

# **EVAPCO Controller User's Manual – Addendum** Communications Guide EC Fan Edition

For eco-Air<sup>™</sup> Air Cooled and Adiabatic Fluid Coolers and Condensers



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# Connecting to the Controller

### **CONTROLLER LAYOUT:**

The eco-Air PLC controller is equipped with the means for communicating to building management systems. The default form of communication is Modbus RTU. The serial connection for Modbus RTU is shown in Detail A. The wiring has been routed to the customer terminal rail for easier installation. Optional expansion cards may be installed to provide a serial connection for BACnet MS/TP or Ethernet for Modbus TCP or BACnet IP. The connections will be made directly to the optional expansion card shown in Detail B.



Figure 1 - Controller Layout with Communication Details



#### **MODBUS RTU:**

Connections for Modbus RTU are made to the set of terminals labeled J25T, J25R, and J25G. This form of communication is always available, regardless of any additional expansion cards. It is recommended to use RS-485 approved twisted pair, shielded cable. The cable shielding should be terminated at only one end of the cable run.



Figure 2 - Modbus RTU Wiring Diagram

#### **BACNET MS/TP:**

Connections for BACnet MS/TP will be made directly to the BACnet RS485 interface card. It is recommended to use RS-485 approved twisted pair, shielded cable. The cable shielding should be terminated at only one end of the cable run.



Figure 3 - BACnet MS/TP Wiring Diagram



Figure 4 - BACnet MS/TP Expansion Card

### **MODBUS TCP & BACNET IP:**

Connections for either Modbus TCP or BACnet IP will be made directly to the RJ45 port of the pcoWeb interface card.





Figure 6 – pcoWeb Expansion Card



# **Communication Parameters**

### DEFAULT COMMUNICATION PARAMETERS:

The controller is setup with default communication parameters detailed on the first page of the control panel wiring diagram. The parameters for BACnet MS/TP and BACnet IP/Modbus TCP are only applicable with the addition of an optional expansion card.



Figure 7 - Communication Parameters



#### HOW TO CHANGE THE MODBUS RTU COMMUNICATION PARAMETERS:

From the Main menu, enter the Service submenu (Fig. 8). Scroll down to the BMS Config menu (Fig. 9) and press the Enter button. The Baudrate, Node Address, Parity, and Stop bit (Fig. 10) are all modifiable as required to match the supervisory settings. The available baud rates are 1200, 2400, 4800, 9600, 19200, and 38400.



#### Figure 8 - Main Menu



#### Figure 9 - Service Menu

Ŗ	Bms2 config. Protocol: Modbus slave ext. 2	1
Prg	Baudrate 19200 Address 1	4
Esc	Stop bit 1	•

Figure 10 - BMS2 Configuration

# HOW TO CHANGE THE BMS EXPANSION CARD PARAMETERS:

The ability to change the parameters of either controller expansion card is through the BIOS menu. Follow the list of instructions below:

 To access the BIOS menu, press the ALARM and ENTER buttons together for 3 seconds. The following screen will appear.

>	S	Υ	S	Т	E	м		1	Ν	F	0	R	м	Α	Т	1	0	Ν
	L	0	G		D	Α	Т	Α										
	0	Т	н	Е	R		1	Ν	F	0	R	М	Α	Т	1	0	Ν	
	F	L	Α	S	н	1	U	S	В		М	Е	М	0	R	Υ		

2) Scroll to the 'Other Information', and press Enter. The following screen will appear.

>	Т	D		Ν	U	М	В	Ε	R		1	Ν	F	0				
	Ρ	С	0	w	Е	В	1	Ν	Е	Т		С	0	Ν	F	1	G	
	М	Е	М	0	R	1	Е	S		S	Т	Α	Т	U	S			

 Select the 'pcoWeb/Net Config' and press Enter. The following screen will appear.

>	Ρ	С	0	w	E	В	s	e	t	t	i	n	g	s		
	Ρ	С	0	Ν	Е	Т	s	e	t	t	i	n	g	s		

# \*Note: For the pcoNet card (BACnet MS/TP), skip to step 6.

4) Select the 'pCOWeb settings' and press Enter. The following screen will appear.

D	Н	С	Ρ	1		-	-	-										
1	Ρ		Α	D	D	R	Е	S	S									
			-	-	-		-	-	-	1	-	-	1	1	-	-		

5) After a short delay, the fields will populate with the current parameters. If the DHCP option is set to ON, the IP address and Netmask fields cannot be changed. Both BACnet and Modbus communication parameters are available to change by continuously pressing the Enter button to cycle through the rest of the screens.

Ν	e	t	m	а	s	k	:										
		-	-	-		-	-	-	 -	-	-	$\sim$	-	-	-		
G	а	t	e	w	а	у											
		-	-	-		-	-	-	 -	-	-	$\sim$	-	-	-		

D	Ν	S	1	:														
		-	-	-		-	-	-		-	-	1	1	1	-	-		
D	Ν	S	2	1														
		-	-	-		-	-	-		-	-	-			-	-		
	I																	
в	Α	С	n	e	t		T	D	:									
В	Α	С	n	e	t		I	D -	:	-	-	-	-	-				
B	A	C C	n n	e	t		I T	D - y	: - p	- e	-	-	-	-				

# \*Note: When the parameters have been changed; skip to step 8.

6) Select 'pCONet settings' and press Enter. The following screen will appear.

В	Α	С	n	e	t		1	D	1								
								-	-	-	-	-	-	-			
В	Α	С	n	e	t		b	а	u	d	1						
						-	-	-	-	-	-	1	-				

 After a short delay, the fields will populate with the current parameters. Continuously pressing the Enter button will cycle through the rest of the screens.

В	Α	С	n	e	t		М	Α	С	1		-	-	-				
Μ	а	х		М	а	s	t	е	r	s	1		-	-	-			
М	а	х		F	r	а	m	e	s	1		-	-	-	-	-		

 Once the parameters have been set, press Enter to scroll to the confirmation screen, change the 'NO' to 'YES' and press Enter. (The screens will read pCONet whenever that expansion card is being updated.)

Ρ	С	0	w	Е	В	С	0	Ν	F	1	G		Ε	Ν	Α	В	L	Ε	
U	р	d	а	t	e	р	С	0	w	e	b	?		Ν	0				

9) While the parameters are being updated, the following message is will be displayed:

Ρ	С	0	w	Ε	В	С	0	Ν	F	1	G		Ε	Ν	Α	В	L	Ε	
Ρ	1	е	а	s	e	w	а	i.	t		f	0	r						
е	n	d		0	f	u	р	d	а	t	е								

 The following screen will be shown upon completion of the update. Power cycle the panel to apply new settings.

Ρ	С	0	w	Ε	В		С	0	Ν	F	1	G		Ε	Ν	Α	В	L	Ε	
U	р	d	а	t	e		с	0	m	р	1	е	t	e						
R	e	b	0	0	t		р	С	0	w	е	b		t	0					
а	р	р	1	у		n	е	w		s	е	t	t	-i-	n	g				



# **MODBUS** Communication Points

In the tables below, the adiabatic application column indicates addresses that only apply to units with adiabatic controls. Holding register 4005011 can be referenced to determine whether the adiabatic system has been enabled for the unit. The data points, indicated with the check mark, can be ignored if the unit is not equipped with the adiabatic water valves.

Register	Name	Units	Access	Range	Description	Adiabatic Application
			COI	L ADDRESSES		
9	Enable Unit	-	RW	BINARY 0 to 1	Enables the unit if it is configured to be enabled via BMS. 0 = Unit not enabled 1 = Unit enabled	
11	Remote Digital Input State	-	R	BINARY 0 to 1	The state of the remote digital input. 0 = No voltage present 1 = Voltage present	
16	Process Sensor Alarm	-	R	BINARY 0 to 1	Fault for either the outlet temperature sensor or the inlet pressure depending on the application. 0 = Normal 1 = Process sensor is not detected	
19	Pre-cooling Valve 1 Status	-	R	BINARY 0 to 1	The state of the first adiabatic pre-cooling valve. 0 = Valve off (water not flowing) 1 = Valve on (water flowing)	$\checkmark$
20	Pre-cooling Valve 2 Status	-	R	BINARY 0 to 1	The state of the second adiabatic pre-cooling valve. 0 = Valve off (water not flowing) 1 = Valve on (water flowing)	$\checkmark$
21	Pre-cooling Valve 3 Status	-	R	BINARY 0 to 1	The state of the third adiabatic pre-cooling valve. 0 = Valve off (water not flowing) 1 = Valve on (water flowing)	$\checkmark$
22	Pre-cooling Valve 4 Status	-	R	BINARY 0 to 1	The state of the fourth adiabatic pre-cooling valve. 0 = Valve off (water not flowing) 1 = Valve on (water flowing)	$\checkmark$
23	Activate Manual Flush	-	RW	BINARY 0 to 1	Manually starts the flushing cycle of the adiabatic system. 0 = Not active 1 = Start manual flush	$\checkmark$
24	Release Pre-cooling System	-	RW	BINARY 0 to 1	0 = Pre-cooling system will not function 1 = Pre-cooling system will function when needed	$\checkmark$



Register	Name	Units	Access	Range	Description	Adiabatic Application
25	Enable Common Alarm	-	RW	BINARY 0 to 1	Enables the common alarm for the digital output. 0 = Common alarm not enabled 1 = Common alarm enabled	
26	Common Alarm Digital Output Status	-	R	BINARY 0 to 1	Status of the alarm digital output. 0 = No alarm/not active 1 = Alarm/active	
35	Force Fans to Run at Full Speed	-	RW	BINARY 0 to 1	0 = Not enabled 1 = Forces fans to run at 100 percent fan speed	
37	Enable Stage Ontime	-	RW	BINARY 0 to 1	When active, the pre-cooling system will honor the minimum on time. 0 = Not active 1 = Active	~
401	Fan 1 Alarm	-	R	BINARY 0 to 1	0 = Normal 1 = Alarm present	
402	Fan 1 Communication Status	-	R	BINARY 0 to 1	This is the communication link between the Evapco controller and the fan motor only. 0 = Fan not online 1 = Fan is online	
411	Fan 2 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
412	Fan 2 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
421	Fan 3 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
422	Fan 3 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
431	Fan 4 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
432	Fan 4 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
441	Fan 5 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
442	Fan 5 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
451	Fan 6 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
452	Fan 6 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
461	Fan 7 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
462	Fan 7 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
471	Fan 8 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
472	Fan 8 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
481	Fan 9 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
482	Fan 9 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
491	Fan 10 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
492	Fan 10 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
501	Fan 11 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
502	Fan 11 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
511	Fan 12 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
512	Fan 12 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
521	Fan 13 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
522	Fan 13 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
531	Fan 14 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
532	Fan 14 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
541	Fan 15 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
542	Fan 15 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
551	Fan 16 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
552	Fan 16 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
561	Fan 17 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
562	Fan 17 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
571	Fan 18 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
572	Fan 18 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
581	Fan 19 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
582	Fan 19 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
591	Fan 20 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
592	Fan 20 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
			HOLD	ING REGISTEI	RS	
1	Outlet Temperature	0.1°	R	-999.9 to 999.9	The outlet temperature of the process fluid. For condenser applications, the outlet temperature is a saturated calculation based on the condensing pressure.	
2	Ambient Temperature	0.1°	R	-999.9 to 999.9	The temperature detected by the ambient temperature sensor.	
3	Active Set Point	0.1°	R	0.0 to 999.9	The active set point that the eco-Air unit will maintain.	
4	Set Point 1 Temperature	0.1°	RW	0.0 to 999.9	The primary process temperature setpoint used when all other alternate setpoints are not active.	
5	Set Point 2 Ambient Temperature Trigger	0.1°	RW	-100.0 to 100.0	The set point that when the ambient temperature falls below, will switch the control to set point 2.	
6	Temperature Regulation Band	0.1°	RW	0.0 to 15.0	The temperature band between the minimum and maximum fan speed for P fan speed control mode.	
7	Set Point 2 Ambient Temperature Trigger Differential	0.1°	RW	0.0 to 10.0	The temperature differential added to the ambient temperature set point 2 trigger. This will switch the control set point back to set point 1.	
8	Pre-cooling Minimum Allowable Temperature Set Point	0.1°	RW	0.0 to 50.0	The minimum ambient temperature at which the pre- cooling system may operate.	$\checkmark$
9	Pre-cooling Minimum Allowable Temperature Difference	0.1°	RW	0.0 to 20.0	The ambient temperature offset added to the minimum allowable temperature, at which the pre-cooling system becomes activate.	$\checkmark$
10	Proportional Gain	0.1	RW	0.0 to 15.0	The proportional gain constant used for the PID controller.	
17	Switch Point #1 Temperature	0.1°	R	0.0 to 999.9	The minimum temperature above which pre-cooling stage 1 will activate.	$\checkmark$
18	Switch Point #2 Temperature	0.1°	R	0.0 to 999.9	The minimum temperature above which pre-cooling stage 2 will activate.	$\checkmark$
19	Switch Point #3 Temperature	0.1°	R	0.0 to 999.9	The minimum temperature above which pre-cooling stage 3 will activate.	$\checkmark$
20	Switch Point #4 Temperature	0.1°	R	0.0 to 999.9	The minimum temperature above which pre-cooling stage 4 will activate.	$\checkmark$
22	Flushing Fan Speed	%	RW	0 to 100	The desired fan speed while performing a flushing cycle.	$\checkmark$



Register	Name	Units	Access	Range	Description	Adiabatic Application
23	Set Point 2 Temperature	0.1°	RW	0 to 999.9	An alternate process temperature set point that may be activated via the scheduler, ambient temperature, or digital input.	
5002	Actual Unit State	-	R	0 to 13	The current state of the EVAPCO Controller. 1 = Unit on and operational 2= Unit is off by an alarm 4 = Unit is off via Modbus/BACnet 5 = Unit is off via the scheduler 6 = Unit is off via the digital input 7 = Unit is switched off locally	
5003	Minimum Allowed Fan Speed	%	RW	0 to 100	The minimum allowable fan speed.	
5004	Maximum Allowed Fan Speed	%	RW	0 to 100	The maximum allowable fan speed.	
5005	Energy Savings Fan Speed	%	RW	0 to 100	The fan speed above which the pre-cooling system will activate.	
5006	Quiet Operation Maximum Fan Speed	%	RW	0 to 100	The maximum allowable fan speed in quiet operation.	
5007	PID Integral Term	Seconds	RW	0 to 1000	PID integral term.	
5008	PID Differential Term	Seconds	RW	0 to 1000	PID differential term.	
5009	Fan Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the fan(s) have been operational × 1000.	
5011	Number of wet stages	Units	R	0 to 4	The number of stages that have been enabled for the adiabatic system. The number of stages is equal to the number of solenoid valves on the unit.	$\checkmark$
5012	Pre-cooling Stage 1 Increase Delay Set Point	Seconds	RW	0 to 32767	The number of seconds that must pass with the process temperature above set point before the stage activates.	$\checkmark$
5013	Pre-cooling Stage 1 Decrease Delay Set point	Seconds	RW	0 to 32767	The number of seconds that must pass with the process temperature below set point before the stage deactivates.	$\checkmark$
5014	Pre-cooling Stage 2 Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1000.	$\checkmark$
5015	Refrigerant	-	RW	0 to 30	For condenser applications 0=R22, 1=R134a, 2=R404A, 3=R407C, 4=R410A, 5=R507, 6=R290, 7=R600, 8=R600a, 9=R717, 10=R744, 11=R728, 12=R1270, 13=R417A, 14=R422d, 15=R413A, 16=R422A, 17=R423A, 18=R407A, 19=R427A, 20=R245Fa, 21=R407F	



Register	Name	Units	Access	Range	Description	Adiabatic Application
5016	Pre-cooling Stage 3 Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1000.	$\checkmark$
5017	Pre-cooling Stage 1 Minimum On Time	Seconds	RW	0 to 32767	The minimum amount of time the pre-cooling stage remains active before turning off.	$\checkmark$
5018	Pre-cooling Stage 2 Minimum On Time	Seconds	RW	0 to 32767	The minimum amount of time the pre-cooling stage remains active before turning off.	$\checkmark$
5019	Pre-cooling Stage 3 Minimum On Time	Seconds	RW	0 to 32767	The minimum amount of time the pre-cooling stage remains active before turning off.	$\checkmark$
5020	Pre-cooling Stage 4 Minimum On Time	Seconds	RW	0 to 32767	The minimum amount of time the pre-cooling stage remains active before turning off.	$\checkmark$
5022	Failsafe Mode Fan Speed	%	RW	0 to 100	The speed at which the fans will operate in Failsafe mode.	
5029	Inlet Pressure	0.1	R	-32767 to 32767	Inlet pressure reading via pressure sensor input. X10	
5030	Reference Fan Speed	%	R	0 to 100	The desired fan speed determined by the controller.	
5031	Flushing Time	Minutes	RW	0 to 9999	The number of minutes to perform the flushing routine once initiated.	$\checkmark$
5037	Flushing Time Accumulator	Seconds	R	0 to 32767	The number of seconds the flushing routine has been active.	$\checkmark$
5038	Drying Time	Minutes	RW	0 to 9999	The number of minutes to dry the pre-cooling pads after a flushing routine.	$\checkmark$
5039	Drying Time Accumulator	Seconds	R	0 to 32767	The number of seconds the drying routine has been active	$\checkmark$
5040	Pre-cooling Stage 4 Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1000.	$\checkmark$
5041	Pre-cooling Stage 1 Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1000.	$\checkmark$
5042	Fan Operating Hours	Hours	R	0 to 999	The number of hours the fan(s) have been operational × 1.	$\checkmark$
5043	Pre-cooling Stage 1 Operating Hours	Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1.	$\checkmark$
5044	Pre-cooling Stage 2 Operating Hours	Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1.	$\checkmark$
5045	Pre-cooling Stage 3 Operating Hours	Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1.	$\checkmark$



Register	Name	Units	Access	Range	Description	Adiabatic Application
5046	Pre-cooling Stage 4 Operating Hours	Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1.	$\checkmark$
5050	Pre-cooling Stage 2-4 Increase Delay Set Point	Seconds	RW	0 to 32767	The number of seconds that must pass with the process fluid temperature above set point before the stages activate.	$\checkmark$
5051	Pre-cooling Stage 2-4 Decrease Delay Set Point	Seconds	RW	0 to 32767	The number of seconds that must pass with the process fluid temperature below set point before the stages deactivate.	$\checkmark$
5052	Pre-cooling Stage 2-4 Decrease Delay Accumulator	Seconds	R	0 to 32767	The number of seconds with the process fluid below set point while the stages are active.	$\checkmark$
5053	Pre-cooling Stage 1 Decrease Delay Accumulator	Seconds	R	0 to 32767	The number of seconds with the process fluid below set point while the stage is active.	$\checkmark$
5054	Pre-cooling Stage 2-4 Increase Delay Accumulator	Seconds	R	0 to 32767	The number of seconds with the process fluid above set point while the stages are not active.	$\checkmark$
5055	Pre-cooling Stage 1 Increase Delay Accumulator	Seconds	R	0 to 32767	The number of seconds with the process fluid above set point while the stage is not active.	$\checkmark$
5404	ebm Fan 1 Alarm Code	-	R	0 to 16	0 = No Alarm 1 = Fan Offline 2 = Phase Fault 3 = Motor Blocked 4 = Low Input Voltage 5 = High Input Voltage 6 = DC Link Overvoltage 7 = DC Link Undervoltage 8 = Motor Overheating 9 = Internal Circuit Overheating 10 = Output Stage Overheating 11 = Hall Sensor Error 12 = Communication Error 13 = Generic Error	



Register	Name	Units	Access	Range	Description	Adiabatic Application
5405	ebm Fan 1 Warning Code	-	R	0 to 16	<ul> <li>0 = No Warning</li> <li>1 = Output Stage High Temperature</li> <li>2 = Internal Circuit High Temperature</li> <li>3 = High Motor Temperature</li> <li>4 = Low DC Link Voltage</li> <li>5 = Power Is Limited</li> <li>6 = Current Is Limited</li> <li>7 = Brake Mode Active</li> </ul>	
5406	ebm Fan 1 Warning Bits	-	R	-32768 to 32767	Bit 0 = Current Is Limited Bit 1 = Not Used Bit 2 = Power Is Limited Bit 3 = Output Stage High Temperature Bit 4 = High Motor Temperature Bit 5 = Internal Circuit High Temperature Bit 6 = Low DC Link Voltage Bit 7 = Brake Mode Active	
5407	ebm Fan 1 Alarm Bits	-	R	-32768 to 32767	Bit 0 = Phase Fault Bit 1 = Not Used Bit 2 = Output Stage Overheating Bit 3 = Communication Error Bit 4 = Generic Error Bit 5 = Motor Overheating Bit 6 = Hall Sensor Error Bit 7 = Motor Blocked Bit 8 = Not Used Bit 9 = Internal Circuit Overheating Bit 10 = Not Used Bit 11 = DC Link Overvoltage Bit 12 = DC Link Undervoltage Bit 13 = Low Input Voltage Bit 14 = High Input Voltage	
5414	ebm Fan 2 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5415	ebm Fan 2 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5416	ebm Fan 2 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
5417	ebm Fan 2 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5424	ebm Fan 3 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5425	ebm Fan 3 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5426	ebm Fan 3 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5427	ebm Fan 3 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5434	ebm Fan 4 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5435	ebm Fan 4 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5436	ebm Fan 4 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5437	ebm Fan 4 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5444	ebm Fan 5 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5445	ebm Fan 5 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5446	ebm Fan 5 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5447	ebm Fan 5 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5454	ebm Fan 6 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5455	ebm Fan 6 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5456	ebm Fan 6 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5457	ebm Fan 6 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5464	ebm Fan 7 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5465	ebm Fan 7 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5466	ebm Fan 7 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5467	ebm Fan 7 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5474	ebm Fan 8 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
5475	ebm Fan 8 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5476	ebm Fan 8 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5477	ebm Fan 8 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5484	ebm Fan 9 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5485	ebm Fan 9 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5486	ebm Fan 9 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5487	ebm Fan 9 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5494	ebm Fan 10 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5495	ebm Fan 10 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5496	ebm Fan 10 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5497	ebm Fan 10 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5504	ebm Fan 11 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5505	ebm Fan 11 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5506	ebm Fan 11 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5507	ebm Fan 11 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5514	ebm Fan 12 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5515	ebm Fan 12 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5516	ebm Fan 12 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5517	ebm Fan 12 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5524	ebm Fan 13 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5525	ebm Fan 13 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5526	ebm Fan 13 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
5527	ebm Fan 13 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5534	ebm Fan 14 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5535	ebm Fan 14 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5536	ebm Fan 14 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5537	ebm Fan 14 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5544	ebm Fan 15 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5545	ebm Fan 15 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5546	ebm Fan 15 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5547	ebm Fan 15 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5554	ebm Fan 16 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5555	ebm Fan 16 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5556	ebm Fan 16 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5557	ebm Fan 16 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5564	ebm Fan 17 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5565	ebm Fan 17 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5566	ebm Fan 17 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5567	ebm Fan 17 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5574	ebm Fan 18 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5575	ebm Fan 18 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5576	ebm Fan 18 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5577	ebm Fan 18 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5584	ebm Fan 19 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
5585	ebm Fan 19 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5586	ebm Fan 19 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5587	ebm Fan 19 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5594	ebm Fan 20 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
5595	ebm Fan 20 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
5596	ebm Fan 20 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
5597	ebm Fan 20 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	



# **BACNET** Communication Points

In the tables below, the adiabatic application column indicates addresses that only apply to units with adiabatic controls. Variable 200010 can be referenced to determine whether the adiabatic system has been enabled for the unit. The data points, indicated with the check mark, can be ignored if the unit is not equipped with the adiabatic water valves.

Register	Name	Units	Access	Range	Description	Adiabatic Application				
DIGITAL VARIABLES										
BINARY_VALUE:100009	Enable Unit	-	RW	0 to 1	Enables the unit if it is configured to be enabled via BMS. 0 = Unit not enabled 1 = Unit enabled					
BINARY_VALUE:100011	Remote Digital Input State	-	R	0 to 1	The state of the remote digital input. 0 = No voltage present 1 = Voltage present					
BINARY_VALUE:100016	Process Sensor Alarm	-	R	0 to 1	Fault for either the outlet temperature sensor or the inlet pressure depending on the application. 0 = Normal 1 = Process sensor is not detected					
BINARY_VALUE:100019	Pre-cooling Valve 1 Status	-	R	0 to 1	The state of the first adiabatic pre-cooling valve. 0 = Valve off (water not flowing) 1 = Valve on (water flowing)	$\checkmark$				
BINARY_VALUE:100020	Pre-cooling Valve 2 Status	-	R	0 to 1	The state of the second adiabatic pre-cooling valve. 0 = Valve off (water not flowing) 1 = Valve on (water flowing)	$\checkmark$				
BINARY_VALUE:100021	Pre-cooling Valve 3 Status	-	R	0 to 1	The state of the third adiabatic pre-cooling valve. 0 = Valve off (water not flowing) 1 = Valve on (water flowing)	$\checkmark$				
BINARY_VALUE:100022	Pre-cooling Valve 4 Status	-	R	0 to 1	The state of the fourth adiabatic pre-cooling valve. 0 = Valve off (water not flowing) 1 = Valve on (water flowing)	$\checkmark$				
BINARY_VALUE:100023	Activate Manual Flush	-	RW	0 to 1	Manually starts the flushing cycle of the adiabatic system. 0 = Not active 1 = Start manual flush	$\checkmark$				
BINARY_VALUE:100024	Release Pre-cooling System	-	RW	0 to 1	0 = Pre-cooling system will not function 1 = Pre-cooling system will function when needed	$\checkmark$				



Register	Name	Units	Access	Range	Description	Adiabatic Application
BINARY_VALUE:100025	Enable Common Alarm	-	RW	0 to 1	Enables the common alarm for the digital output. 0 = Common alarm not enabled	
BINARY_VALUE:100026	Common Alarm Digital Output Status	-	R	0 to 1	Status of the alarm digital output. 0 = No alarm/not active 1 = Alarm/active	
BINARY_VALUE:100035	Force Fans to Run at Full Speed	-	RW	0 to 1	0 = Not enabled 1 = Forces fans to run at 100 percent fan speed	
BINARY_VALUE:100037	Enable Stage Ontime	-	RW	0 to 1	When active, the pre-cooling system will honor the minimum on time. 0 = Not active 1 = Active	$\checkmark$
BINARY_VALUE:100401	Fan 1 Alarm	-	R	0 to 1	0 = Normal 1 = Alarm present	
BINARY_VALUE:100402	Fan 1 Communication Status	-	R	0 to 1	This is the communication link between the Evapco controller and the fan motor only. 0 = Fan not online	
BINARY_VALUE:100411	Fan 2 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100412	Fan 2 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100421	Fan 3 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100422	Fan 3 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100431	Fan 4 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100432	Fan 4 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100441	Fan 5 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100442	Fan 5 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100451	Fan 6 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100452	Fan 6 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100461	Fan 7 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
BINARY_VALUE:100462	Fan 7 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100471	Fan 8 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100472	Fan 8 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100481	Fan 9 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100482	Fan 9 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100491	Fan 10 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100492	Fan 10 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100501	Fan 11 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100502	Fan 11 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100511	Fan 12 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100512	Fan 12 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100521	Fan 13 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100522	Fan 13 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100531	Fan 14 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100532	Fan 14 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100541	Fan 15 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100542	Fan 15 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100551	Fan 16 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100552	Fan 16 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100561	Fan 17 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100562	Fan 17 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100571	Fan 18 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
BINARY_VALUE:100572	Fan 18 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100581	Fan 19 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100582	Fan 19 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100591	Fan 20 Alarm	-	R	Ref. Fan 1	Ref. Fan 1	
BINARY_VALUE:100592	Fan 20 Communication Status	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
			ANAL	DG VARIABLE	S S	
ANALOG_VALUE:100001	Outlet Temperature	0.1°F	R	-999.9 to 999.9	The outlet temperature of the process fluid. For condenser applications, the outlet temperature is a saturated calculation based on the condensing pressure.	
ANALOG_VALUE:100002	Ambient Temperature	0.1°F	R	-999.9 to 999.9	The temperature detected by the ambient temperature sensor.	
ANALOG_VALUE:100003	Active Set Point	0.1°F	R	0.0 to 999.9	The active set point that the eco-Air unit will maintain.	
ANALOG_VALUE:100004	Set Point 1 Temperature	0.1°F	RW	0.0 to 999.9	The primary process temperature setpoint used when all other alternate setpoints are not active.	
ANALOG_VALUE:100005	Set Point 2 Ambient Temperature Trigger	0.1°F	RW	-100.0 to 100.0	The set point that when the ambient temperature falls below, will switch the control to set point 2.	
ANALOG_VALUE:100006	Temperature Regulation Band	0.1°F	RW	0.0 to 15.0	The temperature band between the minimum and maximum fan speed for P fan speed control mode.	
ANALOG_VALUE:100007	Set Point 2 Ambient Temperature Trigger Differential	0.1°F	RW	0.0 to 10.0	The temperature differential added to the ambient temperature set point 2 trigger. This will switch the control set point back to set point 1.	
ANALOG_VALUE:100008	Pre-cooling Minimum Allowable Temperature Set Point	0.1°F	RW	0.0 to 50.0	The minimum ambient temperature at which the pre- cooling system may operate.	$\checkmark$
ANALOG_VALUE:100009	Pre-cooling Minimum Allowable Temperature Difference	0.1°F	RW	0.0 to 20.0	The ambient temperature offset added to the minimum allowable temperature, at which the pre-cooling system becomes activate.	$\checkmark$
ANALOG_VALUE:100010	Proportional Gain	0.1g	RW	0.0 to 15.0	The proportional gain constant used for the PID controller.	
ANALOG_VALUE:100017	Switch Point #1 Temperature	0.1°F	R	0.0 to 999.9	The minimum temperature above which pre-cooling stage 1 will activate.	$\checkmark$
ANALOG_VALUE:100018	Switch Point #2 Temperature	0.1°F	R	0.0 to 999.9	The minimum temperature above which pre-cooling stage 2 will activate.	$\checkmark$
ANALOG_VALUE:100019	Switch Point #3 Temperature	0.1°F	R	0.0 to 999.9	The minimum temperature above which pre-cooling stage 3 will activate.	$\checkmark$
ANALOG_VALUE:100020	Switch Point #4 Temperature	0.1°F	R	0.0 to 999.9	The minimum temperature above which pre-cooling stage 4 will activate.	$\checkmark$
ANALOG_VALUE:100022	Flushing Fan Speed	%	RW	0 to 100	The desired fan speed while performing a flushing cycle.	$\checkmark$



Register	Name	Units	Access	Range	Description	Adiabatic Application				
ANALOG_VALUE:100023	Set Point 2 Temperature	0.1°F	RW	0 to 999.9	An alternate process temperature set point that may be activated via the scheduler, ambient temperature, or digital input.					
INTEGER VARIABLES										
ANALOG_VALUE:200001	Actual Unit State	-	R	0 to 13	The current state of the EVAPCO Controller. 1 = Unit on and operational 2= Unit is off by an alarm 4 = Unit is off via Modbus/BACnet 5 = Unit is off via the scheduler 6 = Unit is off via the digital input 7 = Unit is switched off locally					
ANALOG_VALUE:200002	Minimum Allowed Fan Speed	%	RW	0 to 100	The minimum allowable fan speed.					
ANALOG_VALUE:200003	Maximum Allowed Fan Speed	%	RW	0 to 100	The maximum allowable fan speed.					
ANALOG_VALUE:200004	Energy Savings Fan Speed	%	RW	0 to 100	The fan speed above which the pre-cooling system will activate.					
ANALOG_VALUE:200005	Quiet Operation Maximum Fan Speed	%	RW	0 to 100	The maximum allowable fan speed in quiet operation.					
ANALOG_VALUE:200006	PID Integral Term	Seconds	RW	0 to 1000	PID integral term.					
ANALOG_VALUE:200007	PID Differential Term	Seconds	RW	0 to 1000	PID differential term.					
ANALOG_VALUE:200008	Fan Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the fan(s) have been operational × 1000.					
ANALOG_VALUE:200010	Number of wet stages	Units	R	0 to 4	The number of stages that have been enabled for the adiabatic system. The number of stages is equal to the number of solenoid valves on the unit.	$\checkmark$				
ANALOG_VALUE:200011	Pre-cooling Stage 1 Increase Delay Set Point	Seconds	RW	0 to 32767	The number of seconds that must pass with the process temperature above set point before the stage activates.	$\checkmark$				
ANALOG_VALUE:200012	Pre-cooling Stage 1 Decrease Delay Set point	Seconds	RW	0 to 32767	The number of seconds that must pass with the process temperature below set point before the stage deactivates.	$\checkmark$				
ANALOG_VALUE:200013	Pre-cooling Stage 2 Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1000.	$\checkmark$				



Register	Name	Units	Access	Range	Description	Adiabatic Application
ANALOG_VALUE:200014	Refrigerant	-	RW	0 to 30	For condenser applications 0=R22, 1=R134a, 2=R404A, 3=R407C, 4=R410A, 5=R507, 6=R290, 7=R600, 8=R600a, 9=R717, 10=R744, 11=R728, 12=R1270, 13=R417A, 14=R422d, 15=R413A, 16=R422A, 17=R423A, 18=R407A, 19=R427A, 20=R245Fa, 21=R407F	
ANALOG_VALUE:200015	Pre-cooling Stage 3 Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1000.	$\checkmark$
ANALOG_VALUE:200016	Pre-cooling Stage 1 Minimum On Time	Seconds	RW	0 to 32767	The minimum amount of time the pre-cooling stage remains active before turning off.	$\checkmark$
ANALOG_VALUE:200017	Pre-cooling Stage 2 Minimum On Time	Seconds	RW	0 to 32767	The minimum amount of time the pre-cooling stage remains active before turning off.	$\checkmark$
ANALOG_VALUE:200018	Pre-cooling Stage 3 Minimum On Time	Seconds	RW	0 to 32767	The minimum amount of time the pre-cooling stage remains active before turning off.	$\checkmark$
ANALOG_VALUE:200019	Pre-cooling Stage 4 Minimum On Time	Seconds	RW	0 to 32767	The minimum amount of time the pre-cooling stage remains active before turning off.	$\checkmark$
ANALOG_VALUE:200021	Failsafe Mode Fan Speed	%	RW	0 to 100	The speed at which the fans will operate in Failsafe mode.	
ANALOG_VALUE:200028	Inlet Pressure	0.1 psi	R	-32767 to 32767	Inlet pressure reading via pressure sensor input. X10	
ANALOG_VALUE:200029	Reference Fan Speed	%	R	0 to 100	The desired fan speed determined by the controller.	
ANALOG_VALUE:200030	Flushing Time	Minutes	RW	0 to 9999	The number of minutes to perform the flushing routine once initiated.	$\checkmark$
ANALOG_VALUE:200036	Flushing Time Accumulator	Seconds	R	0 to 32767	The number of seconds the flushing routine has been active.	$\checkmark$
ANALOG_VALUE:200037	Drying Time	Minutes	RW	0 to 9999	The number of minutes to dry the pre-cooling pads after a flushing routine.	$\checkmark$
ANALOG_VALUE:200038	Drying Time Accumulator	Seconds	R	0 to 32767	The number of seconds the drying routine has been active	$\checkmark$
ANALOG_VALUE:200039	Pre-cooling Stage 4 Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1000.	$\checkmark$
ANALOG_VALUE:200040	Pre-cooling Stage 1 Operating Hours (Thousands)	1000 Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1000.	$\checkmark$
ANALOG_VALUE:200041	Fan Operating Hours	Hours	R	0 to 999	The number of hours the fan(s) have been operational x 1.	
ANALOG_VALUE:200042	Pre-cooling Stage 1 Operating Hours	Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1.	$\checkmark$



Register	Name	Units	Access	Range	Description	Adiabatic Application
ANALOG_VALUE:200043	Pre-cooling Stage 2 Operating Hours	Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1.	$\checkmark$
ANALOG_VALUE:200044	Pre-cooling Stage 3 Operating Hours	Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1.	$\checkmark$
ANALOG_VALUE:200045	Pre-cooling Stage 4 Operating Hours	Hours	R	0 to 999	The number of hours the pre-cooling stage has been operational × 1.	$\checkmark$
ANALOG_VALUE:200049	Pre-cooling Stage 2-4 Increase Delay Set Point	Seconds	RW	0 to 32767	The number of seconds that must pass with the process fluid temperature above set point before the stages activate.	$\checkmark$
ANALOG_VALUE:200050	Pre-cooling Stage 2-4 Decrease Delay Set Point	Seconds	RW	0 to 32767	The number of seconds that must pass with the process fluid temperature below set point before the stages deactivate.	$\checkmark$
ANALOG_VALUE:200051	Pre-cooling Stage 2-4 Decrease Delay Accumulator	Seconds	R	0 to 32767	The number of seconds with the process fluid below set point while the stages are active.	$\checkmark$
ANALOG_VALUE:200052	Pre-cooling Stage 1 Decrease Delay Accumulator	Seconds	R	0 to 32767	The number of seconds with the process fluid below set point while the stage is active.	$\checkmark$
ANALOG_VALUE:200053	Pre-cooling Stage 2-4 Increase Delay Accumulator	Seconds	R	0 to 32767	The number of seconds with the process fluid above set point while the stages are not active.	$\checkmark$
ANALOG_VALUE:200054	Pre-cooling Stage 1 Increase Delay Accumulator	Seconds	R	0 to 32767	The number of seconds with the process fluid above set point while the stage is not active.	$\checkmark$
ANALOG_VALUE:200403	ebm Fan 1 Alarm Code	-	R	0 to 16	0 = No Alarm 1 = Fan Offline 2 = Phase Fault 3 = Motor Blocked 4 = Low Input Voltage 5 = High Input Voltage 6 = DC Link Overvoltage 7 = DC Link Undervoltage 8 = Motor Overheating 9 = Internal Circuit Overheating 10 = Output Stage Overheating 11 = Hall Sensor Error 12 = Communication Error 13 = Generic Error	



Register	Name	Units	Access	Range	Description	Adiabatic Application
ANALOG_VALUE:200404	ebm Fan 1 Warning Code	-	R	0 to 16	0 = No Warning 1 = Output Stage High Temperature 2 = Internal Circuit High Temperature 3 = High Motor Temperature 4 = Low DC Link Voltage 5 = Power Is Limited 6 = Current Is Limited 7 = Brake Mode Active	
ANALOG_VALUE:200405	ebm Fan 1 Warning Bits	-	R	-32768 to 32767	Bit 0 = Current Is Limited Bit 1 = Not Used Bit 2 = Power Is Limited Bit 3 = Output Stage High Temperature Bit 4 = High Motor Temperature Bit 5 = Internal Circuit High Temperature Bit 6 = Low DC Link Voltage Bit 7 = Brake Mode Active	
ANALOG_VALUE:200406	ebm Fan 1 Alarm Bits	-	R	-32768 to 32767	Bit 0 = Phase Fault Bit 1 = Not Used Bit 2 = Output Stage Overheating Bit 3 = Communication Error Bit 4 = Generic Error Bit 5 = Motor Overheating Bit 6 = Hall Sensor Error Bit 7 = Motor Blocked Bit 8 = Not Used Bit 9 = Internal Circuit Overheating Bit 10 = Not Used Bit 11 = DC Link Overvoltage Bit 12 = DC Link Undervoltage Bit 13 = Low Input Voltage Bit 14 = High Input Voltage	
ANALOG_VALUE:200413	ebm Fan 2 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200414	ebm Fan 2 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200415	ebm Fan 2 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200416	ebm Fan 2 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
ANALOG_VALUE:200423	ebm Fan 3 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200424	ebm Fan 3 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200425	ebm Fan 3 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200426	ebm Fan 3 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200433	ebm Fan 4 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200434	ebm Fan 4 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200435	ebm Fan 4 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200436	ebm Fan 4 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200443	ebm Fan 5 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200444	ebm Fan 5 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200445	ebm Fan 5 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200446	ebm Fan 5 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200453	ebm Fan 6 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200454	ebm Fan 6 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200455	ebm Fan 6 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200456	ebm Fan 6 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200463	ebm Fan 7 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200464	ebm Fan 7 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200465	ebm Fan 7 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200466	ebm Fan 7 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200473	ebm Fan 8 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200474	ebm Fan 8 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
ANALOG_VALUE:200475	ebm Fan 8 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200476	ebm Fan 8 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200483	ebm Fan 9 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200484	ebm Fan 9 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200485	ebm Fan 9 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200486	ebm Fan 9 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200493	ebm Fan 10 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200494	ebm Fan 10 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200495	ebm Fan 10 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200496	ebm Fan 10 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200503	ebm Fan 11 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200504	ebm Fan 11 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200505	ebm Fan 11 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200506	ebm Fan 11 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200513	ebm Fan 12 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200514	ebm Fan 12 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200515	ebm Fan 12 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200516	ebm Fan 12 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200523	ebm Fan 13 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200524	ebm Fan 13 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200525	ebm Fan 13 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200526	ebm Fan 13 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
ANALOG_VALUE:200533	ebm Fan 14 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200534	ebm Fan 14 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200535	ebm Fan 14 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200536	ebm Fan 14 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200543	ebm Fan 15 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200544	ebm Fan 15 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200545	ebm Fan 15 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200546	ebm Fan 15 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200553	ebm Fan 16 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200554	ebm Fan 16 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200555	ebm Fan 16 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200556	ebm Fan 16 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200563	ebm Fan 17 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200564	ebm Fan 17 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200565	ebm Fan 17 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200566	ebm Fan 17 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200573	ebm Fan 18 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200574	ebm Fan 18 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200575	ebm Fan 18 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200576	ebm Fan 18 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200583	ebm Fan 19 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200584	ebm Fan 19 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	



Register	Name	Units	Access	Range	Description	Adiabatic Application
ANALOG_VALUE:200585	ebm Fan 19 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200586	ebm Fan 19 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200593	ebm Fan 20 Alarm Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200594	ebm Fan 20 Warning Code	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200595	ebm Fan 20 Warning Bits	-	R	Ref. Fan 1	Ref. Fan 1	
ANALOG_VALUE:200596	ebm Fan 20 Alarm Bits	-	R	Ref. Fan 1	Ref. Fan 1	