PROGRAMMABLE CONTROLLER

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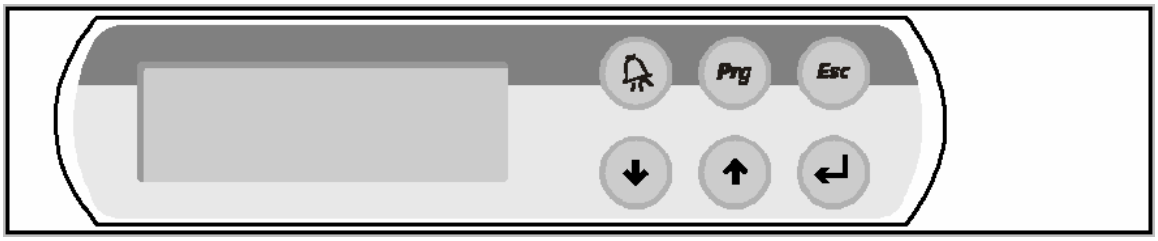
FRONT PANEL VIEW



KEY FUNCTIONS

ALARM KEY: Displays active alarms, alarm history, acknowledge alarms, and clear alarms. Back lit when an alarm is active.

PROGRAM KEY: Allows access to set points and main control parameters.

ESCAPE KEY: Returns to the main menu.

DOWN KEY: Decreases parameter values, and scrolls through screens.

UP KEY: Increases parameter values, and scrolls through screens.

ENTER KEY: Moves the cursor between parameter fields and confirms the set data.

DISPLAY

- liquid crystal display (LCD)

LCD Display

Features

- number of lines: 4
- number of characters per line: 20
- character height: 5 mm

STARTING UP AND OPERATING THE CONTROLLER

KEY: *ESCAPE*

Pressing the **ESC** key will display the following screen. The SYSTEM STATUS screens are display only. To change set points the values must be entered at the corresponding screens. To view the other SYSTEM STATUS screen press the UP or Down Arrow keys.

Note: The main system status screen will change in appearance depending on what options are enabled in the control. The following three screens show what the main system status screen will look like with different options.

```
    SYSTEM STATUS
Product Temp: 04.0°C

12:00:00    05/18/02
```

This screen displays the product temperature and current date and time.

```
    SYSTEM STATUS
P1:04.0°C  P2:04.0°C

12:00:00    05/18/02
```

This screen is displayed when the second product sensor is active.
This screen displays the product temperature and current date and time.

```
    SYSTEM STATUS
P1:04.0°C  P2:04.0°C
50.0% RH  CO2: 6.6 %
12:00:00    05/18/02
```

This screen is the will be seen when the second product temperature sensor is used. The screen shows the two product temperatures (P1, P2) of the cabinet, humidity level (when enabled), percentage of lighting (when enabled), CO2 level and the current date and time.

```
 CURRENT SET POINTS
TEMPERATURE:  04.0°C
HUMIDITY:    50.0%RH
LTS:100%    CO2:100%
```

This screen displays the refrigeration current set points.

KEY: *PROGRAM*

Pressing the **PRG** key will display the following screen.

```
    SET UP MENU
 SET POINTS      >
 PARAMETERS      >
 SENSOR TEST     >
```

This screen allows access to the listed set up screens. Press the **ENT** key to move the cursor to the desired field and press the Up or Down Arrow key to scroll through the screens of each group.

SET POINTS

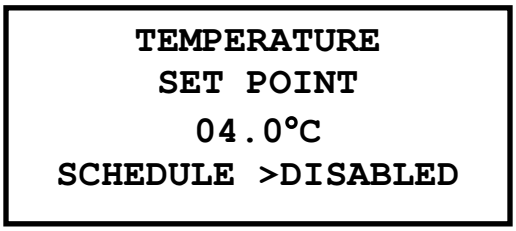
Note: If the password protection is used the following screen will be displayed before allowing access to the SET POINTS screens. On initial start up there is no password protection the passwords are set in the PARAMETERS group. If no password protection is used the "ENTER PASSWORD" screen will not be displayed.

```
   ENTER PASSWORD
        0000

   WRONG PASSWORD
```

Press the **ENT** key to move the cursor to the four-digit password. Use the Up or Down Arrow key to increase or decrease the number. When the correct password is displayed press the **ENT** key to enter the password. If the correct password was entered the corresponding screen will be displayed. If a wrong password was entered "**WRONG PASSWORD**" will be displayed on the bottom line. The password can be re-entered or press the **ESC** key to return to the System Status screen.

SET POINTS: Screen 1



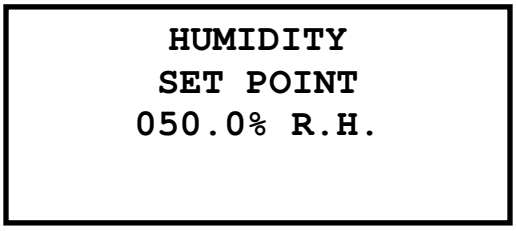
Factory Default Setting: 4.0°C

Note: If the schedule is enabled the temperature will be set through the ramp and soak schedule. To disable the ramp and soak schedule press the **ENT** key to move the cursor to the schedule field. Use the Up or Down Arrow key to disable the schedule. Press the **ENT** key and the cursor will move to the upper left hand corner and the set point will be visible. A full explanation of the ramp and soak schedule follows.

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct set point is displayed press the **ENT** key to enter the set point, the cursor will move to the schedule field. Press the **ENT** key and the cursor will move to the upper left hand corner. Press the Up or Down Arrow key to scroll through the other screens or press the **ESC** key to return to the System Status screen.

SET POINTS: Screen 2

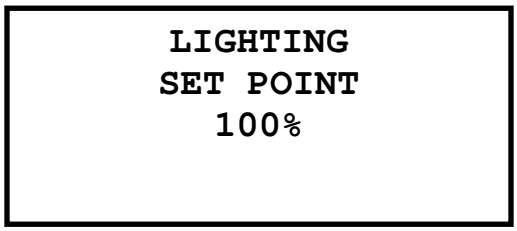
Note: The following screen will only be visible if the humidity is enabled in the Parameter section.



Factory Default Setting: 50.0%

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct set point is displayed press the **ENT** key to enter the set point, the cursor will move to the upper left hand corner. Press the Up or Down Arrow key to scroll through the other screens or press the **ESC** key to return to the System Status screen.

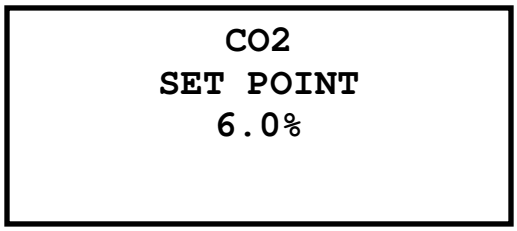
SET POINTS: Screen 3
Note: The following screen will only be visible if the Lights are enabled in the Parameter section.



Factory Default Setting: 100%

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct set point is displayed press the **ENT** key to enter the set point, the cursor will move to the upper left hand corner. Press the Up or Down Arrow key to scroll through the other screens or press the **ESC** key to return to the System Status screen.

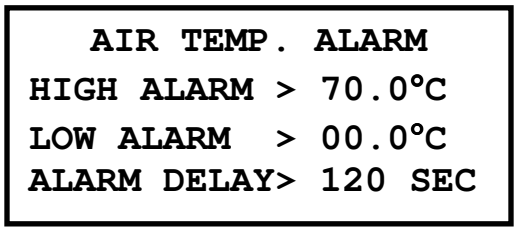
SET POINTS: Screen 4
Note: The following screen will only be visible if the CO2 option is enabled in the Parameter section.



Factory Default Setting: 6.0%

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct set point is displayed press the **ENT** key to enter the set point, the cursor will move to the upper left hand corner. Press the Up or Down Arrow key to scroll through the other screens or press the **ESC** key to return to the System Status screen.

SET POINTS: Screen 5



Factory Default Setting: High Alarm 70.0°C
Factory Default Setting: Low Alarm 0.0°C
Factory Default Setting: Alarm Delay 120 Sec

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the set point, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand

corner and the Up or Down Arrow key to scroll to the next set point screen or press the **ESC** key to return to the System Status screen.

Note: The High and Low Air Temperature Alarms provide an early warning prior to the product temperature alarm. They should be set to allow the normal rise and fall of the air temperature during normal operation. High ambient temperature and heavy door use may require a longer Alarm Delay. The ALARM DELAY is the amount of time in seconds that the temperature must be above or below the alarm set point for the alarm to activate.

SET POINTS: Screen 6

```
 PRODUCT TEMP. ALARM
HIGH ALARM > 70.0°C
LOW ALARM  > 00.0°C
ALARM DELAY> 120 SEC
```

Factory Default Setting: High Alarm 70.0°C
Factory Default Setting: Low Alarm 0.0°C
Factory Default Setting: Alarm Delay 120 Sec

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the set point, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set point screen or press the **ESC** key to return to the System Status screen.

Note: This setting will be applicable to cabinets equipped with a single Product temperature sensor or two sensors. The ALARM DELAY is the amount of time in seconds that the temperature must be above or below the alarm set point for the alarm to activate.

SET POINTS: Screen 7

Note: The following screen will only be visible if the Humidity is enabled in the Parameter section.

```
   HUMIDITY ALARMS
HIGH ALARM > 100.0%
LOW ALARM  > 000.0%
ALARM DELAY> 120 SEC
```

Factory Default Setting: High Alarm 100.0%
Factory Default Setting: Low Alarm 0.0°%
Factory Default Setting: Alarm Delay 120 Sec

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the set point, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set point screen or press the **ESC** key to return to the System Status screen.

Note: The ALARM DELAY is the amount of time in seconds that the humidity level must be above or below the alarm set point for the alarm to activate.

SET POINTS: Screen 8

Note: The following screen will only be visible if the CO2 is enabled in the Parameter section.

```
     CO2 ALARMS
HIGH ALARM > 055.0%
LOW ALARM  > 000.0%
ALARM DELAY> 120 SEC
```

Factory Default Setting: High Alarm 55.0%
Factory Default Setting: Low Alarm 0.0°%
Factory Default Setting: Alarm Delay 120 Sec

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the set point, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set point screen or press the **ESC** key to return to the System Status screen.

Note: The ALARM DELAY is the amount of time in seconds that the CO2 level must be above or below the alarm set point for the alarm to activate.

SET POINTS: Screen 9

```
Dehumidifier Defrost
     Disabled
DF Interval: 60 min.
  DF Length: 30 sec.
```

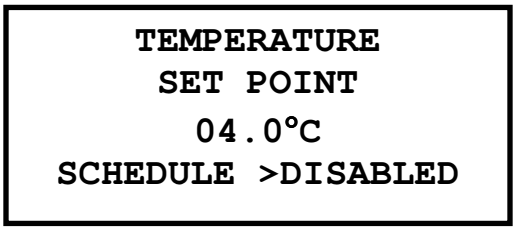
Factory Default Setting: Dehumidifier Defrost > Disabled
Factory Default Setting: DF Interval: 60 min.
Factory Default Setting: DF Length: 30 sec.

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the set point, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set point screen or press the **ESC** key to return to the System Status screen.

DEFROST: Enables or disables the defrost cycle of the dehumidification evaporator coil..
DF Interval: The amount of time in minutes that the dehumidification coil has to be active to initiate an off cycle defrost.
DF Length: The length in seconds of the defrost cycle.

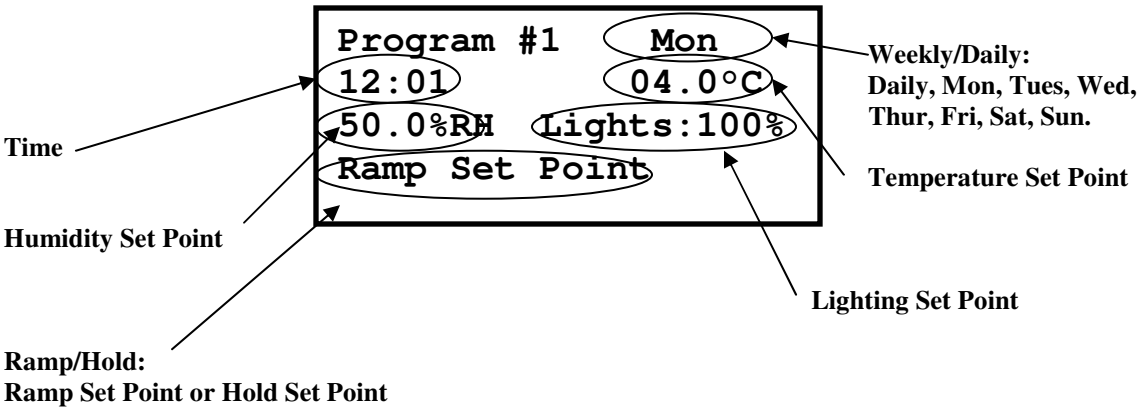
RAMP AND SOAK SCHEDULE

SET POINTS: Screen 1



Press the **ENT** key until the cursor moves to the schedule field. Use the Up or Down arrow key to enable the schedule. Press the **ENT** key and the first of 21 Ramp and Soak screens will be displayed.

RAMP & SOAK



Press the **ENT** key and the cursor moves to the Day of the Week/Daily field. Use the Up or Down arrow key to select daily or the day of the week the schedule is to begin. Press the **ENT** key and the cursor will move to the time field. Use the Up or Down arrow key to enter the desired time to change the set points. Press the **ENT** key and the cursor will move to the temperature set point field. Use the Up or Down arrow key to enter the desired temperature set point. Press the **ENT** key and the cursor will move to the humidity set point field (if activated). Use the Up or Down arrow key to enter the desired humidity set point. Press the **ENT** key and the cursor will move to the light set point field (if activated). Use the Up or Down arrow key to enter the desired lighting set point.
Press the **ENT** key and the cursor will move to the Ramp / Hold field. Use the Up or Down arrow key to select to Ramp the set point to the next scheduled set point or to Hold the set point until the next scheduled set point. Press the **ENT** key and the cursor will move to the upper left hand corner. Press the Down arrow key to go to the next schedule.

Note: If Daily is selected on the Program #1 screen programs 1 through 21 will repeat each day. Any unused programs will have to be turned off.

Ramp and Soak Example

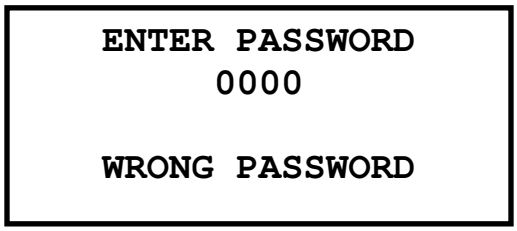
The following example will ramp from 4.0°C to 10.0°C every Monday from 06:00 to 12:00. The temperature will remain at 10.0°C until Wednesday at 06:00 when it will begin ramping the set point down to 4.0°C at 12:00 Wednesday. The set point will remain at 4.0°C until Friday at 06:00 when it will begin ramping the set point up to 10.0°C at 12:00 Friday. The set point will remain at 10.0°C until Sunday at 06:00 when it will begin ramping the set point down to 4.0°C at 12:00 Sunday. The temperature set point will remain at 4.0°C until the schedule repeats Monday at 06:00.

It is recommended to fill out the Ramp and Soak worksheet on page 26 of this manual before programming the ramp and soak functions of the controller.

Program #	Daily/Weekly	Time	Temp.	Humidity	Lights	Ramp/Hold
1	Mon.	6:00	4.0°C	N/A	N/A	Ramp
2	Mon.	12:00	10.0°C	N/A	N/A	Hold
3	Wed.	6:00	10.0°C	N/A	N/A	Ramp
4	Wed.	12:00	4.0°C	N/A	N/A	Hold
5	Fri.	06:00	4.0°C	N/A	N/A	Ramp
6	Fri.	12:00	10.0°C	N/A	N/A	Hold
7	Sun.	06:00	10.0°C	N/A	N/A	Ramp
8	Sun.	12:00	4.0°C	N/A	N/A	Hold
9	Off			N/A	N/A	
10	Off			N/A	N/A	
11	Off			N/A	N/A	
12	Off			N/A	N/A	
13	Off			N/A	N/A	
14	Off			N/A	N/A	
15	Off			N/A	N/A	
16	Off			N/A	N/A	
17	Off			N/A	N/A	
18	Off			N/A	N/A	
19	Off			N/A	N/A	
20	Off			N/A	N/A	
21	Off			N/A	N/A	

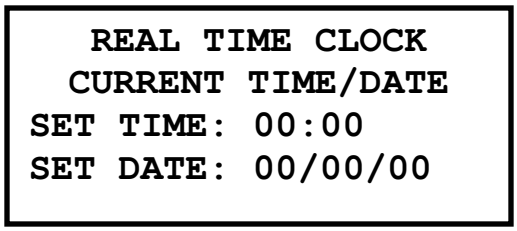
PARAMETERS

Note: If the passwords are used the following screen will be displayed. On initial start up there is no password protection the passwords are set in the PARAMETERS group. If no password protection is used the "ENTER PASSWORD" screen will not be displayed.



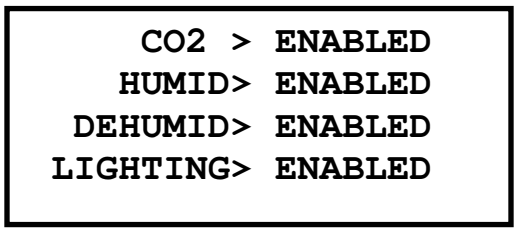
Press the **ENT** key to move the cursor to the four-digit password. Use the Up or Down Arrow key to increase or decrease the number. When the correct password is displayed press the **ENT** key to enter the password. If the correct password was entered the corresponding screen will be displayed. If a wrong password was entered "**WRONG PASSWORD**" will be displayed on the bottom line. The password can be re-entered or press the **ESC** key to return to the System Status screen.

PARAMETERS: Screen 1



Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

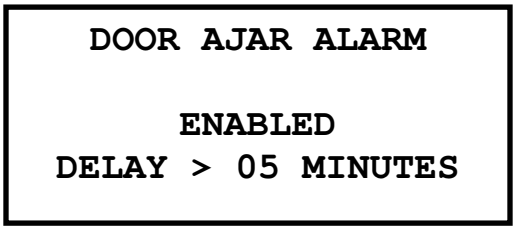
PARAMETERS: Screen 2



Factory Default Setting: CO2 > Disabled
Factory Default Setting: HUMID > Disabled
Factory Default Setting: DEHUMID > Disabled
Factory Default Setting: LIGHTING > Disabled

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to toggle between enabled and disable. When the correct setting is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

PARAMETERS: Screen 3

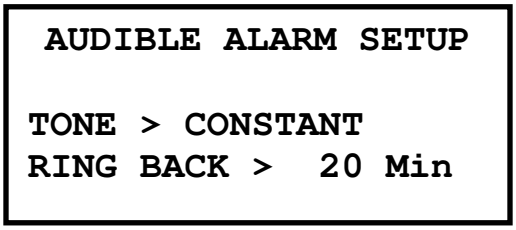


Factory Default Setting: Door Ajar Al. > Disabled
Factory Default Setting: Delay > 5 min.

Press the **ENT** key to move the cursor to the set point enable/disable field. Use the Up or Down Arrow key to toggle between enabled or disabled. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the upper left hand corner. Use the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

DOOR AJAR ALARM: Enables or disables the door ajar alarm.
DELAY: The amount of time in minutes that the door must be open before the alarm activates.

PARAMETERS: Screen 4

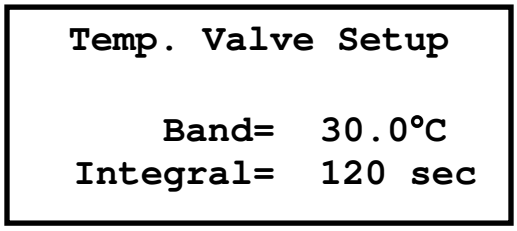


Factory Default Setting: Tone > Constant
Factory Default Setting: Ring Back > 20 min.

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

TONE: CONSTANT, INTER. SLOW, and INTER. FAST. Changes the tone of the alarm buzzer.
RING BACK: Silences the alarm for a period of time after an alarm has been acknowledged.

PARAMETERS: Screen 5

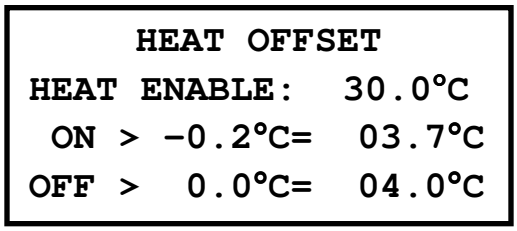


Factory Default Setting: Band= 30.0°C
Factory Default Setting: Interval= 120 sec.

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

Band: Represents the regulation proportional band.
Integral: Represents the integral time, expressed in seconds.

PARAMETERS: Screen 6

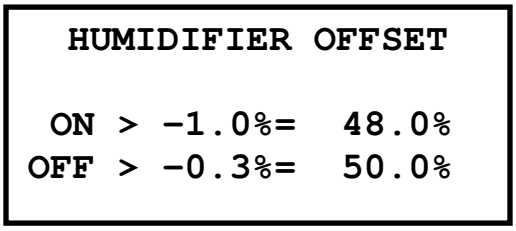


Factory Default Setting: ENABLE > 30.0°C
Factory Default Setting: ON > -0.2°C
Factory Default Setting: OFF > 0.0°C

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

ENABLE: Is the temperature set point that will enable the auxiliary heater.
ON: Is the offset from the actual Temperature Set Point where the heater will turn on.
OFF: Is the offset from the actual Temperature Set Point where the heater will turn off.

PARAMETERS: Screen 7

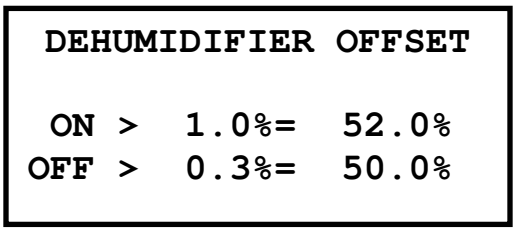


Factory Default Setting: ON > -1.0%
Factory Default Setting: OFF > -0.3%

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

ON: Is the offset from the actual Humidity Set Point where the humidifier will turn on.
OFF: Is the offset from the actual Humidity Set Point where the humidifier will turn off.

PARAMETERS: Screen 8

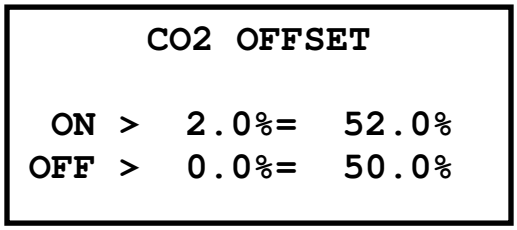


Factory Default Setting: ON > 1.0%
Factory Default Setting: OFF > 0.3%

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

ON: Is the offset from the actual Humidity Set Point where the dehumidifier will turn on.
OFF: Is the offset from the actual Humidity Set Point where the dehumidifier will turn off.

PARAMETERS: Screen 9

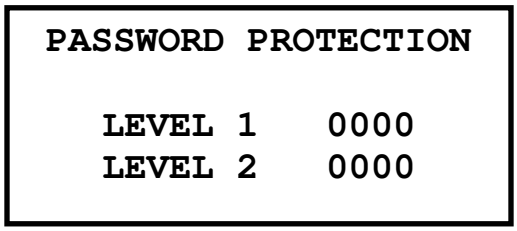


Factory Default Setting: ON > 2.0%
Factory Default Setting: OFF > 0.0%

Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

ON: Is the offset from the actual CO2 Set Point where the CO2 will turn on.
OFF: Is the offset from the actual CO2 Set Point where the CO2 will turn off.

PARAMETERS: Screen 10

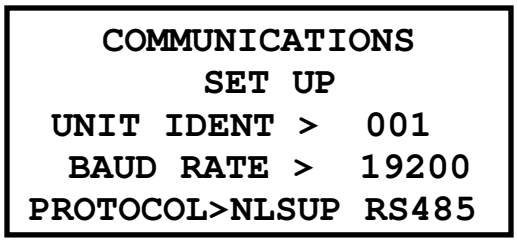


Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

LEVEL 1: Password protection for the SET POINT and SENSOR TEST screens.
LEVEL 2: Password protection for the PARAMETERS screens.

IMPORTANT NOTE: The use and selection of Passwords is RECOMMENDED to protect the system from intentional or inadvertent tampering. If the passwords are not utilized, there will not be password prompting during programming. This is very dangerous as the factory settings, designed to protect personnel and property, are left exposed to tampering.

PARAMETERS: Screen 11 (NOTE: This screen is only used with optional communication boards.)

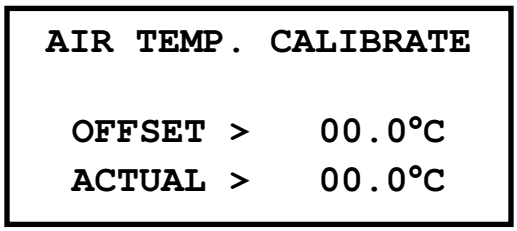


Press the **ENT** key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the parameter, the cursor will move to the next data field. Press enter to move the cursor to the upper left hand corner and the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

UNIT IDENT: Sets the unit identification for serial communications.
BAUD RATE: Sets the Baud Rate for the serial communications. Baud rates supported 1200, 2400, 4800, 9600, & 19200.
PROTOCOL: Sets the Protocol for the serial communications. Protocols supported NLSUP RS232, RS485, & Modbus.

NLSUP RS232: For use with Remote Supervisor. Requires optional software, software key, and RS232 communications board.
NLSUP RS485: For use with Local Supervisor. Requires optional software, software key, and RS485 communications board.
MODBUS: For use with custom software. Requires optional RS485 communications board.

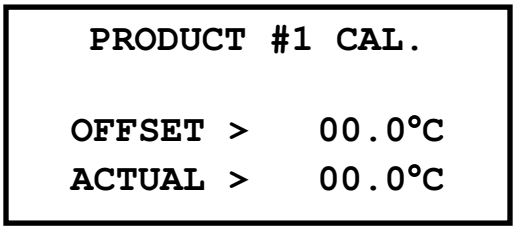
PARAMETERS: Screen 10



Press the **ENT** key to move the cursor to the offset data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the offset, the cursor will move to the upper left hand corner of the screen. Press the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

OFFSET: Allows calibration for the Air Temperature Sensor.
ACTUAL: Displays the current sensor reading.

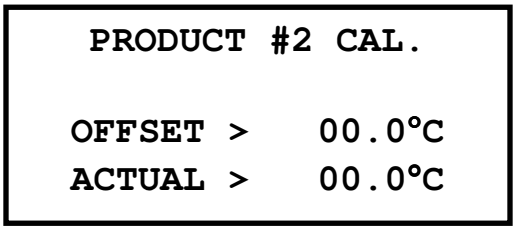
PARAMETERS: Screen 12



Press the **ENT** key to move the cursor to the offset data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the offset, the cursor will move to the upper left hand corner of the screen. Press the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

OFFSET: Allows calibration for the Product #1 Temperature Sensor.
ACTUAL: Displays the current sensor reading.

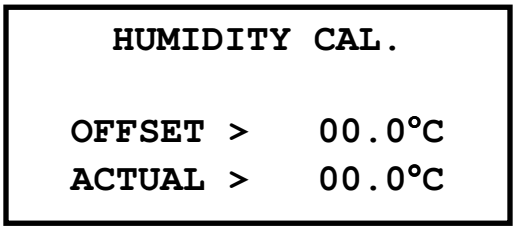
PARAMETERS: Screen 13



Press the **ENT** key to move the cursor to the offset data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the offset, the cursor will move to the upper left hand corner of the screen. Press the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

OFFSET: Allows calibration for the Product #2 Temperature Sensor.
ACTUAL: Displays the current sensor reading.

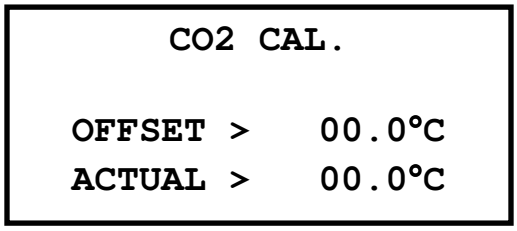
PARAMETERS: Screen 14



Press the **ENT** key to move the cursor to the offset data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the offset, the cursor will move to the upper left hand corner of the screen. Press the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

OFFSET: Allows calibration for the Humidity Sensor.
ACTUAL: Displays the current sensor reading.

PARAMETERS: Screen 15



Press the **ENT** key to move the cursor to the offset data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct value is displayed press the **ENT** key to enter the offset, the cursor will move to the upper left hand corner of the screen. Press the Up or Down Arrow key to scroll to the next set parameter screen or press the **ESC** key to return to the System Status screen.

OFFSET: Allows calibration for the CO2 Sensor.
ACTUAL: Displays the current sensor reading.

QUALITY CONTROL

The following is a recommended procedure for quality control of this cabinet. If other regulations require control in excess of this procedure, the more stringent guidelines should apply.

ACTUAL TEMPERATURE

The display temperatures should be validated on start-up and periodically thereafter to assure that the unit is performing to the requirements. Validation can be accomplished by utilizing a NBS (National Bureau of Standards) traceable thermometer.

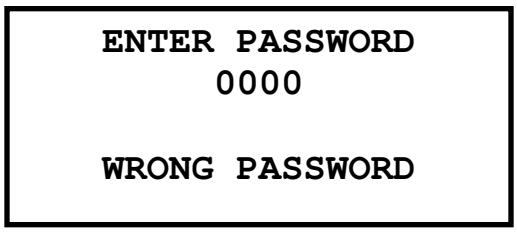
The air temperature can be validated by placing the thermometer on a shelf or drawer so the thermometer is not in direct contact with any metal surfaces. The displayed Air Temperature should read within ±2°C of the NBS Thermometer. If the displayed Air Temperature is out of range enter an offset in the Air Temperature Calibration screen.

Next place the NBS Thermometer in a vial of glycerol or another liquid that will simulate blood. Allow the liquid and thermometer temperature to equalize before comparing the displayed product temperatures and thermometer reading. The displayed Air Temperature should read within ±1°C of the NBS Thermometer. If the displayed Air Temperature is out of range enter an offset in the Air Temperature Calibration screen.

Compare the temperature the NBS with the Chart Recorder temperature. It should agree within ±1°C of the NBS Thermometer. If the Chart Recorder Temperature is out of range refer to the Chart Recorder Manual to make adjustments.

ALARM TEST

Note: If the password protection is used the following screen will be displayed before allowing access to the ALARM TEST screen. On initial start up there is no password protection the passwords are set in the PARAMETERS group. If no password protection is used the "ENTER PASSWORD" screen will not be displayed.



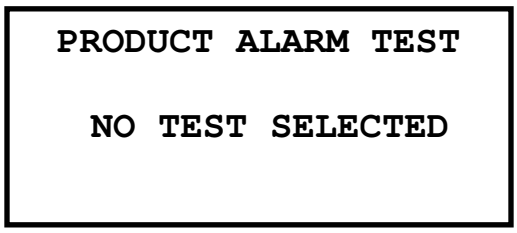
Press the **ENT** key to move the cursor to the four-digit password. Use the Up or Down Arrow key to increase or decrease the number. When the correct password is displayed press the **ENT** key to enter the password. If the correct password was entered the corresponding screen will be displayed. If a wrong password was entered "**WRONG PASSWORD**" will be displayed on the bottom line. The password can be re-entered or press the **ESC** key to return to the System Status screen.

ALARM TEST

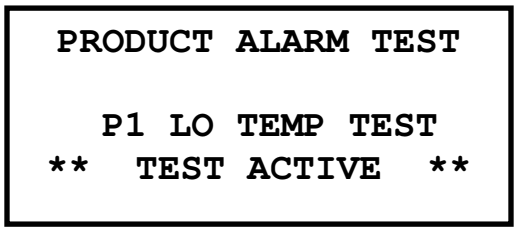
The Alarm Test feature of this controller will test the High and Low Temperature Alarms for the two product temperature sensors.

P1 LO TEMP TEST: Upper product sensor low temperature alarm test.
P1 HI TEMP TEST: Upper product sensor high temperature alarm test.
P2 LO TEMP TEST: Lower product sensor low temperature alarm test.
P2 HI TEMP TEST: Lower product sensor high temperature alarm test.

When the test is active the temperature will begin to rise for the high temperature alarm tests and fall for the low temperature alarm tests. The temperature will continue to rise or fall for **three (3) minutes** then the test will be stopped. When the temperature reaches the Alarm Set Point for the selected sensor the alarm will sound and the display will show the alarm. The Alarm History Screen will log the temperature, time and date that the alarm occurred.



Press the **ENT** key to move the cursor to the NO TEST SELECTED data field. Use the Up or Down Arrow key to scroll through the tests. When the correct test is displayed press the **ENT** key to start the test. Press the **ESC** key to return to the System Status screen.

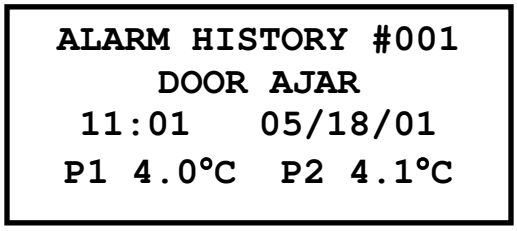


This screen will be displayed when a test is active. To end a test press the **ENT** key to move the cursor to the TEST data field and use the Up or Down Arrow key to scroll through the tests until "NO TEST SELECTED" is displayed. Press the **ENT** key to end the test.

ALARMS

During normal operation, should an alarm occur, the ALARM button will **glow red** and an **audible buzzer** will sound to indicate the presence of the alarm. Pressing the ALARM button once will silence the buzzer for the period of time set for the RING BACK. If the alarm is still active after the RING BACK time has expired the buzzer will sound again. Pressing it again will bring up the first alarm screen. Successive presses of the ALARM button will bring up each alarm screen in sequence until the final screen indicating "NO MORE ALARMS". Pressing the ALARM button on the final screen then returns you to the screen that was being displayed when the alarm sounded. Most alarms are self-explanatory.

During normal operation, when no alarms are active, pressing the ALARM button will display the following screen:

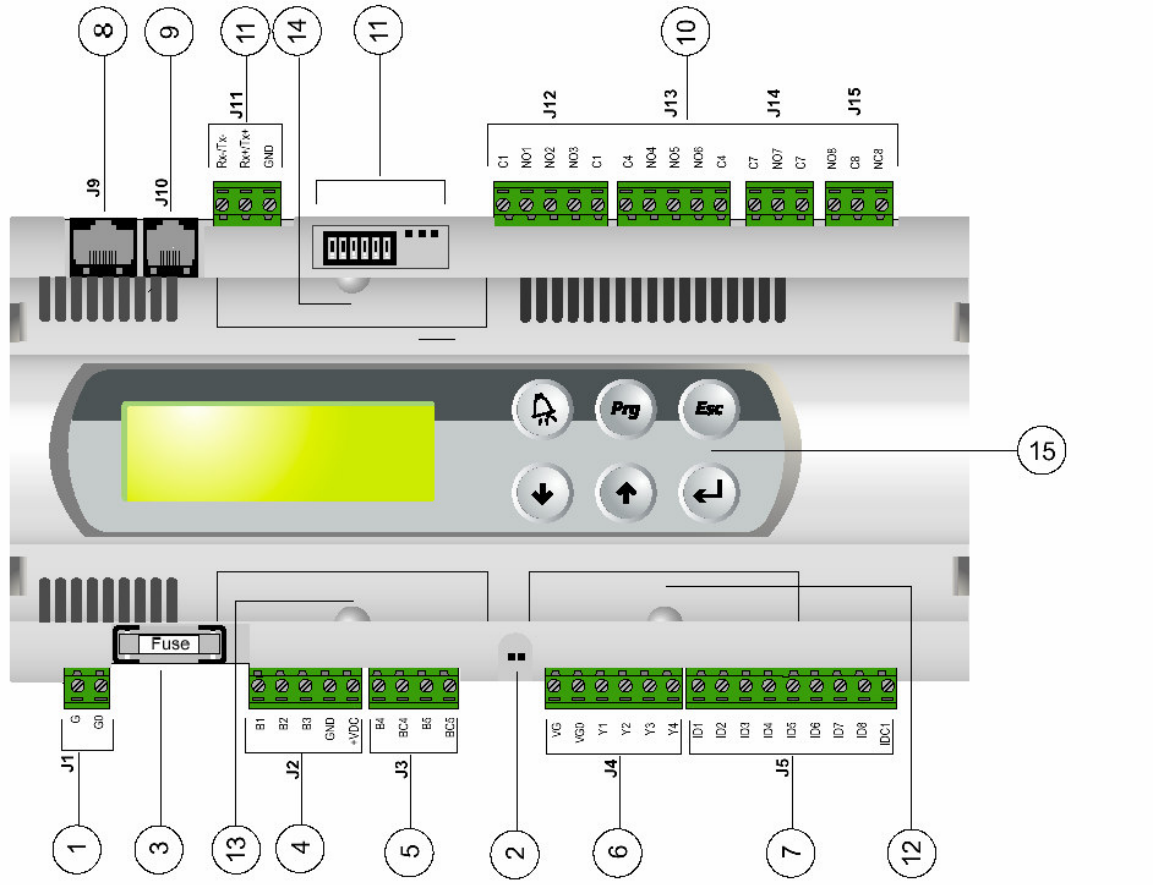


The ALARM HISTORY screen will display the last alarm that has occurred. The controller will store the last 100 alarms that have occurred. To view the Alarm History Log press the **ENT** button to move the cursor to the alarm #. Using the UP and Down Arrow buttons scroll through the stored alarms.

Each alarm will display the date and time of the alarm along with the upper and lower product temperatures when the alarm occurred.

P1: Upper Product Temperature.
P2: Lower Product Temperature.

Technical Specifications



Legend

1. power supply connector [G (+), G0 (-)]
2. yellow LED indicating mains power and red LED for alarms
3. 250Vac, 2A slow-blow fuse (T2A).
4. universal analog inputs NTC, 0/1V, 0/10V, 0/20mA, 4/20mA
5. passive analog inputs NTC, PT1000, ON/OFF
6. analog outputs 0/10V
7. 24Vac/Vdc digital inputs
8. connector for synoptic terminal (external panel with direct signaling)
9. connector for all pCO 2 series standard terminals and for the application program download
10. relay digital outputs
11. connector, addressing and LED for pLAN local network
12. hatch for inserting RS485 serial card for supervisor or RS232 serial card for modem interfacing
13. hatch for inserting the card for connection to a parallel printer
14. hatch for inserting the FLASH-MEMORY expansion card
15. built-in terminal (LCD, buttons and LEDs)

Mechanical Specifications

Dimensions	SMALL board models can be mounted on 13 DIN modules, 110x227.5x60mm MEDIUM and LARGE board models can be mounted on 18 DIN modules, 110x315x60mm
Mounting	on DIN rail
terminal block	with removable-screw male/female connectors or removable pitch header connectors according to the customer requirements – max. voltage: 250Vac - cable cross-section: min. 0.5mm^2 – max.2.5mm^2

Plastic Case

- it can be fastened on DIN rail according to DIN 43880 and CEI EN 50022 standards
- material: technopolymer
- self-extinguishing: V0 (complying with UL94) and 960°C (complying with IEC 695)
- ball pressure test :125°C
- comparative tracking index: 250V
- color: RAL7035 gray or anthracite gray
- cooling vent-holes

Electrical Specifications

power (controller with terminal connected)	22÷40Vdc and 24Vac ±15% 50/60Hz - P= 20W maximum absorption
CPU	H83002, 16 bit and 16MHz
program memory (on FLASH MEMORY)	1 Mbyte organized in 16 bit (it can be expanded up to 6 Mbyte)
data memory (static RAM)	256 kbyte organized in 16 bit (it can be expanded up to 1 Mbyte)
parameter data memory	2 kbyte organized in 16 bit (maximum limit: 400.000 writes per memory location)
operating cycle (with applic. of average complexity)	0.5s (typical value)

Analog Inputs

analog conversion	10 bit A/D converter, built-in CPU
type	**passiv**e: NTC temp. probe, (-50÷100°C; R/T 10k½ ± 1% at 25°C - B 25/80 =3,435°K±1%; step measurement), PT1000 (-100÷200°C; R/T 1000½/°C; step measurement) or free digital input, selected via software (B4, B5 inputs) **universa**l: NTC temp. probe (see passive type), voltage: 0÷1Vdc or 0÷10Vdc>; current: 0÷20mA or 4÷20mA, selected via software (B1, B2, B3 inputs)
time constant for each input	0.5s

WARNING: for powering any active probe it is possible to use the 21Vdc at +Vdc terminal; the max. current that can be
deli-vered is 200mA thermally protected against short circuits.

Digital Inputs

Type	24Vac optically insulated

.

Analog Outputs

Type	0÷10Vdc optically insulated
power external	24Vac/Vdc
resolution	8 bit
max. load	1k½ (10mA)

Digital Outputs

Type	relay

They are grouped in 3 with two common pole terminals in order to assemble the common poles easily. Be careful to the current flowing in common terminals, because it must not exceed the rated current of each single terminal, that is: 8A resistive for removable-screw terminals and 6A resistive for removable pitch header terminals. The relays are divided into groups, according to the insulating distance. Inside each group the relays have their single own insulation, so they must be exposed to the same voltage (in general 24Vac or 230Vac). Among the groups there is double-insulation, therefore the groups can be of different voltage. Anyway the double-insulation does exist toward the rest of the controller and its presence is guaranteed among digital output terminals.

Groups	1, 2, 3, 4, 5, 6, 7 - 8 (alarm relay)
NO contacts	all with 250Vac varistor protection
switch contacts	5 with 250Vac varistor protection on both contacts
commutable power	2500VA, 250Vac, 8A resistives, 2A FLA, 12A LRA according to UL873 2A resistives, 2A inductives, cosj=0,4, 2(2) according to EN 60730-1

Other Specifications

storage conditions	-20T70, 90%r.H. non-condensing
operating conditions	-10T60, 90%r.H. non-condensing
index of protection	IP20, IP40 (front panel only)
environmental pollution	normal
Classification according to	
protection against electric shock	should be integrated into Class 1 and/or 2 devices
PTI of insulating materials	250V
period of electric stress across insulating parts	long
type of actions	1C
type of disconnection or microinterruption	microinterruption
category of resistance to heat and fire	D (UL94 - V0)
immunity against voltage surges	category 1
no. of automatic operating cycles (e.g.: relay)	100,000
software Class and structure	Class A
device is not intended to be and hand-held	

According to the limits quoted on the Safety Standards relevant to electromagnetic compatibility (see conformity declaration published on the installation manual), rare malfunctioning is founded only on display and LED indications. LEDs and display are restored when the disturb ends.

Ramp and Soak Worksheet

Program #	Daily/Weekly	Time	Temp.	Humidity	Lights	Ramp/Hold
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
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