



## **Marvel Plus Microprocessor**

These instructions were a segment within the VariCool VAV unit Installation & Operation Manual. While some of the instructions may differ slightly dependent upon the model the controller is used in, the general scope of the controller would be the same.

If there are any questions please contact United CoolAir at 877-905-1111.

### **MARVEL PLUS CONTROLLER**

The VariCool system is designed to operate using a double microprocessor design control system called a Marvel Plus. The Marvel Plus control system incorporates a Marvel Plus Main Board Control and a Marvel Plus Wall Mount Control and display.

The Marvel Plus Main Board microprocessor is a 16 bit microprocessor programmable controller with onboard flash memory (6 Megabytes) to ensure better performance. An onboard real time clock card allows for setting up of occupancy schedules and recording of alarm occurrence for storing of alarm history. Each Marvel Plus has the ability to record up to 36 alarms/faults under an alarm history page to allow technicians to view alarm history and temperatures when the alarm occurred. Marvel Plus Main Boards allow for connection some of the more widely used Building Management Systems without requiring a Gateway to interface.

The Marvel Plus Wall Controller is a terminal unit used to interface with the Marvel Plus Main Board Controller through the onboard display and keypad. The software stored in the flash memory of the Marvel Plus Main Board was designed with menu driven pages allowing customers to easily navigate through the menus and submenus for setup of their systems.

## OPERATING THE CONTROLLER

To operate the control system, there are six basic buttons on the Marvel Plus Wall Control which are used to change settings, time schedules, system setup, and view alarms. Figure 6 – Wall Controller shows the Marvel Plus Wall Controller.

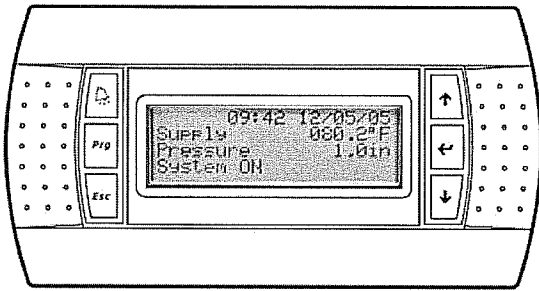


Figure 6 – Wall Control

An explanation of each button is as follows:



ALARM  
BUTTON



UP BUTTON



PROGRAM  
BUTTON



ENTER  
BUTTON





ESCAPE  
BUTTON






DOWN  
BUTTON



ALARM BUTTON

The  button is used for viewing the present alarms with the system. There is a built in watch dog alarm constantly monitoring for alarm conditions with each of the system safeties. It will constantly flash on and off to show that the watch dog alarm is operating. During an alarm condition, the  button is illuminated a continuous Red. Depending on the type of alarm, the system may shut down or

continue to operate. Some types of alarms are just simple faults known as indicators which are not harmful to the operation of the unit but may require attention in the near future. Pressing the  button will reveal what alarm caused the system to shut down. To reset an alarm, press the  button until the screen displays "NO MORE ALARMS, Press ENTER to RESET". Simply pressing the  button will reset the alarm when on the no more alarms screen.



PROGRAM BUTTON

The **Prg** button is used to program the system's set points, alarm thresholds, view alarm history, adjust sensor calibration, enable system operation, view run hours, set occupied/unoccupied schedules, and much more. A complete listing is under the section called menus.



ESCAPE BUTTON

The escape button is used to go back to the previous menu screen.



UP BUTTON

The up button is used to scroll upward through the pages/menus, increase a setting, or toggle a component ON/OFF.



ENTER BUTTON



The enter button is used to confirm temperature, humidity, or pressure settings, and confirm selected components. It is also used to clear alarms once the alarm is viewed.



DOWN BUTTON

The down button is used to decrease a setting or toggle a component ON/OFF.

## **VARICOOL SEQUENCE OF OPERATION**

After power is applied to the system from the main power supply, the unit must be started through the Marvel Plus controller. To start the unit, press and hold the  button for 5 seconds. To stop the unit, press the  button again and hold for 5 seconds. Once the system is started through the Marvel Plus Wall Control, the supply air blower will start after the factory default 15 second time delay (field adjustable) times out.

### **Occupied Schedule Mode**

When the unit is in the occupied mode, the system will be fully operational. Once the unit goes into unoccupied mode, the supply air blower will ramp back to minimum speed. If the Un-Occupied Control or Night Set Back is set up, that function will take over. While in unoccupied control, the unit will maintain between the high and low return air temperatures. Any optional Outdoor Air Dampers and Air Side Economizer Dampers connected to the system will be closed.

### **Occupied Override Mode**

Occupied override is available to override unoccupied mode of operation during after hours tenant occupancy.

### **System Operation**

There are two methods of control depending on the application, options ordered, and functions of the system. The two methods of control are Supply Temperature and Return Air – Mode Enable. Please refer to each specific method for details of the system operation based on set up of each function. The method of control is preset at United CoolAir specific to the unit and options purchased.


## **Supply Temperature Control**


Supply Temperature Control monitors the supply temperature to determine if the supply air temperature is above the supply air temperature set point. If the supply air temperature is above the supply temperature set point plus band set point, mechanical cooling or optional waterside economizer is sequenced to maintain the supply air temperature based on a percentage of cooling demand required. The amount of cooling demand is determined by how far supply air temperature is above the air temperature set point. If the system has Morning Warmup, Morning Warmup is sequenced based on Return Air Temperature and Morning Warmup Set Points.

### **Return Air – Mode Enable Control**

If the application requires both cooling and heating or heat pump or requires humidification or dehumidification, a Return Air Sensor shall be factory provided but must be field installed. The Return Air Sensor will be used to determine the mode of operation e

When the unit is in the occupied mode, the supply air blower will ramp up to a minimum blower speed to supply a minimum required amount of air flow. Once at the minimum speed, the controller will verify that the high duct static pressure switch and air flow switch for alarm conditions. Next, the blower will readjust the signal to the VFD to maintain the supply air blower at the static pressure set point called for by the Marvel Plus controller.

If the pressure in the ducting increases above the high duct static pressure switch setting, the system will shut down all modes of operation. The supply air blower will be shut down and an audible alarm will be generated and displayed in text on the Marvel Plus Wall Control under the  button. The bottom line of the opening screen for System Status will also display "Off by High Press AL".

At any time, if the Marvel Plus control reads there is a loss of air flow, the controller will shut down all modes of operation to protect the system. The supply air blower will be shut down+ and an audible alarm will be generated and displayed in text on the Marvel Plus Wall Control under the  button. The bottom line of the opening screen for System Status will also display "Off by Airflow Alarm".

If both switches are verified and no alarms exist, the controller will continue with cooling or heating modes of operation.

### **Heat Pump Mode (Option)**

The heat pump mode option provides heating based on the Return Air Temperature utilizing the Return Air – Mode Enable setup. If the Return Air Temperature is less than the set point minus the band set point, Heating Mode shall be enabled. When heating mode is enabled, the first sequence of operation is heat pump mode. During heating mode, the heating (heat pump) stages are then sequenced based on Supply Air Temperature Heating Set Points.

If optional additional heating stages were provided, they shall be used as a back up heating source. The system has a low ambient lockout feature which automatically reverts to optional heating stages when the outdoor air temperature is too cold for heat pump mode to properly provide the required heating to maintain the tenant occupied space requirements.

### **Humidification Option**

If the system has the Humidification Option, humidification is based on Return Air Humidity. When the Return Air Humidity is less than the Return Air Humidity Set Point minus the Band Set Point Humidification is enabled. Humidification is then sequenced ON and OFF based on the Humidification

requirement or Humidification Demand. The percentage of Humidification Demand is determined by how far the Return Air Humidity is below the Return Air Humidity Set Point.

### **Dehumidification Option**

If the system has the Dehumidification Option, Dehumidification shall be sequenced based on Return Air Humidity. When the Return Air Humidity is greater than the Return Air Humidity Set Point plus the Band Set Point, dehumidification mode is enabled. Dehumidification is then sequenced / staged ON and OFF by cycling compressors based on the dehumidification requirement or dehumidification demand. The percentage of Dehumidification Demand is determined by how far the Return Air Humidity is above the Return Air Humidity Set Point.

### **Air Side Economizer Option**

If the system has the Airside Economizer Option, the system will utilize the Airside Economizer when the Outdoor Air Enthalpy is less than Return Air Enthalpy and the Outdoor Air Temperature is less than the Outdoor Air Temperature Set Point minus the Band Set Point. Once the Outdoor Air is verified, the Marvel Plus Control sends a modulating signal (0-10vdc) to the field interlock terminal strip as shown on the electrical diagram provided with the unit. The signal provided shall maintain the supply air temperature as close to the supply air temperature set point as possible until the Return Air Temperature (cooling requirement) is satisfied.

### **Water Side Economizer Option**

The Water Side Economizer option provides an economical method of cooling when a free cool coil can be utilized. If the system has a free cool coil and a cooling tower available, the system will use free cooling when the water temperature is below the free cool temperature setting. If the water

temperature is above the free cool setting, the system will use mechanical cooling. If the water temperature is below the free cool setting, the water valve for free cool mode will modulate open to satisfy the cooling requirement.

### Chilled Water Option

If the system has the chilled water coil option, the chilled water valve shall be modulated to maintain the supply air temperature set point based on the cooling demand. The entering water temperature must be below the chilled water temperature set point. Cooling Demand is determined by how far the Supply Air Temperature is above the supply air temperature set point. The chilled water valve shall be modulated open to maintain the Supply Air Temperature as close to the Supply Air Temperature Set Point as possible.

### MARVEL PLUS SCREEN INFORMATION

Each screen listed below has been described for function within the system.

### SYSTEM STATUS

	13:32	09/10/08
Supply		063.5°F
Pressure		0.93in
Off by Keypad		

This screen shows the time and date, supply air temperature reading, static pressure reading within the duct system, and the status of the system.

To turn the system ON/OFF, press the ← button. It will drop the blinking cursor under the Off by Keypad. Next, press the ↓ or ↑ button one time to toggle it to System ON then press the ← button again.

To move through the fields make sure the blinking cursor is at the top left corner of the display screen. At that point, pressing the ↓ or ↑ buttons allows navigation through the screen pages.

Return Sensors	
Temperature	069.5°F
Humidity	050.2%
Occupied	

This is the screen for Return Air conditions. It shows return air temperature and return air humidity.

Ambient Sensors	
Temperature	061.5°F
Humidity	042.2%

This screen shows the outdoor air conditions. It shows the reading of the outdoor air temperature and outdoor air humidity. The Ambient Sensors screen will appear only with the Air Side Economizer option.

Refrigerant	
Discharge	215psi
Leaving Evap	054.2°F

This screen is used with the electronic head pressure control option. It shows the refrigerant discharge pressure reading for the highest operating pressure of all compressors.

It monitors the compressors' discharge pressures for to see which compressor is operating under the highest pressure. If the highest operating discharge pressure is above the discharge pressure set point, the system will modulate the water valve open until the set point is being maintained.

Blower VFD	
Frequency	29.5Hz
Output	03.8vdc

This screen shows the readings for blower motor conditions. The Frequency reading is the position or operating point of the supply air blower motor. The output reading is the modulated position that the Marvel Plus Main Board is calling for the motor to operate at. The amount of output is based on the static pressure reading and static pressure set point. As the static pressure decreases, the VFD will be modulated by the Marvel Plus Main Board to increase the frequency to the motor which will increase the air volume bringing it closer to the air pressure set point.

Water	
Temperature	059.3°F

This screen shows the reading for entering water temperature. It appears only with the water side economizer option.

System Status	
CL Off-Econ ON	045%
Heating	000%

This screen shows the status of the system. It shows the percentage of demand for cooling and heating. The percentage of cooling/heating shown on the screen is the amount of cooling/heating required to bring the area to

Compressor Status	
C1 OFF	C3 OFF
C2 OFF	C4 OFF

This screen monitors the status of the systems compressors. Whenever the wall control displays that these are ON, the particular compressor that has the ON beside it should be operating.


Heating Status	
H1 OFF	H3 OFF
H2 OFF	

This screen monitors the status of the systems optional heaters. Whenever the wall control displays that these are ON, the particular heating bank that has the ON beside it should be operating.

15:10 09/10/08	
Mode	WED OCCUPIED
Override Status	OFF
Override Time	3hrs






This screen shows the status of the System's Occupied/Unoccupied state. Mode indicates the present day of the week and occupancy status for that particular day. Override status allows the customer to change that occupancy status during the unoccupied state to the occupied state. Override Time is the length of time the system should remain in the occupied state during override mode.

To change the occupancy status to be in occupied override, press the ← button. Next, press the ↓ or ↑ button one time then press the ← button again to store the change as occupied override. Then press the ↓ or ↑ button to set the length

of time for the system to remain in occupied override mode. Press the  button one final time.

**MENU and SUB-MENU AREAS**

To enter the menu area, press the *Prg* button one time. The active menu ready for selection will be the one with all capital letters. Each menu item may or may not have sub-menus.

Notice that "FACTORY MENU" is the first menu displayed when pressing the *Prg* button. To go into the Set Points Screen, press the  button and once the Set Points screen appears in capital letters "SET POINTS", press the  button, or to go into another menu, press the  or  button until the preferred menu is selected and press the  button. All the sub menus for each main menu will appear once entered.

**SET POINTS**

Return Temp	
Set Point	070.0°F
Band	05.0°F

**Hot Gas Setup**

Hotgas Setup	
Set point	055.0°F
Band	05.0°F
Integration	600sec





**Set point** is used to set the control set point that as the supply air temperature falls below this set point, the hot gas bypass will modulate to maintain the setting.

**Band** is the setting where the hot gas bypass will maintain between. As long as the temperature is within plus or minus

the band from the hot gas set point, no change will occur.

**ENABLES**

System Enables	
System on/off	ON

This screen is the main screen to turn the unit on and off. To turn the unit on or off, press the  button then press the  or  button one time to toggle the setting on or off then press the  button again.

The Return Temperature set point is the main control set point for the system. When the actual temperature is above the temperature set point plus 1/2 of the Band set point, the system will be in 100% demand for cooling. When the actual temperature is below the temperature set point minus 1/2 of the band set point, the system will be in 100% heating demand. Set the return air temperature to the desired return air temperature.

Supply Limits	
High SetPt	120.0°F
Low SetPt	038.0°F
Band	05.0°F

**High Setpt** is the highest supply air temperature allowed in the ducting. If the temperature in the supply ducting rises above this setting (120°F), heating mode of operation will be shut down.

**Low Setpt** is the lowest supply air temperature allowed in the ducting. If the temperature in the ducting falls below this setting (38°F), cooling mode of operation will be shut down.

Static Pressure	
Set Point	1.0iwc
Dead Band	0.2iwc
Band	0.5iwc

**Set Point** for static pressure is the control setting that the VFD will adjust the blower until it is maintaining the static pressure.

**Dead Band** is the point where no adjustments are made to the VFD.

**Band** is the activation point plus or minus ½ of the band setting before adjustments are made to adjust the static pressure in the ducting.

#### ALARM SET POINTS

The following alarm set point screens are used to monitor fault points. The high and low settings are used to monitor and generate a fault when the temperature or pressure rises above the high or falls below the low settings. During the fault, the system will continue to operate.

*Please note that the refrigerant pressure transducer is only used to monitor head pressure to adjust the water regulating valve. Each refrigerant circuit has its own high pressure switch that will lock out its particular compressor if the discharge pressure rises above the discharge pressure switches fixed trip point.*

Alarm delay is the time delay allowed before the system will show up as a fault. This is used as a means of allowing the system to recover before a fault is initiated.

Static Pressure	
High Alarm	002.5i
Low Alarm	000.0i
Alarm Delay	060sec

Supply Temp	
High Alarm	150.0°F
Low Alarm	035.0°F
Alarm Delay	060sec

Return Temp	
High Alarm	085.0°F
Low Alarm	060.0°F
Alarm Delay	120sec

Refrigerant Pres	
High Alarm	375.0psi
Low Alarm	125.0psi
Alarm Delay	005sec

#### RUN HOURS

The following screens show the actual run hours of each component as tracked by the controller. If any of the screens listed here do not appear, the system does not have that particular option.

Blower	Run Hours	00015hrs
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Comp 1	Run Hours	00005hrs
--------	-----------	----------

Comp 2	Run Hours	00004hrs
--------	-----------	----------

Heat 1	Run Hours	00004hrs
--------	-----------	----------

Heat 2	Run Hours	00003hrs
--------	-----------	----------

Heat 3	Run Hours	00002hrs
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**DAY MIN/MAX**

The next screen day min/max show the high and low return air temperature and humidity.

	Current Day	
	Low	High
TMP=	068.3°F	071.8°F
HUM=	046.8%	054.5%

**ALARM HISTORY**

Alarm History	08
REFRIG HIGH PRESSURE	
Supply 068.3°F	Return 071.8°F
06:31:45	12/06/05

The alarm history screens document the alarm that occurred, supply and return air temperatures at the time the alarm occurred and the time and date of alarm. Up to 36 alarms may be stored in the alarm history pages. Use the ↓ or ↑ buttons to page through the alarm history pages.

**SET TIME**

	REAL TIME CLOCK
DAY=	THU
TIME=	6:35
DATE:	12/08/2005

Set the appropriate day of the week, time, and date. Set up of the real time clock is important to be able to record alarm history or for following scheduled occupied and unoccupied times.

CLOCK SETUP 2
Daylight Savings = Yes

**SCHEDULE**

For the system to follow an occupancy schedule, a Start and End period must be set for each day of the week. If the

control schedule is set to 00:00 for both start and end schedules, the system will remain constantly occupied. Up to 20 Holiday occupancy schedules may be programmed into the system. For the holiday schedule, a start date is programmed and end date is programmed.

Monday- Occupied	
Start:	00:00
End:	00:00

Tuesday- Occupied	
Start:	00:00
End:	00:00

Wed-Occupied	
Start:	00:00
End:	00:00

Thur-Occupied	
Start:	00:00
End:	00:00

Friday-Occupied	
Start:	00:00
End:	00:00

Sat-Occupied	
Start:	00:00
End:	00:00

Sunday-Occupied	
Start:	00:00
End:	00:00

Holidays 01-03	
01:	00-00 to 00-00
02:	00-00 to 00-00
03:	00-00 to 00-00

Holidays 04-06	
01:	00-00 to 00-00
02:	00-00 to 00-00
03:	00-00 to 00-00

Holidays 07-09	
07:	00-00 to 00-00
08:	00-00 to 00-00
09:	00-00 to 00-00

Holidays 10-12	
10:	00-00 to 00-00
11:	00-00 to 00-00
12:	00-00 to 00-00

Holidays 13-15	
13:	00-00 to 00-00
14:	00-00 to 00-00
15:	00-00 to 00-00

Holidays 16-18	
16:	00-00 to 00-00
17:	00-00 to 00-00
18:	00-00 to 00-00

Holidays 19-20	
19:	00-00 to 00-00
20:	00-00 to 00-00

**Unoccupied Control**

The unoccupied control sets the temperature swing that is allowed during the unoccupied time. A temperature high and a temperature low must be set and Temp control must be set to ON in order for Unoccupied Control to operate during unoccupied hours programmed in the previous section.

Unoccupied Control	
Temp Control	OFF
High Temp	078.0°F
Low Temp	065.0°F

**WarmUp Time** is the time that must be set for the length of Morning Warm Up mode to operate before it will switch into normal occupied operation.

WarmUp Time	060min
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**BMS**

COMMUNICATIONS	
PROTOCOL=	LOCAL
IDENT=	000
BAUD RATE=	19200

**CHANGE PASSWORD**

CHANGE PASSWORDS	
LEVEL 1>	0000

**TECHNICIANS MENU**

**Fan Operation**

Delays	
Startup Delay	015s
Airflow Proof	015s

**Temperature Units**

TEMP UNITS	
MODE:	FAHRENHEIT

**Manual Control**

Manual control is used to manually operate the digital and analog outputs of the system. Selecting ON will force the input or output to operate. Selecting OFF will force the input or output to the OFF position. Selecting AUTO will force the component to operate only with the sequence of operation.

Manual Digital Input	
C1 High Press	Auto
C1 Low Press	Auto
C2 High Press	Auto

Manual Digital Input	
C2 Low Press	Auto
Unit On/Off	Auto
Airflow	Auto

Manual Digital Input	
Static Pres	Auto
Water Flow	Auto
C3 High Pres	Auto

Manual Digital Input	
C3 Low Press	Auto
C4 High Press	Auto
C4 Low Press	Auto

Manual Digital Input	
Remote on/off	Auto
Filter	Auto
High Heat	Auto

Manual Digital Input	
Fire	Auto
Freezestat	Auto
Fan Overload	Auto

Manual Relay Outputs	
Fan	Auto
Pump	Auto
Compressor 1	Auto

Manual Relay Outputs	
Fan	Auto
Pump	Auto
Compressor 1	Auto

Manual Analog Inputs		
Return H	OFF	000.0%
Return T	OFF	000.0°

Manual Relay Outputs	
Compressor 2	Auto
Compressor 3	Auto
Compressor 4	Auto

Manual Relay Outputs	
Compressor 2	Auto
Compressor 3	Auto
Compressor 4	Auto

Manual Analog Outputs		
HG Bypas	OFF	00.0vdc

Manual Analog Outputs		
VFD out	OFF	00.0vdc

Manual Analog Outputs		
Water V	OFF	00.0vdc

Manual Analog Outputs		
Economiz	OFF	00.0vdc

Manual Analog Outputs		
Heating	OFF	00.0vdc

Manual Analog Outputs		
Cooling	OFF	00.0vdc

**Sensors**

The sensor screens allow for calibration of temperature, humidity, and pressure sensors. The sensor screens are also used to adjust sensor ranges so that for instance if the low end of a static pressure transducer is 0.0" w.c., and it starts at 4 mA, then the start point would be 4 mA is 0.0" w.c.

Sensor offset	
Return Temperature	
Offset	000.0°F
Actual	070.0°F

Sensor offset	
Return Humidity	
Offset	000.0%RH
Actual	050.0%RH

Sensor offset	
Supply Temperature	
Offset	000.0°F
Actual	055.0°F

Sensor offset	
Ambient Temperature	
Offset	000.0°F
Actual	067.0°F

Sensor offset	
Ambient Humidity	
Offset	000.0%RH
Actual	050.0%RH

Sensor offset	
Duct Pressure	
Offset	0.0iwc
Actual	0.5iwc

Sensor offset	
Water Temperature	
Offset	000.0°F
Actual	067.0°F

Sensor offset	
Duct Pressure	
4mA	0.0iwc
20mA	5.0iwc

Sensor offset	
Refrigerant Pressure	
Offset	00psi
Actual	200psi

Sensor offset	
Refrigerant Pressure	
4mA	000psi
20mA	430psi

Sensor offset	
VFD Frequency	
Offset	00.0Hz
Actual	55.0Hz

Sensor offset	
VFD Frequency	
4mA	00.0Hz
20mA	60.0Hz

HotGas Bypass Output	
Action	Direct
Minimum	00.0vdc
Maximum	10.0vdc

DIGITAL INPUTS			
ALARMS ON:		ACT	
C1	HP	OPEN	CLOSE
C1	LP	OPEN	CLOSE

VFD Output	
Action	Direct
Minimum	00.0vdc
Maximum	10.0vdc

DIGITAL INPUTS			
ALARMS ON:		ACT	
C2	HP	OPEN	CLOSE
C2	LP	OPEN	CLOSE

Water Valve	
Action	Direct
Minimum	00.0vdc
Maximum	10.0vdc

DIGITAL INPUTS			
ALARMS ON:		ACT	
Unit		OPEN	CLOSE

Economizer Output	
Action	Direct
Minimum	00.0vdc
Maximum	10.0vdc

DIGITAL INPUTS			
ALARMS ON:		ACT	
Static		OPEN	CLOSE
Water FI		OPEN	CLOSE

Heating Output	
Action	Direct
Minimum	00.0vdc
Maximum	10.0vdc

DIGITAL INPUTS			
ALARMS ON:		ACT	
C3	HP	OPEN	CLOSE
C3	LP	OPEN	CLOSE

Cooling Output	
Action	Direct
Minimum	00.0vdc
Maximum	10.0vdc

DIGITAL INPUTS			
ALARMS ON:		ACT	
C4	HP	OPEN	CLOSE
C4	LP	OPEN	CLOSE

### Digital Inputs

All digital output active states may be viewed by these screens. **Act** are the Active states. The Alarms On is the state where the input will signal the Marvel Plus initiates an alarm condition. The Alarms On state can be change to activate either on Open or Close depending on the device being connected to its particular input.

DIGITAL INPUTS			
ALARMS ON:		ACT	
Remote		OPEN	CLOSE
Filter		OPEN	CLOSE

DIGITAL INPUTS		
ALARMS ON:		ACT
Ht Limit	OPEN	CLOSE
Fire	OPEN	CLOSE

DIGITAL INPUTS		
ALARMS ON:		ACT
Freeze	OPEN	CLOSE
Fan OL	OPEN	CLOSE

### Economizer

The economizer screen is used to set the type of economizer control (off, chilled water, free cool, enthalpy, or dewpoint). A delay in the economizer sequencing may be set. If the unit has Airside Economizer, a minimum percentage could be set into the setting to allow for a minimum amount of fresh outdoor air.

Economizer	
Type	OFF
Mechanical Del	300s
Damper minimum	000%

### Duct Pressure

The Static Pressure screen is used to increment adjustments at the

**Rate** set into the set point every (x) amount of seconds.

**Output Min** percentage set point is used to hold at least the percentage of output set into the minimum setting.

**Output Max** is the maximum amount the control will output that can be applied to maintain the static. If a setting less than 100% is set into the maximum, then the controller will only apply enough output to maintain the static pressure of the duct at the maximum set into this input even though the static pressure set point may

not be maintained unless more output is applied.

**Step** is the incremented output applied. If the static pressure must be increased with a 10% step then on a 0-10 vdc output, 1 vdc will be applied to the output.

Static Pressure		
Rate=	05s	MIN
Output=		MAX
Step=		010%

### Change Passwords

There are two levels of passwords that may be set into the system.

**Level 1** password is used to lock out the set points area. In the event someone tries to change a standard set point, the controller will require them to enter a password before accepting the change.

**Level 2** password is used to lock out Technician settings from being changed unless a password is provided.

Change Passwords	
LEVEL	1=0000
LEVEL	2=0000

### Software Version

UCA VariCool CONTROLLER	
V1.0	06/20/08

BIOS VERSION	
Version	03.43
Date	10/14/03