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# **STABILITY CHAMBERS**

## **Installation, Operation and Maintenance Instructions**

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## GENERAL

### INTENDED USE

Designed to meet the demanding requirements for scientific and laboratory research. Advanced engineered design incorporates the latest in cabinet, refrigeration, temperature control and monitoring features. Provides energy efficient, convenient, safe and reliable performance for optimal temperature environments necessary for a wide range of life science, pharmacy, biological, medical, clinical and industrial applications.

### TECHNICAL SPECIFICATION

Voltage supply:	115Vac 60HZ 1 phase	Voltage supply:	230Vac 50HZ 1 phase
Maximum fuse size:	20A	Maximum fuse size:	15A
Total amp draw:	14.7A	Total amp draw:	7.5 A
Max set point:	70 C degrees	Max set point:	70 C degrees

Voltage supply: 208-230Vac 60HZ  
1 phase  
Maximum fuse size: 15A  
Total amp draw: 7.5  
Max set point: 70 C degrees

### INSPECTION

When the equipment is received, all items should be carefully checked against the bill of lading to insure all crates and cartons have been received. All units should be inspected for concealed damage by uncrating the units immediately. If any damage is found, it should be reported to the carrier at once, and a claim should be filed with the carrier. This equipment has been inspected and tested in the manufacturing facility and has been crated in accordance with transportation rules and guidelines. Manufacturer is not responsible for freight loss or damage.

### LOCATION

The cabinet should be located within reach of an outlet that has appropriate power supply as listed above with a protective earth ground. The outlet should be easily accessible when installation is complete. The refrigeration system located at the top of the cabinet requires free air access for proper operation. Allow a minimum four-inch clearance on the top, rear, and sides of the cabinet. The cabinet should also be leveled when it is placed in its permanent location. Do not stack items on top of the unit. Vibration during shipping and handling may loosen mechanical connections. Check all connections during installation. Check all wiring, piping and fasteners. This unit has been designed for 75° F or 24°C with 50%RH at up to 2000 Meter elevation. If equipment is not used for its designed manner specified by the manufacturer, the protection provided by the equipment may be impaired.

### WARNINGS AND CAUTIONS

- Do not modify cabinet construction or associated equipment assemblies.
- Do not remove labeling or information supplied with the unit.



**Warning: Electric Shock Hazard.**

**Do Not Remove top electrical cover.** Contact a qualified service representative.

## INSTALLATION

**Door Alignment** – If the doors are not squared up on the cabinet, the doors can be adjusted. Opening the door(s) and loosening the screws that hold both the top and bottom hinges to the cabinet can accomplish this. After adjusting the door so that it is aligned correctly, tighten the screws to securely hold the hinges in place.

**Reversing Swing of Solid Door** - Complete the following steps if reversing the swing of the solid door(s) is desired. These steps apply to both refrigerators and freezers.

1. With a one, two, or three door model, first open the door and locate the screws holding the hinges and door in position.

2. Two people are recommended to make this change. One person should hold the door at a 90° angle to the cabinet while the other person removes the screws holding the door to the cabinet. The normal installation at the factory is to have the spring loaded door-closing mechanism located at the bottom of the cabinet.

***When removing the spring tension bracket from the cabinet bottom, be careful that it does not snap back. This may result in pinched fingers.***

3. After the door(s) are removed, remove the door lock strike(s) from the cabinet by removing the two mounting screws.

4. Find the holes, drilled through the outer skin only, located on the opposite side of the door opening from where the hinges were previously located. Drill through the tapping plate found behind these holes using a 7/32" drill bit.

5. Turn the door over and align it to the cabinet so it will swing in the desired direction. The spring loaded door-closing hinge will now be located at the top of the reversed door. Mount the hinges to the cabinet using the holes that were drilled out in step 4, along with the previously removed screws. Check the door(s) to be certain that it is mounted squarely and that the gaskets seal properly around the door opening. The door can be adjusted by moving the top or bottom hinge slightly.

6. The original hinge holes can be filled with silicone, or with 1/4-20x3/4 pan head stainless steel screws if desired.

**NOTE:** Steps 7, 8 and 9 are only required with center mounted lock.

7. Locate the door lock strike by visually aligning it to the dead bolt lock in the door while the door is in the closed position. While holding the strike in position, mark the top, bottom, and edge of the strike on the cabinet wall or mullion with a pencil or fine point marker that will remain legible until completion of the task. Verify that the strike is positioned properly by assuring that it is aligned to the marks and hold it securely; open and close the door and extend and retract the dead bolt to make certain they clear without touching. **The strike cannot be adjusted after it is mounted.**

8. Align the strike to the marks, which were made in step 7 and mark the centers of the holes for the mounting screws. Using a #20 drill bit, drill the holes you just marked approximately one-half inch deep. **Take care not to puncture the interior side of the cabinet.** Note: If a #20 bit is not available, use a 5/32" drill bit.

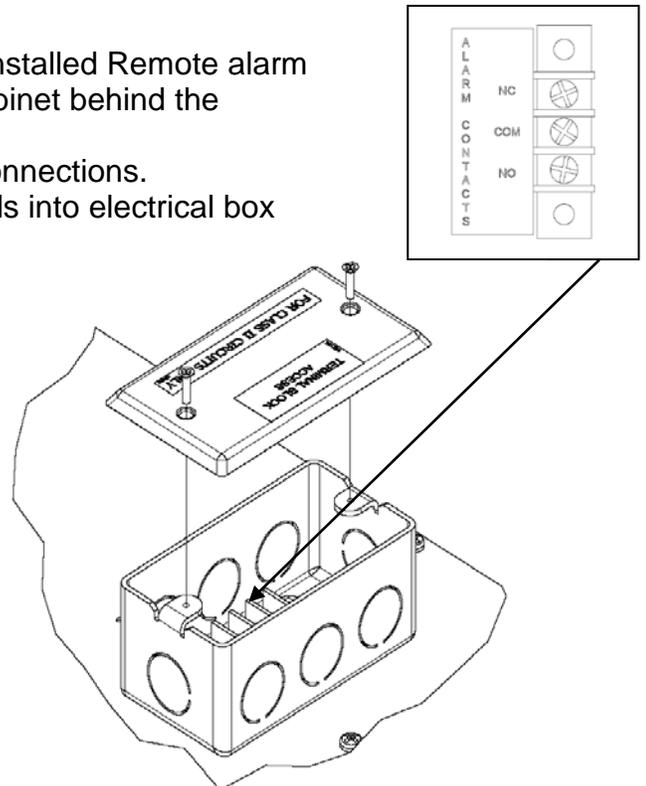
9. Mount the door lock strike using the screws that were removed from the original position. The screws may have to be forced until the thread cutting tip has passed through the entire metal thickness. The original door strike holes can be filled with silicone, or with two 10-24x1/2 stainless steel pan head screws if desired.

**Shelving Installation** - Locate shelf clips in bag inside cabinet, install in shelf supports (4 per shelf)

**Remote Alarms Contacts Access** - The factory installed Remote alarm contacts access box is located at the top of the cabinet behind the microprocessor control.

1. Remove the cover to access the terminal connections.
2. Select and knock-out a hole to run field leads into electrical box terminals.
3. The terminal block in the electrical box is labeled for "normally open" and "normally closed" activation. End user is responsible for proper field installation.

Terminal connections are rated for class II circuits only per NEC table 11(A).  
(Limited power source less than 30vac 8 Amp. max, see applicable notes in NEC).



**2-10 volt DC Output**, is located at the top of the control box behind the microprocessor control, connect wires as per label (4-20 ma optional).

**RS485 port** - (Optional) terminal board for RS485 port is located behind the cabinet façade, on the left hand side of the control box, connect wires as per label.

**Duplex/ or European Outlet** - (Optional) is located near the top of the interior cabinet back. This is a 15 amp 115 volt duplex PN 88010300 with its own power supply cord. Duplex outlet power cord is wrapped up on the back of the cabinet top. Outlet is not interwired thru main cabinet supply and must be plugged into a 115 volt/ or 220/240V power supply. Locate cabinet within 8 feet of the wall receptacle.

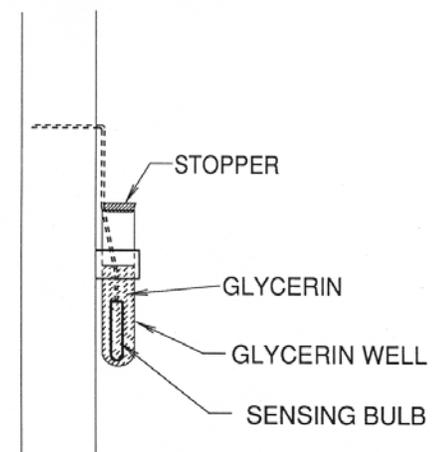
**Access Port 2"** - (Optional) is provided with a spring loaded cover on the right hand side of the cabinet.

## GLYCERIN WELL ASSEMBLY

**Important:** For accurate product temperature reading, the product-sensing bulb must be immersed in glycerin solution contained in the provided well.

One glycerin well is furnished with each model. The purpose of the glycerin is to simulate the product stored in the Lighted Chamber. The glycerin temperature reflects the product's temperature during normal operation.

After the unit is put into operation, check to make sure that the temperature indicating or alarm sensing bulb is positioned inside the glycerin well as far as possible without touching the well itself.



## HUMIDITY INSTALLATION (if applicable)



**Important:** in the event of a water leak, disconnect power and repair leak  
**Never** operate humidifier with viewing pane removed, water damage could occur.  
**Never** place hand or other body parts inside humidification reservoir as burns may occur.

Observe all Warning Labels. Disconnect power supply to eliminate injury from electrical shock or moving parts when servicing equipment.

## INSTALLATION AND OPERATION

1. Connect 1/4" water tube and supply water to the unit.
2. Connect 3/8" water tube to drain.

### Water supply

The ultrasound humidifier works best on de-mineralized water. Using un-treated water will reduce transducer life. Maintenance periods will need to be reduced. If clean water is not used the production capacity may be reduced. RO water is recommended. Water pressure above 60PSI may need to be reduced, as overflowing may occur. Water supply temperature may not exceed 33°F to 104°F.



### **Important:**

Do not add disinfectants or anticorrosive chemicals to the supply water as these are potential irritants. The use of un-treated well water, industrial water and or water from cooling circuits and in general any potentially chemically or bacteriologically contaminated water is prohibited.

## DRAIN INSTALLATION

The Chamber has a floor drain in the bottom of the cabinet. A silicone drain stopper has been placed in this drain. The drain stopper will prevent undesirable liquids from running into the drain.

The stopper can be removed if any possible liquids flowing into this drain are acceptable to go to the floor drain.

An 18" length of 1/2" I.D. drain hose is shipped inside cabinet. Attach hose to drain stub under cabinet with supplied clamp and run to an atmospheric floor drain. May substitute longer drain hose as needed. Humidifier units will require a drain for overflow.

## ELECTRICAL

For electrical requirements see data information and wiring unit diagram located in parts bag, inside of the cabinet.

Check the proposed external power outlet/supply to be used to ensure that the voltage, phase and current carrying capacity of the circuit from the electrical panel correspond to the requirements of the cabinet. **NEVER** use an extension cord to wire any unit. Refer to the serial tag (nameplate data) for all pertinent electrical information.

## **OPERATION**

The stability chambers are designed for use in a controlled interior environment. This unit has been designed for 75 deg with 50%RH at up to 2000 Meter elevation.

These units employ a programmable controller to control the temperature, defrost and humidity settings. The controller, which is located on the facade of the unit, is factory set.

Please see the separate instructions, on the operation of the controller used in the Stability Chambers.

The cabinets use an evaporator coil, located on top of the cabinet as the heat-removing source. Through the refrigeration process, heat is captured in the evaporator, transferred to the condensing unit on top of the cabinet, and expelled to the surrounding outside air. It is extremely important to allow a four-inch clearance on the top, rear, and sides of the unit for the refrigeration process to function properly.

The cabinets utilize electrically operated heaters to warm the cabinets in the heating mode. The heating elements are located in the interior cowl. The programmable control is factory set with a cutout temperature to prevent the cabinet from exceeding its design limits.

**Note:** The cabinets are equipped with two switches located on the façade. One is the main power ON/OFF switch for the unit. The other is a three-position switch for the battery-powered alarm. The alarm switch is placed in the middle, or OFF position, for shipment.

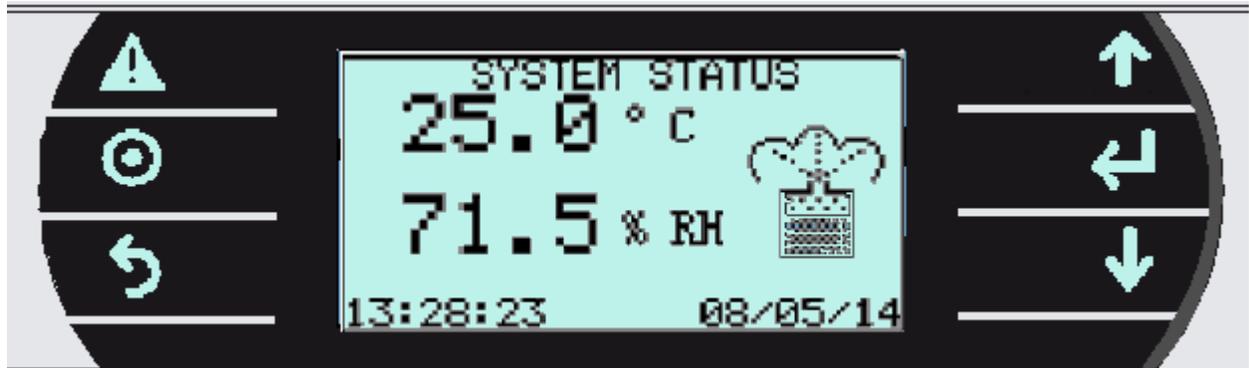
When the Stability Chamber is put into operation, the top of the switch should be pushed in to the ON position. With the switch in the ON position, the battery will sound the alarm if the main power to the cabinet is interrupted. The switch flipped to the bottom position is used to test the battery. This test must be done with power uninterrupted to the cabinet. The alarm will sound if the battery is good. This test should be done periodically. The battery is located on the backside of the control box that is on top of the unit behind the façade.

# 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 (SYSTEM STATUS).



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



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



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

## STARTING UP AND OPERATING THE CONTROLLER

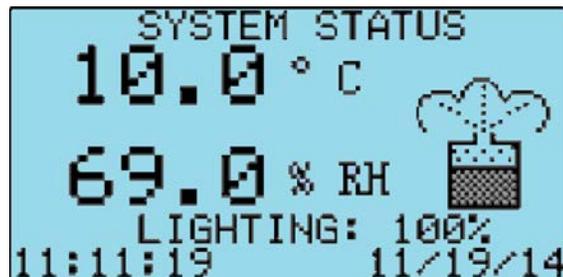


Initial screen: Press  ENTER key to display.

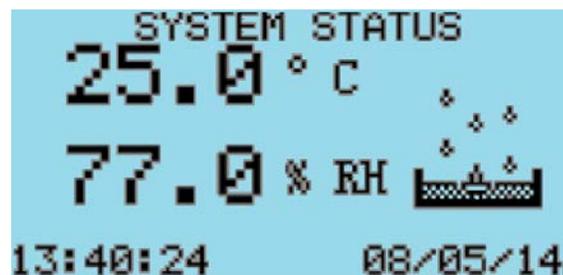
KEY:  ESCAPE

Pressing the  **Escape** 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.



Atomizer on.



Dehumidification on.

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

```

AIR TEMP:      25.0° C
TEMP VALUE:    0.0%
HEAT OUTPUT    50.0%
HUMIDITY       76.5%
COIL TEMP      22.9° C
DEWPOINT       23.6° C
HUMIDIFIER ON
DEHUMIDIFICATION OFF

```

This screen is the will be seen when the second product temperature sensor is used. The screen shows the product temperature, humidity level (when enabled), percentage of lighting (when enabled).

```

CURRENT SETPOINTS
TEMPERATURE:  10.0° C
HUMIDITY:     72.0%RH
LIGHTING:     100%

```

This screen displays the refrigeration current set points.

KEY:  PROGRAM

Pressing the  Program key will display the following screen.

```

SETUP MENU
SETPOINTS      >
PARAMETERS    >
SENSOR TEST    >

PRESS ← TO SELECT
GROUP THEN ↑ OR ↓ TO
SCROLL THROUGH SCREENS

```

This screen allows access to the listed set up screens. Press the  Enter 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.



Press the  Enter 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  Enter 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  Escape key to return to the System Status screen.

SET POINTS: Screen 1

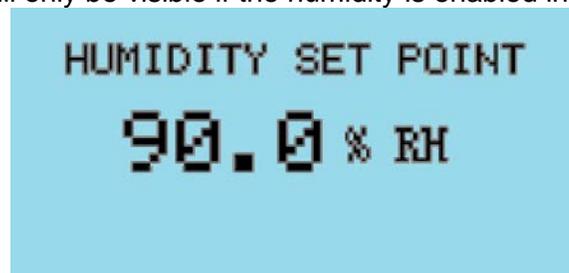


**Note:** If the schedule is enabled the temperature will be set through the ramp and soak schedule. To disable the ramp and soak schedule press the ENT key to move the cursor to the schedule field. Use the Up or Down Arrow key to disable the schedule. Press the ENT key and the cursor will move to the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

Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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.



Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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.



Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape key to return to the System Status screen.

SET POINTS: Screen 4



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  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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> 0.0°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  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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> 5.0%
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  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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



Factory Default Setting: Dehumidifier Defrost > Enabled  
Factory Default Setting: DF Interval: 10 min.  
Factory Default Setting: DF Length: 240 sec.

Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape key to return to the System Status screen.

DEFROST: Enables or disables the defrost cycle of the dehumidification evaporator coil.

DF Interval: 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.

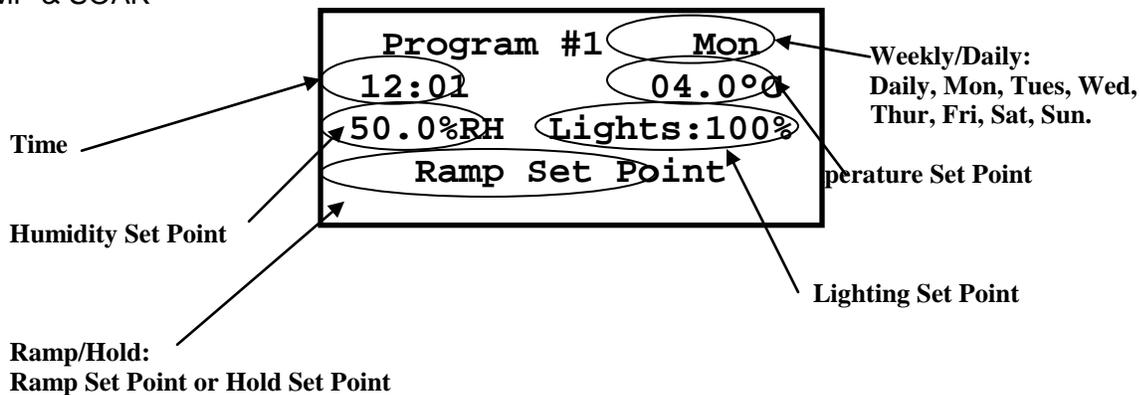
# RAMP AND SOAK SCHEDULE

SET POINTS: Screen 1



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

RAMP & SOAK



Press the Enter 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 Enter 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 Enter 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 Enter 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 Enter 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 Enter 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 Enter 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	

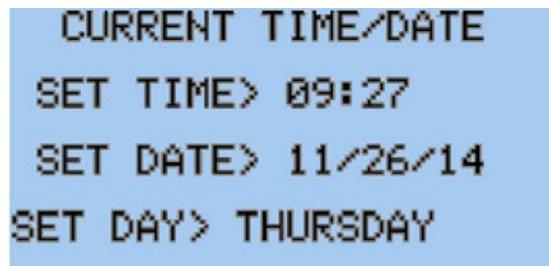
## PARAMETERS

Note: If the 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.



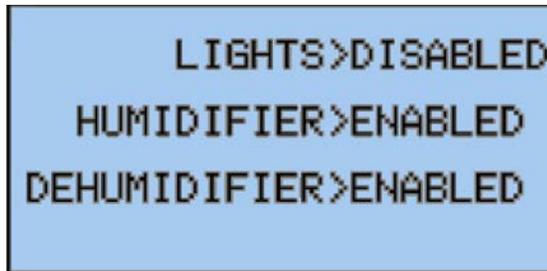
Press the  Enter key to move the cursor to the four-digit password. Use the Up or Down Arrow key to increase or decrease the number. When the correct password is displayed press the  Enter key to enter the password. If the correct password was entered the corresponding screen will be displayed. If a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

PARAMETERS: Screen 1



Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape key to return to the System Status screen.

PARAMETERS: Screen 2



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

Press the Enter 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 Enter key to enter the set point, the cursor will move to the schedule field. Press the Enter 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 Escape key to return to the System Status screen.

PARAMETERS: Screen 3



Press the Enter 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 Enter key to enter the set point, the cursor will move to the schedule field. Press the Enter 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 Escape key to return to the System Status screen.



Factory Default Setting: Door Heater Enable Temp > 10.0°C  
Factory Default Setting: Door Ajar Alarm > Disabled  
Factory Default Setting: Delay > 1 min.

Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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



```
BUZZER SETUP
TONE> CONSTANT
RING-BACK> 20 MIN
```

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

Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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



```
TEMP VALUE SETUP
      BAND> 30.0°C
      INTEGRAL> 120 SEC
VALUE POSITION
DEMAND DEHUM 5.0%
```

Factory Default Setting: Band= 30.0°C  
Factory Default Setting: Interval= 120 sec.  
Factory Default Setting: Valve Position= 5.0%

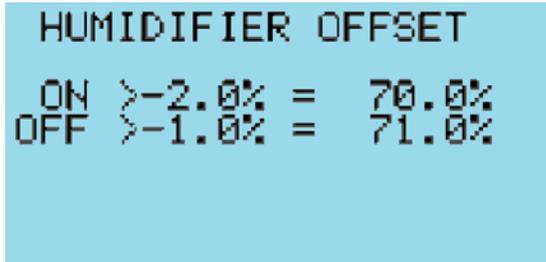
Press the  Enter key to move the cursor to the set point data field. Use the Up or Down Arrow key to increase or decrease the number. When the correct set point is displayed press the  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter key and the cursor will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

Band: Represents the regulation proportional band.

Integral: Represents the integral time, expressed in seconds.

Valve Position Demand Dehum: Represents the percentage open of the hot gas bypass valve during the demand dehumidification cycle.

PARAMETERS: Screen 6



```
HUMIDIFIER OFFSET
ON > -2.0% = 70.0%
OFF > -1.0% = 71.0%
```

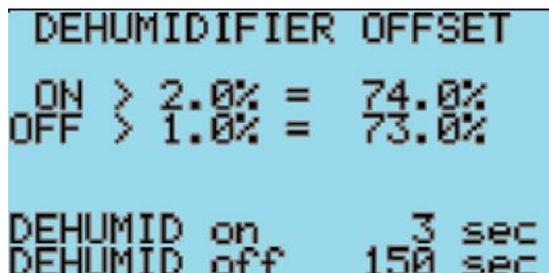
Factory Default Setting: ON > -2.0%  
Factory Default Setting: OFF > -1.0%

Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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



```
DEHUMIDIFIER OFFSET
ON > 2.0% = 74.0%
OFF > 1.0% = 73.0%
DEHUMID on 3 sec
DEHUMID off 150 sec
```

Factory Default Setting: ON > 2.0%  
Factory Default Setting: OFF > 1.0%  
Factory Default Setting: DEHUMID on > 3 sec  
Factory Default Setting: DEHUMID off > 150 sec

Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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.  
DEHUMID on: The on time when the system is NOT in a demand dehumidification cycle.  
DEHUMID off: The off time when the system is NOT in a demand dehumidification cycle.

PARAMETERS: Screen 10



Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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



Press the Enter 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 Enter key to enter the set point, the cursor will move to the schedule field. Press the Enter 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 Escape 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.

PARAMETERS: Screen 10



Press the Enter 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 Enter key to enter the set point, the cursor will move to the schedule field. Press the Enter 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 Escape key to return to the System Status screen.

OFFSET: Allows calibration for the Air Temperature Sensor.

ACTUAL: Displays the current sensor reading.

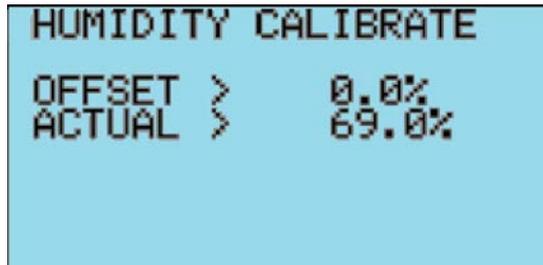
PARAMETERS: Screen 12



Press the  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape 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  Enter 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  Enter key to enter the set point, the cursor will move to the schedule field. Press the  Enter 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  Escape key to return to the System Status screen.

OFFSET: Allows calibration for the Humidity 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  $\pm 2^{\circ}\text{C}$  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  $\pm 1^{\circ}\text{C}$  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  $\pm 1^{\circ}\text{C}$  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 startup 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  Enter 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  Enter 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  Escape 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.

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:

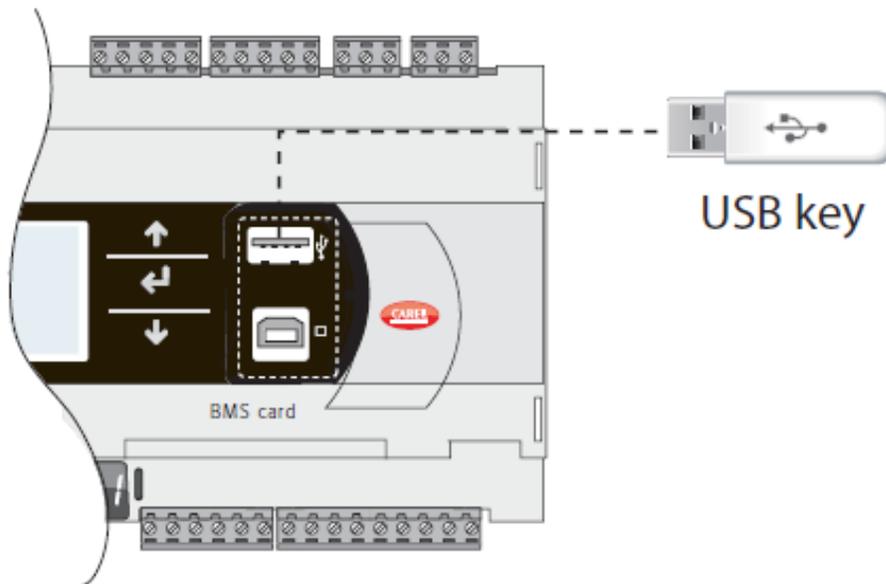


The ALARM HISTORY screen will display the last alarm that has occurred. The controller will store the last 100 alarms that have occurred. To view the Alarm History Log press the ENT button to move the cursor to the alarm #. Using the UP and Down Arrow buttons scroll through the stored alarms.

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.

### Technical Specifications



USB port for flash drives only. Application download/upload and data files upload.

### 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						
15						
16						
17						
18						
19						
20						
21						

## MAINTENANCE



**Observe all Warning Labels. Disconnect power supply(s) to eliminate injury from electrical shock or moving parts when servicing equipment.**

### PERIODIC CLEANING

Disconnect power source, including optional duplex power cord if equipped, before servicing or cleaning.

Beginning with the initial installation, the interior surfaces of the cabinet should be periodically wiped down with a solution of warm water and baking soda. This solution will remove any odors from spillage that has occurred. The exterior of the cabinet should also be cleaned frequently with a commercial grade of glass cleaner. **Caution: Do not use an abrasive or alkaline solution.**

Monthly cleaning of the condenser will aid the heat transfer characteristics of the refrigeration system and increase its efficiency. Dust, dirt, and lint may accumulate on the fins of the condensing unit. This obstruction may affect the flow of air through the condenser, thereby lowering the efficiency of the system. A wire brush or a brush with stiff bristles can be used to loosen these particles that are attached to the fins so that they may be removed with a vacuum cleaner. **Important: Failure to keep the condenser coil clean and clear of obstructions could result in temperature loss and damage to the compressor.** All moving parts have been permanently lubricated and will generally require no maintenance.

**Battery replacement:**

Battery for alarm is 9V lithium, and is located on rear of control box.

**Only qualified service representatives should replace these items.**

**HUMIDIFIER MAINTENANCE**

**PERIODIC CLEANING**

In normal conditions, the tank and ultrasonic generators require periodic maintenance. Normal conditions would be up to 3000 hours if cleaned periodically, or if unit is not used for an extended period or if problems should occur.

**Monthly** or sooner depending on water quality and operational hours, no more than 250 hours completely drain and flush water from vaporization tank by turning blue valve.

**Yearly** or sooner depending on water quality and operational hours, no more than 1500 hours clean or replace ultrasonic discs and confirm proper operation of float valve.

**Disc replacement procedure:**

1. Disconnect humidifier from power
2. Turn off water supply
3. Completely drain water from vaporization tank by turning blue valve
4. Remove viewing ring and window by removing screws
5. Remove winding ring to expose ceramic disc
6. Replace disc (caution make sure gaskets are properly seated)
7. Reinstall viewing ring and window, turn water on and restore power

**Disabling the humidifier in the event of non-use:**

1. Turn off the water supply
2. Open blue drain valve
3. Disable humidity in parameters screen on controller

**Parts and Service contact:**

Telephone: 800-388-5253

Fax: 715-386-4293

## MAINTENANCE SERVICE AND ANALYSIS GUIDE

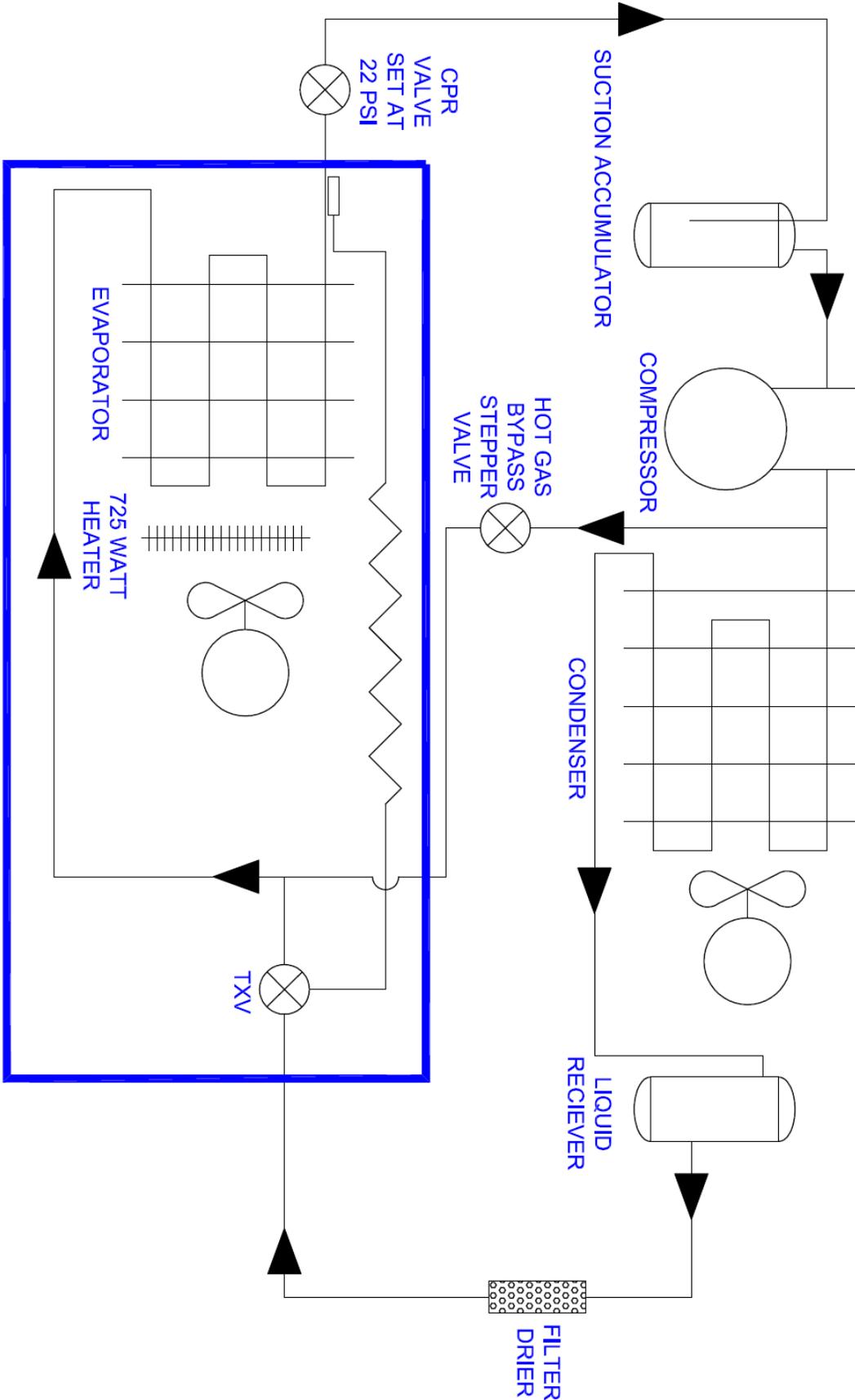
<u>MALFUNCTION</u>	<u>POSSIBLE CAUSE</u>	<u>SOLUTION</u>
Compressor will not start - no hum	<ol style="list-style-type: none"> <li>1. Service cord unplugged</li> <li>2. Overload tripped</li> <li>3. Control stuck open</li> <li>4. Wiring incorrect</li> </ol>	<ol style="list-style-type: none"> <li>1. Plug in service cord</li> <li>2. Determine reasons and correct</li> <li>3. Repair or replace</li> <li>4. Check wiring against the diagram</li> </ol>
Compressor will not start - hums but trips on overload protector	<ol style="list-style-type: none"> <li>1. Improperly wired</li> <li>2. Low voltage to unit</li> <li>3. Starting capacitor defective</li> <li>4. Relay failing to close</li> </ol>	<ol style="list-style-type: none"> <li>1. Check wiring against the diagram</li> <li>2. Determine reason and correct</li> <li>3. Determine reason and replace</li> <li>4. Determine reason, correct or replace</li> </ol>
Compressor starts and runs, but short cycles on overload protector	<ol style="list-style-type: none"> <li>1. Low voltage to unit</li> <li>2. Overload defective</li> <li>3. Excessive head pressure</li> <li>4. Compressor hot-return gas hot</li> </ol>	<ol style="list-style-type: none"> <li>1. Determine reason and correct</li> <li>2. Check current, replace overload protector</li> <li>3. Check ventilation or restriction in refrigeration system</li> <li>4. Check refrigerant charge, fix leak if necessary</li> </ol>
Compressor operates long or continuously	<ol style="list-style-type: none"> <li>1. Short of refrigerant</li> <li>2. Control contact stuck</li> <li>3. Evaporator coil iced</li> <li>4. Restriction in refrigeration system</li> <li>5. Dirty condenser</li> </ol>	<ol style="list-style-type: none"> <li>1. Fix leak, add refrigerant</li> <li>2. Repair or replace</li> <li>3. Determine cause, defrost manually</li> <li>4. Determine location and remove restriction</li> <li>5. Clean condenser</li> </ol>
Compressor runs fine, but short cycles	<ol style="list-style-type: none"> <li>1. Overload protector</li> <li>2. Cold control</li> <li>3. Overcharge</li> <li>4. Air in system</li> <li>5. Undercharge</li> </ol>	<ol style="list-style-type: none"> <li>1. Check wiring diagram</li> <li>2. Differential too close - widen</li> <li>3. Reclaim and recharge</li> <li>4. Reclaim and recharge</li> <li>5. Fix leak, add refrigerant</li> </ol>
Starting capacitor open, shorted or blown	<ol style="list-style-type: none"> <li>1. Relay contacts stuck</li> <li>2. Low voltage to unit</li> <li>3. Improper relay</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean contacts or replace relay</li> <li>2. Determine reason and correct</li> <li>3. Replace</li> </ol>
Relay defective or burned out	<ol style="list-style-type: none"> <li>1. Incorrect relay</li> <li>2. Voltage too high or too low</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and replace</li> <li>2. Determine reason and correct</li> </ol>
Refrigerated space too warm	<ol style="list-style-type: none"> <li>1. Control setting too high</li> <li>2. Refrigerant overcharge</li> <li>3. Dirty condenser</li> <li>4. Evaporator coil iced</li> <li>5. Not operating</li> <li>6. Air flow to condenser or evaporator blocked</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset control</li> <li>2. Reclaim and recharge</li> <li>3. Clean condenser</li> <li>4. Determine reason and defrost</li> <li>5. Determine reason, replace if necessary</li> <li>6. Remove obstruction for free air flow</li> </ol>
Standard temperature system freezes the product	<ol style="list-style-type: none"> <li>1. Control setting is too low</li> <li>2. Control points stuck</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset the control</li> <li>2. Replace the control</li> </ol>
Objectionable noise	<ol style="list-style-type: none"> <li>1. Fan blade hitting fan shroud</li> <li>2. Tubing rattle</li> <li>3. Vibrating fan blade</li> <li>4. Condenser fan motor rattles</li> <li>5. Worn fan motor bearings</li> </ol>	<ol style="list-style-type: none"> <li>1. Reform or cut away small section of shroud</li> <li>2. Locate and reform</li> <li>3. Replace fan blade</li> <li>4. Check motor bracket mounting, tighten</li> <li>5. Replace fan motor</li> </ol>
Failure to Heat	<ol style="list-style-type: none"> <li>1. Manual overload tripped</li> <li>2. Incorrect setting</li> <li>3. Alarm enabled</li> </ol>	<ol style="list-style-type: none"> <li>1. Push reset on hi-limit switch</li> <li>2. See control manual</li> <li>3. See control manual</li> </ol>
Humidity level not correct	<ol style="list-style-type: none"> <li>1. Water supply interrupted</li> <li>2. Incorrect control settings</li> <li>3. Piping not connected / sealed</li> <li>4. No power to humidifier</li> <li>7. Humidity range too high or low</li> </ol>	<ol style="list-style-type: none"> <li>1. Check water supply</li> <li>2. Clean Humidifier</li> <li>1. See control manual</li> <li>1. Connect tubing</li> <li>2. Seal joints</li> <li>1. Check power connections for humidifier</li> <li>1. Modify humidity ON/OFF parameters</li> <li>2. Modify dehumidification ON/OFF parameters</li> </ol>







**TEMPERATURE ONLY**



# HUMIDITY AND TEMPERATURE

