



MODINE CONTROL SYSTEM MANUAL commercial packaged ventilation system Models MPR and ERM



WARNING

1. Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.
2. Improper control adjustments and manual mode control can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before making adjustments.
3. Disconnect power supply before installing the accessory to prevent the unit from operating during installation.

IMPORTANT

1. The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of this unit must be performed by a qualified installation and service agency.
2. These instructions must also be used in conjunction with the Installation and Service Manual originally shipped with the appliance, in addition to any other accompanying component supplier literature.
3. This manual applies to Modine Control System program version series 3 and 4 only. For any other version, please contact Modine. The program version that resides in the unit controller can be found in the Information section of the Service Sub Menu. Refer to the manual for instructions on accessing this screen.

Models MPR & ERM

General Information

Controls are one of the most important components of specialized HVAC equipment. The Modine Control System is designed and engineered around the design of the Atherion™ to ensure that the unit operates safely, reliably, with optimized performance, and maintaining maximum energy efficiency.

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Model Nomenclature – Model MPR

1, 2, 3	4, 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
UT	UNC	CS	AC	EC	CMP	HGR	CA	SB	HP	MT	SV	SA	HT	UNH	TR	HC

Digits 1, 2, 3 - Unit Type (UT)

MPR - Commercial Packaged Ventilation Unit

Digits 4, 5 - Unit Nominal Cooling (UNC)

15 - 15 ton
20 - 20 ton
26 - 26 ton
30 - 30 ton

6 - Cabinet Size (CS)

C - "C" Cabinet

7 - Air Control Configuration (AC)

A - Fresh & Return Air Dampers
D - Fresh Air Dampers (*no Return Air*)
E - Fresh Air Dampers (*with Exhaust Air Opening and Interface to Energy Recovery Module*)
F - Fresh Air Dampers (*with Exhaust Air Opening and Interface to Power Exhaust Module*)
G - Return Air Opening only (*No Dampers or Fresh Air*)

8 - Evaporator Coil (EC)

1 - High Capacity 4 Row, 14fpi DX Coil
2 - High Capacity 4 Row, 14fpi DX Coil with E-Coat

9 - Compressor Staging (CMP)

A - Tandem Digital Scroll Compressor

10 - Hot Gas Reheat (HGR)

0 - No Hot Gas Reheat
1 - Modulating Hot Gas Reheat
2 - Modulating Hot Gas Reheat with E-Coat

11 - Condenser Arrangement (CA)

A - Standard Fans, VFD Control, Microchannel Coils
B - Standard Fans, VFD Control, Microchannel Coils with E-Coat and UV Top Coat

12 - Supply Blower Configuration (SB)

3 - 20" Backward Inclined Airfoil Plenum Fan
5 - 25" Backward Inclined Airfoil Plenum Fan
6 - 28" Backward Inclined Airfoil Plenum Fan

13 - Supply Blower Motor HP (HP) ①

C or Q - 1hp
D or R - 1-1/2hp
E or S - 2hp
F or T - 3hp
G or U - 5hp
H or V - 7-1/2hp
J or W - 10hp
K or X - 15hp

① C thru K include a factory mounted/wired motor starter.

Q thru X are Variable Frequency Drive (VFD) ready.

14 - Supply Blower Motor Type (MT)

1 - ODP - NEMA Premium Efficiency
2 - TE - NEMA Premium Efficiency

15 - Unit Supply Voltage (SV)

4 - 208V/3ph
5 - 230V/3ph
6 - 460V/3ph
7 - 575V/3ph

16 - Supply Blower Sheave Assy (SA)

Refer to AccuSpec

17 - Heating Section Type (HT)

0 - None
1 - Electric
2 - Natural Gas
3 - Natural Gas with 20kW Aux Elec Heat ②
② - Nominal kW rating, derated for 208V/3ph.

18 - Nominal Heat Capacity (UNH)

N - No Heating
A - 20kW Electric ②
B - 40kW Electric ②
C - 60kW Electric ②
D - 80kW Electric ②
E - 100kW Electric
J - 300 MBH Gas - 80%
K - 400 MBH Gas - 80%
L - 500 MBH Gas - 80%
② - Nominal kW rating, derated for 208V/3ph.

19 - Temperature Rise (TR)

N - Not Applicable
(300MBH Gas Only and Electric)
H - High Air Temp Rise (75°F and Higher)
(400 and 500 MBH Gas Only)
L - Low Air Temp Rise (Under 75°F)
(400 and 500 MBH Gas Only)

20 - Heat Control (HC)

N - No Heating
A - Single Stage (Electric Only)
B - Two Stage (Electric Only)
C - Four Stage (Electric Only)
D - Modulating (Gas or Electric)

Model Nomenclature – Model ERM

1, 2, 3	4, 5	6	7	8	9	10	11	12	13	14
UT	NWD	CS	ERT	EBP	EBC	HP	MT	SV	SA	PH

Digits 1, 2, 3 - Unit Type (UT)

ERM - Energy Recovery Module

Digits 4, 5 – Nominal Wheel Diameter (NWD)

48 - 48" (6000 CFM limit)

58 - 58" (8700 CFM limit)

6 - Cabinet Size (CS)

C - "C" Cabinet

7 – Energy Recovery Type (ERT)

T - Total Energy Recovery Wheel

8 – Economizer Bypass (EBP)

E - Economizer Bypass

9 – Exhaust Blower Configuration (EBC)

3 - 20" Backward Inclined Airfoil Plenum Fan

6 - 28" Backward Inclined Airfoil Plenum Fan

10 - Exhaust Blower Motor HP (HP) ①

C or Q - 1hp

D or R - 1-1/2hp

E or S - 2hp

F or T - 3hp

G or U - 5hp

H or V - 7-1/2hp

J or W - 10hp

① C thru J include a factory mounted/wired motor starter.

Q thru W are Variable Frequency Drive (VFD) ready.

11 - Exhaust Blower Motor Type (MT)

1 - ODP - NEMA Premium Efficiency

2 - TE - NEMA Premium Efficiency

12 - ERM Supply Voltage (SV) (must match base model MPR unit)

4 - 208V/3ph

5 - 230V/3ph

6 - 460V/3ph

7 - 575V/3ph

13 - Exhaust Blower Sheave Assy (SA)

Refer to AccuSpec

14 – Electric Preheat (PH)

0 - No Heating

A - 20kW Electric (Nominal kW rating, derated for 208V/3ph.)

Identification of Superheat Control

This manual includes information that varies based on the superheat controller used. The Atherion uses one of two different superheat controllers. The controller can be identified in the unit serial number as follows:

If Digit 12=1, Emerson EC3 Superheat Control is used:

If Digit 12=2, Carel EVD Superheat Control is used:



Sample Unit Serial Plate

Modine Manufacturing Company
1500 DeKoven Avenue
Racine, WI 53403-2552
Phone: 800-828-4328

PACKAGED ROOF TOP COMMERCIAL
UNIT FOR OUTDOOR INSTALLATION
FOR OPTIONAL HEATING AND ERM SECTION SEE SECTION SERIAL PLATE.

ETL LISTED US
9900100
DESIGN CONFORMS TO: UL STD 1995
CERTIFIED TO CAN/CSA C22.2 NO. 236
APPROVED FOR USE IN MASSACHUSETTS
APPROVED FOR USE BY THE CRC

MODEL NUMBER MPR26CD1A1A3E16Z2JND	VOLTS 460	PHASE 3	HERTZ 60	UNIT AMPS (FLA) 57.4
SERIAL NUMBER 1129657811113211-05	MIN. FACTORY AMPS (MCA) 6.18	MAX. CKT. BKR. (MOP) 80	WIRE DIAGRAM 17188	
TAG	SIG	REFRIGERANT TYPE R410A	FACTORY CHARGE 44	FACTORY TEST PRESSURE PSIG 600

MOTORS (PER MOTOR)	QTY.	HP	VOLTS	FLA	RPM	RLA	LRA
COMPRESSOR #1	2		460		25.7	150	
COMPRESSOR #2							
SUPPLY FAN	1	2	460	2.9	1800		
CONDENSER FAN	3	1.5	460	2.5	1200		
POWER EXH. (OPT.)							
ERM WHEEL (OPT.)							
ERM BLOWER (OPT.)							
GAS FURNACE (OPT.)	2	.23	115	2.2	3000		

UNIT SETTINGS (AS SHIPPED)	SHUT DOWN INSTRUCTIONS
SUPPLY FAN RPM 1230	(1) TURN OFF ALL POWER.
EXT. STATIC 1.0 inH ₂ O	(2) CLOSE ANY GAS VALVES.
SUPPLY FAN CFM 4000	START UP INSTRUCTIONS
Furnace Max Outlet 130 °F	(1) TURN ON ALL POWER AND
Furnace ATR 49.5	OPEN ANY GAS VALVES.
PWR. EX. STATIC inH ₂ O	(2) SET TEMPERATURE CONTROL
PWR. EX. RPM	TO CALL FOR COOLING/HEAT.
PWR. EX. FAN CFM	(SYSTEM WILL START AUTOMATICALLY)
	SEE MANUAL FOR MORE INFORMATION

ELECTRIC HEAT	VOLTS	AMPS	kW
ERM PREHEAT (OPT.)			
MAIN HEAT (OPT.)			
AUX. HEAT (OPT.)			

COMMON REPLACEMENT PARTS
For parts ordering, contact the parts wholesaler or the manufacturer's representative serving your area. When inquiring about parts, always provide model number, serial number, description, and part number. When ordering parts, provide part number listed. For service, contact your local qualified installation and service contractor or appropriate utility company.

CLEARANCES (IN.)

36

BASE (TO COMBUST.)

6

48

36

48

FURNACE EX. (TO COMBUST.)

12

SEE MANUAL FOR MORE INFORMATION

WARNING
IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICES OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY, OR DEATH. READ THE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THIS EQUIPMENT.

5881646B Rev. A

Made in U.S.A.

Controller Overview

Description and Features

The Modine Control System utilizes a Carel pCO³ programmable microprocessor controller. Highly advanced with a powerful microprocessor and fast processing speed, the controller features a high number of I/O's for complex HVAC/R applications.

The main controller board is housed in a plastic case that ensures a high index of protection and reduces the risk of electrostatic discharges due to incorrect handling. The controller offers greater safety due to the optical isolation of the serial pLAN, protection of the analog inputs in the event of incorrect connections, and an extended range of operating temperatures. Given the increasing demand for integration, pCO³ can interface with BMS systems via many of the most commonly-used serial communication standards, using optional boards.

Some of the features of the Carel pCO³ programmable microprocessor controller include:

- **10 Analog Inputs**
 - Uses 10K NTC temperature sensors
 - 4-20ma Humidity and CO₂ sensors for reliability
- **6 Analog Outputs**
 - 0-10vdc for easy fault finding
- **18 Digital inputs**
 - Used to monitor all aspects of the unit
- **18 Digital Outputs**
 - True relayed outputs for reliability
- **Real Time Clock**
 - With battery backup and day light savings adjustment
- **pLAN Communication**
 - To allow connectivity to space sensors and other controllers
- **Built In Display**
 - Backlit easy to use and easy to read
- **Alarm Logging**
 - With a snapshot of the unit sensors
- **Run Hours logging**
 - With maintenance setpoints
- **Password Protection**
 - Three levels of password protection
- **Manual Control**
 - For easy startup and service
- **Simple Interface**
 - Easy to understand menus and settings
- **Built in Scheduler**
 - Up to 7 periods per day – Either On/Off control or Occupied/Unoccupied
 - Holiday Scheduler with up to 20 holiday periods
- **Remote Display option**
 - Can be 100ft from unit using standard RJ12 cable
- **All reset points fully adjustable**

Standard and Optional Sensors Monitored

The Modine Control System monitors a number of sensors within the Atherion unit as follows:

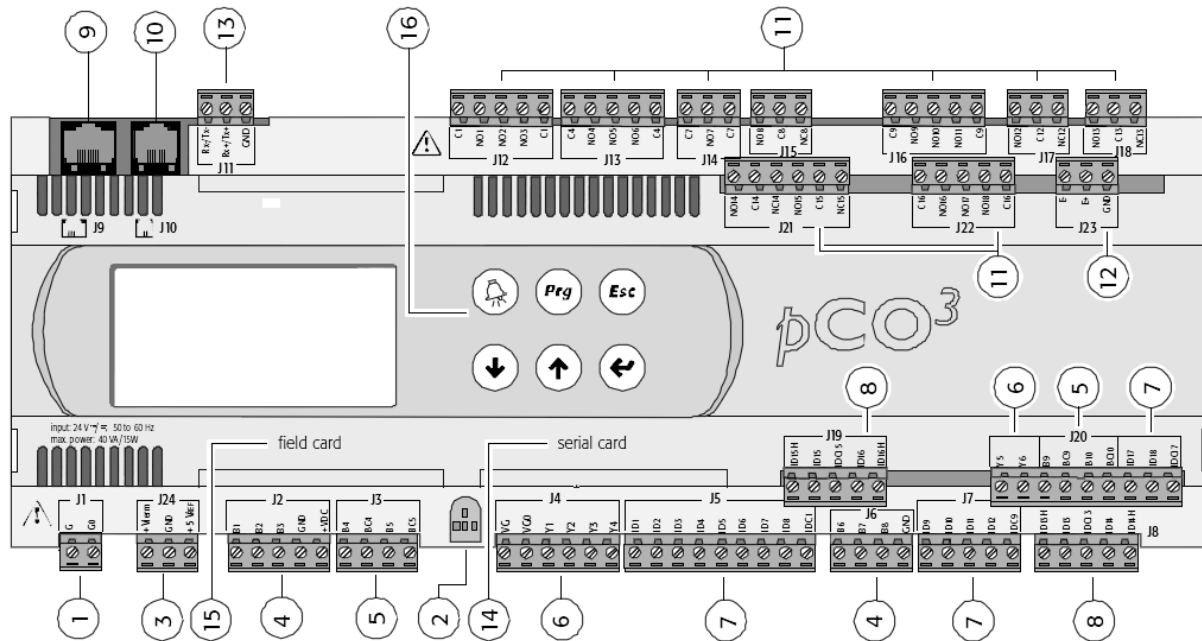
Standard sensors monitored:

- **Supply Air (Field Installed – see main unit Installation Manual)**
 - Main DOAS – HOAS control
- **Outside Temperature (Unit Mounted) and Outside Humidity (Unit Mounted)**
 - Used to calculate OA enthalpy and dew point
- **Suction Pressure (Unit Mounted)**
 - Used for superheat and dehumidification control
- **Liquid Line Pressure (Unit Mounted)**
 - Used for head pressure control
- **Compressor High Pressure Switch (Unit Mounted)**
 - With retry control
- **Compressor Low Pressure Switch (Unit Mounted)**
 - With retry control
- **Supply Fan Air Proving Switch (Unit Mounted)**
 - Pressure differential switch
- **Damper End Switch (Unit Mounted)**
 - Used to enable the supply fan
- **Digital Compressor Alarm (Unit Mounted)**
 - Monitors the compressor protection and superheat modules
- **Cooling Coil Condensate High Level Alarm (Unit Mounted)**
 - Disables the compressors if the drain pan is not draining properly

Optional sensors available:

- **CO₂ Sensor (Field Installed)**
 - Used for demand ventilation control
- **Building Pressure Sensor (Field Installed)**
 - Used to control supply fan, exhaust fan, or dampers
- **Duct Pressure Sensor (Field Installed)**
 - Used to control supply fan
- **Return Air Sensor (Unit Mounted)**
 - Only applicable if the unit has return air
- **pAD Space Temperature and Humidity (Field Installed)**
 - Used for space temperature and humidity control
- **Filter Dirty Switch (Unit Mounted)**
 - Pressure differential switch

PCO³ Controller Layout



Reference	Description
1	Power supply connector [G (+), G0 (-)]
2	Yellow power LED and 3 status LEDs
3	Additional power supply for the terminal and 0 to 5 V ratiometric probes
4	Universal analogue inputs: NTC, 0 to 1 V, 0 to 5 V ratiometric, 0 to 10 V, 0 to 20 mA, 4 to 20 mA
5	Passive analog inputs: NTC, PT1000, ON/OFF
6	0 to 10 V analog outputs
7	24 Vac/Vdc digital inputs
8	230 Vac or 24 Vac/Vdc digital inputs
9	Connector for the display panel (external panel with direct signals)
10	Connector for all standard pCO series terminals and for downloading the application program
11	Relay digital outputs
12	Connector for connection to the I/O expansion board
13	pLAN network connector
14	Cover for inserting the supervisor and maintenance option
15	Cover for inserting the field card option
16	Built-In terminal (LCD, buttons and LEDs)

Display/Keypad Functions

pCO³ Display Keypad



pGD1 Remote Display Keypad (Optional) ①



① Refer to Literature #MCP15-543 for installation instructions. Refer to the Board Settings section for instructions on programming the remote display keypad to the controller.

Standard Buttons




pCO ³ Built-in Display	pGD1 Remote Display	Function	Description
		ALARM	When one or more alarms are active the ALARM button will illuminate red. Pressing the ALARM button once will indicate information regarding any active alarms. Pressing the ALARM button twice will reset any active manual-reset alarms.
		PRG	Pressing the PRG button will select the main navigation menu.
		ESC	Pressing the ESC button will return the user to the main display screen showing unit status.
		UP	Pressing the UP button can either: Scroll through the various display screens, providing the cursor is in the top left position. Increase the value of a set point adjustment.
		ENTER	Pressing the ENTER button will confirm any set point adjustments and move the cursor to the next available set point.
		DOWN	Pressing the DOWN button can either: Scroll through the various display screens, providing the cursor is in the top left position. Decrease the value of a set point adjustment.

Extra Function Button Sequences

pCO ³ Built-in Display	pGD1 Remote Display	Key Combinations	Description
		UP + DOWN + ENTER	Allows access to controller address.
		ALARM + ENTER	Allows access to controller system information.
		ENTER + UP	Change unit on remote display keypad. (ERM Only)

Menu Navigation

The following instructions refer to the built-in display keypad buttons. See the table on the previous page for the corresponding buttons if using the remote keypad.

The Main Status Screen is displayed when the unit is first turned on or after one minute of keypad inactivity. From this Main Status Screen, eight sub menus can be accessed by pressing the  button and using the  or  buttons to move to the desired menu. The selected menu will be highlighted with a black bar. Press  to enter the selected menu.




Navigation Sub Menus

Sub Menu	Description
A. Unit On/Off	Switch on or switch off the unit.
B. Setpoints	View the user setpoints.
C. Clock/Scheduler	View the current time and date and set on/off time zones.
D. Input/Output	View the status of the controller inputs and outputs.
E. Alarm Log	View the alarm log.
F. Board Switch	Change the controller pLAN board address.
G. Service	View maintenance related parameters, such as hours run, sensor calibration and manual overrides.
H. Manufacturer	Manufacturer menu and adjustment of various manufacturer related parameters, such as unit configuration and timing settings.

Details on the Main Status Screen and each sub menu will be covered in the following sections of this manual.

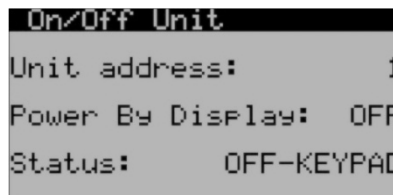
Example Navigation to On/Off Sub Menu






(Similar for all other sub menus):

From the Main Status Screen, press the  key to access the Sub Menu selection screen. Use the  or  buttons to navigate to the On/Off sub menu as shown in the following picture:



Press  to access the On/Off sub menu screen:






Press  to navigate to the parameter to change, then use the  or  button to change the value. Press  again to confirm the setting. Press the  button to exit the sub menu screen, back to the Main Status Screen.

Password Protection

WARNING










Improper control adjustments and manual mode control can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before making adjustments.

To prevent unauthorized adjustments, a password is required to gain access to certain menus. When a password is requested use the  or  keys to enter the number and  to access the page. The passwords for the sub menus are as follows:


SETPOINTS: None
CLOCK/SCHEDULER: None
SERVICE SETTINGS: 0001
MANUFACTURER: Contact Modine

Adjusting Customer Control Settings

The following procedure is used to access and adjust control parameters (refer to Parameters List and Factory Values).









1. After entering the correct password the cursor will appear at the top left corner (Home location).
2. Use the  or  keys to move to the desired menu.
3. To move the flashing cursor to the required adjustable fields press .
4. Use the  or  keys to change the values and press the  key to move the cursor to the next field or Home location.
5. When the cursor is Home either use the  or  keys to scroll to the next sub-menu or the  key to exit and return to the Main Menu page.

Main Menu – Tree of Functions

Irrespective of the current screen displayed, pressing the  key accesses the main menu, as shown below:

Unit Status



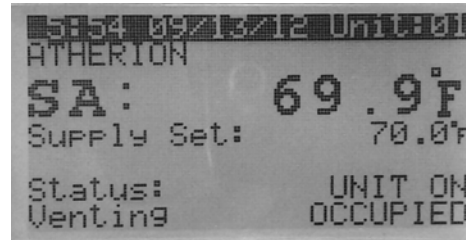
A.  On/Off Unit	On/Off By Display On/Off By pAD (Optional)
B.  Setpoints	Supply Air Setpoint Damper Min Position Room Space Temperature (Optional) Room Space Humidity (Optional) Building Pressure (Optional)
C.  Clock/Scheduler	Date/time Daylight Savings Scheduler Holidays
D.  Input/Output	a. Analog inputs b. Digital inputs c. Analog outputs d. Digital outputs
E.  Data Logger	
F.  Board Switch	
G.  Service	b. Information d. Working Hours e. BMS config. f. Service Settings g. Manual Management
H.  Manufacturer	a. Configuration b. I/O Configuration c. ERM (Optional) d. Initialization e. pAD settings (Optional)



Main Status Screen

The Main Status Screen is displayed when the unit is first turned on or after one minute of keypad inactivity.

The following information is displayed on the Main Status Screen:

- Time/date
- Unit number
- Supply Air Temperature
- Current Supply Air Setpoint
- Unit Status
- Unit Mode





Once this screen is displayed, the user can navigate up and down through the list of Main Status Screen Parameters by using the  +  buttons. These screens are described in further detail in the next section.

Note that the main unit controller will always show as Unit: 01. If the unit is also equipped with an ERM module, it has its own controller, which is Unit: 02. The keypad at the main controller or the remote key pad can be used to change the Main Status Screen to display either Unit 01 or 02.

To change the controller being displayed, press the  +  buttons. If you are viewing the main controller display, pressing those buttons will switch to displaying the ERM controller. Pressing those buttons again will revert back to displaying the main controller.



Main Status Screen Parameters

The status screens can be seen when the  +  buttons are pressed on the Main Status Screen. The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Time and date	Current time and date		
Unit network address	Actual Value	1	
Supply Air Temperature	Actual Value		°F / °C
Supply Air Setpoint	Actual Value		°F / °C
Unit Status	Current status of unit	Unit On OFF by Alarm OFF by pLAN OFF by BMS OFF by Clock OFF by Digital In OFF by Keypad OFF by Demand OFF - Door Open Off Manually Wait - Damper Wait Sup Fan	
Occupied Mode	Current Occupied Mode Note: Unless a pAD Wall Stat is installed the unit only operate in Occupied Mode	Unoccupied Occupied – BMS Occupied – CLK Occupied – DIG Occupied	
Unit Mode	Current Mode of operation	Venting Cooling Heating Dehum	

(continued on next page)



Main Status Screen Parameters (continued)

The status screens can be seen when the  +  buttons are pressed on the main status screen. The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if the optional Space wall stat is installed (pAD)</i>			
pAD Space Temperature	Actual Value		°F / °C
pAD Space Humidity	Actual Value		%RH
pAD Space Enthalpy	Actual Value (Calculated)		BTU/Lb
pAD Space Dew Point	Actual Value (Calculated)		°F / °C
<i>Note: The screen below will only be displayed if the unit has a Return Air Damper or ERM</i>			
Return Temperature	Actual Value		°F / °C
Return Air Humidity	Actual Value		%RH
Return Air Enthalpy	Actual Value (Calculated)		BTU/Lb
Return Air Dew Point	Actual Value (Calculated)		°F / °C
Outside Air Temperature	Actual Value		°F / °C
Outside Air Humidity	Actual Value		%RH
Outside Air Enthalpy	Actual Value (Calculated)		BTU/Lb
Outside Air Dew Point	Actual Value (Calculated)		°F / °C
<i>Note: The screen below will only be displayed if the unit has an ERM module</i>			
ERM Leaving Air Temperature	Actual Value		°F / °C
ERM Leaving Air Humidity	Actual Value		%RH
ERM Leaving Air Enthalpy	Actual Value (Calculated)		BTU/Lb
ERM Leaving Air Dew Point	Actual Value (Calculated)		°F / °C
Cooling Demand	Actual Value	0-100	%
Heating Demand	Actual Value	0-100	%
Outside Air Damper Position	Actual Value	0-100	%
Return Air Damper Position (Optional)	Actual Value	0-100	%
Hot Gas Reheat Valve (If Enabled)	Actual Value	0-100	%
Dehum Demand (If Enabled)	Actual Value	0-100	%
Supply Fan	Actual Value	On or Off	
Supply Fan Modulation (If Enabled)	Actual Value	0-100	%
Exhaust Fan (If Enabled)	Actual Value	On or Off	
Exhaust Fan Modulation (If Enabled)	Actual Value	0-100	%
<i>Note: The screen below will only be displayed if the unit has an ERM module</i>			
ERM Exhaust Fan (If Enabled)	Actual Value	On or Off	
ERM Exhaust Fan Modulation (If Enabled)	Actual Value	0-100	%

(continued on next page)



Main Status Screen Parameters (continued)

The status screens can be seen when the  +  buttons are pressed on the main status screen. The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if the unit has an ERM module</i>			
ERM Wheel	Actual Value	On or Off	
ERM Wheel Status (Optional)	Actual Value	Stopped or Running	
Count On: Off: Wheel minimum on and off counter	Actual Value		Sec
ERM By-Pass Damper	Actual Value	Open or Closed	
ERM Pre-Heater	On or Off		
ERM Door Switch	Open or Closed		
<i>Note: The screen below will only be displayed if the unit has Gas or Electric Heat</i>			
Gas Or Electric Stages On	Actual Value	0-2 (gas) 0-4 Elec. Heat	
Heat Modulation	Actual Value	0-100	%
Heating Lockout	Warning	Heating is locked out	
<i>Note: The screen below will only be displayed if the unit is in EC3 Mode</i>			
Compressor 1 Status	On or Off		
Compressor 1 Minimum On Time	Actual Value (Counts Down)	0-120	S
Compressor 1 Minimum Off Time	Actual Value (Counts Up)	0-120	S
Compressor 2 Status	On or Off		
Compressor 2 Minimum On Time	Actual Value (Counts Down)	0-120	S
Compressor 2 Minimum Off Time	Actual Value (Counts Up)	0-120	S
Digital Compressor Modulation	Actual Value	0-100	%
<i>Note: The screen below will only be displayed if the unit is in CDSS mode</i>			
Status (Digital Compressor)		Off Start-up On Alarm Off By Time On By Time	
Countdown	Actual value		S
Maximum Power Admitted	Actual Value	0-100	%
Digital Compressor	Actual Value	On or Off	
Valve	Actual Value	On or Off	
Requested Capacity	Actual Value	0-100	%
Current Capacity	Actual Value	16.6-100	%

(continued on next page)

Main Status Screen Parameters (continued)

The status screens can be seen when the  +  buttons are pressed on the main status screen. The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if the unit is in CDSS mode</i>			
Compressor 2 Status	On or Off		
Compressor 2 Minimum On Time	Actual Value (Counts Down)	0-120	S
Compressor 2 Minimum Off Time	Actual Value (Counts Up)	0-120	S
<i>Note: The screen below will only be displayed if the unit is in CDSS mode</i>			
Cooling Lockout			
Compressor Enthalpy Lockout		No Enthalpy Lockout Enthalpy LO Comp 1 Enthalpy LO Comp 2 Enthalpy LO Comp 1&2	
Compressor Lockout		Compressor Held Off by Lockout timers	
Condenser Fan Modulation	Actual Value	0-100	%
Discharge Pressure	Actual Value		PSIG
Discharge Temperature (If in CDSS Mode)	Actual value		°F /°C
Suction Pressure	Actual Value		PSIG
<i>Note: The screen below will only be displayed if the unit is in CDSS mode</i>			
Liquid Line Temperature	Actual value		F /°C
Condensing Temperature	Calculated		F /°C
Sub-Cool	Calculated		F /°C
Capacity Reduction	Actual Value	0-100	%
<i>Note: The screen below will only be displayed if the unit is in CDSS mode</i>			
Super-Heat	Calculated		F /°C
Suction Line Temperature	Actual Value		F /°C
Suction Pressure	Actual Value		PSIG
Evaporating Temperature	Calculated		F /°C
EEV Valve Steps	Actual Value	Depends On Valve Type	Steps
EEV Value Percentage	Actual Value	0-100	%
Valve Regulation		Close On Position Wait Stand-By	
<i>Note: The next screen will only be displayed if a clock schedule is enabled</i>			
Clock Override		On or Off	
Override Time		1-9	Hrs.
Manual Control Status & Reset	Actual Value	I/O Automatic or I/O Manual Reset Manual Controls	

On/Off Sub Menu

Main Status Screen ⇒ On/Off

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Unit Address		1	
Power By Display	Actual Value	On or Off	
Status	Actual Value	Unit On OFF by Alarm OFF by pLAN OFF by BMS OFF by Clock OFF by Digital In OFF by Keypad OFF by Demand OFF - Door Open Off Manually Wait - Damper Wait Sup Fan	
<i>Note: The screen below will only be displayed if the optional Space wall stat is installed (pAD)</i>			
pAD Number	Actual Value	1	
On / Off		Permanently Off - On or Off	

Setpoint Sub Menu

Main Status Screen ⇒ Setpoint

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Supply Air Setpoint	70	50-99	°F / °C
Current Setpoint	Actual Value		°F / °C
<i>Note: The screen below will only be displayed if the optional Space wall stat is installed (pAD)</i>			
pAD Thermostat Number	Actual Value		
Space Cooling Temperature Setpoint Note: Heating Setpoint equals cooling setpoint minus 4°F	74	50-100	°F / °C
Space Humidity Setpoint	60	30-100	%RH
Space Humidity Differential	5	0-10	%
Unoccupied Cooling Setpoint	85	60-100	°F / °C
Unoccupied Heating Setpoint	62	40-100	°F / °C
<i>Note: The screen below will only be displayed if Dew Point Dehumidification is enabled</i>			
Occupied OA Dew point Setpoint	55	40-70	°F / °C
Occupied OA Dew point Differential	3	0-10	°F / °C
Unoccupied Space Dew point Setpoint	55	40-70	°F / °C
Unoccupied Space Dew point Differential	3	0-10	°F / °C
<i>Note: The screen below will only be displayed if the optional space wall stat is installed (pAD)</i>			
Occupied Space Humidity Setpoint	60	30-100	%RH
Occupied Space Humidity Differential	5	0-10	%
Unoccupied Space Humidity Setpoint	60	30-100	%RH
Unoccupied Space Humidity Differential	5	0-10	%
<i>Note: The screens below will only be displayed if the unit is setup for HOAS damper control</i>			
Outside Air Minimum Damper Position Note: The Return Air Damper (Optional) will be the inverse of this value	Setting depends on Unit type	0-100	%
OA Damper Position 1 Note: The Return Air Damper (Optional) will be the inverse of this value	30% ID15 and ID 16 Open	0-100	%
OA Damper Position 2	50% ID15 Closed ID 16 Open	0-100	%
OA Damper Position 3	75% ID15 Open ID 16 Closed	0-100	%
OA Damper Position 4	100% ID15 and ID 16 Closed	0-100	%
Note: The Screen below will only be displayed if Damper CO2 Control is selected			
CO2 Setpoint	800	0-2000	PPM
CO2 Level	Actual Value	0-2000	PPM

(continued on next page)

Setpoint Sub Menu (continued)

Main Status Screen ⇒ Setpoint

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The Screen below will only be displayed if Damper Building Pressure Control is selected</i>			
Building Pressure Setpoint	0.2	0-0.5	Inch W.G.
Building Pressure	Actual Value	0-0.5	Inch W.G.
<i>Note: The screen below will only be displayed if Supply Fan CO2 Control is selected</i>			
CO2 Setpoint	800	0-2000	PPM
CO2 Level	Actual Value	0-2000	PPM
<i>Note: The Screen below will only be displayed if Supply Fan Building Pressure Control is selected</i>			
Building Pressure Setpoint	0.2	0-0.5	Inch W.G.
Building Pressure	Actual Value	0-0.5	Inch W.G.
<i>Note: The screen below will only be displayed if Supply Fan Duct Static Pressure Control is selected</i>			
Duct Static Pressure Setpoint	1.0	0-5	Inch W.G.
Duct Pressure	Actual Value	0-5	Inch W.G.
<i>Note: The Screen below will only be displayed if Supply Fan Constant Volume Control is selected</i>			
Supply Fan Speed 1	100% ID15 and ID 16 Open	0-100	%
Supply Fan Speed 2	85% ID15 Closed ID 16 Open	0-100	%
Supply Fan Speed 3	75% ID15 Open ID 16 Closed	0-100	%
Supply Fan Speed 4	50% ID15 and ID 16 Closed	0-100	%
<i>Note: The screen below will only be displayed if Exhaust Fan Building Pressure On/Off Control is selected</i>			
Building Pressure Setpoint	0.2	0-0.5	Inch W.G.
Building Pressure Differential	0.1	0-0.5	Inch W.G.
Building Pressure	Actual Value	0-5	Inch W.G.
<i>Note: The Screen below will only be displayed if Exhaust Fan Building Pressure Control is selected</i>			
Building Pressure Setpoint	0.2	0-0.5	Inch W.G.
Building Pressure	Actual Value	0-0.5	Inch W.G.
<i>Note: The screen below will only be displayed if Exhaust Fan Offset (from Supply Fan) Control is selected</i>			
Exhaust Fan Offset Setpoint (From Sup. Fan)	20	0-100	%

(continued on next page)

Setpoint Sub Menu (continued)

Main Status Screen ⇒ Setpoint

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The Screen below will only be displayed if Exhaust Fan Constant Volume Control is selected</i>			
Exhaust Fan Speed 1	100% ID15 and ID 16 Open	0-100	%
Exhaust Fan Speed 2	85% ID15 Closed ID 16 Open	0-100	%
Exhaust Fan Speed 3	75% ID15 Open ID 16 Closed	0-100	%
Exhaust Fan Speed 4	50% ID15 and ID 16 Closed	0-100	%
<i>Note: The screen below will only be displayed if ERM Exhaust Fan Building Pressure Control is selected</i>			
Building Pressure Setpoint	0.2	0-0.5	Inch W.G.
Building Pressure	Actual Value	0-5	Inch W.G.
ERM Exhaust Fan Minimum Speed	50	0-100	%
<i>Note: The Screen below will only be displayed if ERM is Enabled</i>			
ERM Exhaust Fan Minimum Speed	50	0-100	%

Clock/Scheduler Sub Menu

Main Status Screen ⇒ Clock/Scheduler

Note: The Schedule/Holidays can be used to either turn the unit On/Off or to Cycle the unit from Occupied to Unoccupied (when an Optional Space Sensor is installed).

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Day	Actual day	Monday – Sunday	-
Date	Actual date	MM/DD/YY	-
Hour (Military Time)	Actual time	00:00-23:59	-
Daylight Savings	On	On / Off	
Transition Time	60	0-60	S
Start (Spring)	Second Sunday in March @ 2:00am		
End (Fall)	First Sunday In November @ 3:00am		
Number Of Schedules	0	0-7	-
<i>Note: The screen below will only be shown if at least one schedule is set</i>			
Schedule Number		1-7	-
Time On	00:00	00:00 – 23:59	Hrs:Min
Time Off	00:00	00:00 – 23:59	Hrs:Min
Days Enabled – Selects the days the schedule is to take effect.	None	MTWTFSS	Days
Number of Holidays Note: If a Holiday is one day the Start – Stop will be the same e.g. 7/4 – 7/4	0	0-16	Days
Holiday 1 Start - Stop	0	1/1/ - 12/31	Days
Holiday 2 Start - Stop	0	1/1/ - 12/31	Days
Holiday 3 Start - Stop	0	1/1/ - 12/31	Days
Holiday 4 Start - Stop	0	1/1/ - 12/31	Days
Holiday 5 Start - Stop	0	1/1/ - 12/31	Days
Holiday 6 Start - Stop	0	1/1/ - 12/31	Days
Holiday 7 Start - Stop	0	1/1/ - 12/31	Days
Holiday 8 Start - Stop	0	1/1/ - 12/31	Days
Holiday 9 Start - Stop	0	1/1/ - 12/31	Days
Holiday 10 Start - Stop	0	1/1/ - 12/31	Days
Holiday 11 Start - Stop	0	1/1/ - 12/31	Days
Holiday 12 Start - Stop	0	1/1/ - 12/31	Days
Holiday 13 Start - Stop	0	1/1/ - 12/31	Days
Holiday 14 Start - Stop	0	1/1/ - 12/31	Days
Holiday 15 Start - Stop	0	1/1/ - 12/31	Days
Holiday 16 Start - Stop	0	1/1/ - 12/31	Days

Input / Output Sub Menu

Analog Inputs:

Main Status Screen ⇒ Input/Output ⇒ Analog Inputs

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	INPUT	FACTORY VALUE	RANGE	UNITS
Return Air Humidity (Optional)	B1	Actual	0-100	%RH
CO2 (Optional)	B2	Actual	0-2000	PPM
Building Pressure (Optional) or Duct Static Pressure	B3	Actual	0-4	"WG
Outside Air Temperature	B4		-999.9-999.9	°F / °C
Return Air Temperature (Optional)	B5	Actual	-999.9-999.9	°F / °C
Discharge Line Temperature (In CDSS Mode) or Liquid Line Pressure (In EC3 Mode)	B6	Actual	-999.9-999.9 0-650	°F / °C PSIG
Outside Air Humidity	B7	Actual	0-100	%RH
Not Used (In CDSS Mode) or Suction Pressure (In EC3 Mode)	B8	Actual	0-500	PSIG
Mixed Air Temperature	B9	Actual	-999.9-999.9	°F / °C
Supply Air Temperature	B10	Actual	-999.9-999.9	°F / °C

Digital Inputs:

Main Status Screen ⇒ Input/Output ⇒ Digital Inputs

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	INPUT	FACTORY VALUE	RANGE	UNITS
High Pressure	ID1	Actual	C/O	Normally Closed
Low Pressure	ID2	Actual	C/O	Normally Closed
Supply Fan Air Flow Switch	ID3	Actual	C/O	Closed Fan On
Smoke Detector	ID4	Actual	C/O	Normally Closed
Filter Dirty	ID5	Actual	C/O	Normally Open
Damper End Switch	ID6	Actual	C/O	Cls = Damp. Open
Occupied	ID7	Actual	C/O	Cls = Occupied
Not Used In CDSS Mode or Digital Compressor EC3 Alarm (In EC3 Mode)	ID8	Actual	C/O	Normally Closed
Condensate Pan Float	ID9	Actual	C/O	Normally Closed
Gas Valve 1	ID10	Actual	C/O	Cls = Valve Open
Gas Valve 2	ID11	Actual	C/O	Cls = Valve Open
Freeze Stat	ID12	Actual	C/O	Not Used
Supply Fan Door Switch	ID13	Actual	C/O	Cls = Door Closed
Remote On Off	ID14	Actual	C/O	Cls = Unit On
Supply Fan Speed 2 or Damper Position 2	ID15	Actual	C/O	See Setpoints
Supply Fan Speed 3 or Damper Position 2	ID16	Actual	C/O	See Setpoints
Exhaust Fan Air Flow Switch	ID17	Actual	C/O	Closed on Fan On

(continued on next page)

Input / Output Sub Menu (continued)

Analog Outputs:

Main Status Screen ⇒ Input/Output ⇒ Analog Outputs

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	OUTPUT	FACTORY VALUE	RANGE	UNITS
Not Used (In CDSS Mode) or Compressor Modulation (EC3 Mode) Digital Compressor Control Signal to the EC3 Module	AO1	Actual	0-10	Volts DC
Condenser Fan Control Signal to the Condenser Fan VFD Drive	AO2	Actual	0-10	Volts DC
<i>Note: The screen below will only be displayed if Dehumidification Control is Enabled</i>				
Supplemental Electric Heat (In CDSS Mode) or Hot Gas Re-Heat (EC3 Mode) Control Signal to the Modulating Hot Gas Re-Heat Interface Board (In EC3 Mode)	AO3	Actual	0-10	Volts DC
Heat Control Signal to Either the Modulating Gas Valves or the Electric Heat SCR controller	AO4	Actual	0-10	Volts DC
Supply Fan Control Signal for the Supply Fan VFD (Optional)	AO5	Actual	0-10	Volts DC

Digital Relay Outputs:


Main Status Screen ⇒ Input/Output ⇒ Digital Outputs



The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	OUTPUT	FACTORY VALUE	RANGE	UNITS
Supply Fan	DO7	Actual	On/Off	-
Condenser Fans	DO8	Actual	On/Off	-
Compressor 1	DO3	Actual	On/Off	-
Compressor 2	DO4	Actual	On/Off	-
Outside Air Damper Open	DO5	Actual	On/Off	-
Outside Air Damper Closed	DO6	Actual	On/Off	-
Electric Heat 3	DO1	Actual	On/Off	-
Electric Heat 4	DO2	Actual	On/Off	-
Gas or Electric Heat 1	DO9	Actual	On/Off	-
Gas or Electric Heat 2	DO10	Actual	On/Off	-
Hot Gas Re-Heat Stage 2	DO11	Actual	On/Off	-
Gas Heat 1 Exhaust Fan High	DO12	Actual	On/Off	-
Gas Heat 2 Exhaust Fan High	DO13	Actual	On/Off	-
Digital Compressor Valve (In CDSS Mode) or Hot Gas Re-Heat Close Off Valve (EC3 Mode)	DO14	Actual Actual	On/Off On/Off	-
General Alarm	DO15	Actual	On/Off	-
Return Air Damper Open (Optional)	DO16	Actual	On/Off	-
Return Air Damper Close (Optional)	DO17	Actual	On/Off	-
Exhaust Fan (Optional)	DO18	Actual	On/Off	-

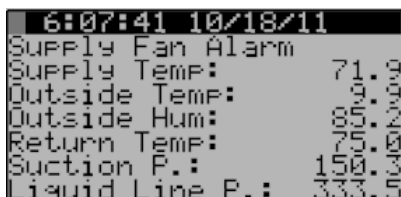
Data Logger Sub Menu

Main Status Screen ⇒ Data Logger

To access contents of the Data Logger menu simply press the  button. The most recent alarm will be displayed on the screen. The upper bar will display the time and date of the most recent alarm. The second line will indicate the alarm generated. The rest of the page will contain readings of certain variables at the time of the alarm.

Use the  button to navigate through previous alarms and the  button to navigate to the most recent. The alarms are chronologically stored and the most recent alarm will be the first displayed.

An example of an alarm log is shown below:

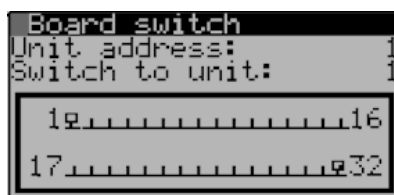


```
6:07:41 10/18/11
Supply Fan Alarm
Supply Temp: 71.0
Outside Temp: 9.0
Outside Hum: 85.2
Return Temp: 75.0
Suction P.: 150.4
Liquid Line P.: 333.9
```

Board Switch Sub Menu

Main Status Screen ⇒ Board Switch

The Board Switch screen will indicate the current devices connected to the pLAN network (Keypad, pAD Wall Stat, and/or ERM unit). In the screen below, the main controller is on address 1.



```
Board switch
Unit address: 1
Switch to unit: 1
12.....16
17.....32
```




The pCO³ controller is factory defaulted to the following for modules communicated with on the pLAN:

- **pCO³ Controller:** Address 1
- **ERM Module:** Address 2
- **Remote Wall Stat (pAD):** Address 4
- **Superheat Control (EVD only):** Address 30
- **Remote Display (pGD1):** Address 32



In the situation that module addresses need to be set up, the board address can be changed within the Board Switch sub menu.

Programming the Remote Display Keypad to the Controller


In the situation that the terminal display address is required to be set up, the following procedure applies:

1. Set the correct address on the display, connect to the controller and then power up the unit.
2. By simultaneously pressing and holding  +  + , the display will show the Display Address screen.











```
Display address
setting.....: 32
I/O Board address: 01
```

3. Pressing  will change the I/O board address to the controller address 1. Press  to display the following screen:

```
Terminal config
Press ENTER
to continue
```

4. Press  again. The display will show the following terminal configuration screen:

```
P:01 Adr Priv/Shared
Trm1 32 Sh
Trm2 05 Pr
Trm3 None -- Ok?No
```

5. To select Terminal 1, press  until the cursor is underneath Trm1 00 Pr.
6. Pressing  or  will change the 00 to the required value 32.
7. To set as Private or Shared, press  until the cursor is underneath the Pr (PRIVATE) symbol.
8. Pressing  or  will change the Pr to Sh (SHARED) symbol. Pr For Normal – Sh if the unit has and ERM unit.
9. Press  until the cursor is underneath the NO.
10. Pressing  or  will change the NO to YES. Press  and the display is programmed.

Service Sub Menu

Information

Main Status Screen ⇒ Service ⇒ Information

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Code (Name of Program)	Actual Value	-	-
Software Version	Actual Value	-	-
Bios Version	Actual Value	0 – 99.99	-
Boot Version	Actual Value	0 – 99.99	-
pCO Type	pCO3 Large	-	-
Total flash	Actual Value	0-9999	KB
RAM	Actual Value	0-9999	KB
Built-In type	Actual Value	-	-
T memory writes	Actual Value	-	-
Main cycle	Actual Value	0-9999	Cycle/s
Control Power Status		-	-
Last Off Time	Actual Value		MM/DD/YY – HH:MM:SS
Last On Time	Actual Value		MM/DD/YY – HH:MM:SS
<i>Note: The screen below will only be displayed if the unit is in CDSS mode</i>			
EVO Firmware Version	Actual Value		

(continued on next page)

Models MPR & ERM

Service Sub Menu (continued)

Working Hours

Main Status Screen ⇒ Service ⇒ Working Hours

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Supply Fan Hours	Actual Value	0-999,999	Hours
Supply Fan Number of Starts	Actual Value	0-999,999	-
Compressor 1 Hours	Actual Value	0-999,999	Hours
Compressor 1 Number of Starts	-	0-999,999	-
Compressor 2 Hours	Actual Value	0-999,999	Hours
Compressor 2 Number of Starts	-	0-999,999	-
<i>Note: The following three screens will only be displayed if Gas Heat is enabled</i>			
Heat Exhaust Fan 1 Hours	Actual Value	0-999,999	Hours
Heat Exhaust Fan 1 Number of Starts	-	0-999,999	-
Heat Exhaust Fan 2 Hours	Actual Value	0-999,999	Hours
Heat Exhaust Fan 2 Number of Starts	-	0-999,999	-
Gas Heat 1 Hours	Actual Value	0-999,999	Hours
Gas Heat 1 Number of Starts	-	0-999,999	-
Gas Heat 2 Hours	Actual Value	0-999,999	Hours
Gas Heat 2 Number of Starts	-	0-999,999	-
<i>Note: The following four screens will only be displayed if Electric Heat is enabled</i>			
Electric Heat 1 Hours	Actual Value	0-999,999	Hours
Electric Heat 1 Number of Starts	-	0-999,999	-
Electric Heat 2 Hours	Actual Value	0-999,999	Hours
Electric Heat 2 Number of Starts	-	0-999,999	-
Electric Heat 3 Hours	Actual Value	0-999,999	Hours
Electric Heat 3 Number of Starts	-	0-999,999	-
Electric Heat 4 Hours	Actual Value	0-999,999	Hours
Electric Heat 4 Number of Starts	-	0-999,999	-
Exhaust Fan Hours	Actual Value	0-999,999	Hours
Exhaust Fan Number of Starts	-	0-999,999	-
<i>Note: The following four screens will only be displayed if the ERM Module is enabled</i>			
ERM Exhaust Fan Hours	Actual Value	0-999,999	Hours
ERM Exhaust Fan Number of Starts	-	0-999,999	-
ERM Wheel Hours	Actual Value	0-999,999	Hours
ERM Wheel Number of Starts	-	0-999,999	-
ERM Preheater Hours	Actual Value	0-999,999	Hours
ERM Preheater Number of Starts	-	0-999,999	-

(continued on next page)

Service Sub Menu (continued)

BMS Configuration

Main Status Screen ⇒ Service ⇒ BMS Configuration (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Protocol	NA Lon BACnet IP\Eth BACnet MSTP PCOLOAD MODBUS MODEM CAREL	The Modine Control System supports the following Protocols: Lon BACnet IP/Eth BACnet MSTP	-
Note: The following three screens will only be displayed if BACnet IP/Ethernet is selected and Enable Plugin is Yes. The information set must be supplied by the controls integrator.			
Device Instance	Actual Value	0-99,000	-
IP Address of the Device	Actual Value	0.0.0.0 – 255.255.255.255	-
SubNet	Actual Value	255.0.0.0 – 255.255.255.0	-
Gateway		0.0.0.0 – 255.255.255.255	-
DNS 1	Actual Value	0.0.0.0 – 255.255.255.255	-
DNS 2	Actual Value	0.0.0.0 – 255.255.255.255	-
Type	IP	IP Ethernet	
Function	Read	Read: Reads the settings from the card Write: Write the setting to the card	-
Update	No	Yes: Sends a Read or Write request to the card (depending on the Function setting)	-
Note: The following two screens will only be displayed if BACnet MSTP is selected and Enable Plugin is Yes. The information set must be supplied by the controls integrator.			
Device Instance	Actual Value	0-99,000	-
Baud Rate (of the MSTP Network)	38400	9600 19200 38400 76800	bps
MAC Address (MSTP Station)	0	0-127	
MaxMasters	0	0-127	
MaxInfoFrames	0	1-99	
Function	Read	Read: Reads the settings from the card Write: Write the setting to the card	-
Update	No	Yes: Sends a Read or Write request to the card (depending on the Function setting)	-

Models MPR & ERM

Service Sub Menu (continued)

Working Hour Setpoint

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Working Hour Setpoint (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
As the Working Hours for each component has already been listed (see "Working Hours") only the supply fan is detailed here but all outputs listed under Working Hours have the same settings	-	-	-
Run Hours Can be change if required.	Actual Value	0-32,000,000	Hours
Setpoint When the Run Hours exceeds this setpoint an alarm is generated but no other action is taken	Actual Value	0-32,000,000	Hours
Reset to Zero Resets the Run Hours back to zero	-	No/Yes	-

Probe adjustment

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Probe adjustment (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
As the probes (sensors) for each component have already been listed (see "Analog Inputs") only the Supply Air Temperature is detailed here but all sensors listed under Analog Inputs have the same settings	-	-	-
Supply Air Temperature Input B10			-
Offset: Calibration Offset	0.0	-99.9-99.9	Depends on Type
Value The actual value after the offset has been added	Actual Value	-	-

(continued on next page)

Models MPR & ERM

Service Sub Menu (continued)

Control Settings

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Enable Unit On/Off Note: Only enable one of the following four selections. The unit will only cycle On and Off by the selected parameter and will not have unoccupied control.	-	-	-
By Digital Input When On Digital Input 14 (ID14) will cycle the unit On and Off (On = Input Closed)	Off	On/Off	-
By Supervisor When set to On a network variable (Lon or BACnet) will cycle the unit On and Off (On = Variable Active)	Off	On/Off	-
By pLAN When set to On the pAD (Wall Stat) will cycle the unit On and Off (pAD Wall Stat required)	Off	On/Off	-
By Schedule When set to On the Clock Schedule will cycle the unit On and Off.	Off	On/Off	-
Temperature Differential Alarm If the compressor or heating comes on and the supply air temperature does not drop or increase by this amount in this time an alarm will be generated, no other action is taken	-	-	-
Differential Alarm Enable	Disable	Enable/Disable	
Cooling Differential	1	0-10	°F /°C
Cooling Alarm Delay	10	0-99	Min
Heating Differential	5	0-10	°F /°C
Heating Alarm Delay	3	0-99	Min
Supply Air Alarms If the supply air temperature does not reach the Low Limit setting within the delay setting, the unit will shut down. The temperature has to increase to the setpoint plus differential before the unit will restart. Note: If this occurs three times within an hour the unit will be locked out permanently requiring an alarm reset.			
Low Limit Temperature	36	32-45	°F /°C
Low Limit Differential	10	1-99	°F /°C
Low Limit Delay	10	0-99	Min
Supply Air High Temperature Alarm Alarm only, no other action is taken	150	100-200	°F /°C
Supply Air High Temperature Alarm Delay	3	0-10	Min

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Service Sub Menu (continued)

Control Settings (continued)

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Supply Fan Alarm Delay The time delay to allow the supply fan air proving switch to make. If the switch does not make during this delay, an alarm will be generated and the heating and cooling locked out while the fan continues to run. (Auto Reset)	15	0-99	Sec
Supply Fan Shutdown Delay The time delay to allow the supply fan air proving switch to make. If the switch does not make during this delay, the supply fan will shut down. Note: If this occurs two times within an hour the unit will be locked out permanently requiring an alarm reset.	180	0-999	Sec
Compressor High Limit Alarm If the Liquid Line Pressure exceeds the high limit setpoint (after the delay) compressor 2 will be locked out, if the pressure exceeds the alarm setpoint both compressors will be locked out and an alarm generated.			
High Limit	580	500-600	PSIG
High Limit Delay	10	0-100	Sec
High Limit Differential	100	0-200	PSIG
High Limit Alarm	620	500-650	PSIG
Compressor Alarm If a compressor alarm occurs, the compressor will be disabled, but the unit will still run. If a unit shutdown is required on a compressor alarm change to Yes.	No	Yes - No	
Compressor Enthalpy Lockouts When the outside Enthalpy (or the Off Wheel Enthalpy if an ERM module is fitted) is below the lockout setpoint the compressor will be locked out.	-	-	-
C1 (Compressor 1)	18.0	0-99	BTU/Lb
C2 (Compressor 2)	21.0	0-99	BTU/Lb
Atmospheric Pressure Enthalpy correction for various altitudes	1000	0-3000	mBar
Note: The screen below will only be displayed if the optional Space Wall Stat is installed (pAD)	-	-	-
Space Supply Air Reset	-	-	-
Cool Setpoint If the space temperature is above this setpoint the supply air setpoint will be reset to the SA Reset value	74	60-90	-

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Service Sub Menu (continued)

Control Settings (continued)

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Cool Differential	1	0-9.9	°F /°C
SA (Supply Air) Reset The supply air temperature setpoint when the space requires cooling	55	45-65	°F /°C
pAD Reset Unoccupied The space unoccupied cooling setpoint that will turn the unit on for cooling if the space temperature is above the setpoint	85	70-90	°F /°C
Heat Offset Used to calculate the heating setpoint. Heating setpoint equals cooling setpoint – heat offset	4	0-9.9	°F /°C
<i>Note: The screen below will only be displayed if the optional Space wall stat is installed (pAD)</i>	-	-	-
Space Supply Air Reset	-	-	-
Heat Setpoint (calculated from the Cool Setpoint) If the space temperature is above this setpoint the supply air setpoint will be reset to the SA Reset value	70	60-90	°F /°C
Heat Differential	1	0-9.9	°F /°C
SA (Supply Air) Reset The supply air temperature setpoint when the space requires heating	80	60-100	°F /°C
pAD Reset Unoccupied The Space unoccupied heating setpoint. If the unit is in unoccupied mode and the space temperature drops below this setpoint the unit will come on and heat the space	62	70-90	°F /°C
Heat Cool Lockouts Outside Air Limits Controls whether the unit will be in heating or cooling mode			
Heating When the outside air temperature is above this setpoint the unit will be in cooling mode. It will remain in cooling mode until the outside air temperature drops below the cooling lockout setpoint	68	40-90	°F /°C
Cooling When the outside air temperature is below this setpoint the unit will be in heating mode. It will remain in heating mode until the outside air temperature increase above the heating lockout setpoint	62	40-90	°F /°C
Heat Cool Changeover Delay The time delay the unit has to wait before cycling from cooling to heating or heating to cooling.	2	0-10	Min

(continued on next page)

Service Sub Menu (continued)

Control Settings (continued)

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if unit is set to Space Neutral Air Reset.</i>	-	-	-
Neutral Air Reset Heating	-	-	-
OA:→SA: The maximum supply air temperature based on the outside air temperature. When the outside temperature is at 30°F, the supply air setpoint will be 78°F	30→78	-	°F /°C
OA: →SA: The minimum supply air temperature based on the outside air temperature. When the outside air is at 60°F the supply air will be 70°F	60→70	0-9.9	°F /°C
<i>Note: The screen below will only be displayed if unit is set to Space Neutral Air Reset.</i>	-	-	-
Neutral Air Reset Cooling	-	-	-
OA:→SA: This is the maximum supply air temp. When the outside temperature is at 70°F the supply air setpoint will be 65°F	70→65	-	°F /°C
OA: →SA: This is the Minimum supply air temp. When the outside air is at 85°F the supply air will be 55°F	85→55	0-9.9	°F /°C
<i>Note: The screen below will only be displayed if Dehumidification Control is enabled</i>	-	-	-
Hot Gas Re-Heat	-	-	-
Modulation Enables Hot Gas Reheat Modulation Control	On	On Off	-
Setpoint The supply air temperature control setpoint when HGRH Set is selected (see below)	70	50-90	°F /°C
Setpoint Selection If SA Set is selected, the HGRH setpoint will be the same as the supply air setpoint with all the required resets If HGRH Set is selected it will control at the HGRH Setpoint (above) and will not have any reset control.	SA Set	SA Set HGRH Set	-
Stage 2 On The percentage at which the 2 nd stage Hot Gas Re-Heat will be enabled	40	0-100	%
Stage 2 Band Stage 2 Disabled. Off = Stage 2 On minus Band	10	0-100	%

(continued on next page)

Service Sub Menu (continued)

Control Settings (continued)

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if Dehumidification Control is enabled</i>	-	-	-
Hot Gas Re-Heat Flush	-	-	-
Flush Time The time the unit will run in Flush mode	3	0-10	Min
Flush Percentage The HGRH level at which point a Flush Cycle is enabled when the HGRH level falls below this value	20	0-100	%
Flush Cycle Time The time HGRH has to be running before a Flush Cycle will occur	20	0-99	Min
Off Flush Cycle Time The time for a Flush Cycle when Dehum is terminated	2	0-10	Min
Supply Air Temperature Control	-	-	-
Cntrl The type of PID control	Both PI Half	Both Rev Dir P P+I P+I+D Half Full	-
Band Proportional Band	40	20-100	°F /°C
Integration Time	80	0-100	S
Output Period	500	0-1000	ms
Supply Air Temperature Control	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C
Condenser Fan	-	-	-
Cntrl The type of PID control	DIR PI FULL	Both Rev Dir P P+I P+I+D Half Full	-
Band Proportional Band	110	20-100	°F /°C
Integration Time	80	0-100	S
Output Period	500	0-1000	ms

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Service Sub Menu (continued)

Control Settings (continued)

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Condenser Fan	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C
<i>Note: The screen below will only be displayed if Dehumidification Control is enabled</i>	-	-	-
Hot Gas Re-Heat	-	-	-
Cntrl The type of PID control	REV PI FULL	Both Rev Dir P P+I P+I+D Half Full	-
Band Proportional Band	40	20-100	°F /°C
Integration Time	80	0-100	S
Output Period	500	0-1000	ms
Hot Gas Re-Heat	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C
<i>Note: The screen below will only be displayed if Dehumidification Control is enabled</i>	-	-	-
Dehumidification	-	-	-
Cntrl The type of PID control	DIR PI FULL	Both Rev Dir P P+I P+I+D Half Full	-
Band Proportional Band	20	20-100	°F /°C
Integration Time	80	0-100	S
Output Period	1	0-1000	ms
Dehumidification	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C

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Models MPR & ERM

Service Sub Menu (continued)

Control Settings (continued)

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if the ERM is enabled</i>	-	-	-
ERM Exhaust Fan	-	-	-
Cntrl The type of PID control	DIR PI FULL	Both Rev Dir P P+I P+I+D Half Full	-
Band Proportional Band	0.5	20-100	"WG
Integration Time	100	0-100	S
Output Period	500	0-1000	ms
ERM Exhaust Fan	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C
ERM Pre-Heater	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C
Supply Fan Building Pressure	-	-	-
Cntrl The type of PID control	REV PI	Both Rev Dir P P+I P+I+D	-
Band Proportional Band	10	20-100	°F /°C
Integration Time	100	0-100	S
Output Period	1	0-1000	ms
Supply Fan Building Pressure	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C

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Service Sub Menu (continued)

Control Settings (continued)

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Supply Fan Static Pressure	-	-	-
Cntrl The type of PID control	REV PI	Both Rev Dir P P+I P+I+D	-
Band Proportional Band	10	20-100	°F /°C
Integration Time	100	0-100	S
Output Period	1	0-1000	ms
Supply Fan Static Pressure	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C
CO2 Damper Control	-	-	-
Cntrl The type of PID control	DIR PI	Both Rev Dir P P+I P+I+D	-
Band Proportional Band	20	20-100	°F /°C
Integration Time	100	0-100	S
Output Period	1	0-1000	ms
CO2 Damper Control	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C
Exhaust Fan Building Pressure	-	-	-
Cntrl The type of PID control	DIR PI	Both Rev Dir P P+I P+I+D	-
Band Proportional Band	5	20-100	°F /°C
Integration Time	100	0-100	S
Output Period	1	0-1000	ms

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Service Sub Menu (continued)

Control Settings (continued)

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ Control Settings (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Exhaust Fan Building Pressure	-	-	-
Dead Band	Off	On/Off	
Above Setpoint	0	0-10	°F /°C
Below Setpoint	0	0-10	°F /°C
Note: The screen below will only be displayed if the unit is in CDSS mode			
EVO 1 Regulation			
Setpoint Superheat	10	5-15	°F /°C
Low Superheat Threshold Below this point the unit will go into alarm (after a time delay) and shut down the compressor	3	Do Not Adjust	°F /°C
Low Operating Pressure This is the evaporating pressure converted to temperature, below this point the unit will go into alarm (after a time delay) and shut down the compressor	-1	Do Not Adjust	°F /°C
Maximum Operating Pressure This is the evaporating pressure converted to temperature, above this point the unit will go into alarm (after a time delay) and shut down the compressor.	100	Do Not Adjust	°F /°C

User DEV/Change PW1

Main Status Screen ⇒ Service ⇒ Service Settings ⇒ User DEV/Change PW1 (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
User Default Settings Allows the user to save all the changes they have made to a separate part of the memory	-	-	-
Save Saves the User settings	Off	On/Off	
Restore Restores the user settings	Off	On/Off	
Insert new passwords Allows the user to view and change the level one password	-	-	-
Service (PW1)	0001	0000-9999	

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Service Sub Menu (continued)

Manual Management

WARNING

Improper control adjustments and manual mode control can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before making adjustments.

Manual Control Reset

Main Status Screen ⇒ Service ⇒ Manual Management ⇒ Manual Control Reset (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Manual Control Reset	-	-	-
Enable If Enable is On, the unit will revert to Full Auto control after the time period (below) has elapsed.	On	On/Off	-
Time	30	0 – 500	Min

Analog Input:

Main Status Screen ⇒ Service ⇒ Manual Management ⇒ Analog Input (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
As the analog inputs have been listed under "Inputs/Outputs" section, only the supply air sensor has been detailed.			
Supply Temperature	-	-	-
Manual Control B10 Puts the input into manual mode	Off	On/Off	-
Manual Position Set the manual value for this input (only has an affect when the input is in manual control, item above is On).	0	-32768 – 32768	°F /°C
Value Actual value of input	0	-32768 – 32768	°F /°C

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Service Sub Menu (continued)

Digital Input:

Main Status Screen ⇒ Service ⇒ Manual Management ⇒ Digital Input (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
As the digital inputs have been listed under "Inputs/Outputs" section, only the door switch has been detailed.			
Door Switch	-	-	-
Manual Digital Input 13 Put the input into manual mode	Off	On/Off	-
Manual Position Changes the inputs state (only has an affect when the input is in manual control, item above is On).	-	Open/Closed	-
Digital Input 13 Status Actual status of input	-	Open/Closed	-

Relay Output:

Main Status Screen ⇒ Service ⇒ Manual Management ⇒ Relay Output (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
As the Digital Outputs have been listed under "Inputs / Output" section only the supply fan has been detailed.			
Supply Fan	-	-	-
Manual Relay 7 Puts the output into manual mode	Off	On/Off	-
Manual Position Changes the output state (only has an affect when the output is in manual control, item above is On).	Off	On/Off	-
Relay 7 Status Actual status of output	-	On/Off	-

Analog Output:

Main Status Screen ⇒ Service ⇒ Manual Management ⇒ Analog Output (🔒 requires password PW1)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen):

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
As the Analog Outputs have been listed under "Inputs / Output" section only the condenser fan has been detailed.	-	-	-
Condenser Fan	-	-	-
Mode Puts the output into manual mode	Auto	Auto/Hand	-
Manual Value Changes the output value (only has an affect when the output is in manual control, item above is On).	0.0	0.0-10.0	VDC
Output Actual value of output	-	0.0-10.0	VDC

Manufacturer Sub Menu

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Disable Buzzer Disables the buzzer on the keypad (during an Alarm event)	Yes	Yes/No	-
Temperature Units	°F	°F /°C	-
PAD Enables the pAD Wall Stat when installed	Off	On/Off	-
ERM Enables the ERM (Energy Wheel) Module when installed	Off	On/Off	
Digital Scroll This selects whether the unit has an Emerson EC3 Digital Scroll Controller or the Carel Digital Scroll Solution Note: Consult Modine before making any changes	CDSS	EC3/CDSS	
EVD EVO This shows the Carel Electronic Expansion Valve (EEV) driver as enabled automatically if CDSS is selected above. This is a read only field, it cannot be adjusted.	Enabled	Enabled/Disabled	
Reset Type If set to Space the Supply Air Setpoint will be reset if there is a space cooling or heating requirement (pAD required) If set to Neutral Air the Supply Air Setpoint will be reset dependent upon the outside air temperature (see Reset control under Service Settings)	None	None Space Neutral Air Space and Neutral Air	
Dehum Mode If set to Space the Dehum sequence will be initiated when the Space Humidity exceeds the Space humidity Setpoint (pAD required) If set to Dew point the Dehum sequence will be initiated when the Outside Air Dew point exceeds the Outside Air Dew point Setpoint	None	None Space Dew Point Space and Dew Point	
Unit Setup Heat Cool:			
Heating Type	Gas	Gas Electric None	
Mod (Heating) Selects the type of modulation control, in Vernier control the modulated output will sequence with each stage of heat.	Demand	Vernier Demand	
Qty (Heating) Number of stages of Heating	2	0-2 for Gas 0-4 for Electric	
Mod (Compressor) Selects the type of modulation control	Vernier	Vernier Demand	
Qty (Compressor) Number of Stages of Cooling	2	0-2	
Dehum Reheat using Gas or Electric Using "New Energy" for reheat is typically not allowed by Code, but under emergency situations it can be enabled. If enabled the unit will use gas or electric heat as dehumidification reheat.	No	Yes/No	

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Manufacturer Sub Menu (continued)

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Gas Staging Setup: Setup for Gas and Electric heat control (20kw)			
Gas and Electric Selects either Gas only or Gas and Electric control	No	Yes/No	
Outside Air Setpoint If gas and electric is selected above and the outside air is above this value the unit will control electric heat and gas will be disabled, if the outside air is below this value the unit will control gas heat and electric will be disabled	50	0-100	°F /°C
Outside Air Differential The gas / electric heat switchover differential	5	0-10	°F /°C
Gas Staging Setup Selects whether the two banks of gas heat work as one or two stages (or auto changeover on outside air temperature)			
Mode In Single mode both banks of gas heat will come on together, In dual mode the two banks will be staged based on heating demand.	Dual	Single/Dual	
Auto Staging (Only visible if Dual Stage mode) Switches from Single to Dual Stage based on the outside air temperature.	On	On/Off	
Outside Air Switchover Setpoint (only visible if Auto Changeover is selected) If the outside air temperature is above the setpoint, the unit will be in Dual Stage mode. If the outside air temperature is below the setpoint, the unit will be in Single Stage mode.	55	0-100	°F /°C
Outside Air Switchover Differential The Single/Dual switchover differential	5	0-10	°F /°C

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Models MPR & ERM

Manufacturer Sub Menu (continued)

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Damper Control			
Damper Mode DOAS = Outside Air damper fully open or closed. No Return air damper. HOAS = Outside air and return air dampers installed, minimum damper position enabled (see Setpoint) ID Cntrl = Outside air and return air dampers installed, four positions available controlled by digital inputs ID15 & ID16 CO2 Cntrl = Outside air and return air dampers installed, minimum damper position overridden by CO2 level (space CO2 sensor required) BP Control = Outside air and return air dampers installed, damper minimum position overridden by building pressure sensor. (Building pressure sensor required)	DOAS	DOAS HOAS ID Control CO2 Control Building Pressure	
Economizer Enables outside air economizer mode, requires either room pAD thermostat or return air temperature and humidity sensor.	Off	On/Off	
Enthalpy Differential The difference between outside and return / room enthalpy before economizer cooling is allowed	0.5	0-10	BTU/LB
Enthalpy Space or Return Select either space enthalpy (pAD required) or return enthalpy (return air temperature and humidity sensor required)	Space	Space/Return	
Supply Fan Control			
Supply Mode Off = Supply fan has no speed control Const. Vol. = The supply fan speed is controlled at four speeds via the digital inputs ID15 & ID16 (VFD required) Manual = The supply fan is controlled to a single speed set in the controller (VFD required) Build Press. = The supply fan is controlled via a building pressure sensor (building pressure sensor required and VFD required) Static Pres. = The supply fan is controlled via the discharge ductwork static pressure. (Static duct sensor and VFD required) CO2 = The supply fan is controlled by the space CO2 level (CO2 sensor and VFD required)	Off	Off Constant Volume Manual Building Pressure Static Pressure CO2	
Depending upon the control option selected a number or setting will become available, see the "Setpoint Parameter" section for details.			

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Models MPR & ERM

Manufacturer Sub Menu (continued)

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Exhaust Fan Control			
Exhaust Mode Off = No Exhaust fan installed On – Relay = Single speed exhaust fan or control output to remote exhaust fan BP - On/Off = The single speed exhaust fan or remote exhaust fan will be cycled on or off by the building pressure (building pressure sensor required) SupF-Offset = The exhaust fan will modulate with the supply fan minus the offset amount (VFD required) Build Press. = The exhaust fan is controlled via a building pressure sensor (building pressure sensor required and VFD required) Const. Vol. = The exhaust fan speed is controlled at four speeds via the digital inputs ID15 & ID16 (VFD required)	Off	Off On - Relay Building Pressure On/Off Supply Fan Offset Building Pressure Constant Volume	
Depending upon the control option selected a number or setting will become available, see the "Setpoint Parameter" section for details.			
Timers	-	-	-
SA Fan Off Delay The time delay for the supply fan to turn off (purge time)	2	0-10	Min
Damper Run Time The time for the damper actuator to fully open or fully closed (required for floating point control)	150	0-300	Sec
Exhaust Fan On/Off Minimum on and off time for the exhaust fan	1	0-10	Min
Compressor Stage Delay The delay between compressor 1 and compressor 2 coming on	60	0-999	Sec
Compressor Min On The minimum cycle On time for the compressor	2	0-10	Min
Compressor Min Off The minimum cycle Off time for the compressor	2	0-10	Min
Low Pressure Control Used to control the compressor when the unit is in Dehumidification mode	-	-	-
Setpoint The Low Pressure (Refrigerant Suction) control setpoint. In Dehum mode the compressor will modulate to maintain this value	130	100-160	PSIG
Demand Low Limit The minimum control signal to the compressor during Dehum Control	10	0-100	%

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Manufacturer Sub Menu (continued)

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Condenser Fan Condenser fan head pressure control			
Modulation Enables head pressure control modulation	Yes	Yes/No	-
Setpoint The setpoint at which the unit will try to control head pressure (by condenser fan modulation) when in cooling mode	250	200-400	PSIG
Setpoint Dehum The setpoint at which the unit will try to control head pressure (by condenser fan modulation) when in dehumidification mode	300	200-400	PSIG
Condenser Fan Start Output 100% For The time the fans will run at 100% when first enabled	15	0-100	Sec
Compressor Staging	-	-	-
Compressor 1 On The minimum percentage of cooling demand required before compressor 1 turns on	5		%
Compressor 1 Off The percentage at which the compressor turns off	0		%
Compressor 2 On The percentage at which compressor 2 turns on	55		%
Compressor 2 Off The percentage at which the compressor turns off	50		%
Compressor Flush Cycle Both compressors are operated at 100% capacity to flush any residual oil throughout the system back to the compressors	-	-	-
Compressor Flush CT Time between flush cycles	60		Min
Compressor Flush Time Duration of flush cycle	2		Min
Compressor Flush Percentage	100	50-100	%

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Manufacturer Sub Menu (continued)

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if Gas Heat is selected</i>	-	-	-
Gas Heat Settings	-	-	-
Min On Time 1 The time heater number one will remain on after it lights	0	0-999	Sec
Min Off Time 1 The time heater number one will remain off after shutting down	60	0-999	Sec
Min On Time 2 The time heater number two will remain on after it lights	0	0-999	Sec
Min Off Time 2 The time heater number two will remain off after shutting down	60	0-999	Sec
Gas High Fire Start 100% For The time the modulating gas valve will stay in high fire (100%) when the main gas valve is energized	20	0-99	Sec
Gas Alarm Delay The alarm delay if there is a call for heat and the main gas valve is not energized.	180	0-999	Sec
Gas Power Exhaust Hi On/Off (80% efficiency only) The control signal output that will change the fan speed of the power exhauster from low to high	-	-	-
Fan 1 On Gas Stage 1 Exhaust Fan Low	1	0-10	VDC
Fan 1 Off Gas Stage 1 Exhaust Fan High	1.5	0-10	VDC
Fan 2 On Gas Stage 2 Exhaust Fan Low	1	0-10	VDC
Fan 2 On Gas Stage 2 Exhaust Fan High	1.5	0-10	VDC
Gas Heat Staging (Occupied) Note: This will change if Dual Mode control is selected			
Gas Occupied Demand			
Stage 1 On	5	0-100	%
Stage 1 Off	0	0-100	%
Stage 2 On	5	0-100	%
Stage 2 Off	0	0-100	%

(continued on next page)

Manufacturer Sub Menu (continued)

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Gas Heat Staging (Unoccupied)			
Gas Unoccupied Demand			
Stage 1 On	5	0-100	%
Stage 1 Off	0	0-100	%
Stage 2 On	65	0-100	%
Stage 2 Off	60	0-100	%
Electric Heat Settings Note: The screen below will only be displayed if Electric Heat is selected			
Minimum On/Off The time the heaters will remain On or Off after turning on or off	1	0-10	Min
Electric Heat Staging (Occupied) Note: The values will change dependent upon the number of stages selected			
Electric Occupied Demand			
Stage 1 On	10	0-100	%
Stage 1 Off	0	0-100	%
Stage 2 On	30	0-100	%
Stage 2 Off	20	0-100	%
Electric Heat Staging (Occupied)			
Gas Occupied Demand			
Stage 3 On	60	0-100	%
Stage 3 Off	50	0-100	%
Stage 4 On	80	0-100	%
Stage 4 Off	70	0-100	%
Electric Heat Staging (Unoccupied) Note: The values will change dependent upon the number of stages selected			
Electric Unoccupied Demand			
Stage 1 On	10	0-100	%
Stage 1 Off	0	0-100	%
Stage 2 On	30	0-100	%
Stage 2 Off	20	0-100	%

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Manufacturer Sub Menu (continued)

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Electric Heat Staging (Unoccupied)			
Gas Unoccupied Demand			
Stage 3 On	60	0-100	%
Stage 3 Off	50	0-100	%
Stage 4 On	80	0-100	%
Stage 4 Off	70	0-100	%
Supply Air Low Temp The number of retries on a supply air low temperature alarm before the unit will lockout and generate an alarm			
Retries The number of retries and the time period for the number of retries before a lockout occurs.	3/60	0-10/0-120	#/Min
Set Disable The time before another retry will occur	300	0-600	Sec
Status The number of retries that have occurred and the time remaining before the count is reset	Actual Values		#/Min
Comp Low Pressure The number of retries on a Low Pressure alarm before the unit will lockout and generate an alarm			
Retries The number of retries and the time period for the number of retries before a lockout occurs.	1/60	0-10/0-120	#/Min
Set Disable The time before another retry will occur	300		Sec
Status The number of retries that have occurred and the time remaining before the count is reset	Actual Values		#/Min
Comp High Pressure The number of retries on a High Pressure alarm before the unit will lockout and generate an alarm			
Retries The number of retries and the time period for the number of retries before a lockout occurs.	1/60	0-10/0-120	#/Min
Set Disable The time before another retry will occur	300		Sec
Status The number of retries that have occurred and the time remaining before the count is reset	Actual Values		#/Min

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Manufacturer Sub Menu (continued)

Configuration

Main Status Screen ⇒ Manufacturer ⇒ Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Condenser Float The number of retries on a Condensate Float alarm before the unit will lockout and generate and alarm			
Retries The number of retries and the time period for the number of retries before a lockout occurs.	1/60	0-10/0120	#/Min
Set Disable The time before another retry will occur	300		Sec
Status The number of retries that have occurred and the time remaining before the count is reset	Actual Values		#/Min
Digital Compressor The number of retries on a Digital Compressor alarm before the unit will lockout and generate and alarm			
Retries The number of retries and the time period for the number of retries before a lockout occurs.	1/60	0-10/0120	#/Min
Set Disable The time before another retry will occur	300		Sec
Status The number of retries that have occurred and the time remaining before the count is reset	Actual Values		#/Min
Supply Fan Shut Down The number of retries on a Fan alarm before the unit will lockout and generate and alarm			
Retries The number of retries and the time period for the number of retries before a lockout occurs.	1		Min
Set Disable The time before another retry will occur	300		Sec
Status The number of retries that have occurred and the time remaining before the count is reset	Actual Values		#/Min
Note: The screen below will only be displayed if the unit is in CDSS mode			
Press Enter to Configure EVO EVD Drive			
See EVO EVD Driver configuration on page 62			

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Manufacturer Sub Menu (continued)

I/O Configuration – Digital Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ I/O Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screens below will only be displayed if the unit is in CDSS mode</i>			
Digital Scroll			
Digital Scroll Comp. Valve Regulation Note: Do NOT make any changes to this setting without contacting the factory.	Optimized Regulation	Optimized Regulation Changeable Cycle Time Constant Cycle Time	
Inertia Factor Note: Do NOT make any changes to this setting without contacting the factory.	3		
Digital Scroll			
Refrigerant Type	R410A	Do not Change	
Enable Envelope	Off	Do Not Change	
Temp Unload Alarm	On	Do Not Change	
High Pressure Pressure Switch reading from the discharge side of the compressors			
Enable Enables the Digital Input	On	On/Off	-
Channel The physical Input on the controller	1	0-18	
<i>Note: The screen below will only be displayed if the High Pressure is Enabled</i>			
Action The inputs normal state	Open	Open Closed	
Delay Time delay when the input changes state	0		Sec
Low Pressure Pressure Switch reading from the suction side of the compressors			
Enable	On	On/Off	-
Channel	2	0-18	
<i>Note: The screen below will only be displayed if the Low Pressure is Enabled</i>			
Action	Open	Open Closed	
Delay	0		Sec

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Manufacturer Sub Menu (continued)

I/O Configuration – Digital Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ I/O Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Air Flow Switch			
Enable	On	On/Off	-
Channel	3	0-18	
<i>Note: The screen below will only be displayed if the Supply Fan is Enabled</i>			
Action	Closed	Open Closed	
Delay	0		Sec
Smoke Detector			
Enable	On	On/Off	-
Channel	4	0-18	
<i>Note: The screen below will only be displayed if the Smoke Detector is Enabled</i>			
Action	Open	Open Closed	
Delay	0		Sec
Filter Dirty filter switch indicates when the filters need to be replaced. "Clogged Filter" will be displayed in the alarms page when this condition occurs			
Enable	On	On/Off	-
Channel	5	0-18	
<i>Note: The screen below will only be displayed if the Filter is Enabled</i>			
Action	Closed	Open Closed	
Delay	120		Sec
Damper End Switch			
Enable	On	On/Off	-
Channel	6	0-18	
<i>Note: The screen below will only be displayed if the Damper End Switch is Enabled</i>			
Action	Open	Open Closed	
Delay	0		Sec

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Models MPR & ERM

Manufacturer Sub Menu (continued)

I/O Configuration – Digital Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ I/O Configuration (⚙ requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Occupied Switch			
Enable	On	On/Off	-
Channel	7	0-18	
<i>Note: The screen below will only be displayed if the Occupied Switch is Enabled</i>			
Action	Closed	Open Closed	
Delay	0		Sec
Digital Comp Alarm			
Enable	Off in CDSS Mode On In ECS Mode	On/Off	-
Channel	8	0-18	
<i>Note: The screen below will only be displayed if the Digital Comp Alarm is Enabled</i>			
Action	Open	Open Closed	
Delay	5		Sec
Condensate Pan Float			
Will indicate when the condensate pan has reached a maximum fill level			
Enable	On	On/Off	-
Channel	9	0-18	
<i>Note: The screen below will only be displayed if the Condensate Float Pan Switch is Enabled</i>			
Action	Open	Open Closed	
Delay	0		Sec
Gas Valve 1			
Enable	On	On/Off	-
Channel	10	0-18	
<i>Note: The screen below will only be displayed if the Gas Valve 1 is Enabled</i>			
Action	Closed	Open Closed	
Delay	0		Sec

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Manufacturer Sub Menu (continued)

I/O Configuration – Digital Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ I/O Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Gas Valve 2			
Enable	On	On/Off	-
Channel	11	0-18	
<i>Note: The screen below will only be displayed if the Gas Valve 2 is Enabled</i>			
Action	Closed	Open Closed	
Delay	0		Sec
Freeze Stat			
Enable	On	On/Off	-
Channel	12	0-18	
<i>Note: The screen below will only be displayed if the Freeze Stat is Enabled</i>			
Action	Closed	Open Closed	
Delay	0		Sec
Door Switch Prevents operation of the unit while supply fan door is open			
Enable	On	On/Off	-
Channel	13	0-18	
<i>Note: The screen below will only be displayed if the Door Switch is Enabled</i>			
Action	Open	Open Closed	
Delay	0		Sec
Remote On/Off			
Enable	On	On/Off	-
Channel	14	0-18	
<i>Note: The screen below will only be displayed if Remote On/Off is Enabled</i>			
Action	Closed	Open Closed	
Delay	0		Sec

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Manufacturer Sub Menu (continued)

I/O Configuration – Digital Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ I/O Configuration (⚙ requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if Supply Fan Constant Volume Control is Enabled</i>			
Supply Fan Speed 2 Used to control the Supply Fan Speed			
Enable	On	On/Off	-
Channel	15	0-18	
Action	Open	Open Closed	
Delay	0		Sec
Supply Fan Speed 3 Used to control the Supply Fan Speed			
Enable	On	On/Off	-
Channel	16	0-18	
Action	Open	Open Closed	
Delay	0		Sec
<i>Note: The screen below will only be displayed if Damper ID Control is Enabled</i>			
Damper Position 2 Used to control the outside and return air damper position			
Enable	On	On/Off	-
Channel	15	0-18	
Action	Open	Open Closed	
Delay	0		Sec
Damper Position 3 Used to control the outside and return air damper position			
Enable	On	On/Off	-
Channel	16	0-18	
Action	Open	Open Closed	
Delay	0		Sec

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Models MPR & ERM

Manufacturer Sub Menu (continued)

I/O Configuration – Digital Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ I/O Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if Exhaust Fan is Enabled</i>			
Exhaust Fan Airflow Switch			
Enable	On	On/Off	-
Channel	18	0-18	
Action	Open	Open Closed	
Delay	0		Sec

I/O Configuration – Analog Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Input Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Return Air Humidity Humidity of the air returning to the unit			
Enable	Set By Program	On/Off	-
Channel	B1		
Normal	Normal/High Res		
Input Type	4-20mA	NTC 10T170 -50T90 NTC HT 0-5Vdc On/Off 4-20mA 0-10Vdc 0-1Vdc PT1000	
Minimum	0.0	0-999	
Maximum	100.0	0-999	
Offset	0.0	0-99	%
Value	Actual Value		%
Return Air Humidity			
Input Will match "Channel" variable from previous page			%
Out of Range Alarm			
Power Delay	10	0-999	Sec
Run Delay	10	0-999	Sec

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Manufacturer Sub Menu (continued)

I/O Configuration – Analog Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Input Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
CO2 CO2 Space Sensor			
En Enables the Analog input	Set By Program	On/Off	-
Ch The physical input on the controller	B2	0-10	-
<i>Note: The screen below will only be displayed if CO2 is Enabled</i>			
Normal The input sampling rate	Normal	Normal/High Res	-
Input Type	4-20mA	4-20mA 0-10Vdc 0-1Vdc PT1000 NTC 10T170 -50T90 NTC HT 0-5Vdc On/Off	
Minimum The minimum value when the inputs at its minimum state	0.0		PPM
Maximum The maximum value when the input is at its maximum state	200.0	0-999.9	PPM
Offset A calibration offset	0.0	0-99	PPM
Value	Actual Value		PPM
CO2			
Input Will match "Channel" variable from previous page			
Out of Range Alarm Time delay when the sensor goes out of range	0	999	Sec
Run Delay Time delay when the controller first powers up	0	999	Sec

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Manufacturer Sub Menu (continued)

I/O Configuration – Analog Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Input Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Building Pressure or Duct Static Pressure			
Enable	Set By Program	On/Off	
Channel	B3		
<i>Note: The screen below will only be displayed if the B.P. or Duct Static sensor is Enabled</i>			
Normal	Normal	Normal High Res	-
Input Type	4-20mA	4-20mA 0-10Vdc 0-1Vdc PT1000 NTC 10T170 -50T90 NTC HT 0-5Vdc On/Off	-
Minimum	0.000	0-99	IWG
Maximum	0.500 or 5.000	0-9	IWG
Offset	0	0-99	IWG
Value	Actual Value		IWG
Building Pressure			
Input			
Will match "Channel" variable from previous page			
Out of Range Alarm	0	0-999	Sec
Run Delay	0	0-999	Sec
Mixed Temperature			
Enable	Not Used	On/Off	-
Channel	B4 in EC3 Mode B9 in CDSS Mode		-
<i>Note: The screen below will only be displayed if Mixed Temperature is Enabled</i>			
Normal	Normal	Normal High Res	-
Input Type	NTC	NTC 10T170 -50T90 NTC HT 0-5Vdc On/Off 4-20mA 0-10Vdc 0-1Vdc PT1000	-
Offset	0.0	0-999	°F /°C
Value	Actual Value		°F /°C

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Models MPR & ERM

Manufacturer Sub Menu (continued)

I/O Configuration – Analog Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Input Configuration (⚙ requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Mixed Temperature			
Input			°F / °C
Out of Range Alarm			
Power Delay	5	0-999	Sec
Run Delay	5	0-999	Sec
Return Air Temperature Temperature of the air returning to the unit			
Enable	Set By Program	On/Off	-
Channel	B5		
Normal	Normal/High Res		
Input Type	NTC	NTC 10T170 -50T90 NTC HT 0-5Vdc 4-20mA 0-10Vdc 0-1Vdc PT1000	
Offset	0.0	0-99	°F / °C
Value	Actual Value		°F / °C
Return Air Temperature			
Input Will match "Channel" variable from previous page			°F / °C
Out of Range Alarm			
Power Delay	10	0-999	Sec
Run Delay	10	0-999	Sec
Note: The screen below will only be displayed if in CDSS mode			
Discharge Line Temperature Temperature of digital compressors discharge line			
Enable	Set By Program	On/Off	-
Channel	B6		
Normal	Normal/High Res		
Input Type	NTC	NTC 10T170 -50T90 NTC HT 0-5Vdc 4-20mA 0-10Vdc 0-1Vdc PT1000	
Offset	0.0	0-99	°F / °C
Value	Actual Value		°F / °C

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Manufacturer Sub Menu (continued)

I/O Configuration – Analog Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Input Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Discharge Line Temperature			
Input Will match "Channel" variable from previous page			°F / °C
Out of Range Alarm			
Power Delay	10	0-999	Sec
Run Delay	10	0-999	Sec
<i>Note: The screen below will only be displayed if in EC3 mode</i>			
Liquid Line Pressure			
Enable	Set By Program	On/Off	-
Channel	B6		
Normal	Normal/High Res		
Input Type	0-5Vdc	0-5Vdc On/Off 4-20mA 0-10Vdc 0-1Vdc PT1000 NTC 10T170 -50T90 NTC HT	
Minimum	0.0	0-9.9	PSIG
Maximum	667.0	0-999.9	PSIG
Offset	0.0	0-9	PSIG
Value	Actual Value		PSIG
Liquid Line Pressure			
Input Will match "Channel" variable from previous page			PSIG
Out of Range Alarm			
Power Delay	5	0-999	Sec
Run Delay	5	0-999	Sec

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Manufacturer Sub Menu (continued)

I/O Configuration – Analog Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Input Configuration (⚙ requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Outside Humidity			
Enable	On	On/Off	-
Channel	B7		
Normal	Normal/High Res		
Input Type	4-20mA	4-20mA 0-10Vdc 0-1Vdc PT1000 NTC 10T170 -50T90 NTC HT 0-5Vdc On/Off	
Minimum	0.0	0-999	%
Maximum	100.0	0-999	%
Offset	0.0	0-99	%
Value	Actual Value		%
Outside Humidity			
Input Will match "Channel" variable from previous page			
Out of Range Alarm			%
Power Delay	10	0-999	Sec
Run Delay	5	0-999	Sec
Note: The screen below will only be displayed if the unit is in EC3 mode			
Low Pressure Pressure sensor reading from the suction side of the compressors			
En	Set By Program	On/Off	
Ch	B8		
Normal	Normal/High Res		
Input Type	0-5Vdc	4-20mA 0-10Vdc 0-1Vdc PT1000 NTC 10T170 -50T90 NTC HT 0-5Vdc On/Off	
Minimum	0.0	0-999	PSIG
Maximum	265.0	0-999	PSIG
Offset	0.0		PSIG
Value	Actual Value		PSIG

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Manufacturer Sub Menu (continued)

I/O Configuration – Analog Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Input Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Low Pressure			
Input Will match "Channel" variable from previous page			
Out of Range Alarm			PSIG
Power Delay	10	0-999	Sec
Run Delay	10	0-999	Sec
Outside Temperature			
Enable	On	On/Off	
Channel	B9 In EC3 Mode B4 In CDSS Mode		
Normal	Normal/High Res		
Input Type	NTC	NTC 10T170 -50T90 NTC HT 0-5Vdc On/Off 4-20mA 0-10Vdc 0-1Vdc PT1000	
Offset	0.0	0-99	°F /°C
Value	Actual Value		°F /°C
Outside Temperature			
Input Will match "Channel" variable from previous page			°F /°C
Out of Range Alarm			
Power Delay	5	0-999	Sec
Run Delay	5	0-999	Sec

(continued on next page)

Manufacturer Sub Menu (continued)

I/O Configuration – Analog Input Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Input Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Supply Temperature Temperature of the air being supplied from the unit	-	-	-
Enable	On	On/Off	-
Channel	B10	0-10	-
Normal	Normal	Normal/High Res	-
Input Type	NTC	NTC PT1000 0-1Vdc 0-10Vdc 4-20mA On/Off 0-5Vdc NTC HT -50T90 10T170	
Offset	0.0	0-99	°F /°C
Value	Actual Value		°F /°C
Supply Temperature	-	-	-
Input Will match "Channel" variable from previous page			°F /°C
Out of Range Alarm			
Power Delay	5	0-999	Sec
Run Delay	5	0-999	Sec

I/O Configuration – Relay Output Configuration:

Main Status Screen ⇒ Manufacturer ⇒ Relay Output Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Supply Fan			
Enable Enable the Relay output	On	On/Off	
Channel The physical output on the controller	7	0-18	
Status	Actual Value	On/Off	
Condenser Fan			
Enable	On	On/Off	
Channel	8	0-18	
Status	Actual Value	On/Off	

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Manufacturer Sub Menu (continued)

I/O Configuration – Relay Output Configuration

Main Status Screen ⇒ Manufacturer ⇒ Relay Output Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Compressor 1			
Enable	On	On/Off	
Channel	3	0-18	
Status	Actual Value	On/Off	
Compressor 2			
Enable	On	On/Off	
Channel	4	0-18	
Status	Actual Value	On/Off	
OA Damper Open			
Enable	On	On/Off	
Channel	5	0-18	
Status	Actual Value	On/Off	
OA Damper Close			
Enable	On	On/Off	
Channel	6	0-18	
Status	Actual Value	On/Off	
Heat 3			
Enable	On	On/Off	
Channel	1	0-18	
Status	Actual Value	On/Off	
Heat 4			
Enable	On	On/Off	
Channel	2	0-18	
Status	Actual Value	On/Off	
Heat 1			
Enable	On	On/Off	
Channel	9	0-18	
Status	Actual Value	On/Off	
Heat 2			
Enable	On	On/Off	
Channel	10	0-18	
Status	Actual Value	On/Off	

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Manufacturer Sub Menu (continued)

I/O Configuration – Relay Output Configuration

Main Status Screen ⇒ Manufacturer ⇒ Relay Output Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
HGRH Stage 2			
Enable	Off	On/Off	
Channel	11	0-18	
Status	Actual Value	On/Off	
Ht1 Exhaust Fan			
Enable	On	On/Off	
Channel	12	0-18	
Status	Actual Value	On/Off	
Ht2 Exhaust Fan			
Enable	On	On/Off	
Channel	13	0-18	
Status	Actual Value	On/Off	
<i>Note: The screen below will only be displayed if the unit is in EC3 mode</i>			
HGRH Close Off Valve			
Enable	Off	On/Off	
Channel	14	0-18	
Status	Actual Value	On/Off	
RA Damper Open			
Enable	Off	On/Off	
Channel	16	0-18	
Status	Actual Value	On/Off	
RA Damper Closed			
Enable	Off	On/Off	
Channel	17	0-18	
Status	Actual Value	On/Off	
General Alarm Relay			
Enable	On	On/Off	
Channel	15	0-18	
Status	Actual Value	On/Off	
Exhaust Fan			
Enable	Off	On/Off	
Channel	18	0-18	
Status	Actual Value	On/Off	

(continued on next page)

Manufacturer Sub Menu (continued)

I/O Configuration – Analog Output Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Output Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if the unit is in EC3 mode</i>			
Compressor			
Channel The physical output on the controller	Y1	None Y1-Y6	
Action Selects either a Direct or Reverse action	Direct	Direct Reverse	
Minimum The minimum output when the control is 0%	0.0	0.0-10.0	VDC
Maximum The maximum value when the control is 100%	10.0	0.0-10.0	VDC
Condenser Fan			
Channel	Y2	None Y1-Y6	
Action	Direct	Direct Reverse	
Minimum	0.0	0.0-10.0	VDC
Maximum	10.0	0.0-10.0	VDC
20kw Electric Heat (in CDSS mode) or Hot Gas Reheat (in EC3 Mode)			
Channel	Y3	None Y1-Y6	
Action	Direct	Direct Reverse	
Minimum	0.0	0.0-10.0	VDC
Maximum	10.0	0.0-10.0	VDC
Modulated Heat			
Channel	Y4	None Y1-Y6	
Action	Direct	Direct Reverse	
Minimum	0.0	0.0-10.0	VDC
Maximum	10.0	0.0-10.0	VDC

(continued on next page)

Models MPR & ERM

Manufacturer Sub Menu (continued)

I/O Configuration – Analog Output Configuration

Main Status Screen ⇒ Manufacturer ⇒ Analog Output Configuration (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Supply Fan			
Channel	Y5	None Y1-Y6	
Action	Direct	Direct Reverse	
Minimum	0.0	0.0-10.0	VDC
Maximum	10.0	0.0-10.0	VDC
Exhaust Fan			
Channel	Y6	None Y1-Y6	
Action	Direct	Direct Reverse	
Minimum	0.0	0.0-10.0	VDC
Maximum	10.0	0.0-10.0	VDC

ERM

Main Status Screen ⇒ Manufacturer ⇒ ERM (if ERM is enabled) (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
ERM (Energy Recovery Module)			
ERM Exhaust Fan			
Follow Supply Fan If enabled the exhaust fan will modulate with the supply fan minus the offset (see below)	No	Yes/No	
Enable Building Pressure Control	No	Yes/No	-
Building Pressure Setpoint The ERM Exhaust fan will slow down and speed up to maintain this pressure	0.5	0-1.0	"WG
Exhaust Fan Minimum Speed The minimum the exhaust fan is allowed to run at	50	0-100	%

(continued on next page)

Manufacturer Sub Menu (continued)

ERM

Main Status Screen ⇒ Manufacturer ⇒ ERM (if ERM is enabled) (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
ERM Exhaust Fan			
Fan Offset Damper When the ERM Bypass damper opens, the setting represents the % reduction in the supply and exhaust fan speeds to maintain the correct airflow.	10	0-100	%
Fan Offset Supply When the supply fan is modulating the exhaust fan will maintain the same speed minus this offset	10	0-100	%
ERM Wheel			
Wheel Proximity Detection Enable the wheel rotation detection (requires the unit be equipped with the option)	No	Yes/No	-
ERM Wheel			
Count On : Off The minimum on and off time counters	Actual Times		Sec
Minimum On time The time the wheel must stay On once turned On	5	0-99	Min
Minimum Off time The time the wheel must stay Off once turned Off	6	0-99	Min
Bump Delay If the wheel rotation is off, this setting represents the time interval in which the wheel is forced to rotate to keep the wheel clean	60	0-99	Min
Bump Duration The time the wheel will run during the bump cycle	5	0-99	Min
Reset Shutdown Used to clear a wheel shutdown alarm			
Wheel Economizer Lockout			
Wheel Cooling Outside Air Temperature In cooling mode, if the outside air temperature is less than this value, the wheel economizer will be disabled.	30	0-100	°F /°C
Outside Air Lock Differential	5	0-100	°F /°C
Economizer Mode Enable Enables Wheel economizer mode	Yes	Yes/No	

(continued on next page)

Models MPR & ERM

Manufacturer Sub Menu (continued)

ERM

Main Status Screen ⇒ Manufacturer ⇒ ERM (if ERM is enabled) (ⓘ requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
ERM Wheel Defrost Used to defrost the energy wheel, note this screen will not be visible if the Preheater is Enabled			
Outside Air Setpoint The temperature at which the defrost sequence is activated	20	0-40	°F /°C
Outside Air Setpoint differential	2	0-40	°F /°C
Defrost Cycle Time The time the wheel must be running at (with the outside air temperature below the setpoint) before the wheel stops	30	0-999	Min
Defrost Off Time The time the wheel will stop to allow exhaust air to defrost the wheel	60	0-999	Sec
Defrost Bump Time The time to jog the wheel so the second half of the wheel will see the exhaust air.	6	0-99	Sec
ERM Preheater			
Preheater Enabled Enables or Disables the ERM preheater	No	Yes/No	-
Preheater Setpoint Selects either a Manual or Calculated preheater setpoint. In manual mode the heater will cycle on and off at a predetermined outdoor air temperature setpoint. In Calculated mode the outdoor air and indoor air temperature and moisture contents are used to calculate the required pre-heat setpoint. This will then only use the pre-heat when required.	Manual	Calculated/Manual	
Preheater Mode Selects either On-Off or Modulated ERM preheater control Note: Modulated preheat not currently offered	On-Off	On-Off/PWM	
Manual Setpoint	20	0-100	°F /°C
Manual Preheater Differential	5	0-50	°F /°C
Calculated Preheater Setpoint When the outdoor air temperature is higher than the calculated setpoint (by the differential) the preheater will energize	Actual Value		°F /°C
Calculated Preheater Differential	0.5	0-10	°F /°C
ERM Alarm Times			
Exhaust Fan Warning	30	0-100	Sec
Exhaust Fan Shut Down	180	0-999	Sec
Wheel Warning	100	0-100	Sec
Wheel Shut Down	180	0-999	Sec
Wheel High Pressure Drop	120	0-999	Sec
ERM Return / Exhaust Filter Alarm	120	0-999	Sec

(continued on next page)

Manufacturer Sub Menu (continued)

Initialization

Main Status Screen ⇒ Manufacturer ⇒ Initialization (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
<i>Note: The screen below will only be displayed if the unit is in CDSS mode</i>			
EVO INSTALLATION Erase user settings and install default values Used to set the required values in the Carel EVO – EVD electronic expansion valve driver	No	Yes/No	
DEFAULT INSTALLATION Erase user settings and install global default values Erases all changes and return the controller back to factory settings	No	Yes/No	
Save? Saves any changes to the factory settings	Off	On/Off	
Restore? Restores the changes saved above	Off	On/Off	
Insert New Passwords			
Service (PW1) Allows you to view and change password 1 (Service Settings)	0001	0000-9999	
Manufacture (PW2) Allows you to view and change password 2 (Factory Settings)	0002	0000-9999	

pAD Settings

Main Status Screen ⇒ Manufacturer ⇒ pAD Settings (if pAD is enabled) (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
pAD Number The pAD number on the system (always 1)	Actual Value		
pAD Lan Address The pLAN address on the pAD (Always 4)	Actual Value (4)		
pAD Firmware Version The firmware version of the pAD	Actual Value		
Hardware Options The hardware version of the pAD (always Humid)	Actual Value (Humidity)		

(continued on next page)

Models MPR & ERM

Manufacturer Sub Menu (continued)

pAD Settings

Main Status Screen ⇒ Manufacturer ⇒ pAD Settings (if pAD is enabled) (requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
pAD Number	Actual Value		
Small Display The type of information to display in the small (bottom) screen of the pAD	Humidity	Humidity Humidity Setpoint Temperature Temperature Setpoint Time	
Large Display The type of information to display in the large (top) display of the pAD	Temperature	Humidity Humidity Setpoint Temperature Temperature Setpoint	
pAD Setpoint Limits The temperature and humidity setpoint adjustment limits			
Temperature Minimum Setpoint	60	45-100	°F /°C
Temperature Maximum Setpoint	90	60-100	°F /°C
Humidity Minimum Setpoint	0	0-100	%
Humidity Maximum Setpoint	100	0-100	%
Key Function The actions of the side keys when pressed, the keys are numbered top to bottom.			
Key 1 If pLAN On/Off control is enabled (see service settings) this button can be used to turn the unit on and off.	1 = On/Off	0 = Disabled (key locked) 1 = On/Off 2 = Mode (not used) 3 = Humidity 4 = Night 5 = Clock (not used) 6 = Temperature 7 = Program (not used) 8 = Fan (not used) 9 = Alarm	
Key 2 This will reset and alarm on the main unit. Note: If the alarm is still active it will retrigger.	9 = Alarm Reset	0 = Disabled (key locked) 1 = On/Off 2 = Mode (not used) 3 = Humidity 4 = Night 5 = Clock (not used) 6 = Temperature 7 = Program (not used) 8 = Fan (not used) 9 = Alarm	
Key 3 Allows adjustment of the humidity setpoint	3 = Humidity Setpoint	0 = Disabled (key locked) 1 = On/Off 2 = Mode (not used) 3 = Humidity 4 = Night 5 = Clock (not used) 6 = Temperature 7 = Program (not used) 8 = Fan (not used) 9 = Alarm	

(continued on next page)

Manufacturer Sub Menu (continued)

pAD Settings

Main Status Screen ⇒ Manufacturer ⇒ pAD Settings (if pAD is enabled) (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
Key 4 Allows for time clock override. When pressed, the hour counted will increase by one hour up to a maximum of nine hours of override. If in override mode and the key is pressed, override will be cancelled.	4 = Night	0 = Disabled (key locked) 1 = On/Off 2 = Mode (not used) 3 = Humidity 4 = Night 5 = Clock (not used) 6 = Temperature 7 = Program (not used) 8 = Fan (not used) 9 = Alarm	
Key 5 Not Used	0 = Disabled	0 = Disabled (key locked) 1 = On/Off 2 = Mode (not used) 3 = Humidity 4 = Night 5 = Clock (not used) 6 = Temperature 7 = Program (not used) 8 = Fan (not used) 9 = Alarm	
Key 6 Temporary override of the main display, when pressed the large (top display) will indicate alternate information (humidity setpoint)	6 = Temp	0 = Disabled (key locked) 1 = On/Off 2 = Mode (not used) 3 = Humidity 4 = Night 5 = Clock (not used) 6 = Temperature 7 = Program (not used) 8 = Fan (not used) 9 = Alarm	

(continued on next page)

Manufacturer Sub Menu (continued)

EVO -EVD Settings (Electronic Expansion Valve Driver)

Main Status Screen ⇒ Manufacturer ⇒ EVO -EVD Settings (if in CDSS mode) (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

Note: This screen will only be visible if the unit is in CDSS mode, See EC3 Manual for EC3 Mode.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
a. Configuration			
EVO No 1			
Valve A: (Expansion Valve)	CAREL EXV	Do Not Change	
Valve B: (Hot Gas Reheat Valve)	SPORLAN SEH175	Do Not Change	
EVO No 1	Actual Value		
Regulation Valve A: Selects the type of control for valve A:	AC/Chiller with Digital Scroll Compressor	Do Not Change	
Regulation Valve B: Selects the type of control for valve B:	AC or Chiller with Plate Evaporator	Do Not Change	
EVO No1 .a			
Probe S1 Suction Line Pressure			
Alarm Enable	EN.	EN./Dis.	
Type	RAZ (Ratiometric)	RAZ 4-20ma 4-20ma Remote 4-20ma External	
Min.	0.0	0-999.9	PSIG
Max.	500.0	0-999.9	PSIG
Alarm Min.	-14.5	0-999.9	PSIG
Alarm Max	550.0	0-999.9	PSIG
EVO No1 .a			
Probe S2 Suction Line Temperature			
Alarm Enable	EN.	EN./Dis.	
Type	NTC Carel	NTC Carel Carel NTC – HT NTC SPKP**T0 0-10V External Signal	
Alarm Min.	-58.0	0-999.9	°F /°C
Alarm Max	221.0	0-999.9	°F /°C

(continued on next page)

Manufacturer Sub Menu (continued)

EVO -EVD Settings (Electronic Expansion Valve Driver)

Main Status Screen ⇒ Manufacturer ⇒ EVO -EVD Settings (if in CDSS mode) (requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

Note: This screen will only be visible if the unit is in CDSS mode, See EC3 Manual for EC3 Mode.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
EVO No1 .b			
Probe S3 Liquid Line Pressure			
Alarm Enable	EN.	EN./Dis.	
Type	RAZ (Ratiometric)	RAZ 4-20ma 4-20ma Remote 4-20ma External	
Min.	0.0	0-999.9	PSIG
Max.	650.0	0-999.9	PSIG
Alarm Min.	-14.5	0-999.9	PSIG
Alarm Max	700.0	0-999.9	PSIG
EVO No1 .a			
Probe S4 Liquid Line Temperature			
Alarm Enable	EN.	EN./Dis.	
Type	NTC Carel	NTC Carel Carel NTC – HT NTC SPKP**T0 0-10V External Signal	
Alarm Min.	-58.0	0-999.9	°F /°C
Alarm Max	221.0	0-999.9	°F /°C
EVO No1 .a			
Valve A Relay Configuration	Disabled	Do Not Change	
EVO No1 .a			
ID1 Configuration	Regulation Backup	Do Not Change	
ID2 Configuration	Regulation Backup	Do not Change	
EVO No1 .a			
Backup Digital Input Valve A	No	Do Not Change	
Backup Digital Input Valve B	No	Do Not Change	
EVO No1 .b			
Valve B Relay Configuration	Disabled	Do Not Change	
EVO No1 .a			
S1 Probe Alarm Management	Valve Forced Closed	Do Not Change	
S2 Probe Alarm Management	Valve Forced Closed	Do Not Change	

(continued on next page)

Manufacturer Sub Menu (continued)

EVO -EVD Settings (Electronic Expansion Valve Driver)

Main Status Screen ⇒ Manufacturer ⇒ EVO -EVD Settings (if in CDSS mode) (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

Note: This screen will only be visible if the unit is in CDSS mode, See EC3 Manual for EC3 Mode.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
EVO No1 .b			
S3 Probe Alarm Management	No Action	Do Not Change	
S4 Probe Alarm Management	No Action	Do Not Change	
EVO No1 .a			
DC Power Supply	No	Yes/No	
b. Regulation			
EVO No1 .a			
Valve A Opening at Start-up	50	0-100	%
EVO No1 .b			
Valve B Opening at Start-up	50	0-100	%
EVO No1 .a			
Valve A Opened in Stand-by	No	Yes/No	
Start-up Delay After Defrost	10 Min	Not Used	
Valve A Preposition Delay	6	0-10	Sec
EVO No1 .b			
Valve B Opened in Stand-by	No	Yes/No	
Start-up Delay After Defrost	10 Min	Not Used	
Valve B Preposition Delay	6	0-10	Sec
EVO No1 .a			
PID Parameters Do not change without consulting factory			
Proportional Gain Inverse, lower number equals faster response	15.0	0-99.0	
Integral Time	80	0-99	Sec
Derivative Time	1.0	0-10.0	Sec
EVO No1 .b			
PID Parameters Do not change without consulting factory			
Proportional Gain Inverse, lower number equals faster response	39.9	0-99.0	
Integral Time	40	0-99	Sec
Derivative Time	1.0	0-10.0	Sec

(continued on next page)

Manufacturer Sub Menu (continued)

EVO -EVD Settings (Electronic Expansion Valve Driver)

Main Status Screen ⇒ Manufacturer ⇒ EVO -EVD Settings (if in CDSS mode) (requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

Note: This screen will only be visible if the unit is in CDSS mode, See EC3 Manual for EC3 Mode.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
EVO No1 .a			
Integral Time			
Low Superheat Protection	2.0	0-10.0	Sec
Low Operating Pressure Protection	3.0	0-10.0	Sec
Maximum Operation Pressure Protection	10.0	0-10	Sec
EVO No1 .b			
Integral Time			
Low Superheat Protection	2.5	0-10.0	Sec
Low Operating Pressure Protection	4.0	0-10.0	Sec
Maximum Operation Pressure Protection	10.0	0-10	Sec
EVO No1 .a			
Alarm Delay			
Low Superheat	10	0-99	Sec
Low Operating Pressure	15	0-99	Sec
Maximum Operating Pressure	25	0-99	Sec
EVO No1 .b			
Alarm Delay			
Low Superheat	10	0-99	Sec
Low Operating Pressure	15	0-99	Sec
Maximum Operating Pressure	25	0-99	Sec
EVO No1 .a			
Alarm Low Suction Temperature			
Threshold	5.0	0-10	°F /°C
Timeout	15	0-99	Sec
EVO No1 .b			
Alarm Low Suction Temperature			
Threshold	5.0	0-10	°F /°C
Timeout	15	0-99	Sec
c. Custom			
EVO No1 .a			
Minimum Steps	50	Do Not Change	
Maximum Steps	480	Do Not Change	
Closing Steps	500	Do Not Change	

(continued on next page)

Manufacturer Sub Menu (continued)

EVO -EVD Settings (Electronic Expansion Valve Driver)

Main Status Screen ⇒ Manufacturer ⇒ EVO -EVD Settings (if in CDSS mode) (🔒 requires password PW2)

The following table describes the menu parameters (**Note:** Change in shading indicates change to next screen). Do NOT make any changes to these settings without contacting the factory.

Note: This screen will only be visible if the unit is in CDSS mode, See EC3 Manual for EC3 Mode.

PARAMETER DESCRIPTION	FACTORY VALUE	RANGE	UNITS
EVO No1 .b			
Minimum Steps	402	Do Not Change	
Maximum Steps	6386	Do Not Change	
Closing Steps	7500	Do Not Change	
EVO No1 .a			
Nominal Step Rate	50	Do Not Change	Hz
Closing Rate	150	Do Not Change	Hz
Move Current	450	Do Not Change	mA
Holding Current	100	Do Not Change	mA
EVO No1 .b			
Nominal Step Rate	200	Do Not Change	Hz
Closing Rate	400	Do Not Change	Hz
Move Current	200	Do Not Change	mA
Holding Current	50	Do Not Change	mA
EVO No1 .a			
Duty Cycle	30	Do Not Change	%
Opening Synchronization	Yes	Do Not Change	
Closing Synchronization	Yes	Do Not Change	
EVO No1 .b			
Duty Cycle	70	Do Not Change	%
Opening Synchronization	No	Do Not Change	
Closing Synchronization	Yes	Do Not Change	

Digital Scroll Compressors

Starting Frequency and Minimum Compressor Running Time

The following default values are used for compressor protection:

- Compressor minimum run-time: 2 minutes
(This time is required to ensure adequate oil return and sufficient motor cooling from the suction gas upon start-up of the compressor.)
- Compressor minimum off-time: 2 minutes
(This time is used to provide a measure of hysteresis to the system. This stops the compressor starting immediately after it has stopped.)
- Inter-Stage Delay:
(After compressor one (digital scroll) has started, there is a five minute delay before compressor two (fixed compressor) is allowed to come on, once compressor two has started it will be governed by the anti-cycle times above)

Digital Scroll Compressor Operation

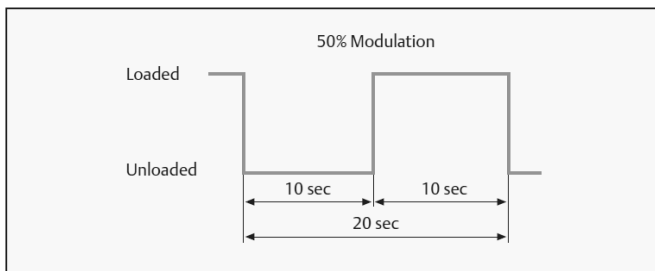
The Copeland Digital Scroll™ technology package is a new generation in modulation technology.

The Copeland Digital Scroll is a compressor capable of seamlessly modulating capacity from 20% to 100%. The compressor is supplied with an external solenoid valve. This “normally closed” (de-energized) solenoid valve is a key component for achieving modulation. When the solenoid valve is in its normally closed position, the compressor operates at full capacity or in the “loaded state”. When the solenoid valve is energized, the two scroll elements move apart axially, or into the “unloaded state”. During the unloaded state, the compressor motor continues running, but since the scrolls are separated, there is no compression. During the “loaded state”, the compressor delivers 100% capacity and during the “unloaded state”, the compressor delivers 0% capacity. A cycle consists of “loaded state” and “unloaded state”. By varying the time of “loaded state” and “unloaded state”, an average capacity is obtained to precisely match the load demand of the system.

Digital Scroll Capacity Modulation Examples:

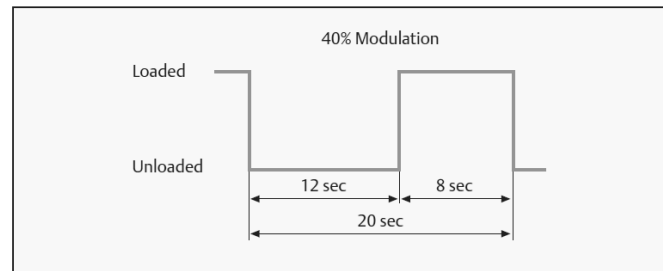
Example 1:

Cycle time: 20 sec Valve active/open: 10 sec
Valve inactive/ closed: 10 sec Resulting capacity: 50%



Example 2:

Cycle time: 20 sec Valve active/open: 12 sec
Valve inactive/ closed: 8 sec Resulting capacity: 40%



Graphic Source: Emerson Climate Technologies

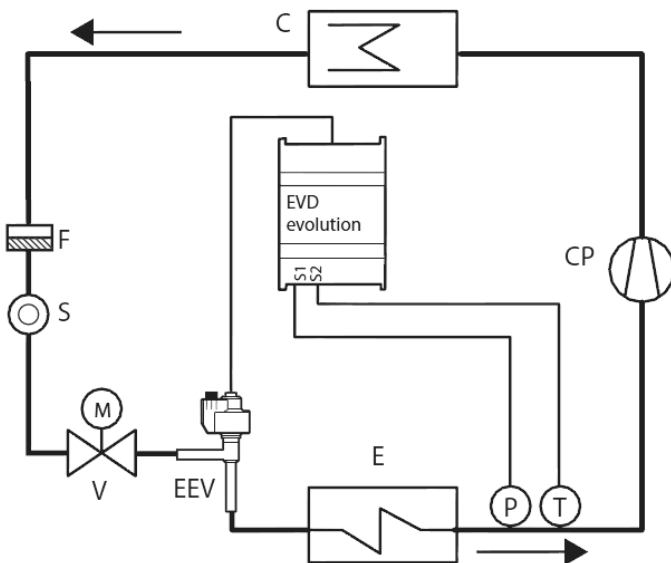
Electronic Expansion Valves Carel CDSS Mode (See Emerson EC3 Manual for EC3 Mode)

The electronic expansion valve enables correct metering of refrigerant. The valve uses both a pressure transducer and temperature probe to ensure that the superheat of the refrigeration system remains correct.

Superheat is used to protect the compressor from liquid flood back as a compressor can only compress vapour. If liquid is allowed to enter a compressor then severe damage can occur.

The superheat is the difference between the gas temperature and the saturated evaporation temperature (the equivalent temperature of the suction pressure and the actual suction line temperature).

If the electronic expansion valve allows too little refrigerant to the system, the compressor has very little suction cooling (vapour) and can cause the compressor to overheat.



Reference	Description
CP	Compressor
C	Condenser
F	Filter/Drier
S	Liquid Indicator
V	Solenoid Valve
EEV	Electronic Expansion Valve
E	Evaporator
P	Pressure Transducer
T	Temperature Probe

Various technologies are used in the background to ensure stable control at these changing heat loads.

Electronic expansion valves differ from the normal thermostatic expansion valves in their ability to maintain control of the suction superheat at reduced head pressures. This can lead to significant energy savings particularly at reduced loading and low ambient temperatures.

EEV step position, superheat setpoint, head pressure set point and other features can be viewed and adjusted via the microprocessor display - far easier than having to manually adjust thermostatic expansion valves.

Unit Alarms

Alarm	AR ①	UD ①	CD ①	Cause	Action
Clock board fault or not connected	•		•	Indicates an error with the real time clock on-board the controller. During alarm any time zones set up would be ignored.	Once the clock returns to functioning correctly the alarm will be automatically reset and any time zones set up will be restored.
Extended memory fault	•		•	Controller memory fault	Alarm is generated
Supply Air Temperature Sensor Failure	•		•	Supply Air Sensor is either faulty or not connected	Alarm is generated – Heating and Cooling has locked out
Outside Air Temperature Sensor Failure	•		•	Outside Air Sensor is either faulty or not connected	Alarm is generated – Heating and Cooling are locked out
Mixed Air Temperature Sensor Failure	•		•	Mixed Air Sensor is either faulty or not connected	Alarm is generated
Outside Air Humidity Sensor Failure	•		•	Outside Air Sensor is either faulty or not connected	Alarm is generated Dehum is locked out
Liquid Line Pressure Sensor Failure	•		•	Liquid Line Pressure Sensor faulty or not connected	Alarm is generated – Condenser fans will run at full speed
Low Pressure Sensor Failure	•		•	Suction Line Pressure Sensor faulty or not connected	Alarm is generated – Dehum is locked out
CO2 Sensor Failure	•		•	CO2 Sensor faulty or not connected	Alarm is generated – Demand ventilation is locked out
Building Pressure Sensor Failure	•		•	Building Pressure Sensor faulty or not connected	Alarm is generated – Building Pressure control is locked out
Static Pressure Sensor Failure	•		•	Static Pressure Sensor faulty or not connected	Alarm is generated – Static Pressure control is locked out
Return Air Temperature Sensor Failure	•		•	Return Air Sensor faulty or not connected	Alarm is generated
Return Air Humidity Sensor Failure	•		•	Return Air Sensor faulty or not connected	Alarm is generated
Compressor High Pressure	•		•	Compressor high tripped on is high pressure limit switch	This input has two strikes, if two trips occur within an hour an alarm will be generated and the compressor is locked out.
Compressor Low Pressure	•		•	Compressor low pressure has tripped	This input has two strikes, if two trips occur within an hour an alarm will be generated and the compressor is locked out.
Air Flow Failure	•		•	Supply fan is running but the air flow proving switch has not made	Alarm is generated (after 15 sec) – All heating and cooling is stopped. After 180 seconds the supply fan will be turned off
Filter Dirty	•			Main filters are dirty	Alarm is generated – No action taken.
Digital Compressor	•		•	The unit has received an alarm from the Emerson EC3 Electronic Expansion Valve module.	This input has two strikes, if two trips occur within an hour an alarm will be generated and the compressor is locked out.
Condensate Float	•		•	The main drain pan is not draining	This input has two strikes, if two trips occur within an hour an alarm will be generated and the compressor is locked out.

① AR = Auto Reset, UD = Unit Disabled, CD = Component Disabled

(continued on next page)

Unit Alarms (continued)

Alarm	AR ①	UD ①	CD ①	Cause	Action
Gas Valve 1	•			The unit is calling for Gas heat but the main gas valve has not been energized	Alarm is generated – No other action taken.
Gas Valve 2	•			The unit is calling for Gas heat but the main gas valve has not been energized	Alarm is generated – No other action taken
Smoke Alarm	•		•	The smoke detector input has been triggered	Alarm is generated – Unit is shut down.
Heating differential (if enabled)	•			If there is a call for heat and the supply air does not rise above the outside air temperature	Alarm is generated – No other action taken.
Cooling differential (if enabled)	•			If there is a call for cooling and the supply air does not drop below the outside temperature	Alarm is generated – No other action taken.
Low Supply Air Lockout	•	•	•	If the supply air does not get above 36F within 10 min the unit will shut down. When shut down if the supply air get above 46F the unit will retry starting	This input has two strikes, if two trips occur within an hour an alarm will be generated and the unit will be locked out
Freeze Stat	•	•	•	Not Currently Used	Alarm will be generated – Unit will shut down.
Supply Air High Temperature	•		•	The supply air temperature has exceeded its maximum setting	Alarm will be generated – No other action taken.
Liquid Line High Pressure	•		•	The liquid line pressure has exceeded it setpoint	If two trips occur within an hour an alarm will be generated and the compressor is locked out.
The Supply Fan has exceeded the set number of run hours Note: Only one alarm is given (See Service Setting – Working Hours Set for a full list).	•			The Supply Fan has gone over the hour's setpoint.	Alarm generated – No other action taken
Note: The following applies only to optional gas and 20kw electric heat option is enabled and the unit is fitted with a pCOe expansion module					
pCOe Offline	•		•	The pCOe is not connected or incorrectly setup and is not communicating to the pCO ³	Alarm generated – Supplemental electric heat is locked out

① AR = Auto Reset, UD = Unit Disabled, CD = Component Disabled

Unit Alarms (continued)

Alarm	AR ①	UD ①	CD ①	Cause	Action
Note: The following applies only to units with an Energy Recovery Section with a pCOxs controller					
ERM Outside Air Humidity Sensor Failure	•		•	ERM humidity sensor is either faulty or not connected	Alarm generated – no other action taken
ERM Outside Air Temperature Sensor Failure	•		•	ERM Temperature sensor is either faulty or not connected	Alarm generated – no other action taken
ERM Exhaust Fan Airflow Failure	•		•	ERM Fan running but the air proving switch has not made	Alarm generated – Fan will shut down after 120 sec
ERM Exhaust Fan Shutdown	•		•	ERM Exhaust Fan has shut down to lack of air flow	Alarm generated – Fan shuts down.
ERM Wheel Failure (only applicable if the unit is fitted with the optional rotation detection)	•		•	Wheel is on but no rotation being detected	Alarm generated – Wheel will shut down after 120 sec
ERM Wheel Shutdown	•		•	Wheel has shut down due to lack of rotation	Alarm generated
ERM Return or Exhaust Filter Dirty	•			ERM filters are dirty	Alarm generated – No further action taken.
ERM Wheel High Pressure Differential	•			ERM Wheel is either dirty, frozen or air flow too high	Alarm generated – No further action taken.
pLAN Communication Down with ERM unit	•	•	•	ERM's pCOxs controller is not communicating to the pCO3 controller, check connections and settings	Alarm generated – ERM section will not run
Note: The following only applies if the unit has a pAD Wall thermostat					
pAD Offline	•		•	pAD is either faulty or not connected	Alarm generated - pAD functions will be disabled
pAD Humidity Fault or Disconnected	•		•	pAD Humidity Sensor is faulty	Alarm generated – Space Dehum functions disabled.
pAD Temperature Probe Faulty or Disconnected	•		•	pAD Temperature Sensor is faulty	Alarm generated – Space heating and cooling will be disabled.

① AR = Auto Reset, UD = Unit Disabled, CD = Component Disabled

Main Unit Controller Inputs/Outputs

pCO³ Inputs

The inputs of the controller are listed below. Note that some items are optional and may not be installed on all models.

Input Type	Input #	Voltage	Description	Notes
Analog	B1	Universal	Return Air Humidity	Optional 4-20ma
	B2	Universal	CO2	Optional 4-20ma
	B3	Universal	Building or Duct Static Pressure	Optional 4-20ma
	B4	Passive	Outside Air Temperature	Optional NTC 10K@77F
	B5	Passive	Return Air Temperature	Optional NTC 10K@77F
	B6	Universal	Discharge Line Temperature or Liquid Line Pressure	NTC 10K@77F 4-20ma In EC3 Mode
	B7	Universal	Outdoor Air Humidity	4-20ma
	B8	Universal	Not Used or Suction Pressure	Not Used or 4-20ma in EC3 Mode
	B9	Passive	Mixed Air Temperature	NTC 10K@77F
	B10	Passive	Supply Air Temperature	Field Installed NTC 10K@77F
Digital	ID1	24Vac / Vac	Compressor High Pressure Switch	Normally Closed (625psig Cut Out)
	ID2	24Vac / Vac	Compressor Low Pressure Switch	Normally Closed
	ID3	24Vac / Vac	Supply Fan Air Proving Switch	Closed when airflow is okay
	ID4	24Vac / Vac	Smoke Detector	Optional, Normally Closed
	ID5	24Vac / Vac	Filter Dirty Switch	Optional, Normally Open
	ID6	24Vac / Vac	Damper End Switch(es)	Closed when the damper(s) is open
	ID7	24Vac / Vac	Remote Occupancy Control (pAD req.)	Open = Unoccupied - Closed = Occupied
	ID8	24Vac / Vac	Not Used or Digital Compressor Alarm	Not Used EC3 Alarm In EC3 Mode
	ID9	24Vac / Vac	Condensate Pan Float Switch	Optional, Normally Closed
	ID10	24Vac / Vac	Gas Valve 1 status	Closed when Main Gas Valve 1 is Open
	ID11	24Vac / Vac	Gas Valve 2 Status	Closed when Main Gas Valve 2 is Open
	ID12	24Vac / Vac	Low Limit Stat	Not Used
	ID13	24Vac / Vac	Supply Fan Section Door Switch	Optional, Normally Closed
	ID14	24Vac / Vac	Remote On – Off Control	Open = Off – Closed = On
	ID15	24Vac / Vac	Supply Fan Speed Control 2	See Supply Fan Control or Damper Control
	ID16	24Vac / Vac	Supply Fan Speed Control 3	See Supply Fan Control or Damper Control
	ID17	24Vac / Vac	Exhaust Fan Air Proving Switch	Closed when airflow is okay
	ID18	24Vac / Vac	Not Used	Not Used

Main Unit Controller Inputs/Outputs (continued)

pCO³ Outputs

The outputs of the controller are listed below. Note that some items are optional and may not be installed on all models.

Output Type	Output #	Voltage	Description	Notes
Analog	Y1	0 - 10Vdc	Not Used or Digital Compressor Modulation	Not Used or Control Signal to the EC3 In EC3 Mode
	Y2	0 - 10Vdc	Condenser Fan VDF Control	Head Pressure Control
	Y3	0 - 10Vdc	Supplemental Electric Heat Option or Hot Gas Re-Heat	To Electric Heat SCR or To HGRH Control Board in EC3 Mode
	Y4	0 - 10Vdc	Modulated Heat Signal	For Either Gas or Electric Heat
	Y5	0 - 10Vdc	Supply Fan VDF	Optional Supply Fan Control
	Y6	0 - 10Vdc	Exhaust Fan VFD	Optional Exhaust Fan Control
Digital	NO1 - C1	NO Relay	Electric Heat Stage 3	If Selected
	NO2 - C1	NO Relay	Electric Heat Stage 4	If Selected
	NO3 - C1	NO Relay	Compressor 1	Digital Compressor Contactor
	NO4 - C4	NO Relay	Compressor 2	Fixed Compressor Contactor
	NO5 - C4	NO Relay	Outdoor Air Damper Open	Damper Tri – State Control
	NO6 - C4	NO Relay	Outdoor Air Damper Close	Damper Tri – State Control
	NO7 - C7	NO Relay	Supply Fan Enable	On/Off or Optional, Enable Signal to Supply Fan VFD
	NO8 - C8	NO Relay	Condenser Fan Enable	Enable Signal to Condenser Fan VFD
	NO9 - C9	NO Relay	Gas or Electric Heat 1	
	NO10 - C9	NO Relay	Gas or Electric Heat 2	
	NO11 - C9	NO Relay	Hot Gas Re-Heat 50%	Off = 50% - On = 100%
	NO12 - C12	NO Relay	Gas 1 Vent Fan High Speed	80% Gas Unit Only
	NO13 - C13	NO Relay	Gas 2 Vent Fan High Speed	80% Gas Unit Only
	NC14 - C14	NO / NC Relay	Digital Scroll Solenoid or HGRH Pump Down	Closed = Not Pump, Open = Pump Closed = Pump-down, Open = Run EC3
	NO15 - C15	NO / NC Relay	Remote Common Alarm Output	Volt Free Dry Contact
	NO16 - C16	NO Relay	Return Air Damper Open	Damper Tri – State Control
	NO17 - C16	NO Relay	Return Air Damper Closed	Damper Tri – State Control
	NO18 - C16	NO Relay	Exhaust Fan Enable	Optional or Remote Exhaust Fan

Main Unit Controller Inputs/Outputs (continued)

pCOe Expansion Module Inputs/Outputs (for Emerson EC3 Superheat Control only)

The inputs/outputs of the controller are listed below. Note that some items are optional and may not be installed on all models.

NOTE: This is NOT used in CDSS Mode.

Input/Output Type	Input/Output #	Voltage	pCOe Expansion Module	Only Used with Gas with Supplemental Electric Heat
Analog Input	S1	Universal	Not Used	Not Used
	S2	Universal	Not Used	Not Used
	S3	Universal	Not Used	Not Used
	S4	Universal	Not Used	Not Used
Digital Input	ID1	24Vac / Vac	Not Used	Not Used
	ID2	24Vac / Vac	Not Used	Not Used
	ID3	24Vac / Vac	Not Used	Not Used
	ID4	24Vac / Vac	Not Used	Not Used
Digital Output	NO1 - C1	NO / NC Relay	Not Used	Not Used
	NO2 - C2	NO / NC Relay	Not Used	Not Used
	NO3 - C1	NO / NC Relay	Not Used	Not Used
	NO4 - C4	NO / NC Relay	Not Used	Not Used
Analog Output	Y1	0 - 10Vdc	Supplemental Electric Heat Control	Gas Heat + Supplemental Electric Heat

EVO/EVD Driver Module Inputs/Outputs (for Carel EVD Superheat Control only)

The inputs/outputs of the controller are listed below. Note that some items are optional and may not be installed on all models.

NOTE: This is NOT used in EC3 Mode.

Input/Output Type	Input/Output #	Voltage	EVO/EVD Driver Module	Only Used In CDSS Mode
Analog Input	S1	Universal	Suction Pressure (PSIG)	0-5V Ratiometric
	S2	Universal	Suction Temperature	NTC 10K@77F
	S3	Universal	Liquid Line Pressure	0-5 Ratiometric
	S4	Universal	Liquid Line Temperature	NTC 10K@77F
Digital Input	ID1	24Vac / Vac	Not Used	Not Used
	ID2	24Vac / Vac	Not Used	Not Used
Digital Output	NO1	24Vac / Vac	Not Used	Not Used
	NO2	24Vac / Vac	Not Used	Not Used

Energy Recovery Module Controller Inputs/Outputs (if equipped)

pCOxs Inputs

The inputs of the controller are listed below. Note that some items are optional and may not be installed on all models.

Input Type	Input #	Voltage	pCOxs Expansion Module	ERM Module Controller
Analog	B1	Universal	ERM Outside Air Humidity	4-20ma
	B2	Universal	Not Used	Not Used
	B3	Universal	ERM Outside Air Temperature	Optional NTC 10K@77F
	B4	Universal	Not Used	Not Used
SYNC (Optional)	SYNC (Optional)	24Vac / Vac	ERM Wheel Status	Pulses When Wheel is spinning
Digital	ID2	24Vac / Vac	ERM Wheel High Pressure Drop	Optional, Normally Open
	ID3	24Vac / Vac	Exhaust – Outside Air Filter Dirty	Optional, Normally Open
	ID4	24Vac / Vac	Exhaust Fan Status	Optional, Normally Closed
	ID5	24Vac / Vac	ERM Door Switch	Normally Closed

pCOxs Outputs

The outputs of the controller are listed below. Note that some items are optional and may not be installed on all models.

Output Type	Output #	Voltage	pCOxs Expansion Module	ERM Module Controller
Digital	NO1 - C1	NO Relay	ERM By-Pass Damper	
	NO2 – C1	NO Relay	ERM Wheel Enable	
	NO3 - C1	NO Relay	ERM Pre-Heater Enable	Optional
	NO4 - C4	NO Relay	ERM Exhaust Fan Enable	On/Off or Optional, Enable Signal to Supply Fan VFD
	NO5 – C5	NO / NC Relay	No Used	Not Used
Analog	Y1	0 – 10Vdc	Not Used	Not Used
	Y2	0 – 10Vdc	ERM Exhaust Fan VFD Control	Optional
	Y3	PWM	Not Used	Not Used

Typical BMS – EMS – BAS System Variables

Carel Side					BMS Side		
Carel Index	Description	Read/Write	Variable Name	Data Type	BACNet	LonWorks	SNVT
1	Return Air Humidity	R	Ret_Air_Hum	A	AV1		
2	Space Temperature	R	pAD_Temperature1	A	AV2	nvoSpaceTemp	temp_p
3	Building Pressure	R	Build_Press	A	AV3		
4	Mixed Air Temperature	R	Mixed_temp	A	AV4		
5	Return Air Temperature	R	return_temp	A	AV5		
6	Liquid Line Pressure	R	LL_Press	A	AV6	nvoLLPress	count
7	Outside Air Humidity	R	OA_hum	A	AV7	nvoOutAirHum	lev_percent
8	Suction Pressure Sensor	R	LP_sensor	A	AV8	nvoSucPress	count
9	Outside Air Temperature	R	OA_Temp	A	AV9	nvoOutAirTemp	temp_p
10	Supply Temperature	R	supply_temp	A	AV10	nvoSupAirTemp	temp_p
11	pAD Temperature Setpoint	R/W	pAD_Setp_Temp	A	AV11	nvo/nviSpaceTempSetC	temp_p
12	Duct Static Pressure	R	Static_Pressure	A	AV12		
13	Neutral Air Temperature Setpoint	R/W	na_setpt	A	AV13		
14	Outdoor Dewpoint Setpoint	R/W	OA_Dp_Sp	A	AV14		
15	Supply Air Cooling Setpoint	R/W	space_cl_sa_sp_oc	A	AV15	nvo/nviSupAirCoolSet	temp_p
16	Supply Air Heating Setpoint	R/W	space_ht_sa_sp_oc	A	AV16	nvo/nviSupAirHeatSet	temp_p
17	Unoccupied Heating Setpoint	R/W	space_ht_sa_sp_unoc	A	AV17		
18	Cooling Unoccupied Setpoint	R/W	space_cl_sa_sp_unoc	A	AV18		
19	NA Heating Changeover	R/W	NA_Heating_Lockout	A	AV19		
20	NA Cooling Changeover	R/W	NA_Cooling_Lockout	A	AV20		

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Typical BMS – EMS – BAS System Variables (continued):

Carel Side					BMS Side		
Carel Index	Description	Read/Write	Variable Name	Data Type	BACNet	LonWorks	SNVT
21	Suction Pressure Setpoint	R/W	LP_Sp	A	AV21		
22	ERM Entering (True Outside) Humidity	R	Ent_Hum	A	AV22	nvoErmOaHum	lev_percent
23	ERV Entering (ERM True Outside) Temperature	R	Ent_Temp	A	AV23	nvoErmOaTemp	temp_p
24	Actual Supply Air Setpoint	R	sa_setpt	A	AV24		
25	Space Heating Setpoint	R	space_ht_sp	A	AV25	nvoSpaceTempSetH	temp_p
26	Heat Setpoint = Cool Setpoint Minus Diff	R/W	Heat_Offset	A	AV26	nvo/nviSpaceSetDiff	temp_p
27	The OA Temp ERM Econ Mode is Disabled	R/W	Erv_Wheel_econ_lock	A	AV27		
28	Unoccupied Dehum Dew Point Set Point	R/W	Un_DeHum_DP_SP	A	AV28		
29	Supply Fan Speed Adjust	R/W	Sup_Fan_Adj	A	AV29		
35	Liquid Line pressure converted to temperature	R	LL_Press_T	A	AV35		
36	Liquid Line Temperature	R	LL_temp	A	AV36		
37	Subcool	R	Subcool	A	AV37		
38	Superheat	R	A10_SH_SH	A	AV38		
39	Compressor Discharge Temperature	R	Discharge_Temp	A	AV39		

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Typical BMS – EMS – BAS System Variables (continued):

Carel Side					BMS Side		
Carel Index	Description	Read/Write	Variable Name	Data Type	BACNet	LonWorks	SNVT
1	Space Humidity	R	pAD_hum	I	AV1001	nvoSpaceHum	count
2	Space Humidity Setpoint	R/W	pAD_Setp_Humid	I	AV1002	nvo/nviSpaceHumSet	count
3	Space CO2 Level	R	CO2	I	AV1003	nvoSpaceCO2	count
4	Space CO2 Setpoint	R/W	CO2_SP	I	AV1004	nvo/nviSpaceCO2Set	
5	Compressor Modulation	R	Comp_mod_disp	I	AV1005		
6	Condenser Fan Modulation	R	Cond_fan_mod_disp	I	AV1006		
7	Hot Gas Reheat Modulation	R	HGRH_mod_disp	I	AV1007		
8	Gas or Electric Heat Modulation	R	Heat_mod_disp	I	AV1008		
9	Supply Fan Modulation	R	Supply_Fan_Mod_Dis	I	AV1009		
10	Exhaust Fan Modulation	R	Ex_Fan_Mod_Dis	I	AV1010		
11	20kw Supplementary Electric Heat Modulation	R	AO1_pCOe_disp	I	AV1011		
12	ERM Exhaust Fan Modulation	R	ERV_Exh_Fan_Spd_Dis	I	AV1012		
13	ERM Wheel Modulation	R	Wheel_Spd_Dis	I	AV1013		
14	Outside Air Damper Position	R	Damper	I	AV1014	nvoOADampPoss	count
15	Cooling Demand	R	Cooling_demand_disp	I	AV1015	nvoCoolDemand	count
16	Dehumidification Demand	R	Dehum_Demand_disp	I	AV1016		
17	Heat Demand	R	Heat_demand_disp	I	AV1017	nvoHeatDemand	count
18	Outside Air Minimum Open Position	R/W	Min_damp_open	I	AV1018	nvo/nviOADampMin	count
19	Unit Mode: 0= (Blank) Venting= 1 Heating= 2 Cooling= 3	R	Mode	I	AV1019	nvoUnitMode	count
20	Return Air Damper Position	R	ra_damper	I	AV1020	nvoRADampPoss	count
21	Occupied Display	R	Occupied_disp	I	AV1021		

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Typical BMS – EMS – BAS System Variables (continued):

Carel Side					BMS Side		
Carel Index	Description	Read/Write	Variable Name	Data Type	BACNet	LonWorks	SNVT
22	Enthalpy Lockout 0= None, 1= Comp 1, 2= Comp 2, 3= Comp 1 and 2	R	Enthalpy_Lockout	I	AV1022		
23	1=UNIT ON, 2=OFF by ALARM, 3=OFF by pLAN, 4= OFF by BM, 5=OFF by CLOCK, 6=OFF-DIGITALIN, 7=OFF-KEYPAD, 10= OFF-DEMAND, 12=OFF-OPEN DOOR, 15=WAIT SUP FAN, 16=WAIT-DAMPER	R	UnitStatus	I	AV1023	nvoUnitStatus	count
24	Compressor 1 Enthalpy Lockout Setpoint	R/W	Comp1_Enth_Lock_Out	I	AV1024		
25	Compressor 2 Enthalpy Lockout Setpoint	R/W	Comp2_Enthalpy_Lock_Out	I	AV1025		
26	Space Unoccupied Dehum Humidity Setpoint	R/W	Un_DeHum_Hum_SP	I	AV1026		
27	Loop Delay From Heating to Cooling	R/W	Heat_Cool_CO_Delay	I	AV1027		
30	Alarm Code Number variable 1	R	Alarm_Code	I	AV1030	nvoAlrCode1	count
31	Alarm Code Number variable 2	R	Alarm_Code_2	I	AV1031	nvoAlrCode2	count
32	Alarm Code Number variable 3	R	Alarm_Code_3	I	AV1032	nvoAlrCode3	count
80	Current day	R	CURRENT_DAY	I	AV1080		
81	Current month	R	CURRENT_MONTH	I	AV1081		
82	Current year	R	CURRENT_YEAR	I	AV1082		
83	Current hour	R	CURRENT_HOUR	I	AV1083		
84	Current minute	R	CURRENT_MINUTE	I	AV1084		

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Typical BMS – EMS – BAS System Variables (continued):

Carel Side					BMS Side		
Carel Index	Description	Read/Write	Variable Name	Data Type	BACNet	LonWorks	SNVT
1	High Pressure Switch	R	HP_sw	D	BV1	nvoHPSwitch	switch
2	Low Pressure Switch	R	LP_sw	D	BV2	nvoLPSwitch	switch
3	Supply Fan Status Switch	R	Supply_fan_sw	D	BV3	nvoAirFlowSwitch	switch
4	Smoke Detector Switch	R	Smoke_detector_sw	D	BV4	nvoFilterDirty	switch
5	Main Filter Dirty Switch	R	Filter_sw	D	BV5	nvoSmokeAlarm	switch
6	Damper End Switch	R	Damper_end_sw	D	BV6	nvoDamperSwitch	switch
7	Occupied Switch (Digital Input)	R	Occupied_sw	D	BV7		
8	EC3 Controller Alarm Switch	R	Digital_comp_sw	D	BV8	nvoDigCompAlarm	switch
9	Condensate Pan Float Switch	R	Cond_float_sw	D	BV9	nvoCondFltSwitch	switch
10	Main Gas Valve 1 On Switch	R	Gas_valve1_sw	D	BV10		
11	Main Gas Valve 2 On Switch	R	Gas_valve2_sw	D	BV11		
12	Hot Water Coil Freeze Protection Switch	R	Freeze_stat_sw	D	BV12		
13	Supply Fan Door Switch	R	door_sw	D	BV13	nvoDoorSwitch	switch
14	Unit On - Off Control Switch	R	Dig_In_OnOff	D	BV14		
15	Supply Fan Speed 2 Switch	R	DI_Sup_Fan_Speed2	D	BV15		
16	Supply Fan Speed 3 Switch	R	DI_Sup_Fan_Speed3	D	BV16		
17	Compressor Locked Out	R	DX_Cooling_Lockout	D	BV17		
18	Heating Locked Out	R	Heating_Lockout	D	BV18		
19	Heat 3 Output	R	Heat_3	D	BV19		
20	Heat 4 Output	R	Heat_4	D	BV20		
21	Compressor 1 Output	R	C1_On	D	BV21	nvoComp1	switch
22	Compressor 2 Output	R	C2_On	D	BV22	nvoComp2	switch

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Typical BMS – EMS – BAS System Variables (continued):

Carel Side					BMS Side		
Carel Index	Description	Read/Write	Variable Name	Data Type	BACNet	LonWorks	SNVT
23	Outside Air Damper Opening	R	oa_damper_open	D	BV23		
24	Outside Air Damper Closing	R	oa_damper_close	D	BV24		
25	Supply Fan Output	R	Supply_fan_out	D	BV25	nvoSupFan	switch
26	Condenser Fan Output	R	Cond_fan	D	BV26	nvoCondFan	switch
27	Heat 1 Output	R	Gas_Heat_1_On	D	BV27	nvoHeat1	switch
28	Heat 2 Output	R	Gas_Heat_2_On	D	BV28	nvoHeat2	switch
29	Hot Gas Reheat Stage 2 Output	R	HGRH_S2	D	BV29		
30	Gas Heat 1 Exhaust Fan Hi Speed Output	R	ht_exh_fan_1	D	BV30		
31	Gas Heat 2 Exhaust Fan Hi Speed Output	R	ht_exh_fan_2	D	BV31		
32	Hot Gas Reheat Close Off Valve Output	R	HGRH_CV	D	BV32		
33	Return Air Damper Opening	R	ra_damper_open	D	BV33		
34	Return Air Damper Closing	R	ra_damper_close	D	BV34		
35	Exhaust Fan Output	R	Ex_Fan	D	BV35	nvoExhustFan	switch
36	General Alarm Output	R	General_Alarm	D	BV36	nvoGenAlarm	switch
37	Occupied Mode 0= Unoccupied 1= Occupied	R	Occupied	D	BV37	nvoOccupied	switch
38	BMS Occupied Comand	R/W	Occupied_Bms	D	BV38	nviOccComand	switch
39	Alarm Reset by BMS Comand	R/W	BMS_Reset	D	BV39	nviAlarmReset	switch
40	Unit is in Manual Mode	R	Manual_OnOff	D	BV40		
41	BMS On-Off Comand	R/W	Superv_OnOff	D	BV41	nviOnOffComand	switch
42	ERM High Wheel Pressure Drop Switch	R	Wheel_P_SW	D	BV42		

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Typical BMS – EMS – BAS System Variables (continued):

Carel Side					BMS Side		
Carel Index	Description	Read/Write	Variable Name	Data Type	BACNet	LonWorks	SNVT
43	ERM Filter Switch (Supply or Return)	R	ERV_Filter_SW	D	BV43		
44	ERM Exhaust Fan Status Switch	R	ERV_Exh_Fan_Stat	D	BV44		
45	ERM Exhaust Fan Door Switch	R	ERV_Door_SW	D	BV45	nvoErmDoorSw	switch
46	ERM Wheel Output	R	Wheel_on	D	BV46	nvoErmWheel	switch
47	ERM By-Pass Damper Output	R	Bypass_Damp	D	BV47		
48	ERM Filter Alarm	R	mERV_Filter_AL	D	BV48		
49	ERM Exhaust Fan Output	R	ERV_Exh_Fan_En	D	BV49	nvoExhFan	switch
50	ERM Preheater Output	R	ERV_Preheater_En	D	BV50		
51	ERM Wheel Status	R	ERV_Wheel_Status	D	BV51		
52	Compressor High Pressure Alarm	R	mHP_alarm	D	BV52		
53	Compressor Low Pressure Alarm	R	mlp_alarm	D	BV53		
54	Supply Fan Alarm	R	mSupply_fan_sw_al	D	BV54		
55	Supply Fan Duct Static Pressure Alarm	R	Sup_Fan_DSP_AL	D	BV55		
56	Condensate Pan Float Switch Alarm	R	mCFS_AL	D	BV56		
57	Gas Valve 1 Alarm	R	mGas_Valve1_al	D	BV57		
58	If the Supply Air Temp Does not Rise above 36F (Adjustable) after the blower comes on	R	SA_Low_Limit_Temp_AL	D	BV58		
59	Gas Valve 2 Alarm	R	mGas_Valve2_al	D	BV59		
60	Unit Shut Down Due to Low Supply Air Temperature	R	mSA_Lockout	D	BV60		

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Typical BMS – EMS – BAS System Variables (continued):

Carel Side					BMS Side		
Carel Index	Description	Read/Write	Variable Name	Data Type	BACNet	LonWorks	SNVT
61	Digital Compressor Switch Alarm	R	mDCS_AL	D	BV61		
62	Exhaust Fan Status Switch	R	Exhaust_Fan_Switch	D	BV62		
63	Compressor Alarm Shuts Down Unit	R	DX_Cooling_Alarm_Unit_Shutdown	D	BV63		
64	Compressor Alarm Shuts Down Unit Selection	R	DX_Cooling_Alarm_Unit_SD_Sel	D	BV64		
65	Exhaust Fan Alarm	R	mExh_Fan_AL	D	BV65		
66	memory Exhaust Fan Shutdown	R	mExh_Fan_SD	D	BV66		
67	Wheel Alarm	R	mWheel_AL	D	BV67		
68	memory Wheel Shut Down	R	mWheel_SD	D	BV68		
69	ERM Wheel Pressure Drop Alarm	R	mWheel_Press_AL	D	BV69		

Modine Manufacturing Company has a continuous product improvement program,
and therefore reserves the right to change design and specifications without notice.

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