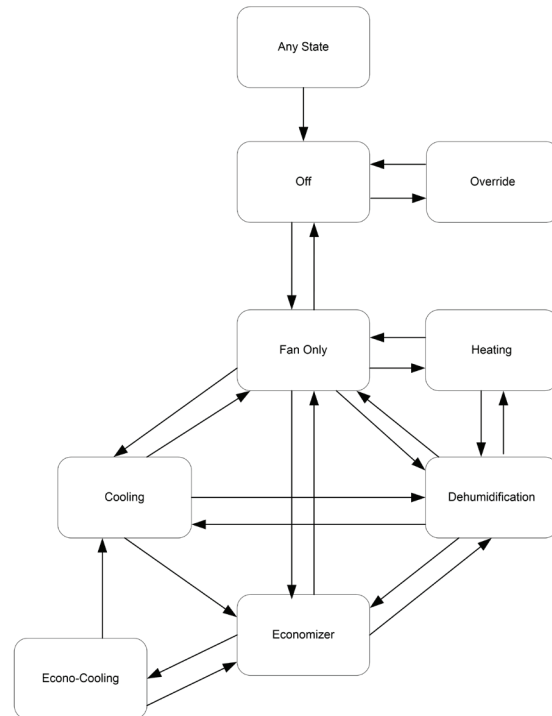
## Unit State

The Unit State can operate in one of seven operational states based on the control temperature source, (Ctrl Temp Src), selected in the HtgClg ChngOvr set up menu, a sensor will drive the unit into the correct state of the states - Heating, Cooling, Economizer, Econo-Cooling, Dehumidification, and Fan Only.

The current state will be displayed by the Unit State parameter in the Main Menu/Quick Menu, or the Main Menu/ViewStatus/Unit Status/Settings Menu

Neither heating or cooling is provided when the unit is in the Fan Only state.

Figure 14: Unit State Diagram



## Off

In the OFF operating state the fans are off, the outsider air dampers are closed and cooling and heating are disabled. The unit is in the OFF state when it is not enabled, or when it is in unoccupied mode with no call for unoccupied operation.

## Fan Only

The unit enters the Fan Only operating state after power up and anytime there is no requirement for heating, cooling, or dehumidification. The outdoor air dampers are open to the minimum position in this state. Based on the control temperature source (Ctrl Temp Src), selected in the HtgClg ChngOvr set up menu, a sensor will drive the unit into one of the states - Heating, Cooling, Economizer, Econo-Cooling, Dehumidification, and Fan Only.

## Cooling

The unit enters the Cooling operating state when cooling is required and the economizer is disabled, not present, or already fully open. Cooling operation can be mechanical DX compressors or chilled water coils.

- The transition to cooling will occur when the following are true:
  - The control temperature rises above the active cooling setpoint. The unit will exit the cooling state when the control temperature falls below the active cooling setpoint minus the occupied/unoccupied off differential.
  - The economizer operation is disabled or not present.

## Economizer

If the unit is equipped with a 0-100% modulating Economizer and the conditions are suitable for free cooling, the unit attempts to satisfy the cooling load by using outdoor air before using mechanical cooling. Suitability for Economizer operation is determined by drybulb, comparative drybulb, or comparative energy/enthalpy. See "Economizer" on page 48 for details.

- The transition to Economizer will occur when the following are true:
  - The control temperature rises above the active cooling setpoint. The unit will exit the economizer state when the control temperature falls below the active cooling setpoint minus the occupied/unoccupied off differential or if the economizer is disabled.
  - The economizer operation is not disabled
- Dehumidification: When a unit is operating in dehumidification, dehumidification must finish operation and transition to cooling before the unit will enter economizer

## Dehumidification

Dehumidification is activated based on a selectable humidity or dewpoint sensor input.

## Heating

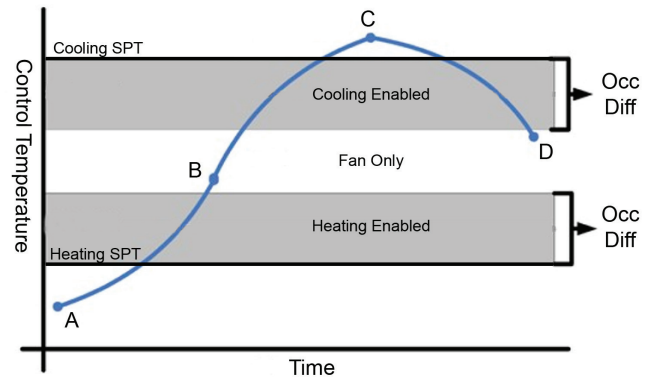
The unit enters the Heating operating state when the control temperature falls below the Occupied or Unoccupied Heating Setpoint. During the Heating operating state, the outdoor air dampers are controlled to the minimum outside air position.

## Heating/Cooling Changeover

### Control Temperature Source

When the control temperature is below the Occupied, Standby, or Unoccupied Heating Setpoint (point A), heating operation is enabled. Heating operation then remains enabled until the control temperature begins to rise and rises above the Occupied, Standby, or Unoccupied Heating Setpoint by more than the occupied off differential (for occupied/standby mode) or unoccupied off differential (for unoccupied mode) (point B), at which point heating operation is disabled and the unit enters the fan only operating state. If the control temperature rises above the Occupied, Standby, or Unoccupied Cooling Setpoint (point C) cooling operation is enabled. Cooling operation remains enabled until the control temperature begins to fall below the Occupied, Standby, or Unoccupied Cooling Setpoint by more than the occupied off differential (for occupied/standby mode) or unoccupied off differential (for unoccupied mode) (point D), at which point the unit returns or fan only operating state.

Figure 15: Heating/Cooling Control Temperature



The "Control Temperature" is defined as the unit temperature input used to make the heat/cool changeover decision. This determines whether or not cooling or heating is enabled. The Control Temperature Source (Cntrl Temp Src) can be selected as Space, RAT, or Average (which will use an average of the space and return air temperature values). The control temperature source selected will vary by application and temperature control configuration.

## Space Setpoint Adjustment

The user has the option of using a space mounted remote sensor with setpoint adjustment functionality to control the setpoint of the space being controlled. See "Remote Integrated Thermostat Operation" on page 21 for more information.

## Supply Air Fan

### Supply Air Fan Operation

**NOTE:** For information on configuration, refer to [page 23](#).  
For information on advanced setup, refer to [page 67](#).

The standard supply fans will be controlled using a single 0-10VDC analog capacity output.

The supply fans will control between an adjustable minimum and maximum fan capacity. The range is adjustable from 0-100%.

The supply fan will always be running before heating or cooling is activated.

If the unit is configured for electric heat, the fan will remain on for a minimum 30 seconds after all electric heat outputs have been de-energized.

If the unit is configured for an optional Airflow Proving Switch digital input, after the fan has been commanded to operate and Air Flow Startup Delay timer has expired, the controller will monitor the input. If the input indicates that the fan is not operating for 30 consecutive seconds the unit will go into an alarm state and shutdown.

When the unit is in unoccupied mode, the fan will be off when there's no demand, and the fan will cycle on with demand when operation is required.

### Supply Air Fan Control Types

#### **Constant Speed**

When fan operation is required, the supply fan 0-10VDC output will drive the fan to run at scaled % output set by the end user. If the unit is configured to support dehumidification, when dehumidification is required, the supply fan 0-10VDC output will drive the fan to run at scaled % output for the Supply Fan Dehumidification Speed Setpoint set by the user.

#### **Single Zone VAV Control(1ZnVAV)**

Single Zone VAV control operates the unit as a single VAV box. The cooling and heating are controlled to maintain a discharge air temperature setpoint and the supply fan is modulated to maintain the appropriate space temperature setpoint.

### **Duct Pressure Control (DSP)**

Duct pressure control operates the unit to maintain the supply duct conditions. The cooling is controlled to maintain a discharge air temperature setpoint and the supply fan is modulated to maintain a supply duct static pressure setpoint. The duct pressure setpoint can be adjusted at the unit controller interface or via a network input signal.

Using the Fan Cycling Configuration, the supply fan can be configured to be always on when in the occupied state or to cycle on/off with demand. If Fan Cycling Configuration is set to "On" and the unit is in the occupied mode, the fan will be at the Supply Fan Minimum Speed when there is no heating or cooling demand.

When fan operation is required, the Zone Damper Output will first be energized and the DSP Startup Delay timer will begin to count down. The supply fan will not be allowed to run until the DSP Startup Delay Timer has expired. When fan operation is required, the fan will initially run at minimum speed for the duration of the DSP Control Delay timer. The supply fan output will be controlled by a field adjustable control loop monitoring the Duct Static Pressure input to maintain it at the Duct Static Pressure Setpoint.

## Exhaust Fan

**NOTE:** For information on configuration, refer to [page 24](#).  
For information on advanced setup, refer to [page 67](#).

Units have the option of being equipped with one or more exhaust fans. When equipped, each exhaust fan will be controlled by a single 0-10VDC analog capacity value. The exhaust fan will be controlled between adjustable minimum and maximum fan capacity.

### Exhaust Fan Control Types

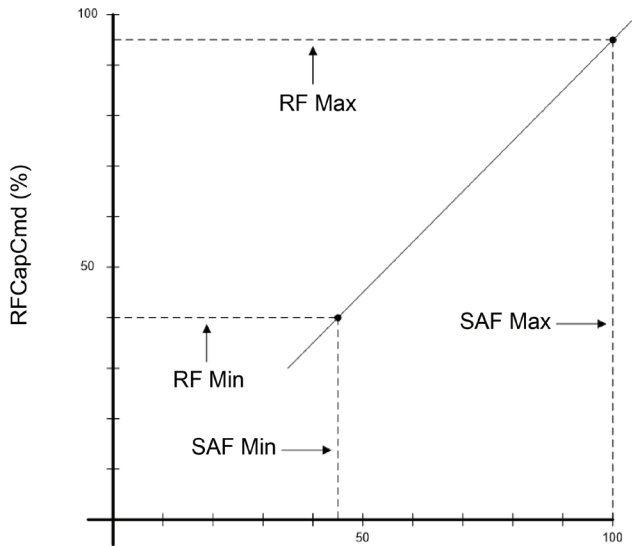
#### **Constant Speed**

When the Exhaust Fan Control is set to Constant Speed, the exhaust fan will be controlled to the Exhaust Fan Constant Speed Setpoint.

#### **Fan Tracking Control (Tracking)**

When the Exhaust Fan Control is set to Tracking the exhaust fan capacity is varied to maintain an adjustable offset between the Exhaust Fan capacity and the Supply Fan capacity. The user specifies the offset at maximum and maximum supply fan capacity and the Exhaust Fan controls linearly between the two points.

Figure 16: Exhaust Fan Tracking



The field process for setting these parameters will be as follows:

1. With the unit running and the outdoor air dampers at minimum position (in Fan Only State for example), the VAV box system will be manipulated to simulate a call for maximum airflow.
2. The supply air fan will be allowed to stabilize (normally under DSP control) and the Supply Fan Maximum Speed parameter will be set to the steady-state SAF Capacity value.
3. The Exhaust Fan at Supply Fan Max value will then be adjusted until the desired building pressure is obtained (usually slightly positive).
4. The VAV Box system will then be manipulated to simulate call for minimum airflow.
5. The supply air fan will be allowed to stabilize (normally under DSP control) and the Supply Fan Maximum Speed Parameter will be set to the steady-state SAF Capacity value.
6. The Exhaust Fan at Supply Fan Minimum Value will be adjusted until the desired building pressure is obtained (generally slightly positive).

**NOTE:** Ideally the minimum and maximum conditions should be checked with the outdoor dampers at minimum and maximum positions to assure there are not significantly different requirements depending on the outdoor damper position. If the differences are significant then the parameters may be manually adjusted to compromise between the two conditions. If the differences are too great, it may be necessary to change to building pressure RAF/EAF control for the application.

**NOTE:** Setting the minimum and maximum tracking points will not necessarily establish minimum and maximum SAF modulation ranges, but rather simply establishes the slope of the tracking curve. The curve line will be projected up to effective max SAF capacity and down to the effective minimum SAF capacity.

### Network Control

The Network Exhaust Fan Enable Input can be used by a building management system to enable/disable the exhaust fan.

### Outdoor Air Damper Control (OAD)

When the unit is equipped with a exhaust fan, the Exhaust Fan Min Damper Position parameter can be used to disable exhaust fan operation when the OA damper position is below the Exhaust Fan Min Damper Position value.



## Cooling

### Staged Compressors

In units equipped with staged compressors that are configured for Constant Speed supply fan control, the compressors stage on and off to maintain the control temperature (Space, RAT, or an average of the two). The control temperature being maintained is the occupied or unoccupied cooling setpoint.

When Compressor Stages is 1, when cooling is required, the compressor 1 output will be energized. If Compressor Stages is 2, the compressor 2 output will be energized when the control temperature reaches the active cooling setpoint plus the compressor cooling differential. If the Compressor 2 output is energized and the control temperature falls below the active cooling setpoint + Compressor Cooling Differential – Unoccupied Off Differential, then Compressor 2 output will de-energize.

When Compressor Stages is 4, the controller will use a PI control to stage the 4 compressor stages.

If the Supply Fan Control is "Constant Speed", the PI loop will stage to control to space temperature. If the Supply Fan Control is "Duct Static Pressure" or "Single Zone VAV" the PI loop will stage to control discharge air temperature to the Cooling Discharge Air Temperature Setpoint.

The compressor outputs Compressor 1, Compressor 2, Compressor 3, and Compressor 4 each represent 25% of the heating capacity.

- When cooling output is >0% Compressor 1 will be energized and it will be de-energized when the cooling output is 0%.
- When cooling output is >25% Compressor 2 will be energized and it will be de-energized when the cooling output is 20%.
- When cooling output is >50% Compressor 3 will be energized and it will be de-energized when the cooling output is 45%.
- When cooling output is >75% Compressor 4 will be energized and it will be de-energized when the cooling output is 70%.

For all compressor configurations, when mechanical cooling is no longer required, it will be de-energized. Additionally, when a stage of cooling is de-energized, the interstage timer will start and the next stage of cooling will not be brought on/off until the interstage timer expires.

### Minimum Compressor On/Off Time

When the Compressor Minimum On/Off Configuration is Enabled, the MicroTech 4 Lite controller will use minimum On and Off timers when staging the compressor outputs. When a compressor is turned off, it must remain off for the duration of the Compressor Minimum Off Time. When a compressor is turned on, it must remain on for the duration of the Compressor Minimum On Time. If the Compressor Minimum On/Off Configuration is disabled, the Compressor Minimum On Time and Compressor Minimum Off Time will not be used when turning on and off any compressor outputs.

After initial power up of the controller, clearing of a fault, or transition from Unoccupied, all compressors must remain off for the duration of the Compressor Minimum Off Time plus a randomly generated value of up to 60 additional seconds. This prevents multiple units from turning on compressors at the same time when power is applied.

### Lead Compressor Selection

If Lead Compressor Configuration is Run Hours, when a compressor is needed to satisfy the cooling requirement, the controller will bring on the compressor with the lowest total runtime. If Lead Compressor Configuration is Compressor 1, when a compressor is needed to satisfy the cooling requirement, the controller will bring on the compressors in numerical order. Compressors will be turned off in the reverse order that they were turned on.

## Valve Control

### Two-Position Chilled Water Valve

In units equipped with a two-position chilled water valve, when cooling is required, the chilled water valve will be open. When cooling is no longer required the chilled water valve will be closed.

### Modulating Chilled Water Valve

In units equipped with a modulating chilled water valve, the controller will use PI control to modulate the valve open and closed.

If the Supply Fan Control is "Constant Speed", the PI loop will modulate to control to space temperature. If the Supply Fan Control is "Duct Static Pressure" or "Single Zone VAV" the PI loop will modulate to control discharge air temperature to the Cooling Discharge Air Temperature Setpoint.



## Heating

### Heating Operation

A unit may be configured with one of several optional types of primary Heating: Hot Water, Steam, or Electric Heat. The options will either be staged or modulating controlled. The unit enters the Heating operating state from the Fan Only operating state when the control temperature falls below the Occupied or Unoccupied Heating Setpoint. The unit transitions from the Heating to Fan Only operating state when the control temperature rises above the Occupied or Unoccupied Heating Set Point plus the Occupied or Unoccupied Off Differential.

### **Single Stage Electric Heat / Two-Position ON/OFF Hot Water Valve**

When heating is active, the Electric Heat will be On or the hot water valve will be open. Electric Heat staging is subject to the Heating Interstage Timer. When heating is no longer required, the electric heat will be Off or the hot water valve will be closed.

### **Four Stage Electric Heat**

The electric heat outputs will each represent 25% for the heating capacity.

- When heating output is >0% Heat Stage-1 will be energized and it will be de-energized when the heating output is 0%.
- When heating output is >25% Heat Stage-2 will be energized and it will be de-energized when the heating output is 20%.
- When heating output is >50% Heat Stage-3 will be energized and it will be de-energized when the heating output is 45%.
- When heating output is >75% Heat Stage-4 will be energized and it will be de-energized when the heating output is 70%.

Electric heat staging is subject to the Heating Interstage Timer.

- Constant Air Volume Fan Control:  
When the unit enters the Heating Operating state the heating outputs will be controlled based on comparing the Control Temperature to the Active Heating setpoint for the space.
- Duct Static Pressure and Single Zone VAV Fan Control:  
When the unit enters the Heating Operating state the heating outputs will be controlled based on comparing the Discharge Air Temperature to the Heating Discharge Air Temperature Setpoint.

### **SCR Electric Heat / Modulating Hot Water Valve**

In units equipped with a SCR electric heat or a modulating chilled water valve, the controller will use PI control to increase or decrease the electric heat output or modulate the valve open and closed.

- Constant Air Volume Fan Control:  
When the unit enters the Heating Operating state the heating outputs will be controlled based on comparing the Control Temperature to the Active Heating setpoint for the space.
- Duct Static Pressure and Single Zone VAV Fan Control:  
When the unit enters the Heating Operating state the heating outputs will be controlled based on comparing the Discharge Air Temperature to the Heating Discharge Air Temperature Setpoint.

## Dehumidification

Dehumidification is an operating mode that is only allowed when the unit is in the Fan Only state. When in dehumidification mode, the unit is not allowed to operate in the Economizer state. Mechanical cooling will be used to lower the air temperature enough to wring out moisture and subsequently reheat will be used to raise it back up to achieve the unit discharge air temperature requirements. Reheat types can be Hot Water or Electric Heat. Dehumidification is only available on units with a reheat coil that are equipped with space humidity, discharge air temperature, and (when necessary) leaving coil temperature sensors.

If there is a call for heating or cooling the unit will exit the dehumidification mode.

When in the dehumidification mode, if all heating outputs are at maximum and the discharge air temperature is below the Dehumidification Discharge Air Temperature setpoint minus 3°F, the unit will leave the dehumidification state for a minimum of 5 minutes. When in the dehumidification mode, if the control temperature drops below the Occupied Heating setpoint (regardless of heating configuration) the unit will exit the dehumidification state.

### **Passive Dehumidification**

Passive dehumidification can be field-enabled on constant air volume units with space humidity sensors, but without reheat coils. Passive dehumidification can be used to reduce the supply fan speed when the unit is cooling and the space humidity is above the dehumidification setpoint.

## Dehumidification Initiation

Dehumidification operation is available in the Fan Only unit state, and is initiated by a humidity sensor that is mounted in the space to sense relative humidity. The unit may be set up to dehumidify based on relative humidity or dewpoint. Humidity sensors are configured in the Dehumidification Set-Up menu.

- **Relative Humidity:**  
When configured for relative humidity, the basis of dehumidification will be determined by the measured relative humidity.
- **Dewpoint:**  
When configured for dewpoint, the basis of dehumidification will be determined by the calculated space dewpoint.

## Dehumidification Operation

### **Single Compressor**

When dehumidification is active the Compressor-1 output will be energized. Reheat will be controlled as described in the Reheat Control section.

### **Two or Four Compressors**

When dehumidification is active the Compressor-1 and Compressor-2 outputs will be staged on and off to maintain the leaving coil temperature setpoint, subject to compressor minimum ON/OFF times and the cooling interstage time. The Compressor-3 and Compressor-4 outputs will not be used. Reheat will be controlled as described in the Reheat Control section.

### **Two-Position ON/OFF Chilled Water Valve**

When dehumidification is active the two-position Chilled Water Valve will be open. Reheat will be controlled as described in the Reheat Control section.

### **Modulating Chilled Water Valve**

When dehumidification is active the Chilled Water Valve will be modulated open or closed to maintain the leaving coil temperature setpoint. Reheat will be controlled as described in the Reheat Control section.

## Reheat Control

### **Single Stage Electric Heat / Two-Position ON/OFF Hot Water Valve**

When dehumidification is active the Electric Heat will be on or the Hot Water Valve will be open when the discharge air temperature is below the Dehumidification Discharge Air Temperature Setpoint. The Electric Heat will be de-energized or the Hot Water Valve will be closed when the discharge air temperature is above the Dehumidification Discharge Air Temperature setpoint plus a 5°F differential. Electric heat staging is subject to the the Heating Interstage Timer.

### **Four Stage / SCR / Modulating Valve**

When dehumidification is active the Electric Heat/Valve outputs will be used to maintain the Dehumidification Discharge Air Temperature setpoint. Electric Heat staging is subject the the Heating Interstage Timer.

## Changeover Valve

### Two-Position Chilled Water Valve

In units equipped with a two-position changeover valve, when cooling or heating is required, the changeover valve will be open. The face and bypass damper will be modulated to control the discharge air temperature. When cooling or heating is no longer required, the changeover valve will be closed.

### Modulating Changeover Valve

In units equipped with a modulating changeover valve, the controller will use PI control to modulate the valve open and closed.

If the Supply Fan Control is "Constant Speed", the PI loop will modulate to control to space temperature. If the Supply Fan Control is "Duct Static Pressure" or "Single Zone VAV" the PI loop will modulate to control discharge air temperature to the Cooling/Heating Discharge Air Temperature Setpoint.

### Entering Water Temperature Sampling

In units equipped with a modulating changeover valve, when there is a call for heating or cooling, the valve will open (20% if modulating and 100% if two-position) and the Entering Water Sample Timer will begin to count down. The controller will monitor the entering water temperature to determine if the water is adequate for heating or cooling. If the Entering Water Sample Timer expires and the water temperature is not deemed adequate for the mode of operation, the changeover valve will close and a notification will be provided to the BAS and at the local keypad. If the desired mode of operation is heating, electric heat will be used if it is available. That mode of operation will be locked out for the duration of the Entering Water Retry Timer. The entering water will be deemed adequate if the Entering Water Temperature is greater than the Control Temperature + Entering Water Temperature Differential for heating or if the Entering Water Temperature is less than the Control Temperature - Entering Water Temperature Differential for cooling.

### Freezestat

When a unit is equipped with chilled water, hot water, or steam coil, a freeze problem occurs when the optional Freezestat contacts open as a result of detecting an abnormally low water or steam coil temperature.

When the freeze problem occurs, the controller opens the chilled water and heating valves. If the freezestat contacts are closed, the valves return to normal operation.

## Outside Air Damper

### Outside Air Damper Operation

Units may be configured with a two-position Outdoor Air (OA) Damper or a 0-100% OA Economizer. During occupied normal operation, units with a 0-100% OA economizer damper control to a minimum outdoor air position, which is a fixed value or optionally determined by space CO<sub>2</sub>.

### Two-Position Outside Air Damper Operation

Two-position actuators are controlled by an analog output so the OA damper is driven to 100% open position when the OA damper analog output is at its maximum value, and it is driven closed when the OA damper analog output is at its minimum value. Units equipped with a two-position OA damper open when the fan is running and close when it is not running. The damper will be closed when the fan is running in the standby/unoccupied modes.

### 0-100% Outside Air Economizer Operation

A 0-100% outdoor air economizer damper is controlled by a modulating analog output. This actuator is driven to its fully open position - nominally 100%, when the OA damper analog output is at its maximum value, and it is closed when the OA damper analog output is at its minimum value. The desired minimum open position between 0 and 100% is normally set by an editable keypad menu item (Min OA Pos). The modulating damper is driven to the closed position when the supply fan is OFF. The modulating damper is driven to the desired minimum open position when the fan is running and the economizer is not required. Control of the dampers in the Economizer state is described "Economizer" on page 48.

### Closed Operation

In the occupied mode in the Off unit state the OA damper position is always closed. In the unoccupied mode the outdoor air damper is always closed, and in standby mode the damper is closed unless overridden by DCV or Economizer functionality.

### Minimum Outside Air Damper Control

When a unit is equipped with a modulating economizer damper the effective minimum OA position is set to a fixed value.

For units equipped with an optional space CO<sub>2</sub> sensor for demand-controlled ventilation (DCV), this minimum position will be automatically adjusted based on comparing the space CO<sub>2</sub> levels to a CO<sub>2</sub> setpoint.

The damper will be at minimum position when the CO<sub>2</sub> level is at or below the MinOACO<sub>2</sub> value, and the damper will be at maximum position when the CO<sub>2</sub> level is at or above the MaxOACO<sub>2</sub> value.

## Economizer Control

### Economizer Operation

If a unit is equipped with a 0-100% Outside Air Economizer, and the outdoor air is suitable for free cooling, the unit attempts to satisfy the cooling load by using the outdoor air before using mechanical cooling. If the control temperature is above the Occupied Cooling Setpoint and the outdoor air is suitable for free cooling, the unit will enter the Econo State.

The transition from the Econo to Econo-Cool operating state occurs when the economizer is unable to satisfy the cooling load and mechanical cooling is available. This will occur if the unit has been in the Econo operating state for longer than the economizer interstage timer.

The economizer changeover method will be preprogrammed based on the sensors shipped with the unit, but may need to be reconfigured in the field to match the desired sequence of operations.

### Fixed Drybulb Economizer

All units equipped with a Fixed Drybulb Economizer can be configured to determine if the outdoor air is suitable for free cooling by using a single, fixed outdoor air drybulb setpoint. When the outdoor air temperature is below this setpoint, the economizer is available.

### Comparative Drybulb Economizer

Units equipped with a Comparative Drybulb Economizer determine the outdoor air is suitable for free cooling by comparing the control temperature with the outdoor air temperature.

### Fixed Outdoor Enthalpy Economizer

Units equipped with a Fixed Outdoor Enthalpy Economizer can be configured to determine if the outdoor air is suitable for free cooling by using a single, fixed outdoor air enthalpy setpoint. When the outdoor air enthalpy is below this setpoint, the economizer is available.

## Comparative Energy/Enthalpy Economizer

Units equipped with a Comparative Energy Economizer determines if the outdoor air is suitable for free cooling by comparing the energy enthalpy of the outdoor air and the control enthalpy. If the IA enthalpy is less than the OA enthalpy (minus the differential setpoint) the economizer is available.

### OA Temperature Lockout

Units with the optional OA Temperature Lockout enabled, the OA damper will be closed when the OA temperature drops below the OAT Lockout setpoint.

## Economizer Fault Detection Diagnostics

The economizer fault detection and diagnostics function provides a warning alarm indication of over economizing, under economizing, stuck dampers and excess outdoor air.

## Return Air Damper Operation (Unit Sizes 060-100)

On units with a separate dedicated return air damper actuator (sizes 060-100), return air damper output will vary between the return air damper minimum position value and the return air damper maximum position value directly proportional to the OA damper output as it varies between the OA damper minimum position value and the OA damper maximum position value.

## Outdoor Air Damper Output Scaling

The signal sent to the outdoor damper actuator to control its position can be scaled based on the calculated outdoor damper position percentage. If the Outdoor Air Damper Output Scaling parameter is set to linear, the output signal will be directly related to the calculated outdoor air damper position percentage. If the Outdoor Air Damper Output Scaling parameter is set to Squared, the output will be scaled to the calculated percentage (%) by the following equation:

$$\text{Outdoor Air Damper Output} = (\text{Calculated } \%^2)/1000$$

## Return Air Damper Output Scaling

The signal sent to the return air damper actuator to control its position can be scaled based on the calculated outdoor damper position percentage. If the Return Air Damper Output Scaling parameter is set to linear, the output signal will be directly related to the calculated outdoor air damper position percentage. If the Return Air Damper Output Scaling parameter is set to Squared, the output will be scaled to the calculated % by the following equation:

$$\text{Outdoor Air Damper Output} = (\text{Calculated } \%^2)/1000$$

## OAD End Switch Calibration

On units equipped with economizer fault detection and diagnostic capabilities, the Outdoor Air Damper (OAD) End Switch input requires calibration function that captures the command position, at which the switches open and close at the closed and open ends of the damper modulation range. This function consists of a manually initiated sequence that strikes the dampers fully open, then fully closed, and detects the changes of state of the switch input and records the points where changes occur. The sequence must be initiated while the Unit State is Off and starting with the end switch input in the closed position.

When the Calibrate OAD parameter is set from No to Yes, the following sequence occurs:

1. The damper command is increased 1% every 2 seconds until the OAD End Switch opens.
2. The damper command is then be decreased 1% every 2 seconds until the OAD End Switch input closes. At this point the current command % is captured.
3. The damper command is increased 1% every 2 seconds until the OAD End Switch input opens. At this point the difference between the current command % and the damper end switch closed value is captured.
4. The damper command is increased and held at 100% until the OAD End Switch input closes.
5. The damper command is decreased 1% every 2 seconds until the OAD End Switch input opens.
6. The damper command is increased 1% every 2 seconds until the OAD End Switch input closes. At this point the current command % is captured.
7. The damper command is decreased 1% every 2 seconds until the OAD End Switch input opens. At this point the difference between the damper open end switch value and the current command % value is captured.
8. The damper command is decreased and held at 0% until the OAD End Switch input closes at which point the values captured in Step 2, Step 3, Step 6, Step 7 are written to the damper end switch open (posSwOpen%). Minimum switch differential (MinSwDiff), damper end switch closed (PosSwClose%) and maximum switch differential (MaxSwDiff) parameters respectively.

Calibrate OAD= parameter is then be set back to No and normal unit operation resumes.

## View Status

**Table 17: Main Menu \ View Status**

Menu Display Name	Default	Range	Description
Unit State=	-	OFF	See "Unit State" on page 32
		HEAT	
		COOL	
		ECONO	
		ECONO_COOL	
		DEHUMID	
		FAN_ONLY	
		OVERRIDE	
Ctrl Mode =	Off	AUTO	Cntrl Mode is an adjustable item which sets the occupancy mode of the unit. The unit can be Heat Only, CoolOnly, Fan Only, Automatic, or Off.
		HEAT	
		COOL	
		FAN_ONLY	
		OFF	
Occ Mode=	Auto	OCCUPIED	Occ Mode is an adjustable item that sets the occupancy mode for manual occupied, standby, and unoccupied operation, or for automatic operation based on a time schedule input, or manual tenant override (bypass) operation.
		UNOCCUPIED	
		BYPASS	
		STANDBY	
		AUTO	
Room Sensor On/Off=	On	ON	Room Sensor On/Off is a status only item that indicates the status of the on/off input from the integrated thermostat.
		OFF	

## Unit Status/Settings

**Table 18: Main Menu \ View Status \ Unit Status\Settings**

Menu Display Name	Default	Range	Description
Unit State=	-	OFF	Unit State is a status only item which indicates the state of unit operation in which the unit is currently operating. The unit can be in any of the operating states shown.
		HEAT	
		COOL	
		ECONO,	
		ECONO_COOL	
		DEHUMID	
		FAN_ONLY	
		OVERRIDE	
Ctrl Mode=	Off	AUTO	Cntrl Mode is an adjustable item which sets the occupancy mode of the unit.
		HEAT	
		COOL	
		FAN_ONLY	
		OFF	
Comp Status=	-	UNAVAIL	Comp Status is a status only item which indicates whether or not compressor cooling is currently allowed.
		AVAIL	
Electric Heat Avail=	-	UNAVAIL	Electric Heat Avail is a status only item which indicates whether or not electric heating is currently allowed.
		AVAIL	



Menu Display Name	Default	Range	Description
Econo Status=	-	UNAVAIL AVAIL	Econo Status is a status only item which indicates whether or not the economizer is currently enabled.
CW Valve Pos=	-	0-100%	CW Valve Pos is a status only item which indicates the percentage that the modulating chilled water valve is currently open.
CW Valve Pos=	-	INACTIVE ACTIVE	CW Valve Pos is a status only item which indicates the condition of the two position chilled water valve output.
Comp Stg 1 =	-	INACTIVE ACTIVE	Comp Stg 1 is a status only item which indicates the condition of the compressor stage 1 output.
Comp Stg 2 =	-	INACTIVE ACTIVE	Comp Stg 2 is a status only item which indicates the condition of the compressor stage 2 output.
Comp Stg 3 =	-	INACTIVE ACTIVE	Comp Stg 3 is a status only item which indicates the condition of the compressor stage 3 output.
Comp Stg 4 =	-	INACTIVE ACTIVE	Comp Stg 4 is a status only item which indicates the condition of the compressor stage 4 output.
HW Valve Pos=	-	0-100%	HW Valve Pos is a status only item which indicates the percentage that the hot water valve is currently open.
SCR Output=	-	0-100%	SCR Output is a status only item which indicates the current capacity of the SCR electric heater.
HW Valve Pos=	-	INACTIVE ACTIVE	HW Valve Pos is a status only item which indicates the condition of the two position hot water valve output.
Htg Stg 1 =	-	INACTIVE ACTIVE	Htg Stg 1 is a status only item which indicates the condition of the electric heat stage 1 output.
Htg Stg 2 =	-	INACTIVE ACTIVE	Htg Stg 2 is a status only item which indicates the condition of the electric heat stage 2 output.
Htg Stg 3 =	-	INACTIVE ACTIVE	Htg Stg 3 is a status only item which indicates the condition of the electric heat stage 3 output.
Htg Stg 4 =	-	INACTIVE ACTIVE	Htg Stg 4 is a status only item which indicates the condition of the electric heat stage 4 output.
SAF Capacity=	-	0-100%	SAF Capacity is a status only item which indicates the current capacity of the supply air fan.
SAF DSP Spt=	-	0-100%	SAF DuctSP Spt is a status only item which indicates the supply fan duct static pressure setpoint. The SAF is modulated with a PI_Loop to maintain this setpoint.
EF Capacity=	-	0-100%	EF Capacity is a status only item indicated the current capacity of the exhaust fans.
OAD Positon=	-	0-100%	OAD/Economizer Cap is a status only item which indicates the percentage that the outdoor air damper is currently open.
OA Rel Hum=	-	0-100%	OA Rel Hum is a status only item that indicates the current outdoor air relative humidity reading.
Space Rel Hum =	-	0-100%	Space Rel Hum is a status only item that indicates the current space relative humidity reading.
Space Dew Point =	-	0-100 °F	Space Dew Point is a status only item that indicates the current calculate space dewpoint.



## Occupancy Menu

**Table 19: Main Menu \ View Status \ Occupancy**

Menu Display Name	Default	Range	Description
Occupancy=	-	Occupied	Occupancy is a status only item that displays the current occupancy status. Occupancy can be one of four values, Occupied, Unoccupied, Bypass and Standby.
		Unocc	
		Bypass	
		Standby	
Occ Mode=	AUTO	Occupied	Occ Mode is an adjustable item that sets the occupancy mode for manual occupied, standby, and unoccupied operation, or for automatic operation based on a time schedule input, or manual tenant override (bypass) operation.
		Unocc	
		Bypass	
		Standby	
		Auto	
NetOccManCmd=	NULL	Occupied	NetOccManCmd is network adjustable item that indicates occupancy mode for manual occupied, standby, and unoccupied operation, or manual tenant override (bypass) operation via a network signal.
		Unocc	
		Bypass	
		Standby	
		Null	
NetCurrState=	NULL	Occupied	NetCurrState is network adjustable item that indicates occupancy mode for scheduled occupied, standby, and unoccupied operation, or manual tenant override (bypass) operation via a network signal.
		Unocc	
		Standby	
		Null	
Scheduled Occ=	NULL	Null	Occupancy is a status only item that displays the current occupancy status of the internally programmed shedule.
		Unocc	
		Occupied	
Tnt OR Tm Spt=	120	0-480 Minutes	Tnt OR Tm Spt is an adjustable item that sets the amount of time the unit will be in the bypass mode when initiated by a tenanat override input.
Tnt OR Time=	-	0-480 minutes	Tnt OR Time is a satus only item that displays the remaining amount of time the unit will be in the bypass mode.
Tnt Override=	-	INACTIVE	Tnt Override is a status only item that indicates if tenant override is active.
		ACTIVE	

## Date/Time/Schedules Menu

**Table 20: Main Menu \ View Status \ Date/Time/Schedule**

Menu Display Name	Default	Range	Description
Time=	-	0-23:0-59:0-59	Time: is an adjustable item that sets the current time (Hr:Mn:Sec)
Date=	-	1-12/0-31/1970-9999	Date is an adjustable item that sets the current date. (M/D/Y)
UTC Diff=	-60 min	-1560	UTC Diff is an adjustable parameter that can be set to indicate how the load time where the unit is situated differs from the Coordinated Universal Time.
<b>DAILY SCHEDULE</b>			
Mon=	HH:MM – HH:MM	HH:MM – 23:59	The Daily Schedule sets the start and stop times for each of the days of the week. One start and one stop time can be set for each day.
Tue=			
Wed=			
Thu=			
Fri=			
Sat=			
Sun=			
Hol=			
<b>HOLIDAY DATES</b>			
Hol 1=	MMMMDD/**- MMMDD/**	MMMDD/**- DEC31/99	The Holiday Schedule is used to set the start and stop times for up to 10 different holidays.
Hol 2=			
Hol 3=			
Hol 4=			
Hol 5=			
Hol 6=			
Hol 7=			
Hol 8=			
Hol 9=			
Hol 10=			
<b>ONE EVENT SCHEDULE</b>			
Beg=	MMMDD/** @ HH:MM	MMMDD/**- DEC31/99 @ HH:MM – 23:59	The One Event Schedule is used to set the start and stop times for one event.
End=			
<b>DAYLIGHT SAVINGS</b>			
DLS Strt Month=	Mar	NA	DLS Strt Mon is an adjustable item that sets the month for daylight savings time to begin.
		Jan-Dec	
DLS Strt Week=	2ndWeek	1stWeek-5thWeek	DLS Strt Week is an adjustable item that sets the week of the month for daylight savings time to begin.
DLS End Month=	Nov	NA	DLS End Mon is an adjustable item that sets the month for daylight savings time to end.
		Jan-Dec	
DLS End Week=	1stWeek	1stWeek-5thWeek	DLS End Week is an adjustable item that sets the week of the month for daylight savings time to end.
DLS Enable=	Auto	Off/Auto	DLS Enable is an adjustable item that sets whether or not daylight savings time is enabled.

Menu Display Name	Default	Range	Description
Schedule Source=	NULL	OneEvent	Schedule Source is a status only item which indicates the input source or function that is responsible for setting the Scheduled Status internal schedule occupancy parameter.
		Holiday	
		Daily	
		NULL	
Schedule Status=	Null	Null	Schedule Status is a status only item that displays the current occupancy status provided by the the internal schedule displayed in Schedule Source.
		Unocc	
		Occ	
One Event Status=	Null	Null	One Event Status is a status only item that displays the current occupancy status provided by the the one event schedule.
		Unocc	
		Occ	
Holiday Status=	Null	Null	Holiday Status is a status only item that displays the current occupancy status provided by the the holiday schedule.
		Unocc	
		Occ	
Daily Status=	Null	Null	Daily Status is a status only item that displays the current occupancy status provided by the the daily schedule.
		Unocc	
		Occ	

**Date/Time Menu**

*Table 21: Main Menu \ View Status \ Date/Time*

Menu Display Name	Default	Range
Time=	-	0-23:0-59:0-59
Date=	-	1-12/0-31/1970-9999
UTC Diff=	-60	-
<b>DAYLIGHT SAVINGS</b>		
DLS Strt Month=	Mar	Jan-Dec
DLS Strt Week=	2ndWeek	1stWeek
		2ndWeek
		3rdWeek
		4thWeek
		5thWeek
DLS End Month=	Nov	Jan-Dec
DLS End Week=	1stWeek	1stWeek
		2ndWeek
		3rdWeek
		4thWeek
		5thWeek
DLS Enable=	Auto	Off
		Auto

## SAF Control

The SAF Control Menu displays the fan operation and the relevant current control parameters.

**Table 22: Main Menu \ View Status \ SAF Control**

Menu Display Name	Default	Range	Description
Supply Fan=	-	DISABLED	Supply Fan is a status only item which indicates the status of the supply air fan.
		ENABLED	
SAF Capacity=	-	0-100%	SAF Capacity is a status only item which indicates the current capacity of the supply air fan.
SAF DuctPress=	-	0.0-5.0 in	SAF DuctSP Spt is an adjustable item which sets the supply fan duct static pressure setpoint. The SAF is modulated with a PI_Loop to maintain this setpoint.
EF Capacity=	-	0-100%	EF Capacity is a status only item which indicates the current capacity of the exhaust fans.
Airflow=	-	NO_FLOW	Airflow is a status only item which indicates the output from the optional airflow proving switch.
		FLOW	
Mn El Ht Fn Spd=	-	0-100%	Mn El Ht Fn Spd is a status only item which indicates the minimum supply fan speed command based on active electric heat capacity.

## Cooling

**Table 23: Main Menu \ View Status \ Cooling**

Menu Display Name	Default	Range	Description
CW Valve Pos=	-	0-100%	CW Valve Pos is a status only item which indicates the percentage that the modulating chilled water valve is currently open.
ChgOvr Valve Pos=	-	0-100%	ChgOvr Valve Pos is a status only item which indicates the percentage that the modulating changeover water valve is currently open.
CW Valve Pos=	Off	INACTIVE	CW Valve Pos is a status only item which indicates the condition of the two position chilled water valve output.
		ACTIVE	
ChgOvr Valve Pos=	-	INACTIVE	ChgOvr Valve Pos is a status only item which indicates the condition of the two position changeover valve output.
		ACTIVE	
Comp Status=	-	-	Comp Status is a status only item which indicates whether or not compressor cooling is currently allowed.
Comp Stg 1 =	-	INACTIVE	Comp Stg 1 is a status only item which indicates the condition of the compressor stage 1 output.
		ACTIVE	
Comp Stg 2 =	-	INACTIVE	Comp Stg 2 is a status only item which indicates the condition of the compressor stage 2 output.
		ACTIVE	
Comp Stg 3 =	-	INACTIVE	Comp Stg 3 is a status only item which indicates the condition of the compressor stage 3 output.
		ACTIVE	
Comp Stg 4 =	-	INACTIVE	Comp Stg 4 is a status only item which indicates the condition of the compressor stage 4 output.
		ACTIVE	

## Dehumidification

**Table 24: Main Menu \ View Status \ Dehumidification**

Menu Display Name	Default	Range	Description
Dehum Status=	-	UNAVAIL	Dehum Status is a status only item which indicates whether or not dehumidification is currently allowed.
		AVAIL	
Indoor Rel Hum=	-	0-100%	Indoor Rel Hum is a status only item that indicates the current space relative humidity value being used by the controller. This will be the network supplied relative humidity if available or the input from the space relative humidity sensor.
Indoor Dewpoint=	-	0F - 100 °F	Indoor Dew Point is a status only item that indicates the current calculate space dewpoint.
LC Temp=	-	-40F - 212 °F	LC Temp is a status only item which displays the current temperature reading from the unit's leaving coil temperature sensor.
Supply Temp=	-	-40F - 212 °F	Supply Temp is a status only item which displays the current temperature reading from the unit's discharge air temperature sensor (DAT).
Fan Speed=	-	0-100%	Fan Speed is a status only item which indicates the current capacity of the supply air fan.

## Heating

**Table 25: Main Menu \ View Status \ Heating**

Menu Display Name	Default	Range	Description
HW Valve Pos=	-	0-100%	HW Valve Pos is a status only item which indicates the percentage that the hot water valve is currently open.
HW Valve Pos=	-	INACTIVE	HW Valve Pos is a status only item which indicates the condition of the two position hot water valve output.
		ACTIVE	
Htg Stg 1 =	-	INACTIVE	Htg Stg 1 is a status only item which indicates the condition of the electric heat stage 1 output.
		ACTIVE	
Htg Stg 2 =	-	INACTIVE	Htg Stg 2 is a status only item which indicates the condition of the electric heat stage 2 output.
		ACTIVE	
Htg Stg 3 =	-	INACTIVE	Htg Stg 3 is a status only item which indicates the condition of the electric heat stage 3 output.
		ACTIVE	
Htg Stg 4 =	-	INACTIVE	Htg Stg 4 is a status only item which indicates the condition of the electric heat stage 4 output.
		ACTIVE	
SCR Output=	-	0-100%	SCR Output is a status only item which indicates the current capacity of the SCR electric heater.

## Economizer

**Table 26: Main Menu \ View Status \ Economizer**

Menu Display Name	Default	Range	Description
OAD Positon=	-	0-100%	OAD Position is a status only item which displays the current OAD position.
Min OA Pos=	-	0-100%	Min OA Pos is an adjustable item which indicates the minimum position of the outdoor damper while the fan is running. The actual OAD damper position will vary between this value and the Max OA Pos depending on economizer and DCV requirements
FreeClgStatus=	-	UNAVAIL	Free Clg Status is a status only item that indicates whether airside economizer free cooling is available or unavailable based on a definable ambient temperature range.
		AVAIL	

## Temperatures

**Table 27: Main Menu \ View Status \ Temperatures**

Menu Display Name	Default	Range	Description
Control Temp=	-	-40-212 °F	Control Temp is a status only item which indicates the current Control Temperature value.
Disch Air=	-	-40.0-212.0 °F	Disch Air is a status only item which displays the current temperature reading from the unit's discharge air temperature sensor (DAT).
Return Air=	-	-40.0-212.0 °F	Return Air is a status only item which displays the current temperature reading from the unit's return air temperature sensor (RAT).
EffSpaceT=	-	-40.0-212.0 °F	EffSpaceT is a status only item which displays the current space temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the integrated thermostat.
RsSpaceT=	-	-40.0-212.0 °F INVALID	RsSpaceT= is a status only item which displays the current space temperature value being provided by the integrated thermostat.
Space Temp=	-	-40.0-212.0 °F INVALID	Space Temp is a status only item which displays the current temperature reading from a space temperature sensor. Up to 3 sensors can be attached to the unit.
OA Temp=	-	-40.0-212.0 °F	OA Temp is a status only item which displays the current temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the outdoor air temperature sensor.
LC Temp=	-	-40.0-212.0 °F	LC Temp is a status only item which displays the current leaving coil temperature reading from the unit mounted temperature sensor. This sensor is available on AHU units with dehumidification capability. This sensor is also installed on AHU units equipped with electric heat and is used by the controller to calculate the heat rise across the heat exchanger by comparing it to the discharge air temperature input. The controller uses this information to protect the heat exchanger against overheating.
EWT=	-	-40.0-212.0 °F	EWT is a status only item which displays the current entering water temperature value being used by the controller. This will be the network supplied entering water temperature if available or the input from the entering water temperature sensor.

## IAQ Status

**Table 28: Main Menu \ View Status \ IAQ Status**

Menu Display Name	Default	Range	Description
EffSpaceT=	-	-40-212 °F	Space Temp is a status only item which displays the current space temperature value being used by the controller. This will be the network supplied space temperature if available or the input from the integrated thermostat.
Indoor Rel Hum=	-	0-100%	Indoor Rel Hum is a status only item that indicates the current space relative humidity value being used by the controller. This will be the network supplied relative humidity if available or the input from the space relative humidity sensor.
Indoor Enthalpy=	-	-200 to 200 BTU/#	Indoor Enthalpy is a status only item that indicates the current calculated indoor enthalpy.
Indoor Dwpnt=	-	0F-100 °F	Indoor Dwpnt is a status only item that indicates the current calculated indoor dewpoint.
Outdoor Rel Hum=	-	0-100%	Outdoor Rel Hum is a status only item that indicates the current outdoor relative humidity value being used by the controller. This will be the network supplied relative humidity if available or the input from the outdoor relative humidity sensor.
Outdoor Enthalpy=	-	-200 to 200 BTU/#	Outdoor Enthalpy is a status only item that indicates the current calculated outdoor enthalpy.
CO2 PPM=	-	0-3000 ppm	CO2 PPM is a status only item that indicates the current space CO2 concentration being used by the controller. This will be the network supplied CO2 concentration if available or the input from the space CO2 sensor.
Supply Air=	-	-40-212 °F	Supply Air is a status only item which displays the current temperature reading from the unit's discharge air temperature sensor (DAT).
Return Air=	-	-40-212 °F	Return Air is a status only item which displays the current temperature reading from an optional return air temperature sensor.



# Unit Maintenance

## BACnet MSTP Set-Up

**Table 29: Main Menu \ Unit Maintenance \ BACnet MSTP Set-Up**

Menu Display Name	Default	Range	Description
ApplyChgs=	No	No Yes	ApplyChanges is an adjustable item which will commit any changes made to the BACnet MS/TP parameters.
Name=	-	-	Name is an adjustable item which sets the BACnet "Name" parameter.
Location=	-	-	Location is an adjustable item which sets the BACnet "Location" parameter.
Description=	-	-	Description is an adjustable item which sets the BACnet "Description" parameter.
Dev Instance=	-	0-4194302	Dev Instance is an adjustable item which sets the BACnet device instance.
MSTP Address=	-	0-127	MSTP Address is an adjustable item which sets the BACnet MS/TP MAC address.
Baud Rate=	38400	9600 19200 38400 76800	Baud Rate is an adjustable item which sets the BACnet MS/TP communication baud rate.
Max Master=	127	1-127	Max Master is an adjustable item which sets the BACnet "Max Master" parameter.
Max Info Frm=	10	1-32	Max Info Frm is an adjustable item which sets the BACnet "Max Info Frames" parameter.
Unit Support=	English	SI/English	Unit Support is an adjustable item which sets the units of measure provided via BACnet communications.

# Service Menus

## Operating Hours Menu

(also available in Unit Maintenance Menu)

The Operating Hours menu contains status items that display the number run hours for various components and operating states.

**Table 30: Main Menu \ Service Menus \ Operating Hours**

Menu Display Name	Default	Range	Description
Supply Fan=	-	0.0-999999.0h	Supply Fan is an adjustable item which displays the current supply fan operating hours. This value can be manually reset when the component is replaced.
Exh Fan=	-	0.0-999999.0h	Exh Fan is an adjustable item which displays the current exhaust fan operating hours. This value can be manually reset when the component is replaced.
Filter=	0.0h	0.0-999999.0h	Filter is an adjustable item which displays the supply fan operating hours with the current air filter. This value can be manually reset when the component is replaced.
Compressor 1=	0.0h	0.0-999999.0h	Compressor 1 is an adjustable item which displays the current compressor 1 operating hours. This value can be manually reset when the component is replaced.
Compressor 2=	0.0h	0.0-999999.0h	Compressor 2 is an adjustable item which displays the current compressor 2 operating hours. This value can be manually reset when the component is replaced.
Compressor 3=	0.0h	0.0-999999.0h	Compressor 3 is an adjustable item which displays the current compressor 3 operating hours. This value can be manually reset when the component is replaced.
Compressor 4=	0.0h	0.0-999999.0h	Compressor 4 is an adjustable item which displays the current compressor 4 operating hours. This value can be manually reset when the component is replaced.
Compressor 1 Starts=	0	0-999999	Compressor 1 Starts is an adjustable item which displays the number of starts recorded for compressor 1. This value can be manually reset when the component is replaced.
Compressor 2 Starts=	0	0-999999	Compressor 2 Starts is an adjustable item which displays the number of starts recorded for compressor 2. This value can be manually reset when the component is replaced.
Compressor 3 Starts=	0	0-999999	Compressor 3 Starts is an adjustable item which displays the number of starts recorded for compressor 3. This value can be manually reset when the component is replaced.
Compressor 4 Starts=	0	0-999999	Compressor 4 Starts is an adjustable item which displays the number of starts recorded for compressor 4. This value can be manually reset when the component is replaced.

## Network Input Status

**Table 31: Main Menu \ Service Menus \ Network Input Status**

Menu Display Name	Default	Range	Description
Net OAT In=	INVALID	-40F to 212 °F	Net OAT In is a status only item which displays the outdoor air temperature value being provided by network communications (if applicable).
		INVALID	
Net SpaceT In=	INVALID	-40F to 212 °F	Net SpaceT In is a status only item which displays the space temperature value being provided by network communications (if applicable).
		INVALID	
NetCurrState=	NULL	OCCUPIED	NetCurrState is a status only item which displays the occupancy scheduler value being provided by network communications (if applicable).
		UNOCCUPIED	
		STANDBY	
		NULL	
Net CI Ena=	NULL	DISABLED	Net CI Ena is a status only item which displays the cooling enable value being provided by network communications (if applicable).
		ENABLED	
		NULL	
Net Ht Ena=	NULL	DISABLED	Net Ht Ena is a status only item which displays the heating enable value being provided by network communications (if applicable).
		ENABLED	
		NULL	
Net Ec Ena=	NULL	DISABLED	Net Ec Ena is a status only item which displays the economizer enable value being provided by network communications (if applicable).
		ENABLED	
		NULL	
Net Dehum Ena =	NULL	DISABLED	Net Dehum Ena is a status only item which displays the dehumidification enable value being provided by network communications (if applicable).
		ENABLED	
		NULL	
Net Space PPM=	INVALID	0-3000 ppm	Net Space PPM is a status only item which displays the space co2 concentration value being provided by network communications (if applicable).
		INVALID	
Net Rel Humid=	INVALID	0-100%	Net Rel Humid is a status only item which displays the space relative humidity value being provided by network communications (if applicable).
		INVALID	
Net OA Humid	INVALID	0-100%	Net OA Humid is a status only item which displays the outdoor air relative humidity value being provided by network communications (if applicable).
		INVALID	
NetOccManCmd=	NULL	OCCUPIED	NetOccManCmd is a status only item which displays the occupancy override command being provided by network communications (if applicable).
		UNOCCUPIED	
		BYPASS	
		STANDBY	
		NULL	
Net EWT In=	INVALID	-40F to 212 °F	Net EWT In is a status only item which displays the entering water temperature value being provided by network communications (if applicable).
		INVALID	
Net Supply Fan=	INVALID	0% to 100%	Net Supply Fan is a status only item which displays the supply fan operating speed value being provided by network communications (if applicable).
		INVALID	

## Alarm Lists

Alarms provide the user with information about abnormal conditions that affect unit operation. The cause of the alarm should be investigated and eliminated before the unit or any disabled equipment in it is placed back into service.

## Viewing Alarms

The Active Alarms menu displays up to 10 active alarms. Pushing the scroll wheel in, will show details about the alarm, as well as when it occurred. The Alarm Log, shows the same information, but up to 50 of the latest alarms - both active and previous alarms.

Alarms are categorized as Warnings, Problems or Faults.

Faults are conditions that are serious enough to shut down the unit.

Problems are conditions that result in some limitation of unit operation, but the unit is allowed to continue to operate.

Warnings inform the user of conditions that should be addressed, but do not limit operation in any way.

All active alarms as well as the date and time that they were detected are displayed on the Active Alarm menu. These alarms are displayed in order of priority. Higher priority alarms are displayed first. The last 50 alarm “events” detected, as well as the date and times that they were detected, are displayed on the Alarm Log menu. An alarm “event” is either an alarm becoming active, or being cleared. A “+” symbol precedes the active alarm event and a “-” symbol precedes the cleared alarm event. These alarms are displayed in the order that they were detected. The alarm that was detected most recently is displayed first. Multiple occurrences of the same alarm may appear.

## Alarm Resets

Alarm resetting has 3 categories:

- **Manual**  
Once the alarm has occurred, the controller will remain in the alarm state until the alarm has been cleared through the keypad, the integrated thermostat, BAS communications, or by cycling power to the controller.
- **Automatic**  
The alarm will clear once the alarm conditions have been resolved with no action necessary.
- **Intelligent Reset**  
The alarm will clear automatically up to two times in a 7-day period once the alarm conditions have been resolved, but will need to be manually cleared on the third occurrence in a 7-day period.

**Table 32: Main Menu \ Service Menus \ Active Alarms**

Menu Display Name	Default	Range
LogCt:** Clr Log:	No	NO
		CLEAR_FAULTS
		CLEAR_PROBLEMS
		CLEAR_WARNINGS
		CLEAR_ALL

**Table 33: Main Menu \ Service Menus \ Alarm Log**

Menu Display Name	Default	Range
LogCt:** Clr Log:	No	0-50:
		No
		Yes

**Table 34: Alarm Types and Descriptions**

Alarm Number	Alarm Display Name	Reset Type	Description
230	Control Model	Auto	A fault alarm that indicates that there is an incompatibility between unit controller hardware and the software application. Contact Daikin Applied to acquire the correct version of software.
225	Freeze Alarm	Manual	When a unit is equipped with chilled water or hot water coil, the Freeze Alarm occurs when the optional freeze stat contacts open as a result of detecting an abnormally low water coil temperature. When the Freeze fault occurs, the controller opens the unit will shut down, 2-position chilled water and/or hot water valves will open, and modulating chilled water and/or hot water valves will open to 50%.
220	Emergency Stop	Auto	An Emergency Stop Fault will occur when the Emergency Stop Input in the Alarm (Open) condition.
215	Control Temp Failure	Manual	If both the space and optional return air temperature sensor are not reliable, a Control Temperature Failure occurs. When the Control Temperature Fault occurs, the unit is shut down. It remains shut down until the Control Temperature Failure is manually cleared through the unit keypad or via a network signal.
210	Airflow Alert	Intel	The Airflow Alert occurs when the airflow switch is installed and indicates that there is no airflow when the supply fan has been running for longer than the air flow start delay. When the Airflow Alert occurs, the unit is shut down.
205	Discharge Air Temp sensor Fail	Auto	If the unit requires a discharge air temperature sensor (DAT) for control and the input is open or short circuited, the Discharge Air Temp sensor fail occurs. When the Discharge Air Temp sensor fail occurs, the unit is shut down.
188	Blocked Condensate	Auto	The Blocked Condensate problem occurs when the optional condensate overflow switch is installed and indicates the presence of condensate for longer than 60 seconds. When the Blocked Condensate problem occurs, mechanical cooling and dehumidification are immediately disabled.
175	Space Temp sensor Fail	Auto	A Space Temp sensor Fail problem will occur if the Control Temperature Source is Space or Average, and the space temperature value is not reliable. When the Space Temp sensor Fail problem occurs, the controller will attempt to temporarily switch the Control Temperature Source to Return Air, if the return air temperature is available, otherwise it will result in a Control Temperature Failure.
165	Duct Static Pressure Sensor Fail	Auto	The Duct Static Pressure Sensor Fail problem occurs if a unit is configured for duct static pressure supply fan control and the duct static pressure sensor input is open or shorted. When the Duct Static Pressure Sensor Fail problem occurs, the supply fan will be set to minimum speed and an alarm will be indicated at the user interfaces and via BACnet.
160	Entering Water Temp sensor Fail	Auto	The Entering Water Temp sensor Fail problem occurs if a unit requiring an entering water temperature sensor for control and the effective entering water temperature is unreliable. When the Entering Water Temp sensor Fail problem occurs, changeover valve heating and cooling will be disabled, and an alarm will be indicated at the user interfaces and via BACnet.
155	Entering Water Temp Inadequate Fail	Auto	The Entering Water Temp sensor Fail problem occurs on a two pipe chilled water/hot water changeover unit if the controller has been sampling the entering water temperature for longer than the entering water temperature sampling time, and it has not been deemed adequate for the appropriate mode of operation. When the Entering Water Temp sensor Fail problem occurs, changeover valve heating and cooling will be disabled for the duration of the entering water temperature retry time, and an alarm will be indicated at the user interfaces and via BACnet.
150	Outdoor Air Temp sensor Fail	Auto	The Outdoor Air Temp sensor Fail problem occurs if a unit requires an outdoor air temperature sensor for control and the effective outdoor air temperature is unreliable. When the Outdoor Air Temp sensor Fail problem occurs, economizer operation will be disabled, and an alarm will be indicated at the user interfaces and via BACnet.
145	CO2 sensor Fail	Auto	The CO2 sensor Fail problem occurs if a unit has demand controlled ventilation enabled and the effective outdoor air temperature is unreliable. When the CO2 sensor Fail problem occurs, demand controlled ventilation operation will be disabled, and an alarm will be indicated at the user interfaces and via BACnet.
140	Outdoor Air Humidity sensor Fail	Auto	The Outdoor Air Humidity sensor Fail problem occurs if a unit requires an outdoor air humidity sensor for control and the effective outdoor air humidity is unreliable. When the Outdoor Air Humidity sensor Fail problem occurs, the economizer strategy will be temporarily be limited to outdoor air temperature, and an alarm will be indicated at the user interfaces and via BACnet.

Alarm Number	Alarm Display Name	Reset Type	Description
135	Dehumidification DAT Low	Intel	The Dehumidification DAT Low problem occurs if a unit is in the dehumidification mode, heating is at maximum and the discharge air temperature is below the dehumidification discharge air temperature setpoint -3F for more than 5 minutes. When the Dehumidification DAT Low problem occurs, dehumidification will be disabled for 5 minutes, and an alarm will be indicated at the user interfaces and via BACnet.
130	Space Humidity Sensor Fail	Auto	The Space Humidity Sensor Fail problem occurs if a unit requires a space air humidity sensor for control and the effective space humidity is unreliable. When the Space Humidity sensor Fail problem occurs, the economizer strategy will be temporarily be limited to outdoor air enthalpy, or outdoor air temperature, and an alarm will be indicated at the user interfaces and via BACnet.
125	Return Air Temp sensor Fail	Auto	A Return Air Temp sensor Fail problem will occur if the Control Temperature Source is Return or Average, and the return air temperature value is not reliable. When the Return Air Temp sensor Fail problem occurs, the controller will attempt to temporarily switch the Control Temperature Source to Space, if the space temperature is available, otherwise it will result in a Control Temperature Failure.
120	Leaving Coil Temp sensor Fail	Auto	The Leaving Coil Temp sensor Fail problem occurs if a unit requires a leaving coil temperature sensor for control and the leaving coil temperature sensor input is open or shorted. When the Leaving Coil Temp sensor Fail problem occurs, the economizer strategy will be temporarily be limited to outdoor air enthalpy, or outdoor air temperature, and an alarm will be indicated at the user interfaces and via BACnet.
45	Outdoor Air Damper Stuck	Auto	<p>A warning alarm indicating the outdoor air dampers are stuck and not modulating will be generated whenever the damper are stuck open or stuck closed. The dampers are considered stuck open when either of the following abnormal situations occurs:</p> <ul style="list-style-type: none"> <li>• The damper command value is less than the calibrated damper end switch closed value continuously for 180 seconds yet the outside air damper end switch input remains open.</li> <li>• The damper end switch input does not change from closed to open with 30 seconds of the damper command value dropping (and remaining) below the calibrated damper end switch open value (less the calibrated maximum switch differential).</li> </ul> <p>The dampers are considered stuck closed when either of the following abnormal situations occurs:</p> <ul style="list-style-type: none"> <li>• The damper command value is greater than the calibrated damper end switch open value continuously for 180 seconds yet the outside air damper end switch input remains open.</li> <li>• The damper end switch input does not change from closed to open with 30 seconds of the damper command value rising above the calibrated damper end switch closed value (plus the calibrated minimum switch differential).</li> </ul> <p>The damper stuck warning will also be generated when the damper end switch operation is unreliable. The end switches are considered unreliable when the end switch input remains closed when the damper command value is between the calibrated end switch closed and open values (plus and minus the calibrated minimum and maximum switch differentials). The alarm will automatically clear when the conditions causing the alarm are no longer present.</p>
40	Excess Outdoor Air	Auto	<p>A warning alarm indicating the unit is delivering excessive outdoor air will be generated whenever the outdoor air dampers are stuck open. The outdoor dampers are considered stuck open when either of the following abnormal situations occurs:</p> <ul style="list-style-type: none"> <li>• The damper command value is less than the calibrated damper end switch closed value continuously for 180 seconds yet the outside air damper end switch input remains open.</li> <li>• The damper end switch input does not change from closed to open with 30 seconds of the damper command value dropping (and remaining) below the calibrated damper end switch open value (less the calibrated maximum switch differential).</li> </ul> <p>The excess outdoor air warning will also be generated while operating in the Econo or Cooling state when the Econo Status is Enabled and the OAT is greater than the Max OAT Limit setting (default 75F).</p> <ul style="list-style-type: none"> <li>• NOTE: This case is ignored when the economizer enable decision is being controlled by a network input or when the economizer changeover method (EconChgover) is set for OAT/RAT dry bulb comparison (OAT/ RAT). The alarm will automatically clear when the conditions causing the alarm are no longer present.</li> <li>• NOTE: The damper end switch open (PosSwOpen%), Minimum switch differential (MinSwDiff), damper end switch closed (PosSwClose%) and maximum switch differential (MaxSwDiff) values are determined during the OAD damper end switch calibration process. The alarm will automatically clear when the conditions causing the alarm are no longer valid.</li> </ul>

Alarm Number	Alarm Display Name	Reset Type	Description
35	Under Economizing	Auto	<p>A warning alarm indicating the unit is not economizing when it should be will be generated whenever the outdoor air dampers are stuck closed while operating in the Econo or Cooling state. The dampers are considered stuck closed when either of the following abnormal situations occurs:</p> <ul style="list-style-type: none"> <li>• The damper command value is greater than the calibrated damper end switch open value continuously for 180 seconds yet the outside air damper end switch input remains open.</li> <li>• The damper end switch input does not change from closed to open with 30 seconds of the damper command value rising above the calibrated damper end switch closed value (plus the calibrated minimum switch differential).</li> </ul> <p>The under economizing alarm will also be generated if the Econo Status is not Enabled when the OAT is less than the Min OAT Limit setting (default 70F).</p> <ul style="list-style-type: none"> <li>• NOTE: This case is ignored when the economizer enable decision is being controlled by a network input or when the economizer changeover method (EconChgovr) is set for OAT/RAT dry bulb comparison (OAT/RAT).</li> </ul> <p>The under economizing alarm will also be generated when the OAT sensor is unreliable or the RAT sensor is unreliable while the OAT is below the Min OAT Limit setting (default 70F) and the economizer changeover method (EconChgovr) is set for OAT/RAT dry bulb comparison (OAT/RAT). The alarm will automatically clear when the conditions causing the alarm are no longer present.</p> <ul style="list-style-type: none"> <li>• NOTE: The damper end switch open (PosSwOpen%), Minimum switch differential (MinSwDiff), damper end switch closed (PosSwClose%) and maximum switch differential (MaxSwDiff) values are determined during the OAD damper end switch calibration process.</li> </ul>
30	Over Economizing	Auto	<p>A warning alarm indicating the unit is economizing when it should not be will be generated whenever the outdoor air dampers are stuck open while operating in the Econo or Cooling operating state. The dampers are considered stuck open when either of the following abnormal situations occurs:</p> <ul style="list-style-type: none"> <li>• The damper command value is less than the calibrated damper end switch closed value continuously for 180 seconds yet the outside air damper end switch input remains open.</li> <li>• The damper end switch input does not change from closed to open with 30 seconds of the damper command value dropping (and remaining) below the calibrated damper end switch open value (less the calibrated maximum switch differential).</li> </ul> <p>The over economizing warning will also be generated if the Econo Status is Enabled when the OAT is greater than the Max OAT Limit setting (default 75F).</p> <ul style="list-style-type: none"> <li>• NOTE: This case is ignored when the economizer enable decision is being controlled by a network input or when the economizer changeover method (EconChgovr) is set for OAT/RAT dry bulb comparison (OAT/ RAT). The alarm will automatically clear when the conditions causing the alarm are no longer present.</li> <li>• NOTE: The damper end switch open (PosSwOpen%), Minimum switch differential (MinSwDiff), damper end switch closed (PosSwClose%) and maximum switch differential (MaxSwDiff) values are determined during the OAD damper end switch calibration process.</li> </ul>
25	Duct Static Pressure Alert	Auto	<p>The Duct Static Pressure Alert warning occurs if a unit is configured for duct static pressure supply fan control and the duct static pressure has been .25in above or below setpoint for longer than the duct static pressure alarm timer. When the Duct Static Pressure Sensor Fail warning occurs, an alarm will be indicated at the user interfaces and via BACnet.</p>
20	Change Filter	Auto	<p>The Change Filter warning occurs based on incremental supply fan run hours, or a digital input depending on the Filter Chg Strategy parameter. When the Change Filter warning occurs, an alarm will be indicated at the user interfaces and via BACnet. The alarm will clear when the switch returns to its normal state, or the Filter operating hours has been reset below the Filter Chg Time.</p>



## Micro Tech 4 Lite Inputs/Outputs

The complete set of Inputs and Outputs that are possible on a Micro Tech 4 Lite are listed below. These vary by configuration and may or not be included on any given unit based on the features selected and shipped from the factory.

**Table 35: Main Menu \ Service Menus \ I/O Module Status**

Menu Display Name	Default	Range	Description
EMA=	-	OK NoComm	EMA is a status only item which indicates the state of communications with optional I/O expansion modules.

**Table 36: Main Menu \ Service Menus \ I/O Status**

Menu Display Name	Default	Range	Description	
Freeze Input=	-	NORMAL FREEZE	Status only item that indicates the present condition of the indicated input/output.	
Change Filter Input=	-	OPEN CLOSED		
Emergency Stop Input=	-	RUN STOP		
OAD End Sw Input=	-	OPEN CLOSED		
Blocked Cond Input=	-	DRY WET		
Air Flow Sts Input=	-	NO_FLOW FLOW		Status only item that indicates the present condition of the indicated input/output.
Space Temp=	-	-40-212 °F INVALID		
Space Humidity=	-	0%-100%		
Return Air=	-	-40-158 °F		
Return Humidity=	-	0-100%		
OA Temp=	-	-40-212 °F		
OA Humidity=	-	0-100%		
CO2 PPM=	-	0-3000 ppm		
Disch Air=	-	-40-212 °F	Status only item that indicates the present condition of the indicated input/output.	
Entering Water Temp=	-	-40-212 °F		
Leaving Coil Temp	-	-40-212 °F		
Duct Static Pressure=	-	0.0-5.0"		
Heating Valve BO=	-	OFF ON		
Htg Stg 1 =	-	OFF ON		
Htg Stg 2 =	-	OFF ON		

Menu Display Name	Default	Range	Description
Htg Stg 3 =	-	OFF	Status only item that indicates the present condition of the indicated input/output.
		ON	
Htg Stg 4 =	-	OFF	
		ON	
CW Valve Pos=	-	OFF	
		ON	
Comp Stg 1 =	-	OFF	Status only item that indicates the present condition of the indicated input/output.
		ON	
Comp Stg 2 =	-	OFF	
		ON	
Comp Stg 3 =	-	OFF	
		ON	
Comp Stg 4 =	-	OFF	
		ON	
VAV Box Output=	-	DISABLED	
		ENABLED	
OA Damper Output=	-	0-10VDC	
Ret Damper Output=	-	0-10VDC	
SAF Cap=	-	0-10VDC	Status only item that indicates the present condition of the indicated input/output.
EF Cap=	-	0-10VDC	
Htg Valve=	-	0-10VDC	
SCR=	-	0-10VDC	
Clg Valve=	-	0-10VDC	
Sen Clg Spt=	-	50-95 °F	
Sen Htg Spt=	-	50-95 °F	
EMA=	-	OK	
		NoComm	

## Main Control Board (POL546)

**Table 37: Main Control Board Terminal Information**

Terminal	Signal	Range	Description
T2-DO1B	24VAC	On/Off	Compressor 1/ Two Position Chilled Water Valve/Two Position CW-HW Changeover Water Valve
T3-DO2B	24VAC	On/Off	Electric Heat Stage 1/Two Position Hot Water Valve
T3-DO3	24VAC	On/Off	Compressor 2
T3-DO4	24VAC	On/Off	Fan Run Enable
T5-DO6	24VAC	On/Off	VAV Box Enable Signal
T12	RS485		
T13	KNX PL-Link		QMX/POS Communicating sensor with Space Temperature, Setpoint Adjust
T7-X9	10K Type II	-40-212 °F (-40-100 °C)	Discharge Air Temperature Sensor
T7-X10	10K Type II	-40-212 °F (-40-100 °C)	Either the Entering Water or Leaving Coil Temperature Sensor
T7-X11	10K Type II	-40-212 °F (-40-100 °C)	Outdoor Air Temperature Sensor
T8-X1	Discrete BI	Open - Closed	Title 24 Outdoor Air Damper End Switch
T8-X2	0-10VDC	0-100% RH (0-10VDC)	Space Humidity Input
T8-X3	0-10VDC	0-5" WC	Duct Static Pressure Sensor
T8-X4	0-10VDC	0-100% (0/2-10VDC)	Outdoor Air Humidity Sensor
T9-X5	0-10VDC	0-100% (0-10VDC)	Supply Fan Control Output
T9-X6	0-10VDC	0-100% (2-10VDC scaled)	Outdoor Air Damper Output
T9-X7	0-10VDC	0-100% (0/2-10VDC)	Modulating Chilled Water Valve Output
T9-X8	0-10VDC	0-100% (0/2-10VDC)	Modulating Hot Water Valve or SCR Heat Output
T10-DI1	Discrete BI	Run - Stop	Emergency Stop Input
T10-DI2	Discrete BI	Dry - Wet	Condensate Overflow Float Switch
T11-DI3	24VAC BI	No Flow - Flow	Airflow Status Switch
T11-DI4	24VAC BI	Normal - Freeze	Freeze Stat Input

## Expansion Module A I/O (POL965)

POL96E module will be used when the unit is equipped with more than one modulating hot gas reheat valve. Otherwise POL965 will be used.

**Table 38: Expansion Module A I/O Terminal Information**

Terminal	Signal	Range	Description
T1-DO1	24VAC	On/Off	Compressor 3
T1-DO2	24VAC	On/Off	Compressor 4
T1-DO3	24VAC	On/Off	Electric Heat Stage 2
T1-DO4	24VAC	On/Off	Electric Heat Stage 3
T2-DO5	24VAC	On/Off	Electric Heat Stage 4
T2-DO6	24VAC	On/Off	Exhaust Fan Enable
T4-X1	10K Type II	-40-212 °F (-40-100 °C)	Return Air Temperature Sensor
T4-X2	0-10VDC	0-100% RH (0-10VDC)	Return Air Relative Humidity Sensor
T4-X3	0-10VDC	0-100% (2-10VDC scaled)	Return Air Damper Output
T4-X4	Discrete BI	Normal - Dirty	Dirty Filter Switch
T5-X5	0-10VDC	0-100% (0-10VDC)	Exhaust Fan Control Output
T5-X6	0-10VDC	0-100% (0-10VDC)	Space CO2 Sensor

## Save / Restore Settings

### Save/Restore Menu


The Save/Restore menu can be used to save or restore the user configured parameters as well as reset the controller back to the factory default parameters. Save Params is an adjustable item used to save the current parameters and configuration.

**Table 39: Main Menu \ Service Menus \ Save / Restore Settings**

Menu Display Name	Default	Range	Description
Rstr Params=	No	No	Rstr Params is an adjustable item used to restore the current parameters and configuration.
		Yes	
Rstr Factory=	No	No	Rstr Factory is an adjustable item used to restore the factory parameters and configuration.
		Yes	
Save To Card/USB=	No	No	SaveToCard is an adjustable item used to save the current parameters and configuration to an SD card.
		Yes	
		NoCard	
		RdOnly	
Load From Card/USB=	No	No	LoadFromCard is an adjustable item used to restore the current parameters and configuration from an SD card.
		Yes	
		RdOnly	

# Advanced Menu

## Unit Configuration

 <b>WARNING</b>
<p>Operational settings should only be made with the advisement of a qualified person; changing key configurations away from factory settings may result in damage to equipment or surrounding property. Recommended settings may vary based on application specific requirements.</p>

### Unit Configuration String

After the main control board application software is loaded into the MCB, it must be “configured” for the specific control application. This consists of setting the value of 26 configuration variables within the MCB. These variables define things such as the type of cooling, number of compressors, cooling stages, and the type of heat. If all of these items are not set appropriately for the specific unit, the unit will not function properly. The correct settings for these parameters are defined for a given unit by the unit “Software Configuration Code.”

The “Software Configuration Code” consists of a 30-character string of numbers and letters. The code can be found on the unit software Identification label located on the back side of the control panel door.

The table below lists the configuration code variables, including the position within the code, description of the parameter, and the applicable settings for each. The default values are shown in bold font. The unit is configured at the factory however may also be configured in the field by accessing the Unit Configuration menu. Once changes have been made to the Unit Configuration menu, the Apply Changes flag must be changed from no to yes in order for the controller to recognize the changes. Setting the Apply Changes Flag to Yes will automatically reset the controller.

## Unit Configuration

**Table 40: Main Menu \ Advanced Menu \ Unit Configuration**

Menu Display Name	Default	Range	Description
Apply Changes=	NO	NO YES	ApplyChanges is an adjustable item which will commit any changes made to the configuration parameters.
SAF Control=	CONST_SPEED	CONST_SPEED DSP SZ_VAV	SAF Control is an adjustable item which configures supply fan speed control.
HeatCool Valve=	NONE	NONE COOLING HEATING BOTH	HeatCool Valve is an adjustable item which configures heating and cooling valve operation.
2/4 Pipe=	2PIPE	2PIPE 4PIPE	2/4 Pipe is an adjustable item which configures the chilled water and/or hot water coils.
EWT=	NOT_INSTALLED	NOT_INSTALLED INSTALLED	EWT is an adjustable item which configures if the controller will expect an entering water temperature sensor input (network or hardwired), required for 2 pipe changeover systems.
Valve Signal=	BINARY24VAC	MOD2_TO_10VDC MOD0_TO_10VDC BINARY24VAC	Valve Signal is an adjustable item which configures the chilled water and/or hot water valve control signal.
Cool Valve Dir=	DIRECT	DIRECT REVERSE	Cool Valve Dir is an adjustable item which configures the chilled water valve action.
Heat Valve Dir=	DIRECT	DIRECT REVERSE	Heat Valve Dir is an adjustable item which configures the hot water valve action.
Chng Valve Dir =	DIRECT	DIRECT REVERSE	Chng Valve Dir is an adjustable item which configures the changeover valve action.
EI Heat Stages=	NONE	NONE, 1STG 4STG SCR	EI Heat Stages is an adjustable item which configures the electric heat control.
Compressor Stages=	NONE	NONE 1STG 2STG 4STG	Compressor Stages is an adjustable item which configures the number of compressor cooling stages.
DCV Enable=	DISABLED	DISABLED ENABLED	DCV Enable is an adjustable item which configures demand controlled ventilation control.
CO2 Sensor=	NOT_INSTALLED	NOT_INSTALLED INSTALLED	CO2 Sensor is an adjustable item which configures the the controller will expect a CO2 sensor input (network or hardwired), required for demand controlled ventilation.
Outdoor Damper=	NOT_INSTALLED	NOT_INSTALLED 2POS MOD	Outdoor Damper is an adjustable item which configures the outdoor air damper control.

Menu Display Name	Default	Range	Description
Economizer=	NONE	NONE	Economizer is an adjustable item which configures the strategy that will be used to determine if the outdoor air is suitable for economizing.
		OAT	
		ENTHALPY_OUT	
		TEMP_DIFF	
		ENTHALPY_DIFF	
OAT Sensor=	NOT_INSTALLED	NOT_INSTALLED	OAT Sensor is an adjustable item which configures if the controller will expect an outdoor air temperature sensor input (network or hardwired), required for economizer operation.
		INSTALLED	
Space Hum Sensor=	NOT_INSTALLED	NOT_INSTALLED	Space Hum Sensor is an adjustable item which configures the controller will expect a space humidity sensor input (network or hardwired).
		INSTALLED	
OA Hum Sensor=	NOT_INSTALLED	NOT_INSTALLED	OA Hum Sensor is an adjustable item which configures the controller will expect a outdoor humidity sensor input (network or hardwired).
		INSTALLED	
Return Air Damper=	NOT_INSTALLED	NOT_INSTALLED	Return Air Damper is an adjustable item which configures the return air damper control.
		INSTALLED	
Exhaust Fan=	DISABLED	DISABLED	Exhaust Fan is an adjustable item which configures exhaust fan speed control.
		TRACKING	
		CONST_SPEED	
Exhaust Fan Output=	NOT_INSTALLED	NOT_INSTALLED	Exhaust Fan Output is an adjustable item which enables exhaust fan speed control.
		INSTALLED	
Dehumidification=	NONE	NONE	Dehumidification is an adjustable item which configures dehumidification control.
		PASSIVE	
		ACTIVE	
Leaving Coil Sensor=	NOT_INSTALLED	NOT_INSTALLED	Leaving Coil Sensor is an adjustable item which configures the controller will expect a leaving coil temperature sensor input.
		INSTALLED	
Econo FDD=	DISABLED	DISABLED	Econo FDD is an adjustable item which configures economizer fault detection and diagnostics.
		ENABLED	
Damper End Sw=	NOT_INSTALLED	NOT_INSTALLED	Damper End Sw is an adjustable item which configures the controller will expect outdoor air damper end switch input, required for economizer fault detection and diagnostics.
		INSTALLED	
Filter Notification=	NONE	NONE	Filter Notification is an adjustable item which configures dirty filter notification.
		RUNTIME	
		BINARY_INPUT	
		BOTH	
RAT Sensor=	NOT_INSTALLED	NOT_INSTALLED	RAT Sensor is an adjustable item which configures the controller will expect a return air temperature sensor input (network or hardwired).
		INSTALLED	
Config Index=	0	0 to 35	-
Apply Changes=	NO	NO	ApplyChanges is an adjustable item which will commit any changes made to the configuration parameters.
		YES	



## Advanced Timers

**⚠ WARNING**

Operational settings should only be made with the advisement of a qualified person; changing key configurations away from factory settings may result in damage to equipment or surrounding property. Recommended settings may vary based on application specific requirements.

**Table 41: Main Menu \ Advanced Menus \ Advanced Timers**

Menu Display Name	Default	Range	Description
Apply Changes=	No	No Yes	Apply Changes is an adjustable item which will commit any changes made to the BACnet MS/TP parameters.
Pwd Timeout=	10 min	3-30 min	Pwd Timeout is an adjustable item that sets the amount of time in minutes that the controller will allow access to applicable menus without re-entering the necessary password. If the keypad display remains idle for this time period the display will revert to the "main menu" requiring a re-entering of the password.
SAF Ctrl Dly=	-	5-120 Seconds	SAF Ctrl Dly is an adjustable item that sets the duration of time that the minimum speed signal is sent to the variable speed supply air fan after the supply fan is started via a modbus or digital output. Control reverts to either duct pressure or speed after the fan has been on for the SAF CtrlDelay (default 30 seconds).
Change Filter Time=	1440 Hours	360 – 4320 Hours	Change Filter Time is an adjustable item which sets the incremental supply fan run hours that must occur before a dirty filter warning will be indicated when the Filter Chg Strategy is BINARY_INPUT or BOTH.
Filter Runtime=	0.0 h	0 – 300000 Hours	Filter Runtime is an adjustable item which displays the supply fan operating hours with the current air filter. This value can be manually reset when the component is replaced.
Heat Stage Timer=	-	0-999999 seconds	Heat Stage Timer is a status only item which displays the amount of time remaining before the heating stage timer expires.
Ele Heat Stage Timer=	-	0-30 seconds	Ele Heat Stage Timer is a status only item which displays the amount of time remaining before the supply fan electric heat off timer expires.
DSP Dly Timer=	-	0-120 seconds	DSP Dly Timer is a status only item which displays the amount of time remaining after the VAV box output was energized, before duct static pressure control will be allowed.
SAF On Timer=	-	0-999999 seconds	SAF On Timer is a status only item indicating the amount of time the supply air fan has been running.
State Change Timer=	-	0-999999 seconds	State Change Timer is a status only item indicating the value of the state change timer.
Startup Timer=	-	0-999999 seconds	Startup Timer is a status only item indicating the value of the unit startup change timer.
EWT Htg Tmr=	-	0-600 seconds	EWT Htg Tmr is a status only item indicating the value of the entering water temperature sampling timer for heating.
EWT Clg Tmr=	-	0-600 seconds	EWT Clg Tmr is a status only item indicating the value of the entering water temperature sampling timer for cooling.
EWT Htg Retry=	-	0-600 min	EWT Htg Retry is a status only item indicating the value of the entering water temperature retry timer for heating.
EWT Clg Retry=	-	0-600 min	EWT Clg Retry is a status only item indicating the value of the entering water temperature retry timer for cooling.

Menu Display Name	Default	Range	Description
DSP Alm Tmr=	-	0-360 seconds	DSP Alm Tmr is a status only item indicating the value of the duct static pressure alarm timer.
RS Comm=	-	INACTIVE	RS Comm is a status only item indicating the status of communications with the integrated thermostat.
		ACTIVE	
RS Spc Tmp Tmr=	-	0-420 seconds	RS Comm is a status only item indicating the value of the timer used in establishing communications with the integrated thermostat.
Comp Start Delay Tm=	-	0-420 seconds	Comp Start Delay Time is a status only item indicating the value of the compressor startup delay timer.
Tnt OR Timer=	-	0-480 minutes	Tnt OR Timer is a status only item indicating the value of the tenant override temporary occupancy timer.

## SAF Set-Up

### SAF DSP Control

**Table 42: Main Menu \ Advanced Menu \ SAF Set-Up \ DSP Control**

Menu Display Name	Default	Range	Description
DSP Period=	5	0-600 seconds	DSP Period is an adjustable item that sets the “sampling time” used in the PI control function to vary the supply fan speed when DSP supply fan control is selected.
DSP Gain=	0.1	0.0-255.0	DSP Gain is an adjustable item that sets the “gain” used in the PI control function to vary the supply fan speed when DSP supply fan control is selected.
DSP PAT=	60 seconds	0-600 seconds	DSP PAT is an adjustable item that sets the “project ahead time” used in the PI control function to vary the supply fan speed when DSP supply fan control is selected.
DSPMaxChg=	5%	0.0-10.0	DSPMaxChg is an adjustable item that sets the maximum value of increase or decrease of the supply fan speed each period used in the PI control function to vary the supply fan speed when DSP supply fan control is selected.
DSP PI Target=	-	0.0-5.0 IWC	DSP PI Target is a status only item that indicates the target value used calculate the error for DSP control.
DSP PI Input=	-	0.0-5.0 IWC	DSP PI Input is a status only item that indicateds the measured value that is compared to the DSP PI Target to calculate the error for DSP control.
DSP PI Output=	-	0-100%	DSP PI Output is a status only item that indicates the supply fan speed output for DSP supply fan control.

### 1 Zone VAV Control

**Table 43: Main Menu \ Advanced Menu \ SAF Set-Up \ 1ZnVAV Control**

Menu Display Name	Default	Range	Description
1ZnVAV Period=	60sec	0-600 seconds	1ZnVAV Period is an adjustable item that sets the “sampling time” used in the PI control function to vary the supply fan speed when 1ZnVAV supply fan control is selected.
1ZnVAV Gain=	2	0.0-255.0	1ZnVAV Gain is an adjustable item that sets the “gain” used in the PI control function to vary the supply fan speed when 1ZnVAV supply fan control is selected.
1ZnVAV PAT=	400sec	0-600 seconds	1ZnVAV PAT is an adjustable item that sets the “project ahead time” used in the PI control function to vary the supply fan speed when 1ZnVAV supply fan control is selected.
1ZnVAVMaxChg=	10.00%	0.0-10.0	1ZnVAVMaxChg is an adjustable item that sets the maximum value of increase or decrease of the supply fan speed each period used in the PI control function to vary the supply fan speed when 1ZnVAV supply fan control is selected.

## EF Set-Up

**Table 44: Main Menu \ Advanced Menu \ EF Set-Up**

Menu Display Name	Default	Range	Description
EF Damper Setpt=	20%	0-100%	EF Damper Setpt is an adjustable item that sets the minimum commanded outdoor air damper position, above which the exhaust fan will be allowed to operate.
EF Const Speed Setpt=	75%	0-100%	EF Const Speed Setpt is an adjustable item that sets the exhaust fan operating speed when the EF Ctrl= Const. Speed.

## Changeover Valve Set-up

**Table 45: Main Menu \ Advanced Menu \ ChngOvr Vlv Set-Up**

Menu Display Name	Default	Range	Description
Clg Period=	20 seconds	1-600 seconds	Clg Period is an adjustable item that sets the “sampling time” used in the PI control function to vary the modulating changeover valve position in cooling.
Clg Gain=	1	0.0-255.0	Clg Gain is an adjustable item that sets the “gain” used in the PI control function to vary the modulating changeover valve position in cooling.
Clg PAT=	40 seconds	0-600 seconds	Clg PAT is an adjustable item that sets the “project ahead time” used in the PI control function to vary the modulating changeover valve position in cooling.
Clg Max Chg=	15.00%	0.0-10.0%	ClgMaxChg is an adjustable item that sets the maximum value of increase or decrease of the modulating changeover valve each period used in the PI control function in cooling.
Htg Period=	60 seconds	1-600 seconds	Htg Period is an adjustable item that sets the “sampling time” used in the PI control function to vary the modulating changeover valve position in heating.
Htg Gain=	1.5	0.0-255.0	Htg Gain is an adjustable item that sets the “gain” used in the PI control function to vary the modulating changeover valve position in heating.
Htg PAT=	90 seconds	0-600 seconds	Htg PAT is an adjustable item that sets the “project ahead time” used in the PI control function to vary the modulating changeover valve position in heating.
Htg Max Chg=	10.00%	0.0-10.0%	HtgMaxChg is an adjustable item that sets the maximum value of increase or decrease of the modulating changeover valve each period used in the PI control function in heating.
CO Valve Direction=	DIRECT	DIRECT	CO Valve Direction is an adjustable item that sets the changeover water valve output as direct acting (increasing voltage opens the valve) or reverse acting (decreasing voltage opens the valve).
		REVERSE	
CO Valve Signal=	BINARY24VAC	MOD2_TO_10VDC	CO Valve Signal is an adjustable item that sets the type of signal used to control the changeover water valve.
		MOD0_TO_10VDC	
		BINARY24VAC	
EWT Diff=	5F	0-10 °F	EWT Diff is an adjustable item that sets the entering water temperature differential.
EWT=	-	-40-212 °F	EWT is a status only item which displays the current entering water temperature value being used by the controller. This will be the network supplied entering water temperature if available or the input from the entering water temperature sensor.
Htg PI Target=	-	50-95 °F	Htg PI Target is a status only item that indicates the target value used calculate the error for modulating changeover valve control in heating.
Htg PI Input=	-	-40F-212 °F	Htg PI Input is a status only item that indicateds the measured value that is compared to the Htg PI Target to calculate the error for modulating changeover valve control in heating.
Htg PI Output=	-	0-100%	Htg PI Output is a status only item that indicates the changover valve output for modulating changeover valve control in heating.
HW Heating Avail=	-	UNAVAIL	HW Heating Avail is a status only item that indicates if hot water heating is available.
		AVAIL	
Clg PI Target=	-	50-95 °F	Clg PI Target is a status only item that indicates the target value used calculate the error for modulating changeover valve control in cooling.
Clg PI Input=	-	-40-212 °F	Clg PI Input is a status only item that indicateds the measured value that is compared to the Clg PI Target to calculate the error for modulating changeover valve control in cooling.

Menu Display Name	Default	Range	Description
Clg PI Output=	-	0-100%	Clg PI Output is a status only item that indicates the changeover vale output for modulating changeover valve control in cooling.
CW Cooling Avail=	-	UNAVAIL	CW Heating Avail is a status only item that indicates if chilled water cooling is available.
		AVAIL	
EWT Heating Status=	IDLE	IDLE	EWT Heating Status is a status only item that indicates that status of the entering water temperature sampling for heating mode.
		TESTING	
		GOOD	
		WAITING	
EWT Cooling Status=	IDLE	IDLE	EWT Cooling Status is a status only item that indicates that status of the entering water temperature sampling for cooling mode.
		TESTING	
		GOOD	
		WAITING	
EWT Htg Tmr=	-	0-600 seconds	EWT Htg Tmr is a status only item indicating the value of the entering water temperature sampling timer for heating.
EWT Clg Tmr=	-	0-600 seconds	EWT Clg Tmr is a status only item indicating the value of the entering water temperature sampling timer for cooling.
EWT Htg Retry=	-	0-600 min	EWT Htg Retry is a status only item indicating the value of the entering water temperature retry timer for heating.
EWT Clg Retry=	-	0-600 min	EWT Clg Retry is a status only item indicating the value of the entering water temperature retry timer for cooling.

## CW Clg Set-Up

**Table 46: Main Menu \ Advanced Menu \ CW Clg Set-Up**

Menu Display Name	Default	Range	Description
Clg Period=	20 seconds	1-600 seconds	Clg Period is an adjustable item that sets the “sampling time” used in the PI control function to vary the modulating chilled water valve position.
Clg Gain=	1	0.0-255.0	Clg Gain is an adjustable item that sets the “gain” used in the PI control function to vary the modulating chilled water valve position.
Clg PAT=	40 seconds	0-600 seconds	Clg PAT is an adjustable item that sets the “project ahead time” used in the PI control function to vary the modulating chilled water valve position.
Clg Max Chg=	15.00%	0.0%-100.0%	ClgMaxChg is an adjustable item that sets the maximum value of increase or decrease of the modulating chilled water valve each period used in the PI control function.
CW Valve Direction=	Direct	Direct	CW Valve Direction is an adjustable item that sets the chilled water valve output as direct acting (increasing voltage opens the valve) or reverse acting (decreasing voltage opens the valve).
		Reverse	
CW Valve Signal=	OnOff24VAC	Mod0-10V	CW Valve Signal is an adjustable item that sets the type of signal used to control the chilled water valve.
		Mod2-10V	
		OnOff24VAC	
CW Cooling Avail=	-	Unavail	CW Cooling Avail is a status only item that indicates if chilled water cooling is available.
		Avail	
Clg PI Target=	-	50-95 °F	Clg PI Target is a status only item that indicates the target value used calculate the error for modulating chilled water valve control.

Clg PI Input=	-	-40-212 °F	Clg PI Input is a status only item that indicates the measured value that is compared to the Clg PI Target to calculate the error for modulating chilled water valve control.
Clg PI Output=	-	0-100%	Clg PI Output is a status only item that indicates the supply fan speed output for modulating chilled water valve control.

## HW Htg Set-Up

**Table 47: Main Menu \ Advanced Menu \ HW Htg Set-Up**

Menu Display Name	Default	Range	Description
Htg Period=	60 seconds	1-600 seconds	Htg Period is an adjustable item that sets the “sampling time” used in the PI control function to vary the modulating hot water valve position.
Htg Gain=	1.5	0.0-255.0	Htg Gain is an adjustable item that sets the “gain” used in the PI control function to vary the modulating hot water valve position.
Htg PAT=	90 seconds	0-600 seconds	Htg PAT is an adjustable item that sets the “project ahead time” used in the PI control function to vary the modulating hot water valve position.
Htg Max Chg=	10.00%	0.0-100.0%	HtgMaxChg is an adjustable item that sets the maximum value of increase or decrease of the modulating hot water valve each period used in the PI control function.
HW Valve Direction=	Direct	Direct	HW Valve Direction is an adjustable item that sets the hot water valve output as direct acting (increasing voltage opens the valve) or reverse acting (decreasing voltage opens the valve).
		Reverse	
HW Valve Signal=	OnOff24VAC	Mod0-10V	HW Valve Direction is an adjustable item that sets the type of signal used to control the hot water valve.
		Mod2-10V	
		OnOff24VAC	
HW Heating Avail=	-	Unavail	HW Heating Avail is a status only item that indicates if hot water heating is available.
		Avail	
Htg PI Target=	-	50-95 °F	Htg PI Target is a status only item that indicates the target value used calculate the error for modulating hot water valve control.
Htg PI Input=	-	-40-212 °F	Htg PI Input is a status only item that indicates the measured value that is compared to the Htg PI Target to calculate the error for modulating hot water valve control.
Htg PI Output=	-	0-100%	Htg PI Output is a status only item that indicates the supply fan speed output for modulating hot water valve control.

## EI Htg Set-Up

**Table 48: Main Menu \ Advanced Menu \ EI Htg Set-Up**

Menu Display Name	Default	Range	Description
Htg Period=	10sec	1-600 seconds	Htg Period is an adjustable item that sets the “sampling time” used in the PI control function to vary the electric heat output.
Htg Gain=	1	0.0-255.0	Htg Gain is an adjustable item that sets the “gain” used in the PI control function to vary the electric heat output.
Htg PAT=	100 seconds	0-600 seconds	Htg PAT is an adjustable item that sets the “project ahead time” used in the PI control function to vary the electric heat output.
Htg Max Chg=	1	0.0-10.0%	HtgMaxChg is an adjustable item that sets the maximum value of increase or decrease of the electric heat output each period used in the PI control function.
Htg PI Target=	-	50-95 °F	Htg PI Target is a status only item that indicates the target value used calculate the error for electric heat output control.
Htg PI Input=	-	-40-212 °F	Htg PI Input is a status only item that indicateds the measured value that is compared to the Htg PI Target to calculate the error for electric heat output control.
Htg PI Output=	-	0-100%	Htg PI Output is a status only item that indicates the supply fan speed output for electric heat output control.
Elec Heat Avail=	-	UNAVAIL	Elec Heat Avail is a status only item that indicates if electric heat is available.
		AVAIL	
Desired Htg Stage=	-	0-4	Desired Htg Stage is a status only item that indicates the calculated number of electric heat stages required.
Current Htg Stage=	-	0-4	Current Htg Stage is a status only item that indicates the actual number of electric heat stages energized, limited by availability and stage timers.



## Cooling Set-Up

**Table 49: Main Menu \ Advanced Menu \ Cooling Set-Up**

Menu Display Name	Default	Range	Description
Lead Circuit=	Runtime	Runtime	Lead Circuit is an adjustable item that sets how the controller determines the sequence in which compressor outputs are activated and deactivated.
		Comp1	
Compressor Diff=	2 °F	1-5 °F	Compressor Diff is an adjustable item that sets the stage 2 compressor cooling differential.
Clg Period=	10 seconds	0-600 seconds	Clg Period is an adjustable item that sets the “sampling time” used in the PI control function to vary the compressor stage outputs.
Clg Gain=	1	0.0-255.0	Clg Gain is an adjustable item that sets the “gain” used in the PI control function to vary the compressor stage outputs.
Clg PAT=	100 seconds	0-600 seconds	Clg PAT is an adjustable item that sets the “project ahead time” used in the PI control function to vary the compressor stage outputs.
Clg Max Chg=	1.0 °F	0.0-10.0 °F	ClgMaxChg is an adjustable item that sets the maximum value of increase or decrease of the compressor stage output each period used in the PI control function.
Compressor Avail=	-	UNAVAIL	Compressor Avail is a status only item that indicates if compressor cooling is available.
		AVAIL	
Comp Off Timer=	-	0-999999 seconds	Comp Off Timer is a status only item indicating the value of the compressor minimum off timer.
Comp On Timer=	-	0-999999 seconds	Comp On Timer is a status only item indicating the value of the compressor minimum on timer.
Cooling Stage Timer=	-	0-999999 seconds	Cooling Stage Timer is a status only item indicating the value of the cooling stage timer.
Desired Cooling=	-	0-100%	Desired Cooling is a status only item that indicates the calculated percentage of compressor cooling capacity required.
Desired Cooling Stg=	-	0-4	Desired Cooling Stg is a status only item that indicates the calculated compressor cooling stage required.
Current Cooling Stage=	-	0-4	Current Cooling Stage is a status only item that indicates the actual number of compressor stages energized, limited by availability, stage timers, and minimum on/off timers.
Comp Turn On=	-	UNAVAIL	Comp Turn On is a status only item that indicates if next sequenced compressor output is available to be energized based on stage and compressor minimum on timers.
		AVAIL	
Comp Turn Off=	-	UNAVAIL	Comp Turn Off is a status only item that indicates if the energized compressor output sequenced to be turned off next is available to be deenergized, based on stage and compressor minimum off timers.
		AVAIL	
Ctg PI Target=	-	-40-212 °F	Clg PI Target is a status only item that indicates the target value used calculate the error for compressor staging control.
Ctg PI Input=	-	-40-212 °F	Clg PI Input is a status only item that indicates the measured value that is compared to the Clg PI Target to calculate the error for compressor staging control.
Ctg PI Output=	-	0-100%	Clg PI Output is a status only item that indicates the supply fan speed output for compressor staging control.

## Econo Set-Up

**Table 50: Main Menu \ Advanced Menu \ Econo Set-Up**

Menu Display Name	Default	Range	Description
Econo Strategy=	NONE	NONE	Econo Strategy is an adjustable item which sets the strategy that will be used to determine if the outdoor air is suitable for economizing.
		OAT	
		ENTHALPY_OUT	
		TEMP_DIFF	
		ENTHALPY_DIFF	
OAD Out Scaling=	LINEAR	LINEAR	OAD Out Scaling is an adjustable item which sets how the return air damper output signal is scaled.
		SQUARED	
OAD Min=	20%	0-100%	Min OA Pos is an adjustable item which sets the minimum position of the outdoor damper while the fan is running. The actual OAD damper position will vary between this value and the Max OA Pos depending on economizer and DCV requirements.
OAD Max=	100%	0-100%	Max OA Pos is an adjustable item which sets the maximum outdoor damper signal that the controller will send.
RAD Out Scaling=	LINEAR	LINEAR	OAD Out Scaling is an adjustable item which sets how the outdoor air damper output signal is scaled.
		SQUARED	
RAD Min=	20%	0-100%	Min RA Pos is an adjustable item which sets the position of the return air damper when the outdoor air damper is at its minimum position.
RAD Max=	100%	0-100%	Max RA Pos is an adjustable item which sets the position of the return air damper when the outdoor air damper is at its maximum position.
Econo OAT Setpt=	70 °F	0-100 °F	Econo OAT Setpt is an adjustable item which sets the outdoor drybulb temperature, above which the economizer will not be available.
Outdoor Enth Setpt=	28 BTU/#	5-50BTU/lb	Outdoor Enth Setpt is an adjustable item which sets the Outdoor Enthalpy setpoint used in determining economizer availability.
Temp Diff Setpt=	2 °F	1-10 °F	Temp Diff Setpt is an adjustable item which sets the control temperature to outdoor air temperature differential used in determining economizer availability.
Enth Diff Setpt=	2 BTU/#	1-10 BTU/lb	Enth Diff Setpt is an adjustable item which sets the control enthalpy to outdoor air enthalpy differential used in determining economizer availability.
OAT Lockout Ena=	DISABLED	DISABLED	OAT Lockout Ena is an adjustable item which sets if economizer lockout based on low outdoor air temperature is enabled.
		ENABLED	
OAT Lockout Setpt=	36 °F	25-60 °F	OAT Lockout Setpt is an adjustable item which sets the outdoor air temperature at which OAT Lockout will be enabled.
Econo Stg Time=	5 min	5-60 min	Econo Stg Time is an adjustable item which sets the economizer interstage timer.
Outdoor Enthalpy=	-	-200-200 BTU/lb	Outdoor Enthalpy is a status only item that indicates the current calculated outdoor enthalpy.
Indoor Enthalpy=	-	-200-200 BTU/lb	Indoor Enthalpy is a status only item that indicates the current calculated indoor enthalpy.
OAT High Status=	-	INACTIVE	OAT High Status is a status only item that indicates if the current outdoor air temperature is too high for economizing.
		ACTIVE	
OAT Lockout Status=	-	UNLOCK	OAT Lockout Status is a status only item that indicates if the OAT Lockout functionality is preventing economizing.
		LOCK	
OAT Status=	-	NOT_OK	OAT Status is a status only item that indicates if the outdoor air temperature is suitable for economizing.
		OK	

Menu Display Name	Default	Range	Description
Econo Avail=	-	UNAVAIL AVAIL	Econo Status is a status only item which indicates whether or not the economizer is currently enabled.
DCV OA Signal=	-	0-100%	DCV OA Signal is a status only item that indicates the OA damper position being commanded as part of DCV control.
Eff Econo Strategy=	NONE	NONE OAT ENTHALPY_OUT TEMP_DIFF ENTHALPY_DIFF	Eff Econo Strategy is an adjustable item which indicates the economizer strategy currently being used to determine if the outdoor air is suitable for economizing. This is based on the Econo Strategy and the reliability of the required sensors.

## CO2 Sensor Set-Up

**Table 51: Main Menu \ Advanced Menu \ CO2 Set-Up**

Menu Display Name	Default	Range	Description
DCV Enable=	DISABLED	DISABLED ENABLED	DCV Enable is an adjustable item which sets if demand controlled ventilation will be enabled.
Min OA CO2 Spt=	500 ppm	0-3000 ppm	Min OA CO2 Spt is an adjustable item which sets the measured CO2 level where the DCV OA Signal will be the minimum OA damper position.
Max OA CO2 Spt=	2000 ppm	0-3000 ppm	Max OA CO2 Spt is an adjustable item which sets the measured CO2 level where the DCV OA Signal will be the maximum OA damper position.
DCV OA Signal=	-	0-100%	DCV OA Signal is a status only item that indicates the OA damper position being commanded as part of DCV control.
DCV Status=	No	No Yes	DCV OA Signal is a status only item that indicates if DCV has been disabled because of a CO2 sensor problem.

## Dehum Set-Up

**Table 52: Main Menu \ Advanced Menu \ Dehum Set-Up**

Menu Display Name	Default	Range	Description
Dehum Strategy=	NONE	NONE	Dehum Strategy is an adjustable item which configures the controller to use active, passive, or no dehumidification.
		PASSIVE	
		ACTIVE	
Dehum Type=	DEWPT	REL_HUM	Dehum Type is an adjustable item which configures dehumidification will be enabled based on a space relative humidity setpoint or a space dewpoint setpoint.
		DEWPT	
Dehum Required=	-	NONE	Dehum Required is a status only item which indicates if dehumidification is required.
		NEEDED	
Dehum CW Vlv Cmd=	-	0-100%	Dehum CW Vlv Cmd is a status only item that indicates the chilled water valve output being commanded as part of dehumidification control.
Dehum Cmp Clg Cmd=	-	0-50%	Dehum Cmp Clg Cmd is a status only item that indicates the compressor cooling output being commanded as part of dehumidification control.
Dehum HW Vlv Cmd=	-	INACTIVE	Dehum HW Vlv Cmd is a status only item that indicates the status of hot water valve control related to dehumidification.
		ACTIVE	
Dehum EH Cmd=	-	INACTIVE	Dehum EH Cmd is a status only item that indicates the status of electric heat control related to dehumidification.
		ACTIVE	
Dehum Available=	-	UNAVAIL	Dehum Available is a status only item that indicates if dehumidification is available.
		AVAIL	
Dehum DAT Sp=	70.0 °F	55.0-80.0 °F	Dehum DAT Sp is an adjustable item which sets the temperature that the DAT should be maintained at when it is in the dehumidification mode of operation.

## IO Readings

**Table 53: Main Menu \ Advanced Menu \ IO Readings**

Menu Display Name	Default	Range	Description
<b>MCB Universal</b>			
MCB X1=	-	0-9999999	Status only item that indicates the unprocessed data of the indicated input/output.
MCB X2=	-	0-9999999	
MCB X3=	-	0-9999999	
MCB X4=	-	0-9999999	
MCB X5=	-	0-9999999	
MCB X6=	-	0-9999999	
MCB X7=	-	0-9999999	
MCB X8=	-	0-9999999	
MCB X9=	-	0-9999999	
MCB X10=	-	0-9999999	
MCB X11=	-	0-9999999	
<b>EMA Universal</b>			
EMA X1=	-	0-9999999	Status only item that indicates the unprocessed data of the indicated input/output.
EMA X2=	-	0-9999999	
EMA X3=	-	0-9999999	
EMA X4=	-	0-9999999	
EMA X5=	-	0-9999999	
EMA X6=	-	0-9999999	
EMA X7=	-	0-9999999	
EMA X8=	-	0-9999999	
<b>MCB DI</b>			
MCB DI1=	Off	Off	Status only item that indicates the unprocessed data of the indicated input/output.
		On	
MCB DI2=	Off	Off	
		On	
MCB DI3=	Off	Off	
		On	
MCB DI4=	Off	Off	
		On	
MCB DI5=	Off	Off	
		On	
MCB DI6=	Off	Off	
		On	
EMA DI1=	Off	Off	
		On	

Menu Display Name	Default	Range	Description
<b>MCB DO</b>			
MCB DO1=	Off	Off	Status only item that indicates the unprocessed data of the indicated input/output.
		On	
MCB DO2=	Off	Off	
		On	
MCB DO3=	Off	Off	
		On	
MCB DO4=	Off	Off	
		On	
MCB DO5=	Off	Off	
		On	
MCB DO6=	Off	Off	
		On	
MCB DO7=	Off	Off	
		On	
MCB DO8=	Off	Off	
		On	
MCB DO9=	Off	Off	
		On	
MCB DO10=	Off	Off	
		On	
<b>EMA DO</b>			
EMA DO1=	Off	Off	Status only item that indicates the unprocessed data of the indicated input/output.
		On	
EMA DO2=	Off	Off	
		On	
EMA DO3=	Off	Off	
		On	
EMA DO4=	Off	Off	
		On	
EMA DO5=	Off	Off	
		On	
EMA DO6=	Off	Off	
		On	

## About This AHU

*Table 54: Main Menu \ About This AHU*

Menu Display Name	Description
App Version=	Status only indicating information concerning the unit controller application version.
Controller ID=	
Controller PN=	
Device ID=	
Main BSP=	
HMI GIUD=	
OBH GIUD=	

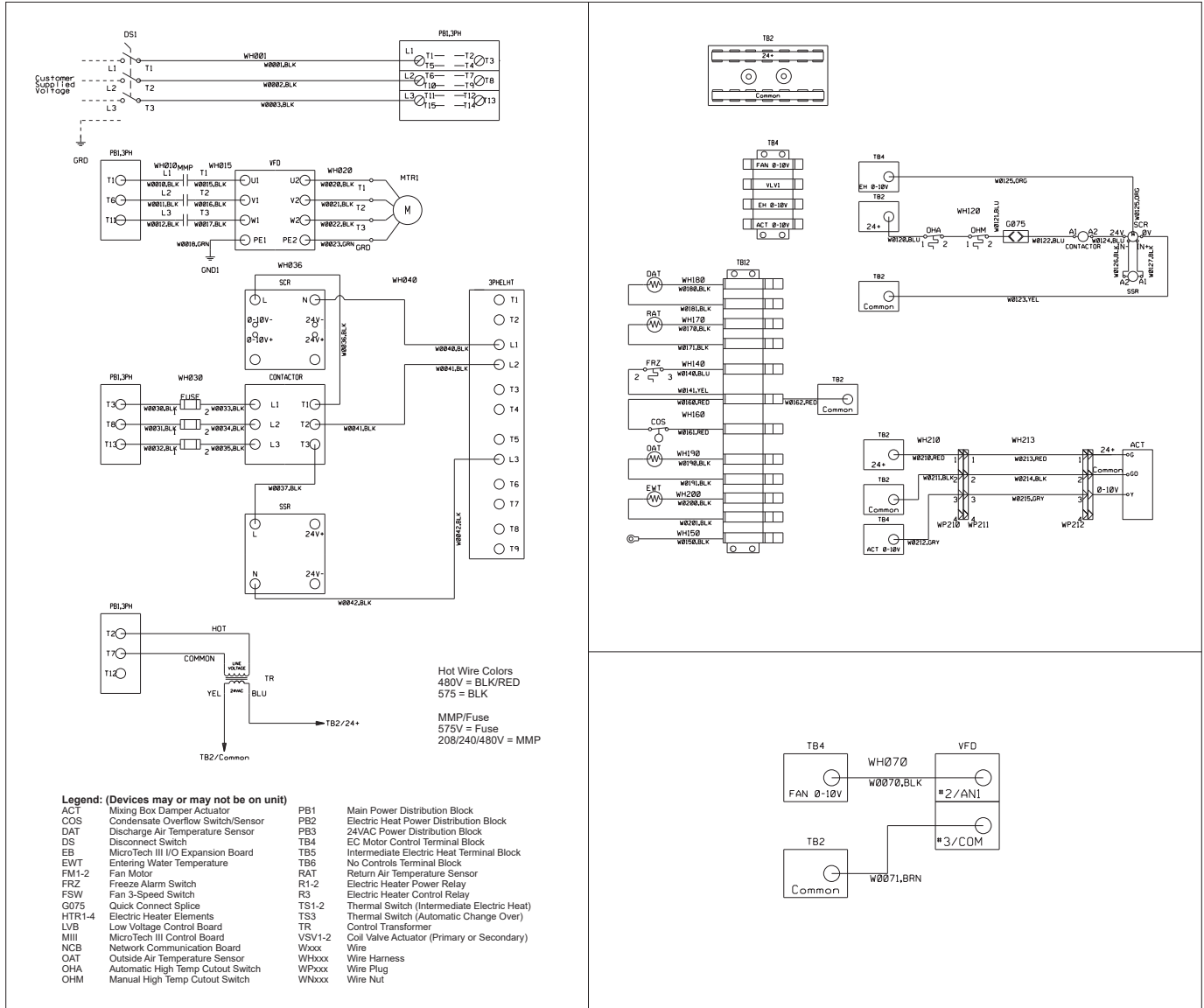


# Appendix

## Example Wiring Diagrams

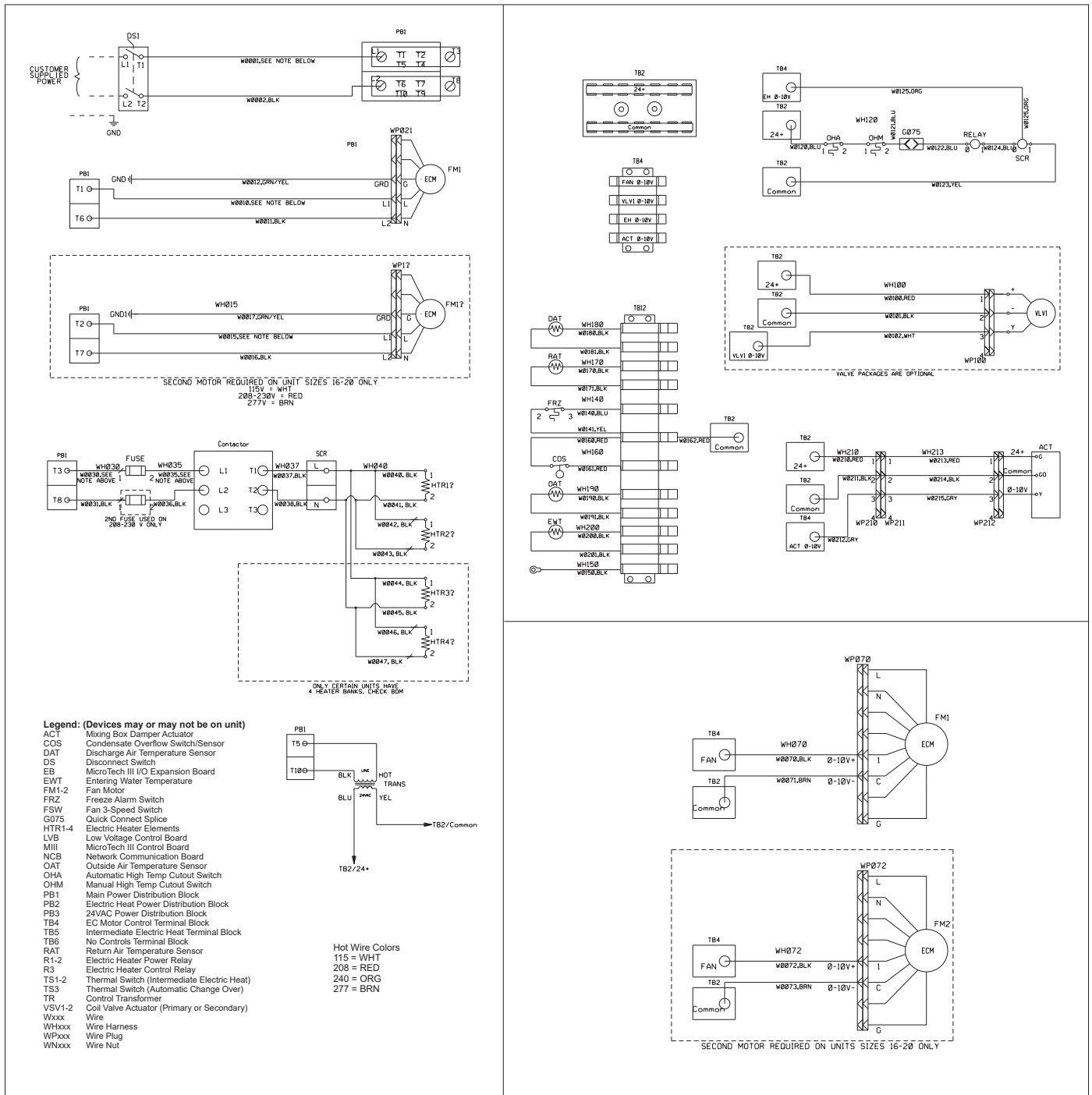
**NOTE:** Wiring diagrams are typical, always defer to the wiring diagram provided with the unit.

### 3 Phase Power, SCR Electric Heat, No Valve, Modulating Damper, VFD Fan



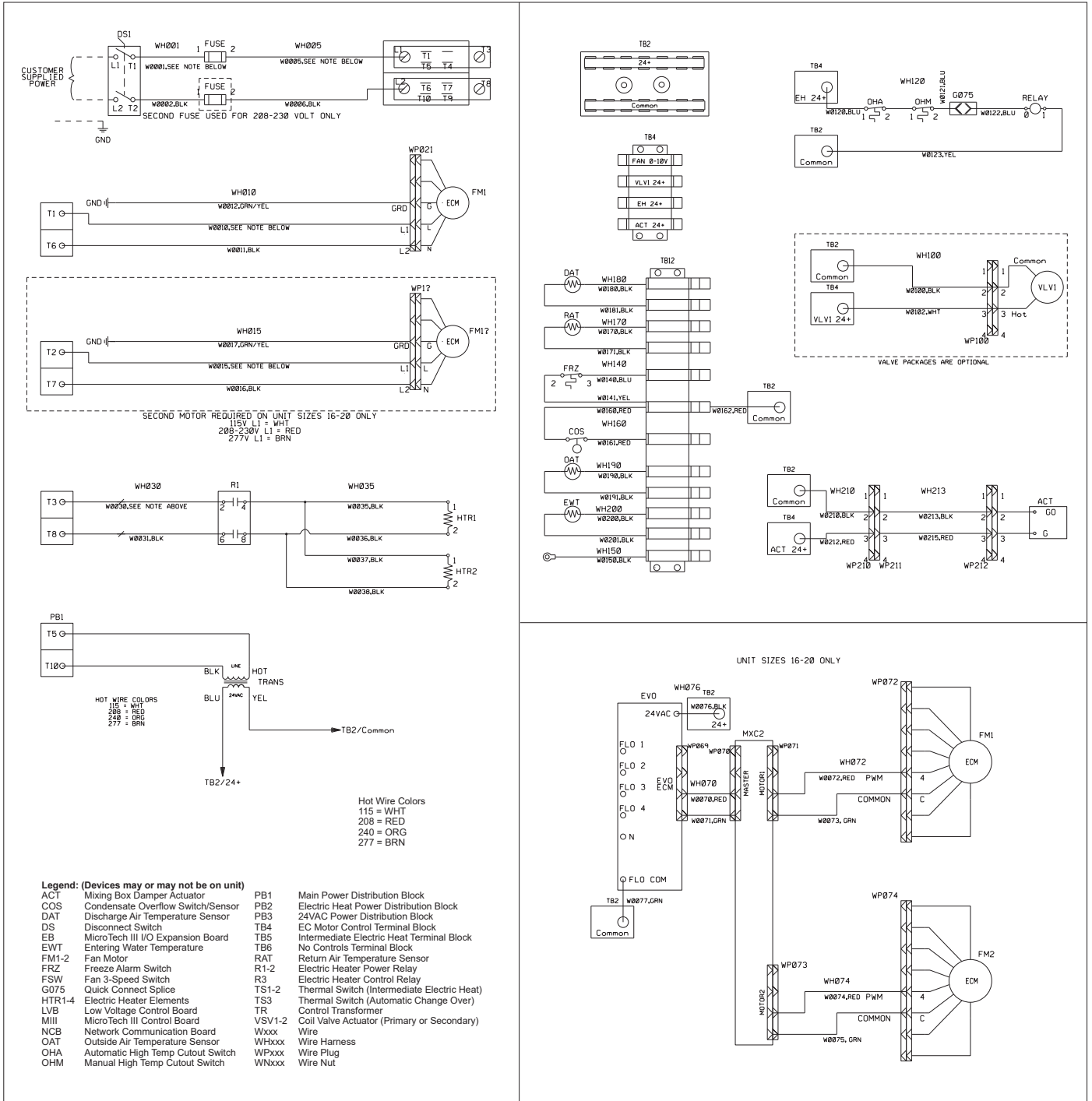
NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit.

# 1 Phase Power, SCR Electric Heat, Modulating Valve, Modulating Damper, Modulating Fan



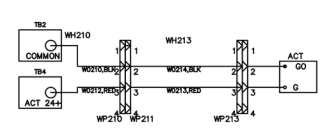
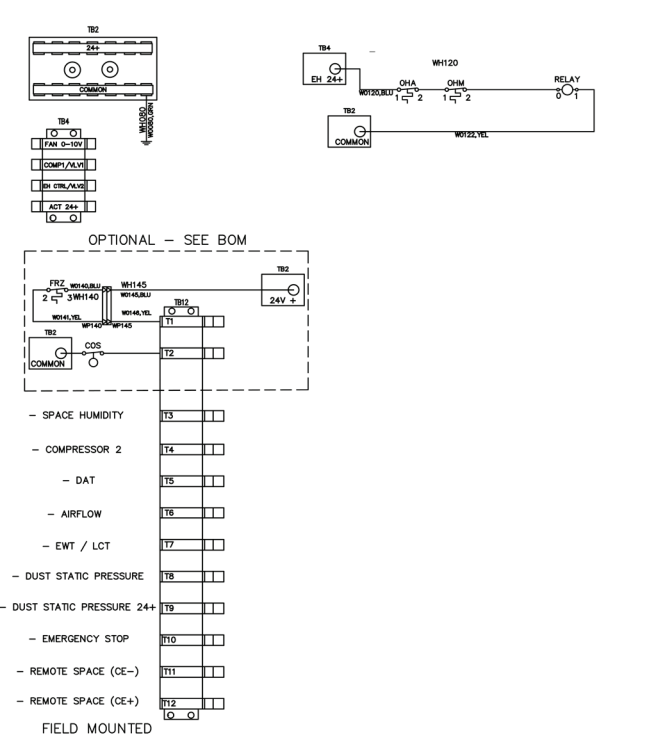
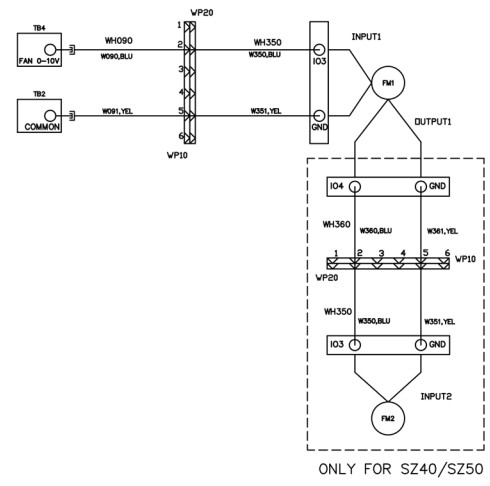
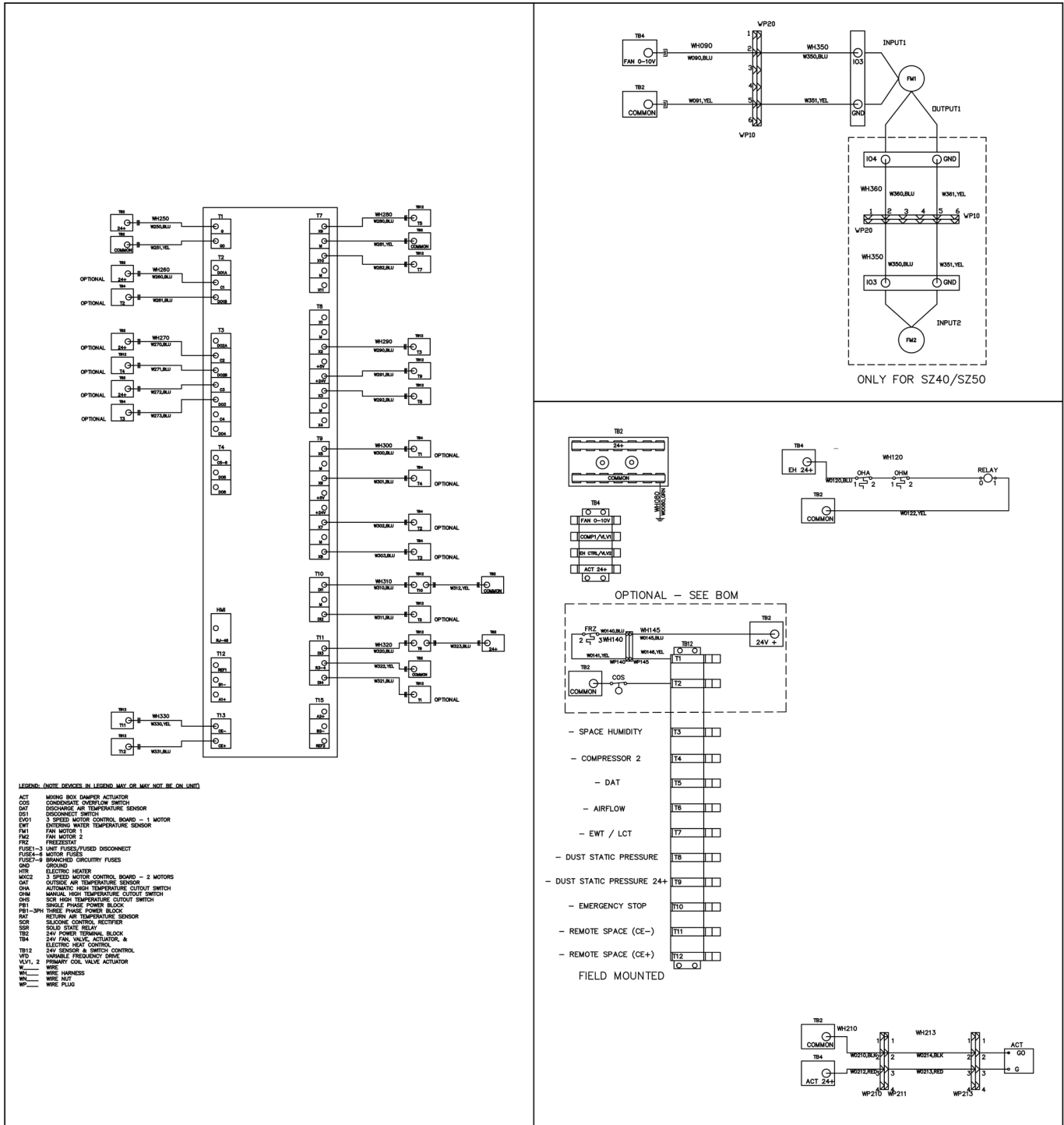
**NOTE:** Wiring diagrams are typical, always defer to the wiring diagram provided with the unit.

# 1 Phase Power, On-Off Electric Heat, On-Off Valve, On-Off Damper, 3-Speed Fan



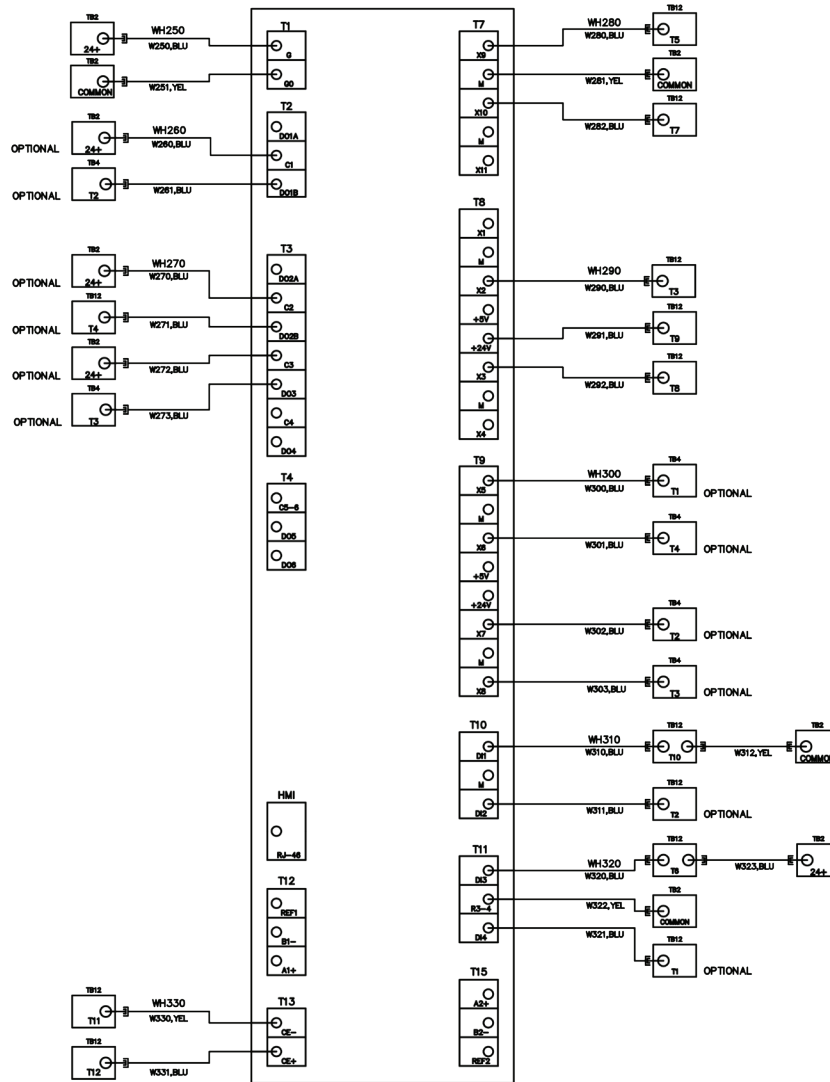
NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit

### 3-Phase Power, Welded Aluminum Airfoil Plenum Fan, On-Off Electric Heat, On/Off Damper, Fused



NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit

### MicroTech 4 Lite Controller for Sizes 006-050

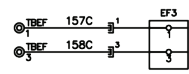
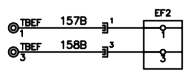
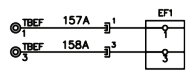
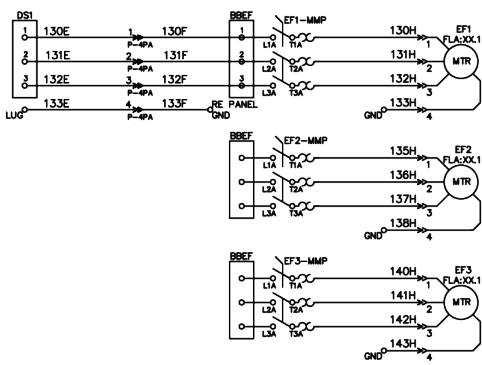
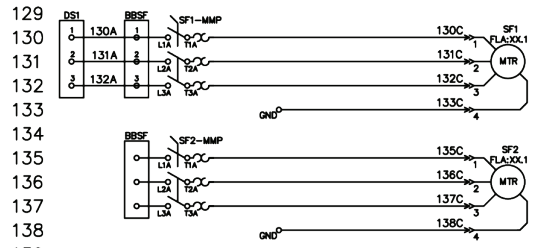
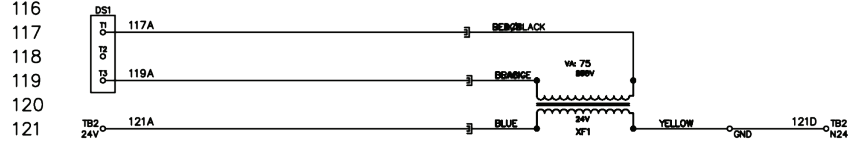
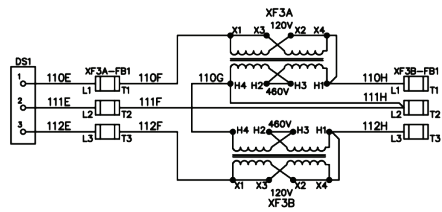
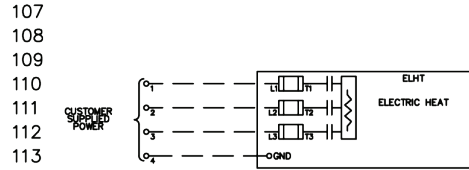
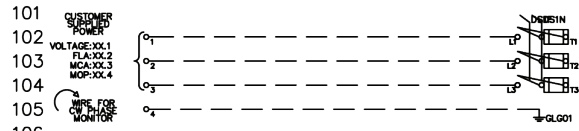


LEGEND: (NOTE DEVICES IN LEGEND MAY OR MAY NOT BE ON UNIT)

- ACT MIXING BOX DAMPER ACTUATOR
- COS CONDENSATE OVERFLOW SWITCH
- DAT DISCHARGE AIR TEMPERATURE SENSOR
- DS1 DISCONNECT SWITCH
- EVO1 3 SPEED MOTOR CONTROL BOARD - 1 MOTOR
- EWT ENTERING WATER TEMPERATURE SENSOR
- FM1 FAN MOTOR 1
- FM2 FAN MOTOR 2
- FRZ FREEZESTAT
- FUSE1-3 UNIT FUSES/FUSED DISCONNECT
- FUSE4-6 MOTOR FUSES
- FUSE7-9 BRANCHED CIRCUITRY FUSES
- GND GROUND
- HTR ELECTRIC HEATER
- MXC2 3 SPEED MOTOR CONTROL BOARD - 2 MOTORS
- OAT OUTSIDE AIR TEMPERATURE SENSOR
- OHA AUTOMATIC HIGH TEMPERATURE CUTOFF SWITCH
- OHM MANUAL HIGH TEMPERATURE CUTOFF SWITCH
- OHS SCR HIGH TEMPERATURE CUTOFF SWITCH
- PB1 SINGLE PHASE POWER BLOCK
- PB1-3PH THREE PHASE POWER BLOCK
- RAT RETURN AIR TEMPERATURE SENSOR
- SCR SILICON CONTROL RECTIFIER
- SSR SOLID STATE RELAY
- TB2 24V POWER TERMINAL BLOCK
- TB4 24V FAN, VALVE, ACTUATOR, & ELECTRIC HEAT CONTROL
- TB12 24V SENSOR & SWITCH CONTROL
- VFD VARIABLE FREQUENCY DRIVE
- VLV1, 2 PRIMARY COIL VALVE ACTUATOR
- W WIRE
- WH WIRE HARNESS
- WN WIRE NUT
- WP WIRE PLUG

NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit

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