
SCIENTIFIC WARMING CABINET

Installation, Operation and Maintenance Instructions

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GENERAL

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 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 and fasteners.

WARNINGS AND CAUTIONS

Warning: Burn Hazard

Do Not exceed 150°F for non-vented closures; (screw caps, crimp seals, plastic pouches, etc.) Do Not exceed pre-sterile solution manufacturer's temperature requirements.

Do Not raise set temperature to increase rate of heating. Allow approximately 4-6 hours for solutions to reach desired temperatures.

Do Not use liquids on or inject in living tissue unless actual liquid temperature has been measured and is acceptable. Temperature of warming cabinet's contents may be hotter than the displayed air temperature. For patient safety, always check liquid temperature prior to using.

Warning: Electric Shock Hazard.

Do Not remove top electrical cover. Contact a qualified service representative.

Warning: Explosion Hazard.

Do Not use in the presence of flammable anesthetics. Do not heat liquids in the presence of flammable solvents.

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

INSTALLATION

Door Alignment - If for some reason 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.

Shelving Installation - Locate shelves inside cabinet, install shelf supports (2 RH support, 2 LH support per shelf.)

Remote Alarms Contacts Access - The factory installed Remote alarm contacts access is located on the top of the cabinet under top cover, 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 – Terminal board for 2-10v DC Output for temperature re-transmit is located behind the cabinet façade, next to Remote Alarm access box. Connect wires as per label.

RS485 port - (Optional) terminal board for RS485 port is located behind the cabinet façade, next to the Remote Alarm access box, connect wires as per label.

OPERATION

The warming cabinet is designed for an operating range of 90°F to 160°F and is intended for indoor use only. A transverse blower optimizes airflow and ensures tight temperature uniformity.

These units employ a programmable controller to control the temperature. The controller is located on the facade of the unit. Please see the separate instructions, part number 143378, on the operation of the controller used in the warming cabinet.

The cabinet utilizes an electrically operated heater to warm the product. The programmable control is factory set with a cutout temperature of 160°F to prevent the cabinet from exceeding its design limitations.

NOTE: The cabinet is 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 Warming cabinet 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 control box that is on top of the unit behind the facade.

DRAWER OPTION

The Warming cabinet is offered with drawers as an option.

Drawer Removal – The warming cabinet may accommodate up to eight drawers. To remove the drawers for cleaning, locate the black release tabs found on the inside front of the drawer. See Figure C. Push the release tabs on each side inward and lift up the drawer. Slide the drawer towards you and remove.

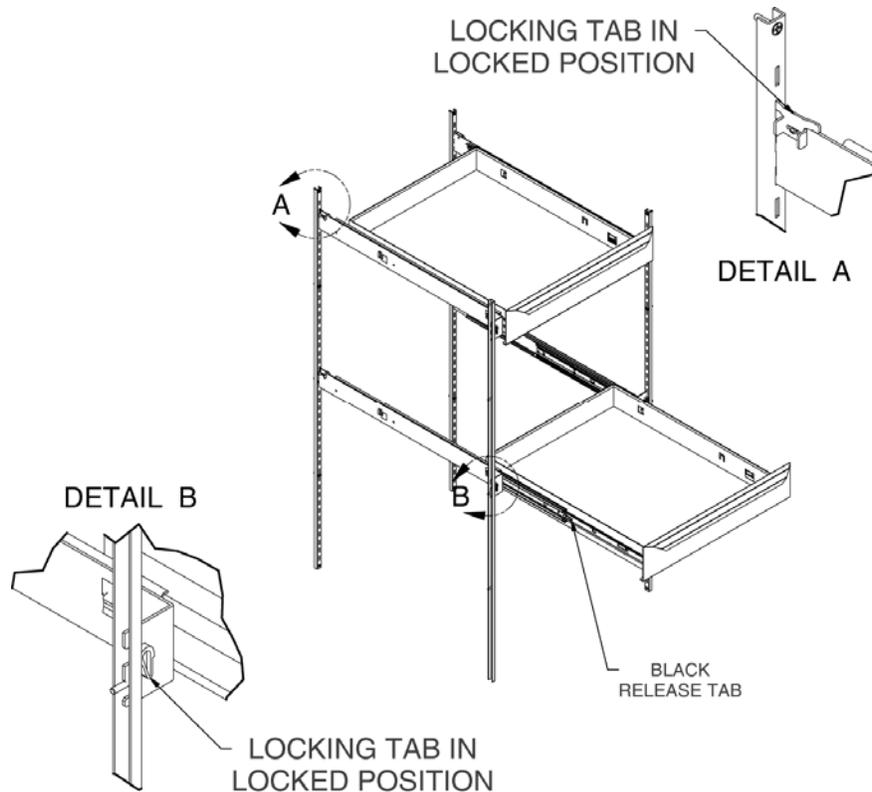


Figure C

Drawer Slide Removal / Adjustment – Each drawer slide is independently removable and can be adjusted to different levels. First remove the drawer per above instructions. Release the locking tabs located on the drawer slide, move the front tab up and release the tab in the back of the cabinet, by sliding the locking tab towards the front. See illustration. Unhook the drawer slide assembly from both the front and back shelf standards by lifting up on the assembly.

To install a drawer slide, reverse the process used to remove the slide. Secure the locking tabs into position after the drawer slide assembly is in place. Reinstall the drawer.

PROGRAMMING MANUAL

INITIAL SCREEN

The following screen appears upon power up. This screen will also be displayed when the enter key is pressed when in the “SYSTEM STATUS” screen. The version number may be needed if service questions are asked of the factory.

```
WARMING CABINET
Version 146985
```

SYSTEM STATUS

The system status screen details the cabinet operating temperature, the date and the time.

```
SYSTEM STATUS
160°F
12:08:04    07/16/10
```

“SYSTEM STATUS” will change to the following during an alarm condition.

“HIGH AIR TEMP”, “LOW AIR TEMP”, “TEMP SENSOR FAIL”, “DOOR AJAR”

The alarm condition will flash 1 second off/2 seconds on.

Pressing the up or down key will display the SYSTEM STATUS 2 screen.

```
SYSTEM STATUS 2
STATUS:ON MANUAL
SET POINT> 160.0°F
HEAT:50%    FAN:ON
```

This screen displays the operating STATUS of the unit—“ON MANUAL”, “ON SCHEDULE”, “OFF SCHEDULE”, “ON HOLIDAY”, “OFF HOLIDAY”

This screen allows the changing of the air temperature set point and displays the status of the “HEAT” and the “FAN”.

PASSWORD

Pressing the enter key will display the following screen. Entering the correct password will allow the changing the air temperature set point. The password is “14”.

```
ENTER PASSWORD
0
```

If an alarm occurs, the alarm button will be lit red and the buzzer will sound. Pressing the alarm button will silence the buzzer. The alarm button will remain lit red and the alarm condition will flash on the “SYSTEM STATUS” page until the alarm condition is corrected.

ALARMS

The offset for the high and low temperature alarms is 10.0°F. That is, if the air temperature set point is 160.0°F, then the high temp alarm is at 170.0°F and the low temp alarm is at 150.0°F. If the air temperature set point is changed to 120.0°F, for example, then the high and low temp alarms would automatically change to 130.0°F and 110.0°F, respectively. See the Air Temperature Alarm Set Points screen to adjust the offset.

Pressing the alarm button when the alarm button is not lit red will display the alarm/event history screen.

```
ALARM HISTORY # 0
POWER RESET
12:08 07/16/10
AIR TEMP: 150.0°F
```

The alarm history retains the event/alarm description, the date and time of the event/alarm and the air temperature at the time of the alarm.

Press the enter key and then use the up and down arrow keys to scroll through all the items within the history data base. The controller saves the latest 100 events/alarms.

Possible events/alarms are:

“POWER RESET”—occurs upon power up

“HIGH AIR TEMP”—heating is disabled during this alarm

“LOW AIR TEMP”

“AIR SENSOR FAIL”—heating is disabled during this alarm

“DOOR AJAR”—occurs if the door remains open for 1 minute—comes disabled from factory.

Consult factory to enable.

SETUP

Pressing the Prg button and holding it down for 5 seconds will display the following setup menu.

```
      SETUP MENU
    SET POINTS      >
PARAMETERS      >
```

Pressing the ← key will move the cursor to the SET POINTS field. Pressing the down arrow key will display the following screens.

Note: As detailed above, a password of 14 is required to enter the following screens.

Screen 1: Temperature Set Point

```
      TEMPERATURE
      SET POINT
160.0°F
```

Screen 2: Air Temperature Alarm Set Points

```
      AIR TEMP ALARM
      OFFSET>10.0°F
HIGH:170.0°F
```

OFFSET: Offset from the air temperature set point which an alarm will occur.

HIGH: High temperature alarm setting.

LOW: Low temperature alarm setting.

Screen: Air Temperature Alarm Set Points 2

```
      AIR TEMP ALARM 2
      ALARM DELAY>120 sec
```

ALARM DELAY: Amount of time in seconds that an air temperature alarm setting is exceeded before an alarm will occur.

Pressing the down arrow key while in the PARAMETERS field will display the following screens.

Note: A password of 20 is required to enter the following screens.

Screen 1: Real Time Clock Setup

```
CURRENT TIME/DATE
SET TIME>00:00

SET DATE>00/00/00
SET DAY>TUESDAY
```

Pressing the ↵ key will move the cursor to the appropriate field.
Pressing the up and down arrow keys will allow the editing of the field.

Screen 2: Door Ajar Alarm

```
DOOR AJAR ALARM
ENABLE

DELAY> 1 min
```

ENABLE/DISABLE: Allows the user to enable or disable the door ajar alarm.

DELAY: Time in minutes that the door must remain open before the door ajar alarm will occur.

Screen 3: Air Temp Calibrate

```
AIR TEMP
CALIBRATE

OFFSET> 0.0°F
```

OFFSET: Allows calibration of the air temperature sensor.

Screen 4: Units

```
UNITS
FAHRENHEIT
```

UNITS: Allows the changing of the temperature read out from Fahrenheit to Centigrade.

Note: Changing the UNITS will not change the alarm offset or the calibration values.

Screen 5: Communication Parameters

```
COMMUNICATIONS
UNIT IDENT> 1
BAUD RATE> 19200
PROTOCOL>MODBUS
```

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:

SUP RS232--For use with Remote Supervisor. Requires optional software, software key, and RS232 communications board.

SUP 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.

Screen 6: Analog Output for Air Temperature Re-Transmit

```
ANALOG OUTPUT SETUP
LOW SETUP>2V
2V> 60.0 °F
10V>180.0 °F
```

LOW SETUP: This can be set to 2V for 2 to 10VDC output or 0V for a 0 to 10VDC output.

2V(0V): This calibrates the temperature to the lowest voltage output.

10V: This calibrates the temperature to the highest voltage output.

```
SCHEDULE SETUP 1
SCHEDULE>DISABLE
MONDAY START>07:00
MONDAY END>17:00
```

```
SCHEDULE SETUP 2
TUESDAY START>07:00
TUESDAY END>17:00
```

```
SCHEDULE SETUP 3
WEDNESDAY START>07:00
WEDNESDAY END>17:00
```

```
SCHEDULE SETUP 4
THURSDAY START>07:00
THURSDAY END>17:00
```

```
SCHEDULE SETUP 5
FRIDAY START>07:00
FRIDAY END>17:00
```

```
SCHEDULE SETUP 6
SATURDAY START>00:00
SATURDAY END>00:00
```

```
SCHEDULE SETUP 7
SUNDAY START>00:00
SUNDAY END>00:00
```

SCHEDULE: DISABLE/ENABLE the daily schedule. If this set point is set to disable, the unit will run 24 hours a day, 7 days a week.

MONDAY START...SUNDAY START: The time(hour:minute) which the unit will start operating on the respective day. Set this time approximately 1 hour before the unit will be utilized since it takes about 1 hour to reach operating temperature.

MONDAY END...SUNDAY END: The time(hour:minute) which the unit will stop operating on the respective day.

Note: If the start and end times are set to the same time, the unit will not operate during that respective day.

Note: The holiday schedule will override the daily schedule.

Screen 14 through 19: Holiday Override.

HOLIDAY OVERRIDE 1
 MONTH>NA DAY>NA
 START>00:00
 END>00:00

HOLIDAY OVERRIDE 2
 MONTH>NA DAY>NA
 START>00:00
 END>00:00

HOLIDAY OVERRIDE 3
 MONTH>NA DAY>NA
 START>00:00
 END>00:00

HOLIDAY OVERRIDE 4
 MONTH>NA DAY>NA
 START>00:00
 END>00:00

HOLIDAY OVERRIDE 5
 MONTH>NA DAY>NA
 START>00:00
 END>00:00

HOLIDAY OVERRIDE 6
 MONTH>NA DAY>NA
 START>00:00
 END>00:00

MONTH: Month of holiday. Set to NA when not used.

DAY: Day of holiday. Set to NA when not used

START: The time(hour:minute) which the unit will start operating on the respective date. Set this time approximately 1 hour before the unit will be utilized since it takes about 1 hour to reach operating temperature.

END: The time(hour:minute) which the unit will stop operating on the respective date.

Note: The schedule must be enabled in order for the holiday override to operate—see screen 4.

Note: The holiday schedule will override the daily schedule.

MAINTENANCE

PERIODIC 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.**

All moving parts have been permanently lubricated and will generally require no maintenance.

MAINTENANCE SERVICE AND ANALYSIS GUIDE

MALFUNCTION

POSSIBLE CAUSE

SOLUTION

Heater inoperative

1. High limit thermostat tripped
2. Wiring incorrect

1. Manually reset thermostat
2. Check wiring against diagram

No power to cabinet

1. Service cord unplugged
2. Circuit breaker supplying main electrical receptacle tripped
3. Wiring incorrect
4. Main cabinet power switch off

1. Plug in service cord
2. Determine reason and correct
3. Check wiring against diagram
4. Turn on power switch

Objectionable noise

1. Vibrating fan blade
2. Worn fan motor bearings

1. Replace fan blade
2. Replace fan motor

