Platelet Incubator Service Manual

i.Series® and Horizon Series™

Countertop

i.Series

PC100i, PC900i, PC1200i

PC100h, PC900h, PC1200h

Floor

i.Series

PC2200i, PC3200i, PC4200i

PC2200h, PC3200h, PC4200h

360096-1/Q

Document History

Revision	Date	CO	Supersession	Revision Description
I	28 JUN 2013	8414	Supersedes A, B, C, D, E, F, G, H	Revised layout for ease of navigation and locating information.
J	23 DEC 2013	8965	J supersedes I	Added 100 V information. Added caution note for remote alarm interface. Revised section I for consistency with existing manuals.
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Q	17 AUG 2018	13839	Q supersedes P	Updated refrigerant charge information for PC100, PC900 and PC1200, 230 V models. Added FCC compliance information.

* *Date submitted for Change Order review. Actual release date may vary.*

Document Updates

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The screenshots and component images appearing in this guide are provided for illustrative purposes only, and may vary slightly from the actual software screens and/or product components.

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1 About this Manual

This manual covers all platelet incubators, which may be identified singly, by their size, or by their respective “Series” and provides information on how to use the device. It is intended for use by end users of the platelet incubator and authorized service technicians.

Generic references are used throughout this manual to group models that contain similar features. For example, “PC100 models” refers to all models of that size (PC100i, PC100h).

1.1 Safety Precautions and Symbols

Symbols found in this document

The following symbols are used in this manual to emphasize certain details for the user:

Task Indicates procedures which need to be followed.

Note Provides useful information regarding a procedure or operating technique when using Helmer Scientific products.

NOTICE Advises the user against initiating an action or creating a situation which could result in damage to equipment; personal injury is unlikely.

CAUTION Advises the user against initiating an action or creating a situation which could result in damage to equipment or impair the quality of the products or cause minor injury.

WARNING Advises the user against initiating an action or creating a situation which could result in damage to equipment and serious personal injury to a patient or the user.

Authorized representative in the European Community

Symbols found on the units

The following symbols may be found on the refrigerator or refrigerator packaging:

CE Mark (European units only)

Caution: Risk of damage to equipment or danger to operator

Caution: Hot surface

Caution: Shock / electrical hazard

Caution: Unlock all casters

Earth / ground terminal

Protective earth / ground terminal

Product falls under the scope of the WEEE (Waste Electrical and Electronic Equipment) directive.

Avoiding Injury

Review safety instructions before installing, using, or maintaining the equipment.

- Before moving unit, remove contents from the drawers (if applicable).
- Do not open multiple drawers at the same time (if applicable).
- Before moving unit, ensure door(s) are closed and casters (if applicable) are unlocked and free of debris.
- Before moving unit, disconnect the AC power cord and secure the cord.
- When moving unit, use assistance from a second person.
- Never physically restrict any moving component.
- Avoid removing electrical service panels and access panels unless so instructed.
- Keep hands away from pinch points when closing the door or when agitation motion is enabled (if applicable).
- Avoid sharp edges when working inside the electrical compartment.
- Ensure biological materials are stored at recommended temperatures determined by standards, literature, or good laboratory practices.
- Proceed with caution when adding and removing samples from the platelet incubator.
- Use supplied power cord only.
- Using the equipment in a manner not specified by Helmer Scientific may impair the protection provided by the equipment.
- Ensure biological materials are stored safely, in accordance with all applicable organizational, regulatory, and legal requirements.
- The platelet incubator is not considered to be a storage cabinet for flammable or hazardous materials.

NOTICE

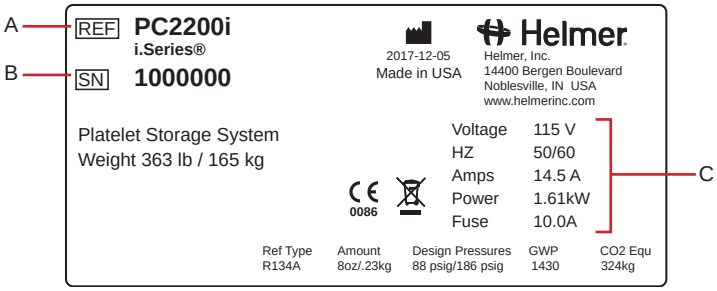
Decontaminate parts prior to sending for service or repair. Contact Helmer Scientific or your distributor for decontamination instructions and a Return Authorization Number.

1.2 Product Labels

Note

Service information varies depending on the model and power requirements.

This information appears on the product specification label, on the back of the platelet incubator.



Sample Product Specification label.

Label	Description
A	Model
B	Serial number (SN)
C	Power requirements

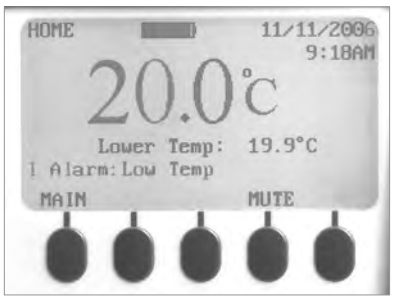
1.3 Control System

Note

Service information varies depending on the control system.

i.Center Control System

i.Series platelet incubators are equipped with the i.Center monitoring system. A separate temperature controller is located behind the control panel on the platelet incubator.



i.Center monitoring system.

Temperature controller.

Horizon Series Control System

Horizon Series platelet incubators feature the combined temperature monitor and controller. The Horizon Series system controls chamber temperature and monitors and displays operational information.

Horizon Series temperature controller and display.

1.4 Temperature Probes

Number and location of probes varies by model:

Model	Location
PC100	Front, top right corner
PC900	Back, right bottom corner
PC1200	Back, right bottom corner
PC2200	Front, right, between upper shelf and top of cabinet
PC3200	Front, right, between upper shelf and top of cabinet
PC4200	Front, right, next to middle shelf

1.5 Chart Recorder

If installed, refer to the Temperature Chart Recorder Operation and Service Manual.

The chart recorder has a battery system, enabling a period of continuous operation if power is lost. Battery life varies by manufacturer as well as voltage level remaining. Providing full power is available, backup power for the temperature chart recorder is available for up to 14 hours.

Prior to use:

- Install battery.
- Add paper.
- Calibrate chart recorder to match upper chamber temperature.

Open door by pressing and releasing.

Install Chart Paper

Note

For accurate temperature reading, ensure that current time is aligned with time line groove when chart knob is tightened.

1. Press and hold **C** button. When stylus begins to move left, release button. The LED flashes to indicate current temperature range.
2. When stylus stops moving, remove chart knob then move knob up and away.
3. Place chart paper on chart recorder.
4. Gently lift stylus and rotate paper so current time line corresponds to time line groove.

5. Hold chart paper and reinstall chart knob.
6. Confirm temperature range is set to the correct value.
7. Press and hold **C** button. When stylus begins to move right, release button.
8. Confirm stylus is marking temperature correctly.

i.Series® Models

2 Installation and Configuration

2.1 Install Batteries for Backup Power

The monitoring system and chart recorder each have a battery system, enabling a period of continuous operation if power is lost.

Battery life varies by manufacturer as well as voltage level remaining. Providing full power is available and no battery-related alarms are active, backup power for the monitoring system is available for up to two hours.

The batteries are located on the top of the platelet incubator, under a removable access panel.

Batteries are disconnected for shipping. Reconnect batteries to provide monitoring system with backup power in the event of AC power failure.

Notes

- The monitoring system will start on battery power alone. If the platelet incubator was previously not connected to AC power and the batteries are connected, the monitoring system will begin running on battery power.
- If AC power is lost, the monitoring system will continue to collect data until battery power is depleted.

CAUTION

Before installing or replacing batteries, switch the power **OFF** and disable backup power to the i.Center monitoring system by switching the ON/OFF key switch **OFF** (located behind the control door). Disconnect the platelet incubator from AC power.

NOTICE

Use only manufacturer supplied battery when installing a replacement battery.

2.2 Platelet Agitator and Platelet Incubator Compatibility

i.Series platelet incubators may be fitted with i.Series platelet agitators. When installed in an i.Series platelet incubator, the i.Series platelet agitator can be monitored by the platelet incubator's AgiTrak™ system.

The AgiTrak system receives alarm information through a direct connection from the platelet agitator's alarm system to the platelet incubator's alarm system.

Note

Only i.Series platelet incubators can monitor i.Series platelet agitators.

Platelet Incubator	Compatible Helmer Platelet Agitator
PC100i	PF15i
PC900i	PF48i
PC1200i, PC2200i, PC3200i	PF96i

2.3 Install a Platelet Agitator in the Platelet Incubator

Notes

- This section is not applicable to the PC4200i platelet incubator, which has a built-in platelet agitator.
- For additional instruction on configuring a platelet agitator in a platelet incubator, refer to the platelet agitator service manual.

PC900i platelet incubator with a PF48i platelet agitator installed.

Helmer platelet agitators can be installed inside Helmer platelet incubators. i.Series platelet agitators can be connected to i.Series platelet incubators via a data cable. The connection allows the platelet incubator to monitor the platelet agitator motion, and to sound an alarm when agitation motion stops.

PC2200i and PC3200i platelet incubators hold 1 agitator per shelf. Each shelf features a corresponding power connector. In PC2200i and PC3200i platelet incubators, each shelf includes a data port. Through the data port and data cable, agitation motion is communicated from i.Series platelet agitators to the i.Series platelet incubator.

When installing a platelet agitator on a shelf, use the power connector for that shelf to prevent the power cord from obstructing the agitation motion. When installing an i.Series platelet agitator on a shelf in an i.Series platelet incubator, use the data port for that shelf so agitation motion is communicated appropriately.

2.4 External Monitoring Devices

The remote alarm interface is a relay switch with three terminals:

- Common (COM)
- Normally Open (NO)
- Normally Closed (NC)

Terminals are dry contacts and do not supply voltage. Interface circuit is either normally open or normally closed, depending on terminals used.

Requirements for your alarm system determine which alarm wires must connect to terminals.

CAUTION

- The interface on the remote alarm monitoring system is intended for connection to the end user's central alarm system(s) that uses normally-open or normally-closed dry contacts.
- If an external power supply exceeding 30 V (RMS) or 60 V (DC) is connected to the remote alarm monitoring system's circuit, the remote alarm will not function properly; may be damaged; or may result in injury to the user.

NOTICE

- For any platelet incubator (except PC4200i) without a platelet agitator installed, a bypass plug is needed for a normally-closed interface circuit.
- The bypass plug is needed if multiple platelet agitators are installed, and not all are Helmer i.Series platelet agitators. For each position in which a non-Helmer i.Series platelet agitator is installed, the bypass plug must be installed in the data port.
- To obtain a bypass plug, contact Helmer Technical Service.

The terminals on the remote alarm interface have the following maximum load capacity:

- 0.5 A at 30 V (RMS)
- 1.0 A at 24 V (DC)

Connect to Remote Alarm Interface

1. Switch the Battery ON/OFF key switch **OFF**. Switch the AC ON/OFF switch **OFF**.
2. On the alarm panel, locate the remote alarm terminals.
3. Connect remote alarm wires to appropriate terminals, according to requirements for your alarm system.
4. Use a cable tie to relieve strain on alarm wires (as necessary).
5. Switch the Battery ON/OFF switch **ON**. Switch the AC ON/OFF switch **ON**.
6. Touch **MUTE** to disable the high temperature alarm while platelet incubator reaches operating temperature.

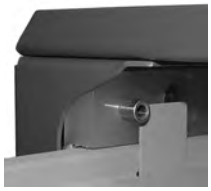
Remote alarm interface.

2.5 Configure Drawers (PC4200i)

⚠ CAUTION

- Before moving drawers, ensure they are completely empty for safe lifting.
- Open the drawer using the drawer handle; not the label holder.

Remove / Install Drawer

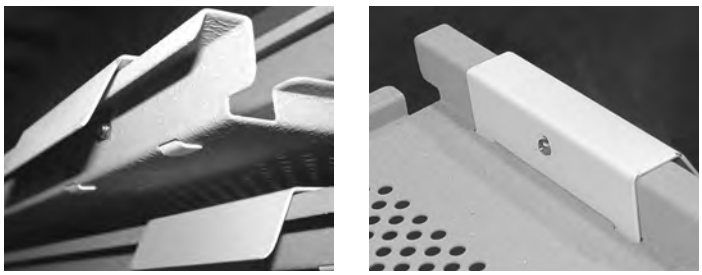

Drawer in the full open position.

Drawer with the tab in front of the drawer stop.

1. Pull drawer out until it stops (when the tabs on the drawer contact the spring-loaded stops).
2. Depress the spring-loaded drawer stops.
3. Pull the drawer outward until the tabs on the drawer have passed the drawer stops.
4. Pull drawer free of the drawer slides.
5. Align drawer with the drawer slides.
6. Push drawer in until it stops (when the tabs on the drawer contact the spring-loaded stops).
7. Depress the spring-loaded drawer stops.
8. Push the drawer into the storage frame until it stops.

2.6 Drawer Labels

Drawer label holders may be installed on platelet agitator drawers.


Installed label holder.

Install Label Holders:

1. Insert the tabs on the label holder into the slots on the drawer.
2. Pivot the holder around the drawer handle. Align the hole on the label holder with the corresponding hole on the drawer.
3. Insert a screw through the hole in label holder and through the hole in the drawer.
4. Install the nut on the screw, on the back side of the label holder.

3 Temperature Monitor Settings

Through the i.Center monitoring system, current settings may be viewed and changed. The settings that can be viewed or changed are as follows:

Setting	Description
Clock Mode	Time format used on the HOME screen and the Event Log
Date Format	Date format used on the HOME screen and on the Event Log
Door Ajar Timeout	Number of minutes the door can be open before an alarm activates
Pwr Failure Timeout	Number of minutes the platelet incubator can be without AC power before an alarm activates
High Alarm Setpoint	Temperature at which the High Temperature Alarm activates
Low Alarm Setpoint	Temperature at which the Low Temperature Alarm activates
Cond. Alarm Setpoint	Temperature at which the Condenser Temperature Alarm activates
Alarm Volume	Volume for audible alarms
Alarm Pulse	Pattern for audible alarms
Chart Paper Timer; or Chart Paper Days Left	Setting for the chart paper timer (disabled); or the number of days remaining before chart paper must be changed (if temperature chart recorder is installed)
Temperature Graph	The setting for the temperature graph feature (Enabled or Disabled)
Agitator Alarms	Settings for the motion alarm for each Helmer i.Series agitator installed in the platelet incubator, or built-in agitator (PC4200i) • All platelet incubators are programmed to monitor three positions, even though some models accommodate fewer platelet agitators. • Positions that are not in use are set to **OFF**. • Positions that are in use are set to **ON** and display the number of minutes the agitator can be stopped before an alarm activates.

View settings

Note

The Configuration screen is password protected. The factory default password is “1234”.

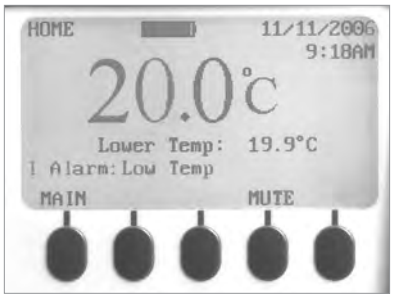
1. On the Home screen, press the **MAIN** button.
2. Press the **DOWN** button to highlight View Configuration. Press the **SELECT** button.
3. Press the **UP** or **DOWN** button to highlight the desired option. Press the **SELECT** button.
4. Press the **BACK** button to return to the View Configuration screen, or press the **HOME** button to exit.

NOTICE

Changing temperature monitor settings affects operation of the platelet incubator. Do not change settings unless instructed in product documentation or by Helmer Technical Service.

3.1 Home Screen

The Home screen appears when the **HOME** button is touched from any other screen, or there is no interaction for two minutes on any screen other than the password entry screen.



HOME screen on the monitoring system.

Home Screen Functions

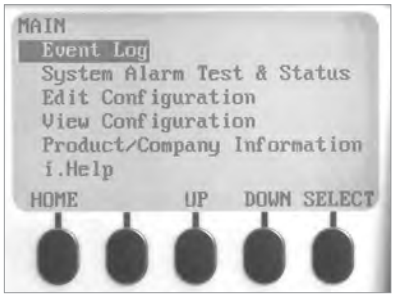
Note

Refer to section 9 (i.Center Screen Reference) for a complete list of screens in the i.Center monitoring system.

- View current temperature readings
- View the current time and date
- View detailed information about current or previous alarm events
- View the remaining backup battery charge
- View active alarms
- Mute audible alarms
- Adjust contrast
- View 24-hour chamber temperature graph
- Access Main screen to view and change settings

3.2 Main Screen

The Main screen displays functional options that allow access to all other screens in the system.



MAIN screen functional options.

Functions available from the Main screen:

Option	Function
Event Log	View historical information about alarms and operational events
System Alarm Test & Status	Start or stop an automatic test for temperature alarms View the number of days remaining before the paper for the temperature chart recorder needs to be changed View the current status of the door (OPEN or CLOSED) View the current condenser temperature
Edit Configuration (password required)	Change the language used for text Change date and time information Change temperature units Change the volume and pattern for audible alarms Enable or disable the chart paper timer Enable or disable the temperature graph display Change alarm-related setpoints and timers Calibrate the temperature probe reading Change some settings to the factory default values Change the password, preventing unauthorized changes Configure the AgiTrak system to monitor agitation
View Configuration	View the date and time formats View alarm-related setpoints and timers View the volume and pattern for audible alarms View the setting for the chart paper timer View the setting for the temperature graph display View the settings for agitator alarms
Product/Company Information	View the software versions for control and display components of the monitoring system View information to contact Helmer
i.Help	Access the on-board help system View real-time agitation speed and cycle counts View historical agitation event logs and details Reset cycle counters for agitators

3.3 Change Configuration Password

The default password is 1234. A new password must use four digits, ranging from 1 to 5.

Change the password:

1. On the Home screen, press the **MAIN** button.
2. Press the **DOWN** button to select Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to select Change Password. Press the **SELECT** button.
5. Enter the new password, then re-enter the new password when prompted. If password entries match, the “update” message is displayed. If password entries do not match, the “incorrect match” message is displayed.
6. Repeat the procedure to change the password.

3.4 Calibrate Temperature Probes

Verify the temperature probe(s) are reading chamber temperature correctly by comparing the chamber probe reading to temperature read by an independent thermometer. If the chamber temperature probe(s) are not reading correctly, change the value displayed on the temperature monitoring system.

Notes

- If the variance is within acceptable limits for your organization, changing probe settings is optional.
- Default setting for chamber temperature is 22.0 ºC. Value is factory-preset
- Value can be changed from -40.0 ºC to +40.0 ºC

Calibrate Probe(s)

Model	Location	Model	Location
PC100i	Front, top right corner	PC3200i	Upper reading: next to upper temperature probe Lower reading: next to lower temperature probe
PC900i, PC1200i	Back, right bottom corner	PC4200i	Upper or lower reading: in the middle shelf on the right side
PC2200i	Next to upper temperature probe		

1. Using the table above, place a calibrated independent reference thermometer traceable per national standards in the specified location.
2. Close the door and allow the chamber temperature to stabilize for 30 minutes.
3. Observe and note the thermometer temperature.
4. On the Home screen, press the **MAIN** button.
5. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
6. Enter the password when prompted.
7. Press the **DOWN** button to highlight Temperature Calibration. Press the **SELECT** button.
8. Follow the system prompts for Model Type.

- ***For models with two probes***, press the **UP** or **DOWN** buttons to select the Upper Probe or Lower Probe options. Press the **SELECT** button, then press the **DOWN** button to highlight the Temperature option.
- ***For models with one probe***, the Upper Probe option is displayed and the Temperature option is highlighted.

9. Press the **INC** or **DEC** buttons to change the displayed value to match the value measured by the independent thermometer.
10. Press the **DOWN** button to highlight Store Calibration.
11. To save the new value, press the **ENTER** button. The “Calibration Memorized” message appears. New settings are saved.
12. To discard the new value, press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. New settings are not saved.
13. Remove the thermometer from the chamber and close the door.

Notes

- The current temperature displayed by the monitoring system may change so that it no longer matches the new probe calibration value. This is normal.
- If a new probe value is entered but not saved, the new value will appear when the calibration setting for the probe is viewed. This is normal.

3.5 Factory Default Settings

Settings listed below may be simultaneously returned to factory default values.

Setting	Restored Value
High Alarm Setpoint	24.0 °C
Low Alarm Setpoint	20.0 °C
Cond. Alarm Setpoint	50.0 °C
Door Ajar Timeout	3 minutes
Power Failure Timeout	3 minutes
Agitator 1 Setpoint	ON, 3 minutes
Agitator 2 Setpoint	ON, 3 minutes
Agitator 3 Setpoint	ON, 3 minutes

Restore Factory Default Settings

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Factory Default Settings. Press the **SELECT** button.
5. Press the **ENTER** button to restore the Factory default settings.

3.6 Alarm Reference

If an alarm condition is met, an alarm activates. Some alarms are visual only; others are visual and audible. Some alarms are sent through the remote alarm interface.

The table indicates if an alarm is audible (A), visual (V), or sent through the remote alarm interface (R).

Alarm	Alarm Type
High Temperature	A, V, R
Low Temperature	A, V, R
Condenser Temperature	A, V, R (i.Series)
Door Open	A, V, R (i.Series)
Low Battery	V (i.Series)
No Battery	A, V, R (i.Series)
AC Power Failure	A, V, R
Change Chart Paper [1]	V (i.Series)
Agitator 1 Motion Alarm [2]	A, V, R (i.Series); A, R (Horizon Series)
Agitator 2 Motion Alarm [3, 5]	A, V, R (i.Series); R (Horizon Series)
Agitator 3 Motion Alarm [4, 5]	A, V, R (i.Series); R (Horizon Series)

(1) Applicable if a temperature chart recorder is installed. Additional alarms may be available on the stand-alone chart recorder. Refer to the Temperature Chart Recorder operation and service manual.

(2) Applicable to PC4200 platelet incubators. For other models, this alarm applies if a Helmer i.Series platelet agitator is installed as Agitator 1.

(3) Applicable to PC2200 and PC3200 platelet incubators with a Helmer i.Series platelet agitator installed as Agitator 2.

(4) Applicable to PC3200 platelet incubators with a Helmer i.Series platelet agitator installed as Agitator 3.

(5) Not applicable to PC4200h platelet incubators.

3.7 Alarm Settings

The following alarm settings may be changed by the operator. The setpoint for temperature alarms may be changed (where applicable), as well as the time delay between when the alarm condition commences and when the visual and audible alarms are initiated.

Setting	Default Setting	Default Time Delay
Alarm Volume	10	n/a
Alarm Pulse	Single	n/a
High Alarm Setpoint	24.0 °C	n/a
Low Alarm Setpoint	20.0 °C	n/a
Condenser Alarm	50.0 °C	n/a
Power Failure	n/a	3 minutes
Door Ajar Timeout	n/a	3 minutes
Motion	On	3 minutes

Alarm Volume

The Alarm Volume controls volume for all audible alarms. The default setting is 10 and can be changed from 1 to 10 with 10 being the maximum setting.

Change the Alarm Volume

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight System Options. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Alarm Volume.
6. Press the **INC** or **DEC** buttons to change the setting.
7. Press the **BACK** button to return to Edit Configuration screen, or press the **HOME** button to exit. The new settings are saved.

Alarm Pulse

The alarm pattern can be changed to provide an easily distinguished sound. The default setting is Single, but may be changed to Double, Triple or Constant.

Change the Alarm Pulse

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight System Options. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Alarm Pulse.
6. Press the **INC** or **DEC** buttons to change the setting.
7. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. The new settings are saved.

High Chamber Temperature Alarm

The High Alarm setpoint specifies the temperature at which the High Temperature Alarm activates. If the temperature detected by the upper chamber probe is greater than or equal to this value, the alarm activates. The default setpoint is 24 °C and can be changed from -40 °C to +40 °C.

Change High Temperature Setpoint:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Alarm Setpoints. Press the **SELECT** button.
5. Press the **DOWN** button to highlight High Alarm Setpoint.
6. Press the **INC** or **DEC** buttons to change the setting.
7. Press the **BACK** button to return to Edit Configuration screen, or press the **HOME** button to exit. The new settings are saved.

Low Chamber Temperature Alarm

The Low Alarm setpoint specifies the temperature at which the Low Temperature Alarm activates. If the temperature detected by the upper chamber probe is less than or equal to this value, the alarm activates. The default setpoint is 20 °C and can be changed from -40 °C to +40 °C.

Change Low Temperature Setpoint:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Alarm Setpoints. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Low Alarm Setpoint.
6. Press the **INC** or **DEC** buttons to change the setting.
7. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. The new settings are saved.

Condenser Temperature Alarm

The Condenser Alarm setpoint specifies the temperature at which the Condenser Temperature Alarm activates. If the temperature of the condenser discharge line is greater than or equal to this value, the alarm activates. The default setpoint is 50 °C and can be changed from -40 °C to +80 °C.

NOTICE

Condenser Temperature Alarm should not be changed unless directed by Helmer Technical Service.

Change Condenser Temperature Setpoint:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Alarm Setpoints. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Cond. Alarm Setpoint.
6. Press the **INC** or **DEC** buttons to change the setting.
7. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. The new settings are saved.

Power Failure Alarm

The Power Failure Timeout specifies longest time the platelet incubator can be without AC power before the alarm activates. If the time elapsed since the last power failure is greater than or equal to this value, the alarm activates. The default setting is three (3) minutes and can be changed from 0 to 60 minutes.

Change the Power Failure Alarm Delay:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Alarm Setpoints. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Power Failure Timeout.
6. Press the **INC** or **DEC** buttons to change the setting.
7. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. The new settings are saved.

Door Ajar Timeout

The Door Ajar Timeout specifies longest time the platelet incubator door(s) can be open before the alarm activates. If the time elapsed since the last door opening is greater than or equal to this value, the alarm activates. The default delay setting is three (3) minutes and can be changed from 0 to 60 minutes.

Change the Door Ajar Alarm Delay:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Alarm Setpoints. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Door Ajar Timeout.
6. Press the **INC** or **DEC** buttons to change the setting.
7. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. The new settings are saved.

Motion Alarm (PC4200i)

Unlike other i.Series models, the PC4200i platelet incubator has a motion alarm delay control. When the platelet agitator motion stops, this control delays when alarm information is sent to the remote alarm interface on the platelet incubator. The alarm delay control does not delay motion information sent to the AgiTrak system. When the Agitator Alarm Setpoint is reached, the AgiTrak system activates an alarm, which is also sent to the remote alarm interface on the platelet incubator.

Notes

- To prevent a motion alarm being communicated by an external monitoring device but not by the platelet incubator, set the alarm delay control to a value greater than the Agitator 1 Setpoint.
- The alarm delay control for the motion alarm is located on the rear of the platelet incubator.

Top: Motion alarm volume control. Bottom: Alarm delay control for the motion alarm.

The default motion alarm delay is set at the halfway point (approximately four (4) minutes). To change the motion alarm delay, use a small flat-head screwdriver. The maximum alarm delay is eight (8) minutes.

The default alarm volume is set at the middle position (medium).

Note

Do not set the alarm delay to 0 minutes.

Change Motion Alarm Delay:

Using a small, flat-head screwdriver, rotate the control to the left (counterclockwise) to shorten the motion alarm delay, or to the right (clockwise) to extend the motion alarm delay.

Change Motion Alarm Volume:

1. On back of the platelet incubator, locate the alarm volume control.
2. Position the switch to correspond with the desired motion alarm volume.

3.8 Alarm Tests

Test alarms to ensure they are working correctly. The platelet incubator has alarms for chamber temperature, compressor temperature, door open (time), agitation motion (for installed platelet agitators and built-in PC4200i platelet agitator), low battery, and power failure.

Note

Before testing alarms, protect items in the platelet incubator from extended exposure to adverse temperature.

Automatic Chamber Temperature Alarm Test

Note

- Calibrate the chamber temperature probe prior to performing the Automatic Chamber alarm test.
- The test can be aborted by selecting the Cancel High or Low Test option.
- The test takes less than five minutes.

When performing an automatic temperature alarm test, the Peltier device heats or cools the temperature probe until the high or low alarm setpoint is reached. An event is added to the Event Log to indicate a temperature alarm was activated.

Test the low alarm:

1. Identify the current setting for the low alarm setpoint.
2. Press the **MAIN** button.
3. Press the **DOWN** button to select System Alarm Test & Status. Press the **SELECT** button. The System Alarm Test & Status screen appears.
4. Press the **DOWN** button to select Start Low Alarm Auto Test. Press the **SELECT** button. The “Low Alarm Test in Progress” message appears. When the test is complete, the message clears.
5. View the Event Log. Note the temperature at which the low alarm occurred. Compare the temperature to the low alarm setpoint. If the values do not match, refer to Troubleshooting.

Test the high alarm:

1. Identify the current setting for the high alarm setpoint.
2. Press the **MAIN** button.
3. Press the **DOWN** button to select System Alarm Test & Status. Press the **SELECT** button. The System Alarm Test & Status screen appears.
4. Press the **DOWN** button to select Start High Alarm Auto Test. Press the **SELECT** button. The “High Alarm Test in Progress” message appears. When the test is complete, the message clears.
5. View the Event Log. Note the temperature at which the low alarm occurred. Compare the temperature to the high alarm setpoint. If the values do not match, refer to Troubleshooting.

Cancel the test:

1. Press the **MAIN** button.
2. Press the **DOWN** button to select System Alarm Test & Status. Press the **SELECT** button. The System Alarm Test & Status screen appears.
3. Press the **DOWN** button to select Cancel High or Low Test. Press the **ENTER** button. The test is cancelled.

Note

When cancelling an automatic test, the message indicating the test is in progress clears immediately. If a setpoint was reached before the test was cancelled, the alarm activates and clears, as described earlier.

Manual Chamber Temperature Alarm Test (PC100i)

Notes

- Perform the low alarm test before the high alarm test to control the temperature more closely and complete the testing more quickly.
- Calibrate the chamber temperature probe prior to performing the manual chamber alarm test.
- To perform the manual chamber alarm test on PC100i platelet incubators, obtain the alarm check tube.
- Fill the tube with 2” (51 mm) of hot or cold water as noted in the instructions, and place the filled alarm check tube over the chamber probe to perform the test.
- Do not remove the chamber probe from PC100i platelet incubators.
- Temperature probes are fragile; handle with care.

Test the Low Alarm:

1. Identify the current setting for the low alarm setpoint.
2. Remove the installed platelet agitator(s) to allow access to the to the chamber probe.
3. Fill the alarm check tube with cold water.
4. Place the alarm check tube in the holding bracket. Slide the tube upward to immerse the probe tip.
5. When the low temperature alarm sounds, note the temperature on the monitoring and control system display.
6. Compare the temperature at which the alarm sounds to the low alarm setpoint. If the values do not match, refer to Troubleshooting.

Test the High Alarm:

1. Identify the current setting for the high alarm setpoint.
2. Fill the alarm check tube with hot water.
3. Place the alarm check tube in the holding bracket. Slide the tube upward to immerse the probe tip.
4. When the high temperature alarm sounds, note the temperature on the monitoring and control system display.
5. Compare the temperature at which the alarm sounds to the high alarm setpoint. If the values do not match, refer to Troubleshooting.
6. Reinstall the platelet agitator in the chamber.
7. Slide the alarm check tube down so the probe is no longer immersed.

Manual Chamber Temperature Alarm Test (PC900i, PC1200i, PC2200i, PC3200i, PC4200i)

Notes

- Perform the low alarm test before the high alarm test to control the temperature more closely and complete the testing more quickly.
- Calibrate the chamber temperature probe prior to performing the manual chamber alarm test.
- To perform the manual chamber alarm test on PC100i platelet incubators, obtain the alarm check tube.
- Fill the tube with 2” (51 mm) of hot or cold water as noted in the instructions, and place the filled alarm check tube over the chamber probe to perform the test.
- Do not remove the chamber probe from PC100i platelet incubators.
- Temperature probes are fragile; handle with care.

Test the Low Alarm:

1. Identify the current setting for the low alarm setpoint.
2. Remove the installed platelet agitator(s) to allow access to the to the chamber probe.
3. Loosen the screws securing the chamber probe bracket to the chamber wall. Slide the bracket up and away from the wall.
4. Remove the probe from the bracket by unscrewing and removing the fitting securing the probe to the bracket.

5. Slide the probe tip upward and free the probe from the bracket.

6. Immerse the probe in cold water. Ensure the probe is at the bottom of the glass.
7. When the low temperature alarm sounds, note the temperature on the monitoring system display.
8. Compare the temperature at which the alarm sounds to the low alarm setpoint. If the values do not match, refer to Troubleshooting.

Test the High Alarm:

1. Identify the current setting for the high alarm setpoint.
2. Immerse the probe in hot water. Ensure the probe is at the bottom of the glass.
3. When the high temperature alarm sounds, note the temperature on the monitoring system display.
4. Compare the temperature at which the alarm sounds to the high alarm setpoint. If the values do not match, refer to Troubleshooting.
5. Remove the probe from the warm water.
6. Install the probe in the chamber probe bracket.
7. Install the fitting to secure the probe to the probe bracket, leaving approximately 1” (25 mm) of the probe exposed beyond the fitting.
8. Install the probe bracket in the chamber and tighten the screws.
9. Reinstall the platelet agitator(s) in the chamber.

Power Failure Alarm Test

Notes

- During a power failure, the power failure alarm sounds and the batteries provide power to the monitoring system.
- If AC power fails, the backup batteries will allow for continued data collection and temperature display.
- If the backup batteries fail, data is not collected and the temperature is not displayed.
- When power is restored, the 24 hours of data prior to the power loss are retained in the system memory. Stored temperature data is displayed on the graph and the monitoring system resumes data collection and display.

Test Power Failure Alarm

1. Confirm the platelet incubator is connected to AC power.
2. Ensure the monitoring system backup battery is switched **ON**.
3. Press the **MAIN** button.
4. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
5. Enter the password when prompted.
6. Press the **DOWN** button to highlight Alarm Setpoints. Press the **SELECT** button.
7. Press the **DOWN** button to highlight Power Failure Timeout.
8. Press the **DEC** button to change the setting to 0.
9. Switch the AC ON/OFF switch **OFF**. Power failure alarm will activate immediately.
10. Switch the AC ON/OFF switch **ON**. Power failure alarm will clear and audible alarm will cease.
11. Change the Power Failure Timeout setting to the original setting.

Door Ajar Alarm Test

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Agitator Setpoints. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Door Ajar Timeout.
6. Press the **DEC** button to change the setting to 0.
7. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. New settings are saved.
8. Open the door. Door ajar alarm will activate immediately.
9. Close the door. Door ajar alarm will clear and audible alarm will cease.
10. Change the Door Ajar Timeout setting to the original setting.

Motion Alarm Test

1. Ensure the Motion Alarm ON/OFF switch is switched **ON**.
2. Press the **MAIN** button.
3. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
4. Enter the password when prompted.
5. Press the **DOWN** button to highlight Alarm Setpoints. Press the **SELECT** button.
6. Press the **DOWN** button to highlight Agitator Alarm Setpoint. Press the **SELECT** button.
7. Press the **DOWN** button to highlight Agitator 1 Setpoint.
8. Press the **DEC** button to change the setting to 0.
9. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. New settings are saved.
10. Open the door. Agitation motion will stop and the motion alarm will activate immediately.
11. Close the door. Agitation motion will resume. The motion alarm will clear and the audible alarm will cease.
12. Change the Motion Alarm Delay setting to the original setting.

No Battery Alarm Test

Test the no battery alarm to ensure that it activates in the event the backup batteries are depleted.

Notes

- During a power failure, the power failure alarm sounds and the batteries provide power to the monitoring system.
- If AC power fails, the backup batteries will allow for continued data collection and temperature display.
- If the backup batteries fail, data is not collected and the temperature is not displayed.

Test No Battery Alarm:

1. Switch the Battery ON/OFF key switch **OFF**. The No Battery alarm will activate.
2. Switch the battery ON/OFF key switch **ON**. The No Battery alarm will clear.

NOTICE

Use a battery meeting manufacturer's specifications.

3.9 AgiTrak™ System

The AgiTrak system is integrated into the i.Center monitoring system. The AgiTrak system simultaneously receives motion information from as many as three i.Series platelet agitators. Within the AgiTrak interface, the topmost platelet agitator installed in the platelet incubator is numbered 1, and subsequent platelet agitators are numbered in ascending order.

Note

In the PC4200i platelet incubator, the built-in agitator is numbered 1.

Platelet Incubator Model	Agitator Positions
PC100i	1
PC900i	1
PC1200i	1
PC2200i	2
PC3200i	3
PC4200i	1

Note

The PC4200i's built-in agitator transmits motion and speed information directly to the AgiTrak system without a separate data cable.

The platelet incubator has a data port for each platelet agitator position. The installed platelet agitator transmits motion and speed information to the AgiTrak system through a data cable and the data port in the platelet incubator. The AgiTrak system monitors platelet agitator motion on/off status and current agitation speed.

If motion is not detected for the pre-configured amount of time, the AgiTrak system activates an alarm and records the alarm event(s) in the event log. For agitation information to be monitored correctly, each platelet agitator position must be enabled in the AgiTrak interface.

Disable a platelet agitator position through the AgiTrak interface under the following conditions:

- The position is not available
- The position is not in use
- The position has a Horizon Series agitator installed

Note

If a Horizon Series platelet agitator is installed in the platelet incubator, its position (in the AgiTrak interface) should be disabled to prevent false alarms.

The Agitator Alarm Setpoint specifies the longest the agitator can be stopped prior to alarm. If the time elapsed is greater than or equal to this value, an alarm activates. The default setting is three minutes. The Setting can be changed from 0 minutes to 60 minutes

Note

The AgiTrak system is intended to replace each i.Series platelet agitator alarm. The motion alarm on each installed i.Series platelet agitator should be disabled when using the alarms in the AgiTrak system.

View Real-Time Agitation Speed

For each i.Series platelet agitator installed in the platelet incubator (or for the built-in platelet agitator, in the case of a PC4200i platelet incubator). agitation speed may be viewed in real-time.

View Agitation Speed:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight i.Help. Press the **SELECT** button.
3. Press the **DOWN** button to highlight Agitator Information. Press the **SELECT** button. The Agitator RPM screen is displayed. The current speed for each platelet agitator is shown.
4. Press the **BACK** button to return to the i.Help screen, or press the **HOME** button to exit.

View Real-Time Agitator Cycle Counts

For each i.Series platelet agitator installed in the platelet incubator (or for the built-in platelet agitator, in the case of a PC4200i platelet incubator), cycle counts may be viewed in real-time. The cycle counter information is useful for troubleshooting problems with the agitation motion sensor, or for scheduling additional preventive maintenance functions.

View Agitation Cycle Count:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight i.Help. Press the **SELECT** button.
3. Press the **DOWN** button to highlight Agitator Information. Press the **SELECT** button. The Agitator RPM screen is displayed.
4. Display the Agitator Cycle Count by pressing the **DOWN** button to highlight Agitator RPM.
5. Press the **SELECT** button. The Agitator RPM screen is displayed.
6. Press the **CYCLES** button.
7. Press the **DOWN** button to highlight Agitator Cycles. The platelet agitator cycle count is displayed, in units of thousands.
8. Press the **BACK** button to return to the i.Help screen, or press the **HOME** button to exit.

3.10 Additional System Settings

Display Language

The i.Center monitoring system stores two languages. English is the default language. If a different language is desired, it must be loaded from the flash memory card. If a flash memory card is not included with the platelet incubator, the languages may have been loaded to the i.Center prior to shipment.

To obtain a flash memory card to load an alternate language, contact Helmer Technical Service.

Note

Each time the platelet incubator is powered on, the i.Center display language must be selected.

Set Display Language on Power-on:

1. Switch the AC ON/OFF switch **ON**.
2. Switch the Battery ON/OFF key switch **ON**. The platelet incubator powers on and the i.Center will display the System Options screen.
3. Press the **INC** or **DEC** buttons to select the desired language. Press the **SELECT** button
4. Press the **HOME** button to return to the Home screen.
5. If a temperature alarm sounds, press the **MUTE** button.

Change Display Language

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight System Options. Press the **SELECT** button.
5. Press the **UP** or **DOWN** buttons to select Language. Press the **SELECT** button.
6. Press the **INC** or **DEC** buttons to select the desired language.
7. Press the **BACK** button to return to the System Options screen, or press the **HOME** button to exit. The new settings are saved.

Date and Time

The Date Format setting controls the order in which the month (mm) and day (dd) are displayed. The default date format is mm/dd/yyyy.

The Clock Mode setting controls whether the time is displayed in a 12-hour or 24-hour format. When using the 12-hour format, AM or PM must be specified. Default setting is 12-hour.

Change Date and Time Settings:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Set Date & Time. Press the **SELECT** button.
5. Press the **UP** or **DOWN** buttons to select the date and time settings to change.
6. Press the **INC** or **DEC** buttons to change the setting.
7. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. The new settings are saved.

Temperature Units

Temperature units can be displayed in Celsius (°C) or Fahrenheit (°F). The default temperature unit is Celsius.

Change temperature units:

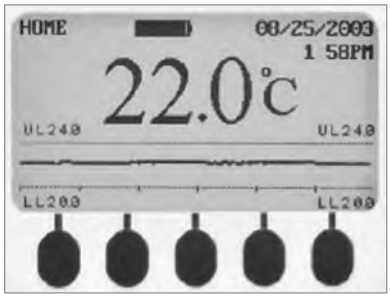
1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight Temperature Units.
5. Press the **INC** or **DEC** buttons to select the desired temperature units.
6. Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit. The new setting is saved.

Temperature Graph

The home screen includes a user-enabled 24-hour temperature graph. Current readings from the temperature probe(s) are displayed. While the i.Center monitoring system is powered on, temperature data from the upper temperature probe is displayed in real-time. The default setting is Enabled.

Notes

- Inactivity of one minute on any i.Center screen results in an automatic return to the Temperature Graph screen (if the temperature graph is enabled).
- The graph is cleared if a button is pressed or if an alarm activates.



Home screen with temperature graph.

Enable or disable the temperature graph:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight System Options. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Temperature Graph.
6. Press the **INC** or **DEC** buttons to enable or disable the temperature graph.
7. Press the **BACK** button to return to the System Options screen, or press the **HOME** button to exit. The new setting is saved.

View Chart Paper Status

The i.Center monitoring system includes a resettable count-down timer for the chart paper. This serves as a reminder to change the chart paper when the 7-day paper is nearly depleted.

View Chart Paper Status:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight System Alarm Test & Status.
3. Press the **SELECT** button. The number of days remaining (if the chart paper timer is enabled) is displayed. If the chart paper timer is not enabled, the status of the chart paper timer is displayed.
4. Press the **BACK** button to return to the Main screen, or press the **HOME** button to exit.

Enable, Disable, or Reset the Chart Paper Timer

The default setting for the chart paper timer is Enabled. One sheet of chart paper records temperatures continuously for seven days. The timer activates an alarm 6.5 days from when the timer is reset. The timer period cannot be changed.

Note

Enabling the timer also resets the timer.

Change Chart Paper Timer Setting:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
3. Enter the password when prompted.
4. Press the **DOWN** button to highlight System Options. Press the **SELECT** button.
5. Press the **DOWN** button to highlight Chart Paper Timer.
6. Press the **INC** or **DEC** buttons to select Enabled, Disabled, or Reset.
7. If Enabled or Disabled is selected, press the **BACK** button to return to the System Options screen, or press the **HOME** button to exit. The new setting is saved.
8. If Reset is selected, press the **DOWN** button then press the **PAPER-CHANGED** button. The System Options screen appears with the Chart Paper Timer set to Enabled.
9. Press the **BACK** button to return to the System Options screen, or press the **HOME** button to exit. The new setting is saved.

Door Status

The door open/closed status may be viewed through the i.Center monitoring system. This may be helpful in troubleshooting functional problems.

View Door Status:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight System Alarm Test & Status. Press the **SELECT** button. The door status (OPEN or CLOSED) is displayed.
3. Press the **BACK** button to return to the Main screen, or press the **HOME** button to exit.

Condenser Temperature

The temperature of the condenser discharge line may be referenced for troubleshooting operational problems.

View Condenser Temperature:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight System Alarm Test & Status. Press the **SELECT** button. The condenser temperature is displayed.
3. Press the **BACK** button to return to the i.Help screen, or press the **HOME** button to exit.

i.Help

The i.Center monitoring system includes an on-board help system.

Access i.Help System:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight i.Help. Press the **SELECT** button. The i.Help screen is displayed.
3. Follow on-screen instructions to view additional help topics.
4. Press the **BACK** button to return to the Main screen, or press the **HOME** button to exit.

Note

The level of detail in i.Help may differ slightly from the contents of this manual.

3.11 Event Log

The Event Log allows 50 (most recent) alarm events to be viewed and shows information regarding the number of door opening from the current and previous day. Information regarding agitator cycle counter reset can also be viewed.

View the Event Log:

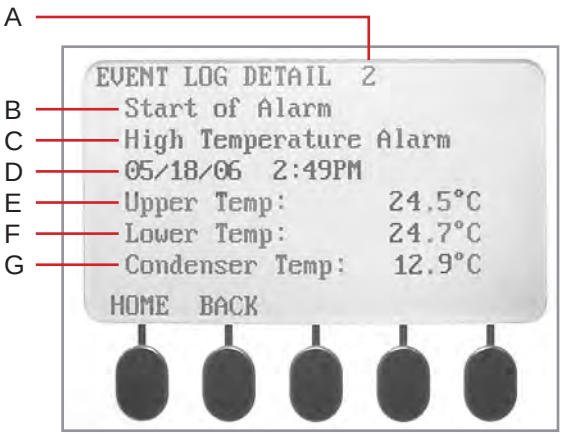
1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Event Log. Press the **SELECT** button. The Event Log screen is displayed.

Event log format:

EVENT LOG Door AA/AA BB/BB
Openings: C D
EE F GG HH/HH/HH II:IIJ KK.KK°L

Item	Description
AA/AA	Current date (month and day)
BB/BB	Previous date (month and day)
C	Number of door openings on current date
D	Number of door openings on previous date
EE	Event number. The most recent event is numbered as 1. Values can be 1-50.
F	Event. “S” indicates the start of an alarm condition. “R” indicates the alarm was reset and the system returned to normal.
GG	Alarm Type: DR Door Open HI High temperature LO Low temperature CO Condenser temperature NB No Battery AC Power failure A(n) Agitator (n) stopped (where n is 1, 2, or 3, depending on model)
HH/HH/HH	Date of event (month and day, and the last two digits of the year)
II:II	Time (hours and minutes) of event
J	Time (appears for 12-hour format). “A” indicates AM. “P” indicates PM.
KK.KK	Upper chamber temperature at time of event
L	Temperature units. C = Celsius. F = Fahrenheit.

Event Details



Event Log Detail screen.

Label	Description
A	Event number
B	Event
C	Alarm Type
D	Date and time of event
E	Upper chamber temperature at time of event
F	Lower chamber temperature at time of event (PC3200i and PC4200i)
G	Condenser discharge line temperature at time of event

View an Event:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight Event Log. Press the **SELECT** button.
3. From the Event Log screen, press the **UP** or **DOWN** buttons to highlight the desired event number. Press the **SELECT** button. The Event Log Detail screen for the selected event is displayed.
4. Press the **BACK** button to return to the Event Log screen, or press the **HOME** button to exit.

Note

If the event is highlighted the alarm for that event was caused by a system self-test, initiated by an operator.

Agitator Count Log

The i.Center monitoring system has three cycle counter logs, one for each agitator. Logs display date, time, and cycle count for the previous 50 reset events. Each time a counter is reset for an agitator, an event is recorded in the log for that agitator.

View agitator count logs:

1. Press the **MAIN** button.
2. Press the **DOWN** button to highlight i.Help. Press the **SELECT** button.
3. Press the **DOWN** button to highlight Agitator Information. Press the **SELECT** button.
4. Press the **UP** or **DOWN** buttons to highlight Agitator Count Logs. Press the **SELECT** button.
5. Press the **UP** or **DOWN** buttons to highlight the desired Agitator Count Log. Press the **ENTER** button. The Agitator Count Log screen is displayed.
6. Press the **UP** or **DOWN** buttons to view previous events in the Agitator Count Log.
7. Press the **BACK** button to return to the Agitator Information screen, or press the **HOME** button to exit.

Agitator Count Log Format

Total Counts AAAAAAAAA
BB CC/CC/CC DD:DDE FFFFFFFFF

Item	Description
AAAAAAAAA	Total cycles counted
BB	Reset event number. The most recent event is numbered as 1. Values can be 1-50.
CC/CC/CC	Date of event (month and day, and the last two digits of the year)
DD:DD	Time (hours and minutes) of event.
E	Time (appears for 12-hour format). A indicates AM, and P indicates PM.
FFFFFFFFF	Cycles counted since the last reset event

3.12 System Firmware Upgrade

Helmer may occasionally issue updates for the i.Center firmware. Follow upgrade instructions included with the firmware update.

3.13 Reset the i.Center Monitoring System

1. Switch the Battery ON/OFF key switch **OFF**.
2. Switch the AC ON/OFF switch **OFF**.
3. Switch the AC ON/OFF switch **ON**.
4. Switch the Battery ON/OFF key switch **ON**.

3.14 View Manufacturer and Product Information

1. Press the **MAIN** button.
2. Press the **INC** or **DEC** buttons to select the Product/Company Information option. Press the **SELECT** button. Manufacturer contact information appears. Software version appears.

4 Temperature Controller Setpoints

Temperature controller setpoints are programmed at the factory. Setpoints can be viewed and changed through the temperature controller. Parameter values reside in four program levels.

Temperature controller display.

Changeable Parameters

Parameter	Program Level	Function
ZEro	3	Calibrate the temperature controller readout
AL.hi	1	Set high temperature alarm value: Horizon Series
AL.Lo	1	Set low temperature alarm value: Horizon Series

View / Change Parameter Values:

NOTICE

Changing parameter values affects platelet incubator operation. Do not change parameter values unless instructed in product documentation or by Helmer Technical Service.

Note

When there is no interaction for 60 seconds, the temperature controller exits program mode.

1. Press and hold the **UP** and **DOWN** buttons simultaneously for approximately three seconds. “tunE” and “oFF” flash on the display. The temperature controller is now in Level 1 program mode.
2. Press and release the **UP** or **DOWN** buttons until the desired parameter flashes on the display.
3. Change a parameter value by pressing and holding the ✱ button.
4. Press the **UP** or **DOWN** buttons to change the parameter value.
   - ♦ To access Level 2 parameters, change the value for the “LEVL” parameter to **2**.
   - ♦ To access Level 3 parameters, change the value for the “LEVL” parameter to **3**.
5. Release all buttons to exit the parameter. New settings are saved. If the “LEVL” parameter value is changed, the temperature controller returns to the selected program level.
6. Repeat steps 2 through 4 to access another program level, or to view or change parameter values in the selected level.
7. Access Level 4 parameters by navigating to Level 3 program mode.
8. Select the “UEr” parameter.
9. Press and hold the **UP** and **DOWN** buttons simultaneously for approximately 10 seconds. The “LOCK” parameter flashes on the display.
10. Exit program mode by pressing and holding the **UP** and **DOWN** arrow buttons simultaneously for approximately three seconds, or until the current chamber temperature is displayed.

4.1 Level 1 Parameters and Values

Notes

- Parameters are listed in order of appearance.
- SP1 refers to the chamber heater.
- SP2 refers to the temperature alarm for Horizon Series models.
- Default values for AL.Lo and AL.hi may vary: the values listed are for temperature controllers programmed at the factory with a platelet incubator setpoint of 22 °C.

Parameter	Description	Default Value (Countertop Models)	Default Value (Floor Models)
tunE	Autotune selection	oFF	oFF
bAnd	SP1 proportional band (gain) or hysteresis (in °C)	7.5	3.2
intt	SP1 integral time/reset (in minutes)	7.5	15
dErt	SP1 derivative time/rate	oFF	oFF
dAC	SP1 derivative approach control	0.5	0.5
CYCt	SP1 proportional cycle-time	0.5	0.5
oFSt	SP1 offset (manual reset)	0.5	0.5
SPLY	Lock main setpoint	oFF	oFF
SPrr	Ramp rate (if ramp is on)	0	0
SPrn	Ramp selection	oFF	oFF
SoAt	Soak time selection	--	--
ALLo	SP2 low alarm setpoint (in °C)	20.0 (see note above)	20.0 (see note above)
ALhi	SP2 high alarm setpoint (in °C)	24.0 (see note above)	24.0 (see note above)
bnd2	SP2 hysteresis or proportional band (in °C)	0.1	0.1
CYC2	SP2 mode selection (ON/OFF or proportional cycle-time)	on.oF	on.oF
LEUL	Parameter level currently selected	1	1

4.2 Level 2 Parameters and Values

Parameter	Description	Default Value (Countertop Models)	Default Value (Floor Models)
SP 1.P	Display of SP1 output power percentage (read-only)	(read only)	(read only)
hAnd	Selection for manual control of power for SP1	oFF	oFF
PL.1	SP1 power limit percentage	100	100
PL.2	SP2 power limit percentage (cooling)	0	0
SP2.A	Main SP2 operating mode (alarm strategy)	bAnd	bAnd
SP2.b	Subsidiary SP2 mode	nonE	nonE
d, SP	Display resolution	0.1°	0.1°
hi.SC	Full scale	35.0	35.0
Lo.SC	Minimum scale	15.0	15.0
, nPt	Input sensor type	rtd	rtd
uni t	Units (°C / °F)	°C	°C
LEUL	Parameter level currently selected	2	2

4.3 Level 3 Parameters and Values

Parameter	Description	Default Value (Countertop Models)	Default Value (Floor Models)
SP 1.d	SP1 output device type	SSd1	SSd1
SP2.d	SP2 output device type (read only)	SSd2	SSd2
burn	Sensor burn-out protection type (upscale or downscale)	uP.SC	uP.SC
rEU.d	Output mode (reverse or direct)	1r.2r	1r.2r
rEU.L	LED indicator modes for SP1 and SP2 (normal or inverted)	1n.2n	1n.2n
SPAn	Sensor span adjust	0.0	0.0
2Ero	Zero sensor error (calibration across full scale)	(varies)	(varies)
ChEY	Selection for the control accuracy monitor	oFF	oFF
rEAd	Read control accuracy monitor results (variance)	UAr°	UAr°
tECh	Read autotune tuning cycle data	Ct A	Ct A
UEr	Software version (select this parameter to access Level 4 parameters)	392b	392b
rSEt	Function reset	nonE	nonE
LEUL	Parameter level currently selected	3	3

4.4 Level 4 Parameters and Values

Parameter	Description	Default Value (Countertop Models)	Default Value (Floor Models)
LoCY	Program security lock	nonE	nonE
dEr.S	Derivative sensitivity	0.5	0.5
di S.S	Display sensitivity (or direct display of input)	dir	dir
no.AL	Disable SP2 alarm annunciator	oFF	oFF
ProG	Program mode auto-exit switch (returns display to normal mode if no activity for one minute)	Auto	Auto

4.5 Platelet Incubator Setpoint

The default setpoint is 22.0 °C. The temperature controller adjusts chamber temperature around the setpoint. When chamber temperature is below setpoint, the controller activates the heater to warm the chamber. When temperature rises above setpoint, the controller deactivates the heater to allow the chamber to cool. The compressor runs continuously.

NOTICE

Do not change the setpoint to a value outside the temperature control range.

Open the control door to access the temperature controller. The current chamber temperature is displayed. The temperature may be different from the setpoint, especially if the chamber temperature has not yet stabilized.

Temperature controller display.

Change Platelet Incubator Setpoint

1. Press and hold the ✱ button to access the setpoint adjustment function. The controller displays current setpoint value.
2. Press and hold the ✱ button. to change the setpoint.
3. Press the **UP** or **DOWN** buttons to increase or decrease setpoint in increments of 0.1 °C.
4. Release all buttons to exit the setpoint parameter. New settings are saved.

4.6 Calibrate the Temperature Controller Display

The temperature controller senses chamber temperature through a probe in the chamber. The chamber setpoint typically varies from the measured temperature, so an offset value is used by the control system to compensate for the difference.

NOTICE

Do not change the control sensor offset unless instructed in product documentation or by Helmer Technical Service.

Notes

- Value is factory-preset and varies for each unit
- Offset value can be changed from -10.0 °C to +10.0 °C
- If the variance is within acceptable limits for your organization, changing the offset value is optional.

Determine New Offset Value:

1. Use the zip tie to attach a calibrated independent thermometer traceable per national standards to the control probe.
2. Close door and allow chamber temperature to stabilize for 30 minutes.
3. Observe independent thermometer temperature for 10 minutes and determine temperature range.
4. From the range, calculate the average temperature.
5. Remove the thermometer from the control probe.
6. Determine the change in value to reach desired setpoint.

Example
- Current setpoint is 22.0 ºC
- Average temperature is 23 ºC
- Offset adjustment value is +1.0 ºC

Enter New Offset Value:

Note

When there is no interaction for 60 seconds, the temperature controller exits program mode.

1. Press and hold the **UP** and **DOWN** buttons simultaneously for approximately three seconds. “tunE” and “oFF” flash on the display. The temperature controller is now in Level 1 program mode.
2. Press and release the **UP** or **DOWN** buttons until “LEVL” flashes on the display.
3. Press and hold the ✱ button.
4. Press the **UP** or **DOWN** buttons to change the parameter value to **3**.
5. Release the ✱ button.
6. Press and release the **UP** or **DOWN** buttons until “ZEro” flashes on the display.
7. Press and hold the ✱ button.
8. Press the **UP** or **DOWN** buttons to change the value to the calculated offset adjustment value.
9. Release the ✱ button.
10. Release all buttons to exit the parameter. New settings are saved. If the “LEVL” parameter value is changed, the temperature controller returns to the selected program level.
11. Press and hold the **UP** and **DOWN** arrow buttons simultaneously for approximately three seconds, or until the current chamber temperature is displayed to exit program mode.

5 Maintenance

NOTICE

- Before performing maintenance, protect items in platelet incubator from extended exposure to adverse temperature.
- Allow platelet incubator temperature to stabilize at setpoint after performing service or after extended door opening.

Note

Refer to the operation manual for the preventive maintenance schedule.

5.1 Recharge Refrigerant

CAUTION

- Review all safety instructions prior to recharging refrigerant.
- Maintenance should only be performed by trained refrigeration technicians.

NOTICE

Use only non-CFC R-134A refrigerant.

Full initial refrigerant charge by model.

Model	Volts	Initial Charge
PC100i, PC900i, PC1200i	115	5.0 oz (142 g)
PC100i, PC900i, PC1200i (serial numbers prior to 2054189)	230	5.0 oz (142 g)
PC100i, PC900i, PC1200i (serial number 2054189 and after)	230	3.3 oz (94 g)
PC2200i, PC3200i, PC4200i (serial numbers prior to 2042392)	115	8.0 oz (227 g)
PC2200i, PC3200i, PC4200i (serial number 2042392 and after)	115	4.0 oz (113 g)
PC2200i, PC3200i, PC4200i (serial numbers prior to 2046319)	230	8.0 oz (227 g)
PC2200i, PC3200i, PC4200i (serial number 2046319 and after)	230	12.0 oz (340 g)

Add Refrigerant:

Note

Pressure varies depending on ambient air temperature.

1. Attach calibrated pressure gauge (0 lbs/in² to 60 lbs/in² (0 kPa to 400 kPa)) to the fittings on the refrigeration lines.
2. Measure the low side (suction) pressure.
3. Add refrigerant so the peak low side pressure corresponds to pressure (at the stated ambient temperature) in the tables below.

Ambient Temperature		Low Side Pressure		
°C	°F	lbs/in²	kPa	bar
18	64.4	29.0	200	2.00
19	66.2	29.5	203	2.03
20	68.0	30.0	207	2.07
21	69.8	30.5	210	2.10
22	71.6	31.0	214	2.14
23	73.4	31.5	217	2.17
24	75.2	32.0	221	2.21

Ambient Temperature		Low Side Pressure		
°C	°F	lbs/in²	kPa	bar
25	77.0	32.6	225	2.25
26	78.8	33.3	230	2.30
27	80.6	33.5	231	2.31
28	82.4	34.3	236	2.36
29	84.2	34.8	240	2.40
30	86.0	35.4	244	2.44

4. Remove pressure gauge.

5.2 i.Center Batteries

The i.Center monitoring system has visual indicators for battery charge level. If the batteries deplete to a particular voltage output, a flashing Low Battery alarm is initiated. If the batteries are missing or nearly depleted, the flashing No Battery alarm initiates.

Test i.Center Backup Batteries:

1. Switch AC ON/OFF switch **OFF**. Screen should continue to display information with reduced brightness. If the display is blank, replace battery.
2. Switch AC ON/OFF switch **ON**.

Replace the i.Center Batteries

NOTICE

Use batteries which meet manufacturer's specifications. (1.5 V D-cell alkaline batteries or equivalent)

1. Switch AC ON/OFF switch **OFF**. Disconnect the platelet incubator from AC power.
2. Remove the access panel from the top of the platelet incubator.
3. Remove six batteries and replace with six new batteries.
4. Reinstall access panel.
5. Reconnect the platelet incubator to AC power. Switch AC ON/OFF switch **ON**.

5.3 Motion Alarm Battery (PC4200i)

The motion alarm battery is applicable to the PC4200i platelet incubator only.

Test Motion Alarm Battery

1. Ensure the Motion Alarm ON/OFF switch is switched **ON**.
2. Ensure the monitoring system backup battery is switched **ON**.
3. Using a small flat-head screwdriver, rotate the Motion Alarm Delay control to the left (counterclockwise) to shorten the motion alarm delay to five seconds.
4. Open the door to disable agitation. Motion alarm will activate after five seconds.

Note

- If the agitation motion alarm sounds, the battery does not need to be replaced.
- If the agitation motion alarm does not sound, replace the motion alarm backup battery.

5. Close the door to enable agitation. Agitation motion alarm will clear and audible alarm will cease.
6. Using a small flat-head screwdriver, rotate the Motion Alarm Delay control to the right (clockwise) to change the motion alarm delay to the original setting.

Replace the Motion Alarm Battery (PC4200i)

NOTICE

Use a battery which meets manufacturer's specifications. (9 V nickel-metal hydride rechargeable battery or equivalent)

Note

The motion alarm battery is applicable to the PC4200i platelet incubator only.

1. Switch the Battery ON/OFF key switch **OFF**.
2. Switch the AC ON/OFF switch **OFF**.
3. Disconnect the platelet incubator from AC power.
4. Remove the access panel on top of the platelet incubator.
5. Remove the battery. Replace with a new battery.
6. Reinstall the access panel.
7. Reconnect the platelet incubator to AC power.
8. Switch the AC ON/OFF switch **ON**.
9. Switch the Battery ON/OFF switch **ON**.

5.4 Clean the Platelet Incubator

WARNING

Disconnect platelet incubator from AC power when cleaning.

Condenser Grill

In environments where the platelet incubator is exposed to excessive lint or dust, the condenser grill may require cleaning more frequently than stated in preventive maintenance schedule.

Clean the condenser grill using a soft brush and a vacuum cleaner.

Exterior

Clean glass surfaces with soft cotton cloth and glass cleaner. Clean exterior surfaces with soft cotton cloth and non-abrasive liquid cleaner.

CAUTION

The condensate evaporator and water evaporation tray are hot.

NOTICE

For PC4200i platelet incubators, clean the vents in the base as needed.

Interior

Clean painted surfaces with mild detergent. Clean stainless steel surfaces with a general-purpose laboratory cleaner suitable for stainless steel. For PC4200i models, clean textured drawer surfaces with a soft brush.

Door Gaskets

Clean with soft cloth and mild soap and water solution.

5.5 Lubricate the Drawer Slides (PC4200i)

CAUTION

- Before moving drawers, ensure they are completely empty.
- Open the drawer using the drawer handle; not the label holder.
- Do not open more than one drawer at a time.

Clean the slots in the drawer guides with a clean, dry cloth. Apply a thin film of petroleum jelly to the bottom of each drawer where it contacts the drawer guide.

5.6 Lubricate and Service Internal Parts (PC4200i)

WARNING

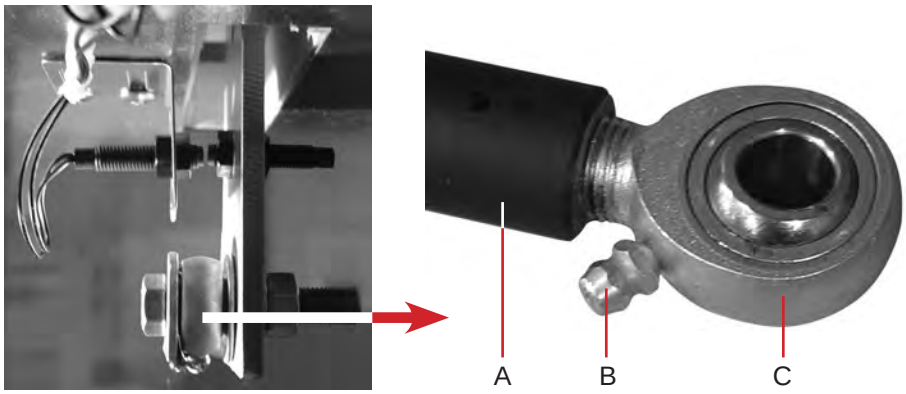
Disconnect platelet incubator from AC power when lubricating internal parts.

Drive Rod Bearings

Clean drive rod end bearings, wheels, and components according to the preventive maintenance schedule in the operation manual.

Lubricate Drive Rod Bearings:

1. Obtain a grease gun with bearing grease.
2. Inject bearing grease into the grease fitting on the bearing.



Label	Description
A	Drive rod
B	Grease fitting
C	Rod end bearing

Drive rod and rod end bearing detail.

Wheels

NOTICE

Do not use oil or aerosol lubricant.

Lubricate wheel axles with a light machine oil. Remove the cover to access the front wheels for inspection, cleaning, and lubrication. Replace wheels as necessary. The hole in each wheel should be circular. If the hole is out-of-round, replace the wheel. If the wheels need to be replaced, contact Helmer Technical Service.

6 Troubleshooting

⚠ CAUTION

Review all safety instructions prior to troubleshooting.

6.1 General Operation Problems

Problem	Possible Cause	Action
Display on the monitoring system is hard to read.	Screen contrast is set too low.	Change the screen contrast.
Monitoring system is not responding.	Digital electronics are locked because of an interruption in power.	Reset the monitoring system.
Roll-out shelf does not slide easily (PC2200i and PC3200i).	Debris in the shelf slides.	Pull the shelf out and confirm the slides are free of debris. Clean if necessary.
	Shelf slides are not lubricated.	Using a lightweight oil, lubricate the bearings in the slides.
	Shelf slide is faulty.	Contact a qualified service technician.
Drawer does not slide easily (PC4200i).	Debris in slots of drawer guides.	Pull the drawer out and confirm the slots are free of debris. Clean if necessary.
	Drawers are not lubricated.	Clean and lubricate the drawer slots.
Door does not open easily (PC100i and floor models).	Debris in hinges.	Confirm the hinges are free of debris. Clean the hinges if necessary.
	Door hinges are not lubricated.	Using a general-purpose grease, lubricate the pivots in the hinges.
	Hinge cam is faulty.	Contact a qualified service technician.
Hood does not open easily (PC900i and PC1200i).	Damping cylinder or hood hinge is faulty.	Contact a qualified service technician.
Platelet incubator does not roll easily (floor models).	One or more casters are locked.	Unlock the casters. Push the platelet incubator from the sides, not from the front or back.
Platelet incubator is connected to AC power, and doors are closed, but built-in platelet agitator is not moving (PC4200i).	Platelet agitator is obstructed.	Verify the platelet agitator is free of obstructions.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Agitation is noisy or rough (PC4200i).	Platelet incubator is not level.	Verify the platelet incubator has been set up appropriately.
	Moving parts are grinding against each other.	Verify that moving parts are lubricated and in good condition. Lubricate or replace if necessary.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Main power switch is on, but nothing is working.	Outlet connection is faulty.	Verify power at the outlet. Repair original outlet or connect to a different outlet if necessary.
	Power cord is faulty.	• Check condition of the power cord. Replace if in poor condition. • Check that voltage through the cord is appropriate. If not, replace cord.
	Power connector is faulty (all models except 115 V floor models).	• Check that connections between power cord and power connector are secure. • Check that voltage through power connector is appropriate. If not, replace power connector.
	Circuit breaker was tripped (230 V countertop models, all 100/115 V models).	Confirm that all circuit breakers are seated. Push circuit breaker to reset if necessary.
	One or both fuses have blown (230 V floor models).	Verify fuse has not blown. Replace fuse if necessary.
	Power line filter is faulty (230 V floor models).	Verify power output from the filter. Replace power line filter if necessary.
	Power switch is faulty.	Verify power output from the switch. Replace switch if necessary.
	Terminal board is faulty.	Confirm terminal board is supplying power to other components. Replace terminal board if necessary.

Problem	Possible Cause	Action
Main power switch is on, but temperature controller is not working.	Connection between terminal board and temperature controller is loose or a part is faulty.	• Check connections between terminal board and temperature controller. Secure connections if necessary. • Confirm terminal board is supplying power to temperature controller. Replace temperature controller or terminal board if necessary.
Main power switch is on, but compressor is not running.	Connection between terminal board and the compressor is loose or a part is faulty.	• Check connections between the terminal board and compressor. Secure connections if necessary. • Confirm terminal board is supplying power to compressor by checking whether condensing unit fan is working. • Replace terminal strip if necessary (floor models only). • Replace starting relay coil, compressor/condensing unit, or terminal board if necessary.
Main power switch is on, but chart recorder is not working.	Connection between terminal board and chart recorder is loose or a part is faulty.	• Check connections between terminal board and chart recorder. Secure connections if necessary. • Confirm terminal board is supplying power to chart recorder. • Replace chart recorder or terminal board if necessary. Refer to the temperature chart recorder operation and service manual.
Main power switch is on, and the doors are closed, but built-in platelet agitator is not agitating (PC4200i).	Doors are not closing completely.	• Confirm hinge cams are not damaged. Replace if necessary. • Confirm door gaskets are sealing completely. Replace door gasket if necessary.
	One or both door switches are faulty.	Check connections for door switches. Replace one or both door switches if necessary.
	Secondary circuit breaker has tripped (100/115 V models).	Confirm that all circuit breakers are seated. Push circuit breaker to reset it if necessary.
	Agitation motor is faulty.	Check connections for agitation motor. Replace motor if necessary. On 230 V models, replace motor capacitor if necessary.
	Terminal board is faulty.	• Confirm terminal board is supplying power to door switch(es). Replace terminal strip if necessary (floor models only). • Replace terminal board if necessary.
Main power switch is on, and door/hood/doors is closed, but platelet agitators installed inside platelet incubator are not agitating (all models except PC4200i).	Door(s) are not closing completely (PC100i and floor models only).	Confirm hinge cams (floor models) or hinge bearings (PC100i) are not damaged.
	Hood is not closing completely (PC900i and PC1200i).	• Confirm damping cylinder is not damaged. Replace it if necessary. • On chamber wall in the hinge area, check nutsert for looseness. Replace nutsert if necessary.
	One or both door switches are faulty.	Check connections for door switch(es). Replace door switch(es) if necessary.
Main power switch is on, and door/hood/doors is closed, but platelet agitators installed inside platelet incubator are not agitating (all models except PC4200i).	Terminal board is faulty.	Confirm terminal board is supplying power to door switch(es). Replace terminal strip if necessary (floor models only). Replace terminal board if necessary.
	Secondary circuit breaker has tripped (100/115 V models).	Confirm that all circuit breakers are seated. Push circuit breaker to reset it if necessary.
	One or more interior outlets are faulty.	Check connections for interior outlets. Replace outlets as necessary.
	Platelet agitator component is faulty or internal connections are loose.	Refer to the platelet agitator service manual.
Main power switch is on, but one or both chamber fans are not running.	Chamber fan is faulty (PC100i).	Check connections for the fan. Replace fan if necessary.
	One or both chamber fan motors are faulty (all models except PC100i).	Check connections for the fan. Replace fan motor if necessary.
Roll-out shelf does not slide easily (PC2200i and PC3200i).	Slide is faulty.	Confirm slide is operating correctly. Replace slide if necessary.
Door does not open easily (PC100i and floor models).	Hinge cam is faulty (floor models only).	Confirm hinge cam is not damaged. Replace if necessary.
	Hinge bearing is faulty (PC100i).	Confirm bearings are not damaged. Replace if necessary.
Hood does not open or close easily or slams shut instead of gradually closing (PC900i and PC1200i).	Damping cylinder is faulty.	Replace damping cylinder.
	Hinge hardware is loose or faulty.	On chamber wall, check nutsert for looseness. Replace nutsert if necessary.

Problem	Possible Cause	Action
Agitation is noisy or rough (PC4200i).	One or more wheels are worn.	Check hole through each wheel for wear. If a wheel is out-of-round, replace wheel or wheel assembly.
	Drive rod is loose or disconnected.	Check connections from drive rod to drive plate on the storage frame, and to the crank block on the motor. Secure connections if necessary.
	Bearing on drive rod assembly is grinding or worn.	On drive rod assembly, check bearing on end connected to the drive plate. Lubricate bearing by injecting grease through grease fitting. If bearing is worn, replace drive rod assembly.
Agitation is noisy or rough (PC4200i).	Crank block on the motor is worn.	Check crank block on the motor for wear. Replace crank block if worn.
	Motor is faulty.	Replace motor.
Agitation of installed platelet agitators is noisy or rough (all models except PC4200i).	One or more feet on platelet incubator are worn (countertop models).	Check feet for wear. Replace feet if necessary.
	Platelet agitator component is faulty or internal connections are loose.	Refer to the platelet agitator service manual.

6.2 Chamber Temperature Problems

Problem	Possible Cause	Action
Chamber temperature displayed is higher or lower than actual temperature.	Monitor is not calibrated.	Confirm upper temperature probe is reading correctly. Calibrate probe if necessary.
	Digital electronics are locked because of an interruption in power.	Reset monitoring system.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Chamber temperature does not stabilize at platelet incubator setpoint.	Condenser grill is dirty.	Check condenser grill. Clean if necessary.
	Air circulation at top of chamber is not adequate.	Check for items that may obstruct air flow and remove necessary.
	Ambient air temperature around platelet incubator is too high.	Confirm platelet incubator is placed appropriately.
	Refrigerant level is too low.	Contact a qualified service technician.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.

6.3 Alarm Activation Problems

Problem	Possible Cause	Action
Platelet incubator is in an alarm condition, but alarms are not audible.	Audible alarms have been muted.	Verify audible alarms are not muted. If time remaining on Mute timer is greater than five minutes, change Mute timer value to five minutes and wait until timer resets.
	Volume is set too low.	Check volume and change if necessary.
	Alarm is not communicated audibly, visually, or through remote alarm interface.	Verify whether active alarm should be communicated audibly.
	Audible alarm time delay has not elapsed.	Allow the alarm time delay to elapse or change the alarm delay.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
All alarms are activating sporadically.	Component is faulty or internal connections are loose.	Contact a qualified service technician.
No Battery alarm is activating sporadically.	Battery voltage level on backup batteries for monitoring system is low.	Replace backup batteries for monitoring system.

Problem	Possible Cause	Action
Platelet incubator meets a high or low temperature alarm condition, but appropriate alarm is not active.	Alarm setpoint was changed.	Check current setpoints for alarms. Change setpoints if necessary.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Active temperature alarm, but platelet incubator does not meet high or low temperature condition.	Monitor is not calibrated.	Confirm upper temperature probe is reading within appropriate tolerance. Calibrate probe if necessary.
High or low temperature alarm activated, but temperature recorded at activation does not match alarm setpoint.	Monitor is not calibrated.	Confirm upper temperature probe is reading within appropriate tolerance. Calibrate probe if necessary.
	Temperature changed slightly around time of activation.	No action needed.
Platelet incubator is not receiving AC power, but power failure alarm is not active.	Alarm setpoint was changed.	Check current setpoints for alarms. Change setpoints if necessary.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Condenser alarm is active.	Compressor is overheating due to lack of airflow.	• Check condenser grill. Clean if necessary. • Confirm platelet incubator is placed appropriately.
	Condenser alarm setpoint is too low.	Confirm alarm setpoint is set at appropriate value.
	Refrigerant level is too low.	Contact a qualified service technician.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
	Condenser probe is not calibrated.	Contact a qualified service technician.
Platelet incubator is connected to power, but AC Power Failure alarm is active.	Circuit breakers have tripped or are not seated correctly (115 V floor models, all countertop models).	Confirm circuit breakers are seated. Push circuit breaker(s) to reset if necessary. If breaker(s) cannot be reset or trip again, contact a qualified service technician.
	Fuses have blown (230 V floor models).	Contact a qualified service technician.
	No AC power to platelet incubator.	Verify power cord is connected securely to platelet incubator and outlet. Tighten connections if necessary. Verify outlet is operational and meets power requirements for platelet incubator. Repair original outlet or connect to a different outlet if necessary.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Door Open alarm is activating sporadically.	Door Ajar Timeout is set to 0, causing alarm to activate immediately when door is opened.	Check current setpoint for Door Ajar alarm. Change setpoint if necessary.
	Doors are not closing completely.	Confirm doors are aligned. Contact a qualified service technician if necessary.
	Doors are closing but not sealing completely.	Confirm door gasket seals completely. Contact a qualified service technician if necessary.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Motion alarm is active, but platelet agitator is moving.	A Horizon Series platelet agitator is installed, but alarm for the corresponding position was not disabled.	Disable motion alarm for that position.
	i.Center monitoring system is not receiving motion information from the platelet agitator (models without built-in platelet agitator).	On platelet incubator's monitoring system, verify agitation information is being received. Verify data cable is connected securely to platelet agitator and corresponding port in the platelet incubator. Tighten connections if necessary.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.

Problem	Possible Cause	Action
Agitation has stopped, but motion alarm is not active.	Motion alarm for position where platelet agitator is installed has been disabled.	Enable motion alarm.
	Platelet agitator alarm setpoint value has not been reached.	Wait until setpoint has been reached. Alarm should activate.
	Delay period for motion alarm is set too low (PC4200i).	Verify delay period control is set to a value greater than platelet agitator alarm setpoint.
	Motion alarm system is not receiving power.	• Check that there is AC power to platelet incubator. • Test backup battery. If battery is not functioning, replace battery.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Motion alarm is activating sporadically while platelet agitator is moving.	Alarm system is not receiving power consistently (PC4200i).	• Check that there is AC power to platelet agitator. • Test backup battery. If battery is not functioning or has been in use for one year, replace battery.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Motion alarm is active, but there is no platelet agitator installed at that position (models without a built-in platelet agitator).	Alarm is enabled for that position when it should be disabled.	Disable motion alarm for that position.
Motion alarm is activating immediately when agitation is started (PC4200i).	Delay period is set to 0 minutes, which activates alarm before motion can be sensed.	Change delay period to a value greater than 0 minutes.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.

6.4 Testing Problems

Problem	Possible Cause	Action
Automatic temperature tests do not work.	High Alarm setpoint is set significantly higher than default value, or Low Alarm setpoint is set significantly lower than default value.	• Confirm alarm setpoints are set at appropriate values. • Test temperature alarms manually.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
	Connections between upper chamber temperature probe and control board are loose or a part is faulty.	Test probe connections. Secure connections if necessary. Replace probe if necessary. Replace parts with control and display board kit, if necessary.

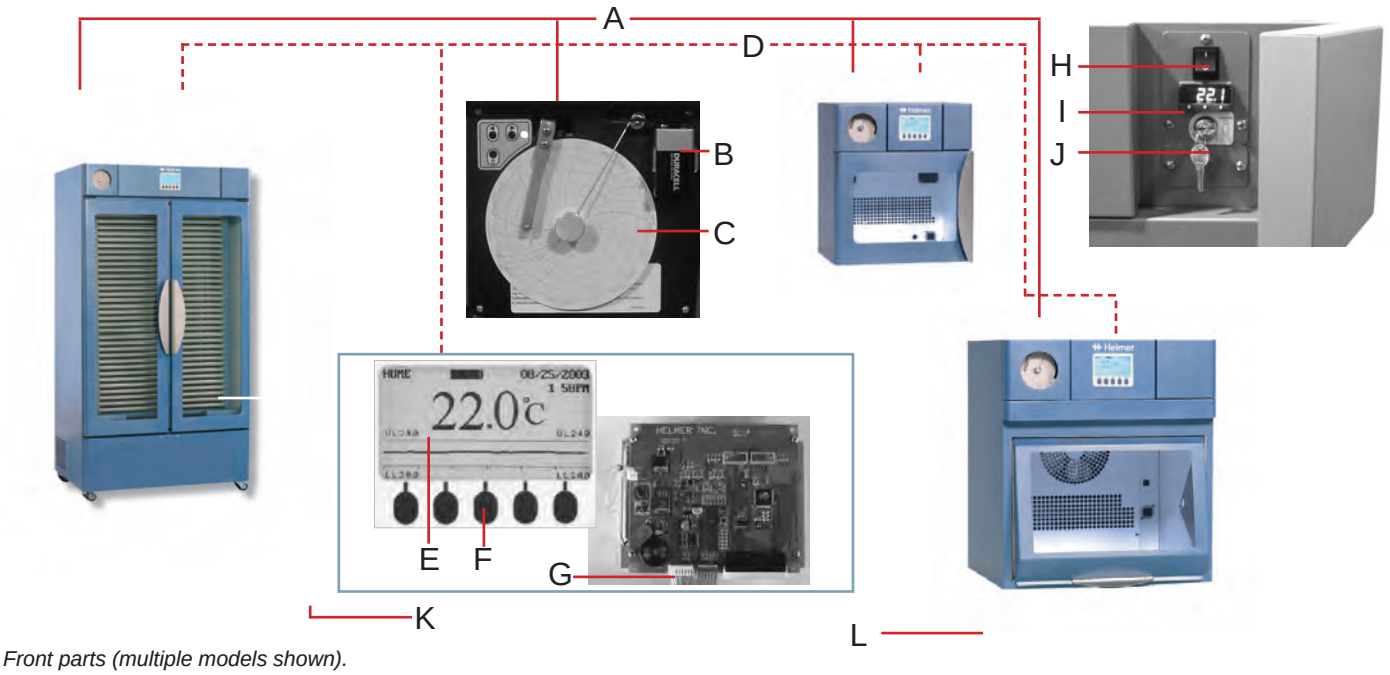
6.5 Condensation Problems

Problem	Possible Cause	Action
Excessive water in water evaporation tray.	Humid air is entering chamber.	Confirm platelet incubator is level and doors are aligned, closing tightly, and sealing correctly. Contact a qualified service technician if necessary.
	Heater in evaporation tray is faulty.	Confirm heater is hot. Contact a qualified service technician to confirm heater is drawing the appropriate current.
Excessive water in chamber.	Humid air is entering chamber.	Confirm platelet incubator is level and doors are aligned, closing tightly, and sealing correctly. Contact a qualified service technician if necessary.
Excessive humidity on doors.	Humid air is entering chamber.	Confirm platelet incubator is level, and the doors are aligned, closing tightly, and sealing correctly. Contact a qualified service technician if necessary.
	Relative humidity around the platelet incubator is too high.	Confirm platelet incubator is placed appropriately.
Excessive water in water evaporation tray (countertop models).	Connections between terminal board and condensate evaporator are loose or a part is faulty.	• Check connections between terminal board and condensate evaporator (heater). Secure connections if necessary. • Confirm condensate evaporator is working correctly. It should be hot and drawing appropriate current: • For 100/115 V models, current should be approximately 0.43 A to 0.55 A. • For 230 V models, current should be approximately 0.21 A to 0.35 A. • Replace condensate evaporator or terminal board if necessary.

7 i.Series Parts

Note

- Before replacing parts, protect items in platelet incubator from extended exposure to adverse temperature.
- Allow platelet incubator temperature to stabilize at setpoint after replacing parts or after extended door opening.

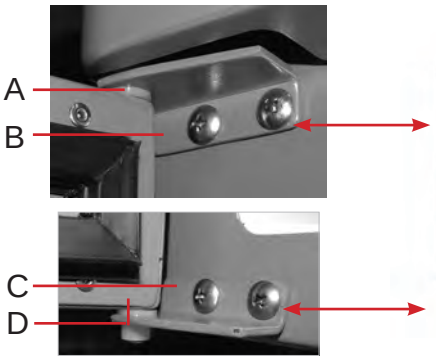


Front parts (multiple models shown).

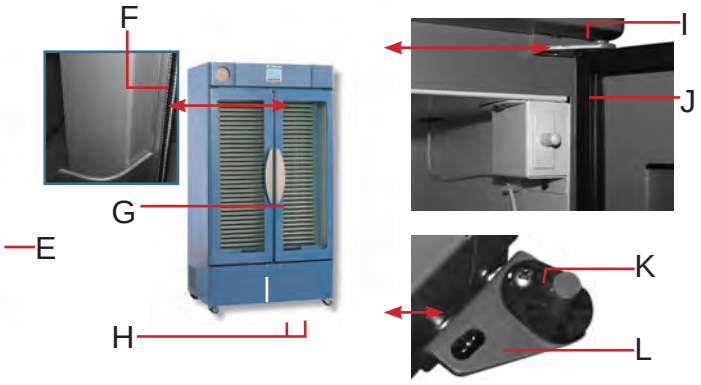
Label	Description	Part Number
A	Chart recorder	400409
B	Chart recorder backup battery	120218
C	Chart paper	220273
D	Display assembly	400509-1
E	LCD Board	12045
F	Touchpad	320722-1
G	Interface cable * PC100i only	400502-3* 400502-2

Label	Description	Part Number
H	Main power switch	120478
I	Temperature controller (countertop)	400600-1
	Temperature controller (floor model)	400601-1
J	Battery backup key switch, 2-way	120227
K	Caster (swivel with brake; floor models)	220261
L	Foot (countertop models)	220432

Door and Hinge



Door and Hinge (PC100i)



Door and Hinge (PC2200i, PC3200i, and PC4200i)

Label	Description	Model	Part Number
A	Hinge bearing		220295
B	Upper hinge bracket	100	320846-1
C	Lower hinge bracket	100	310846-2
D	Door seal kit	100	400785-1
E	Door handle		320865-1
Not shown	Door lock		220374
F	Door brush seal	2200	320920-2
	Door brush seal	3200/4200	320920-1

Label	Description	Model	Part Number
G	Door handle		320865-1
H	Door lock		220374
I	Upper hinge bracket (left)	2200/3200/4200	400647-2
	Upper hinge bracket (right)	2200/3200/4200	400647-1
J	Door seal kit	2200	400787-1
		3200/4200	400788-1
K	Hinge cam		320742-1
L	Lower hinge bracket (left)	2200/3200/4200	400647-1
	Lower hinge bracket (right)	2200/3200/4200	400647-2

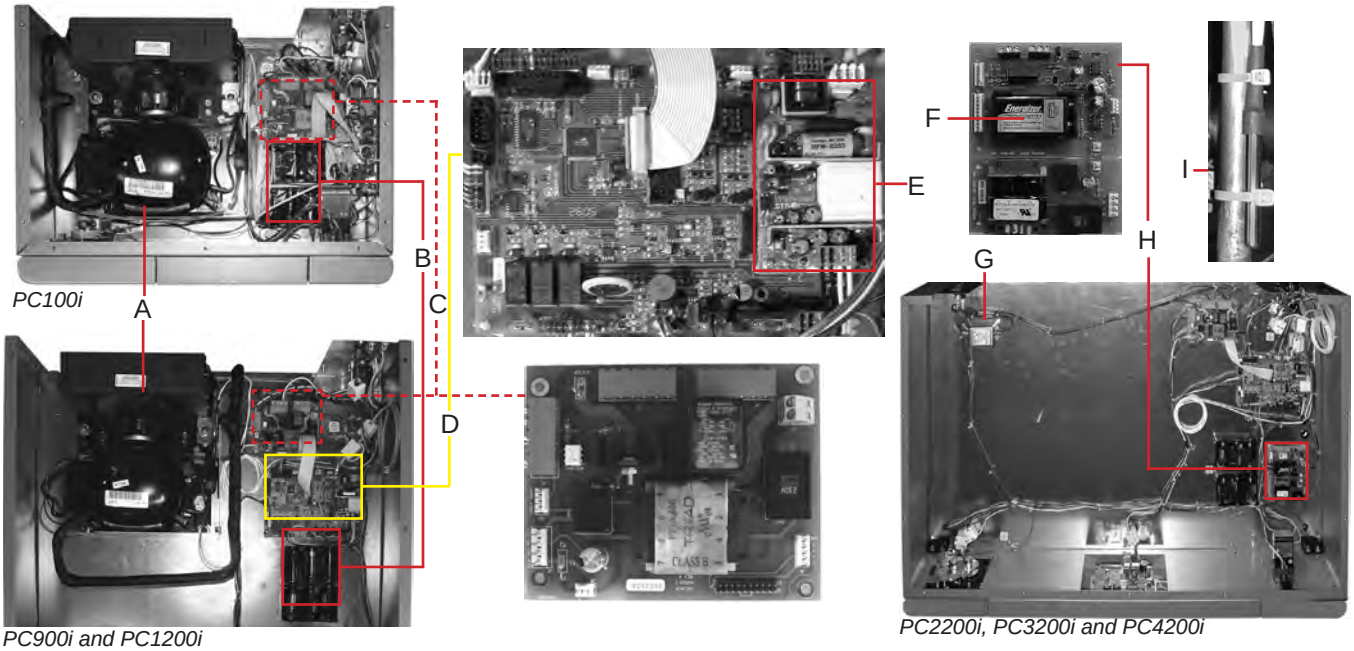
Hood

(PC900i and PC1200i)

Label	Description	Model	Part Number
A	Hood assembly (Excludes damping cylinder and door lock)	900	800098-1
		1200	800099-1
B	Damping cylinder		220210

Label	Description	Model	Part Number
C	Hood lock		220272
Not shown	Hood seal kit	900	400786-1
		1200	400786-2

Top



PC100i

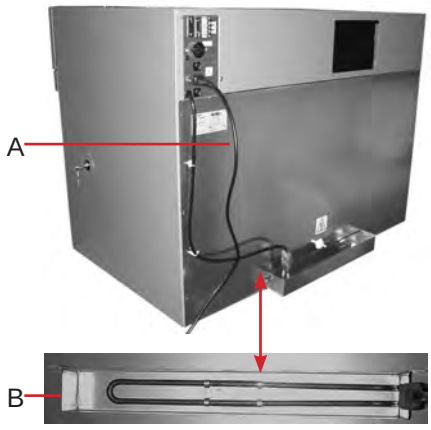
PC900i and PC1200i

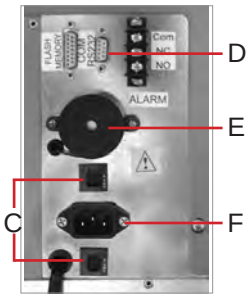
PC2200i, PC3200i and PC4200i

Label	Description	Model	Volts	Part Number
A	Compressor/condensing unit	100/900/1200	115	400668-1
			230	400668-2
B	Monitor backup battery (six required)			715031
C	Terminal board		115/230	800285-1
			100	800292-1
D	Control board (included in Display assembly)			400650-1

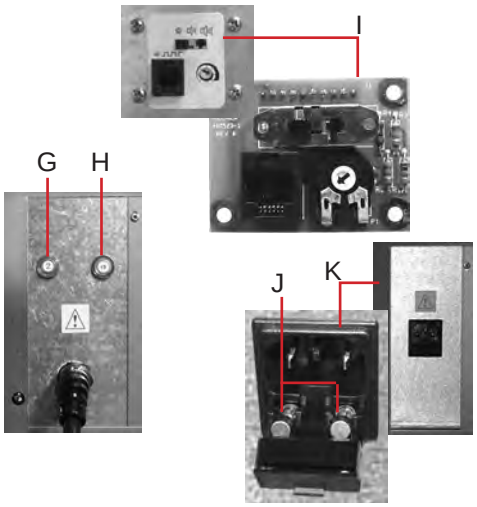
Label	Description	Model	Volts	Part Number
E	Power supply board			400633-1
F	Motion alarm battery	4200		120232
G	Power line filter		230	120400
H	Agitator board			400516-1
I	Condenser probe			400674-1
Not Shown	Compressor relay		100/115	120528
			230	120523

Rear





PC100i, PC900i, and PC1200i

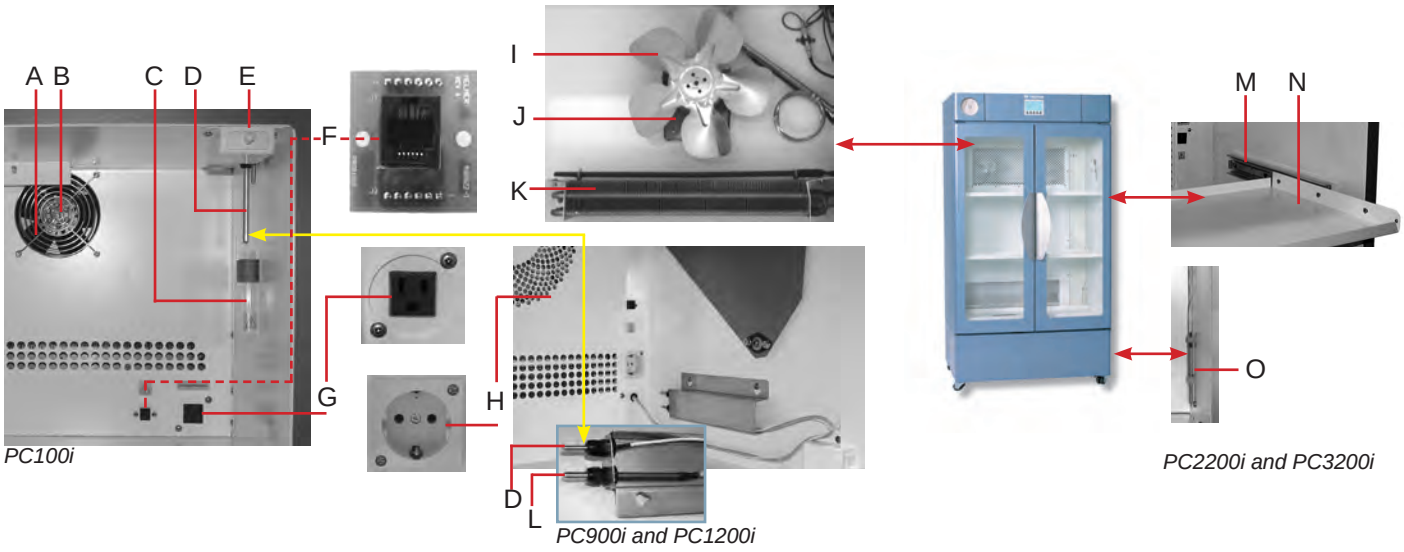


PC2200i, PC3200i, and PC4200i

Label	Description	Model	Volts	Part Number
A	Power cord	100/900/1200	100/115	120630
		all models	230	120156
		2200/3200	115	120130
		4200	115	110040
B	Condensate evaporator kit (includes tray)		100/115	400791-1
			230	400791-2
C	Circuit breaker (6 A)		230	120288
D	RS-232 port (optional)			400705-2
E	Alarm buzzer			120457

Label	Description	Model	Volts	Part Number
F	Power connector (includes power line filter)			120299
G	Circuit breaker (secondary, 2A)	2200/3200	115	120252
	Circuit breaker (secondary, 5A)	4200	115	120514
H	Circuit breaker (primary, 15A)	2200/3200	115	120259
	Circuit breaker (primary, 20A)	4200	115	120191
I	Motion alarm control board	4200		400523-1
J	Fuse (10 A)		230	120174
K	Power connector with fuse holder		230	120379

12.4 Interior



PC100i

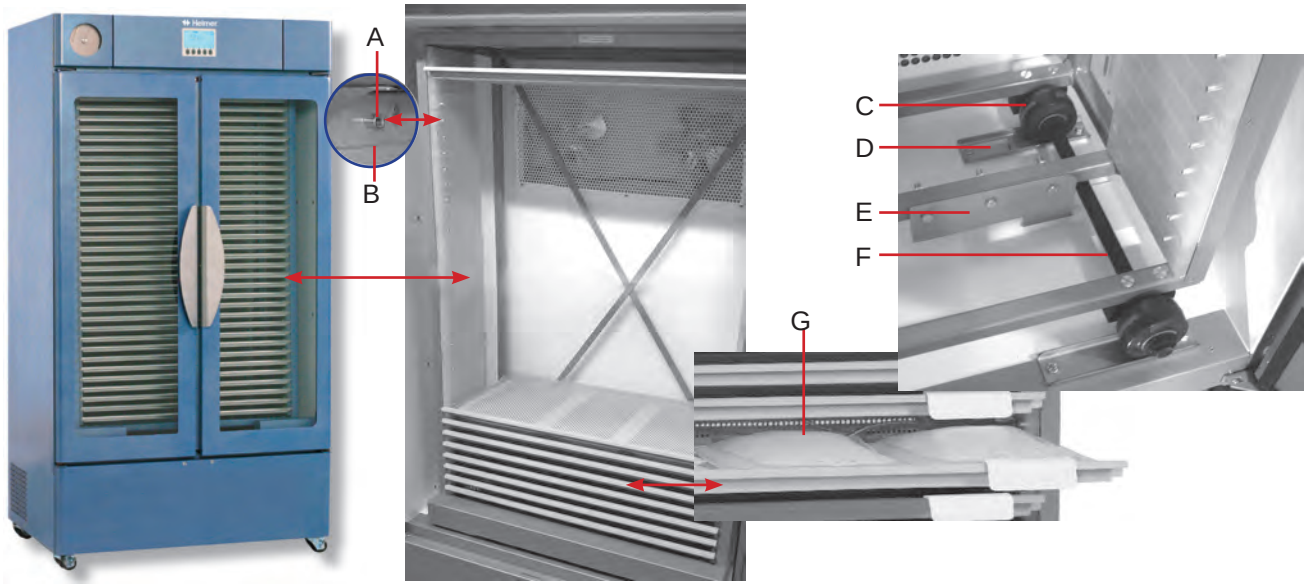
PC900i and PC1200i

PC2200i and PC3200i

Label	Description	Volts	Part Number
A	Chamber fan guard		220122
B	Chamber fan	100/115	120009
		230	120010
C	Alarm check tube		220299
D	Control and chart recorder probe		120315
E	Door switch		120490
F	Agitator port board		400522-1
G	Interior outlet	100/115	120499
H	Interior outlet	230	120097

Label	Description	Volts	Part Number
I	Chamber fan blade		220177
J	Chamber fan motor	100/115	120170
		230	120171
K	Chamber heater	100/115	120313
		230	120314
L	Temperature monitoring probe		400510-1
M	Shelf slide		400717-1
N	Roll-out shelf		320971-1
O	Lower chamber probe (PC3200i)		400513-1

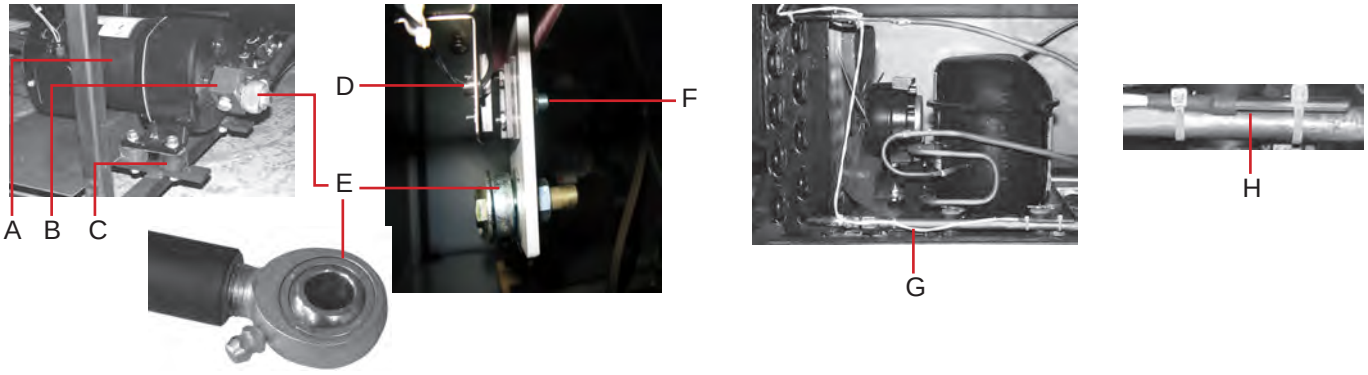
Agitation Parts (PC4200i)



Label	Description	Part Number
A	Drawer stop	400174-1
B	Drawer guide (Top left)	320540-1
	Drawer guide (Top right)	320540-2
	Drawer guide (Bottom left)	320541-1
	Drawer guide (Bottom right)	320541-2
C	Wheel (included in wheel assembly)	320566-1

Label	Description	Part Number
D	Wheel track	320215-1
E	Drive plate	321005-1
F	Wheel assembly (includes two wheels, axle, mounting bracket)	400159-1
E	Drawer assembly (includes label holder kit.) * = (silver drawer - standard) ** = (red drawer) *** = (black drawer)	400616-1* 400617-1** 400615-1***

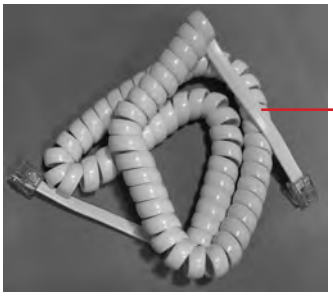
Base (PC4200)



Label	Description	Volts	Part Number
A	Agitation motor (includes capacitor) * for serial numbers 968995 and lower ** for serial numbers 968996 and greater	115	400305-1
		230	400306-1*
		230	400638-1**
B	Crank block	115	320222-1
		230	321032-1
C	Motor mount		220079
D	Proximity sensor		400694-1

Label	Description	Model	Volts	Part Number
E	Drive rod assembly			400111-1
F	Proximity actuator			120125
G	Compressor/condensing unit * = units with serial # 2046319 above ** = units with serial # 2046318 and prior	2200/3200/ 4200	115	400669-1
			230	800977-1*
			230	800978-1**
H	Condenser probe			400674-1
Not Shown	Starting relay coil		115	120524
			230	120525

Accessories



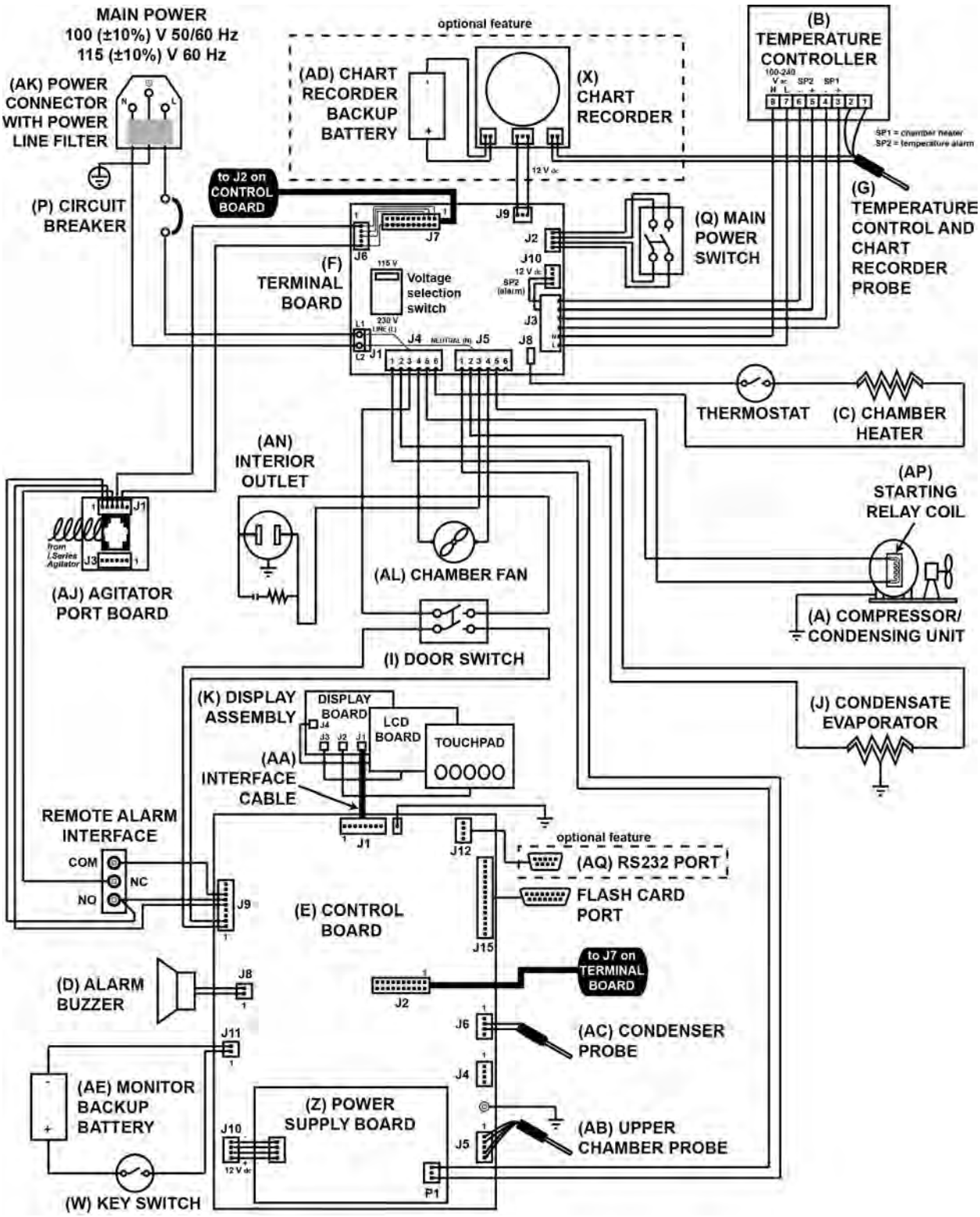
Label	Description	Model	Volts	Part Number
A	Data Cable			320842-1
B	Fan airflow deflector	100		320967-1
Not shown	Power cord, short (For all models except PC4200)	100/900/1200/ 2200/3200	100/115	120316
			230	120317

Label	Description	Model	Part Number
Not shown	Shelf for platelet rotator	900	400618-1
		1200	400619-1
	Label holder kit	4200	400620-1*
	Bypass plug		400657-1

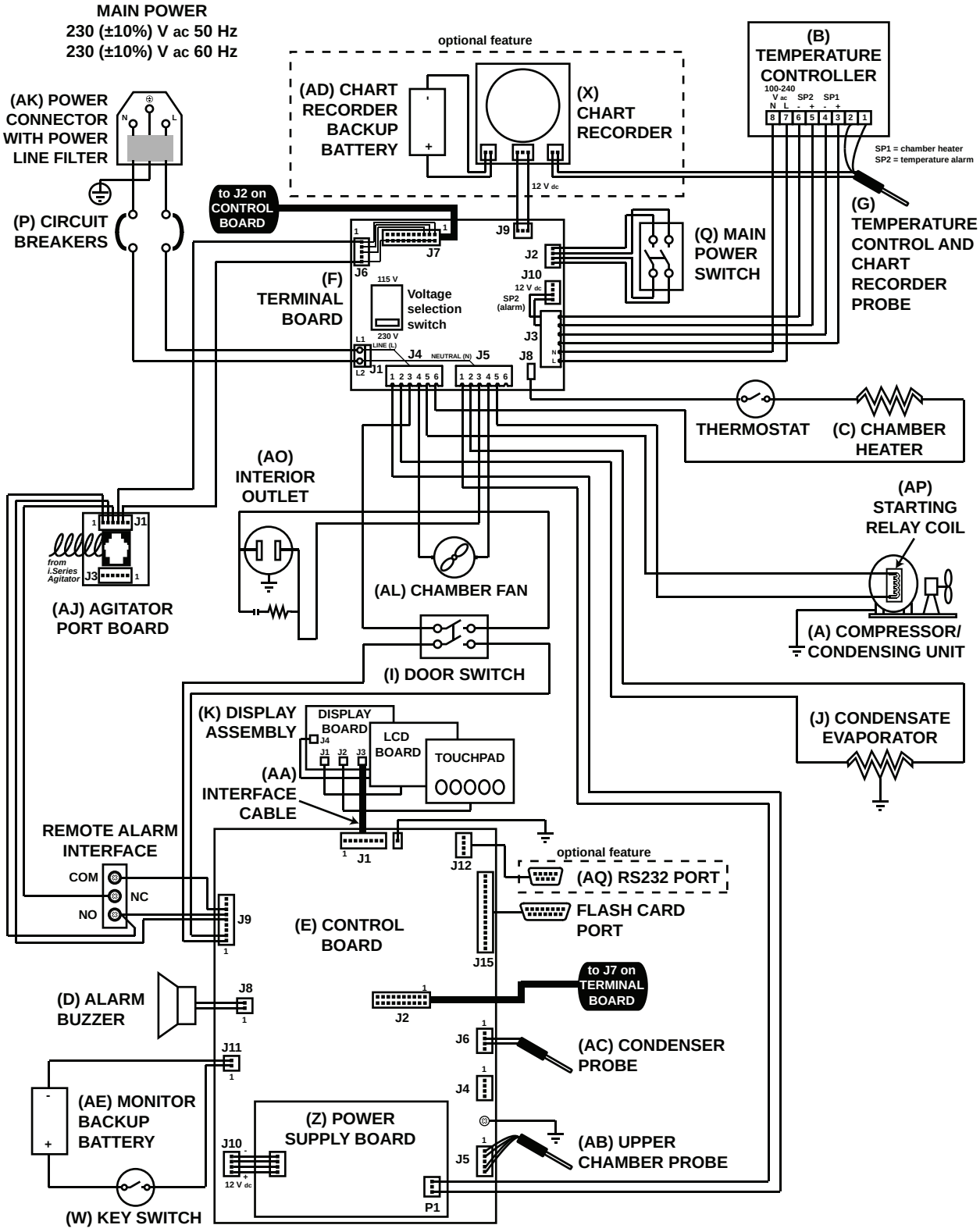
** Label holder kit if for PC4200h and includes label, label holder, hardware and installation tool. Also included in drawer assembly*

8 Schematics

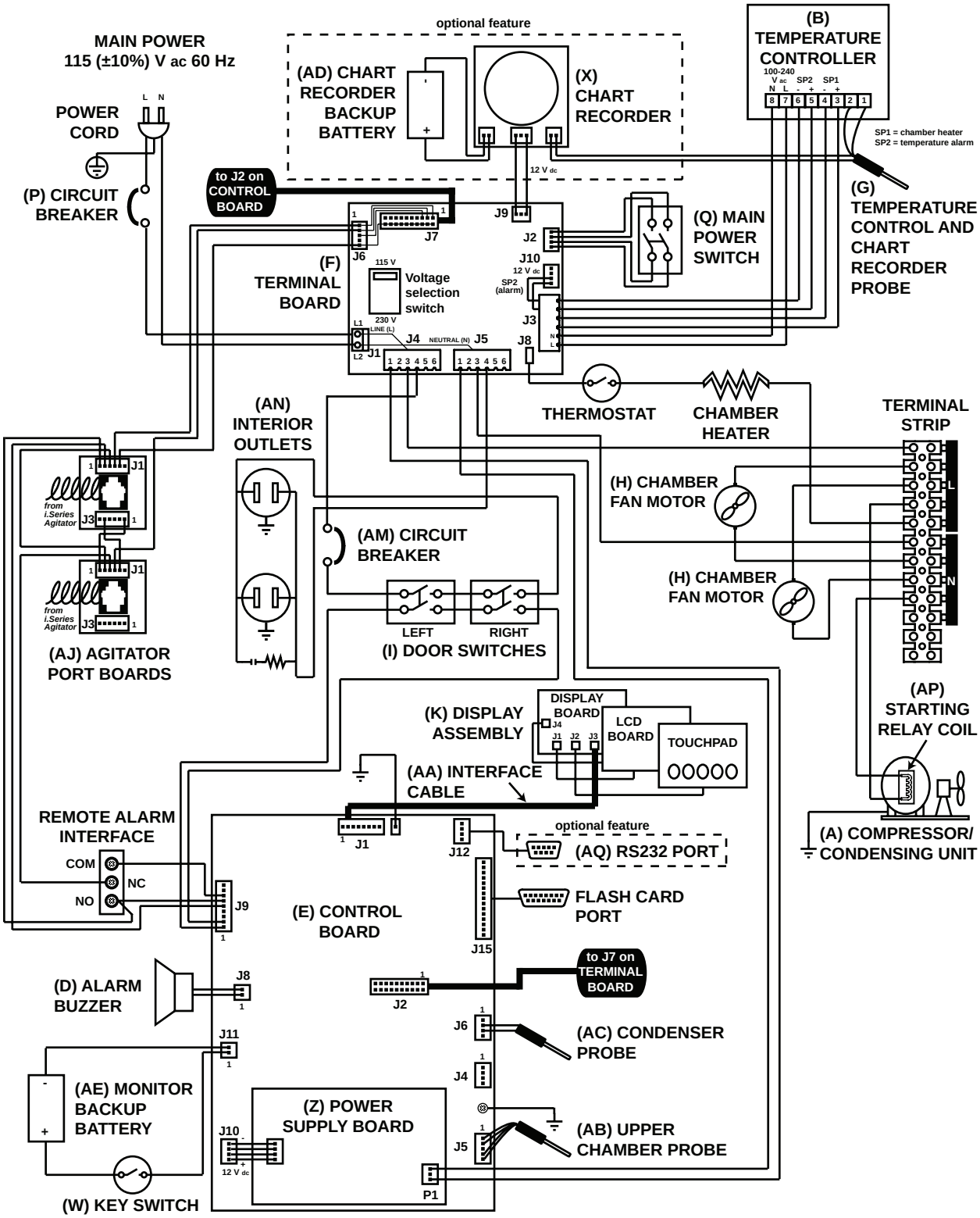
8.1 PC100i, PC900i, PC1200i (100/115 V)



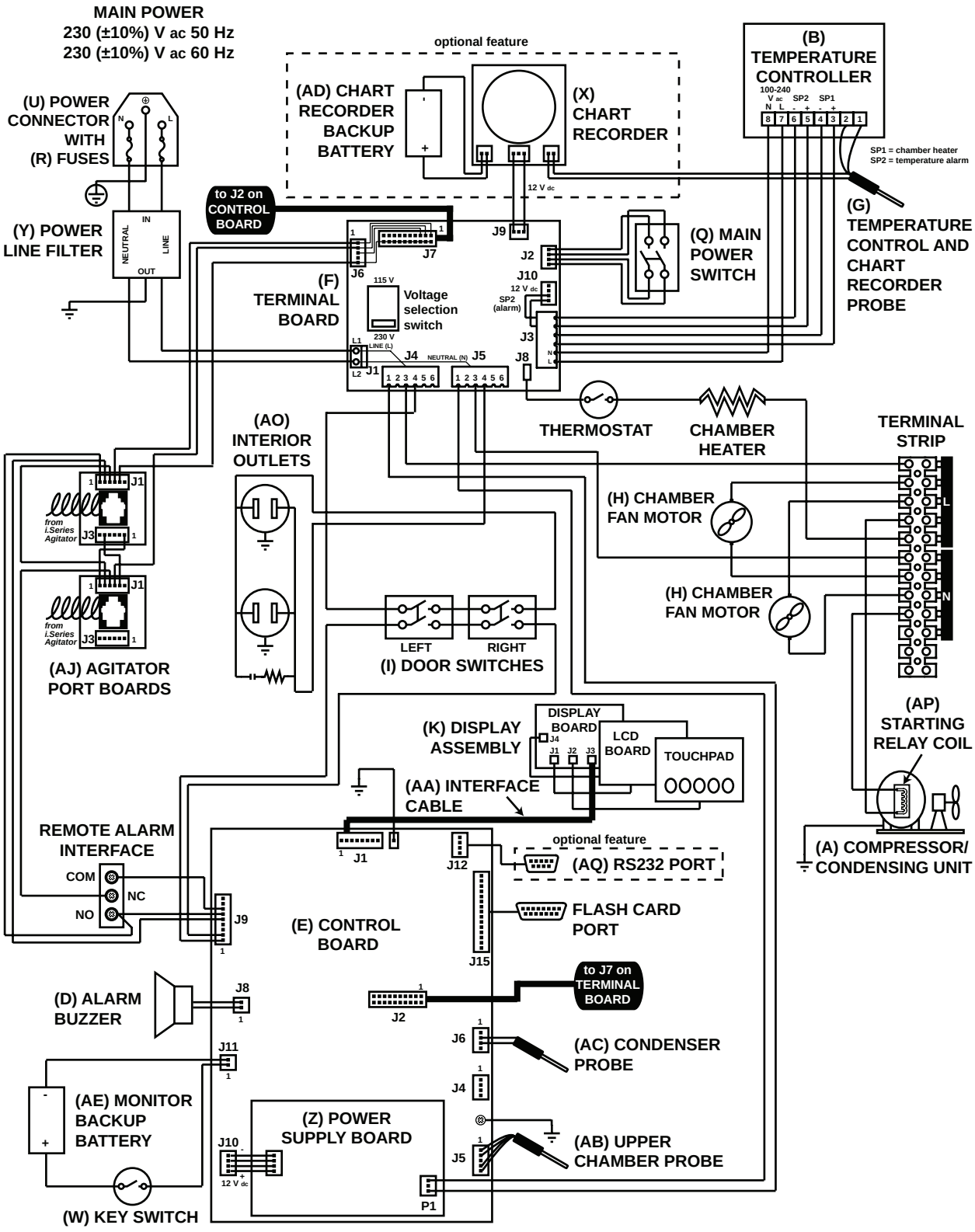
8.2 PC100i, PC900i, PC1200i (230 V)



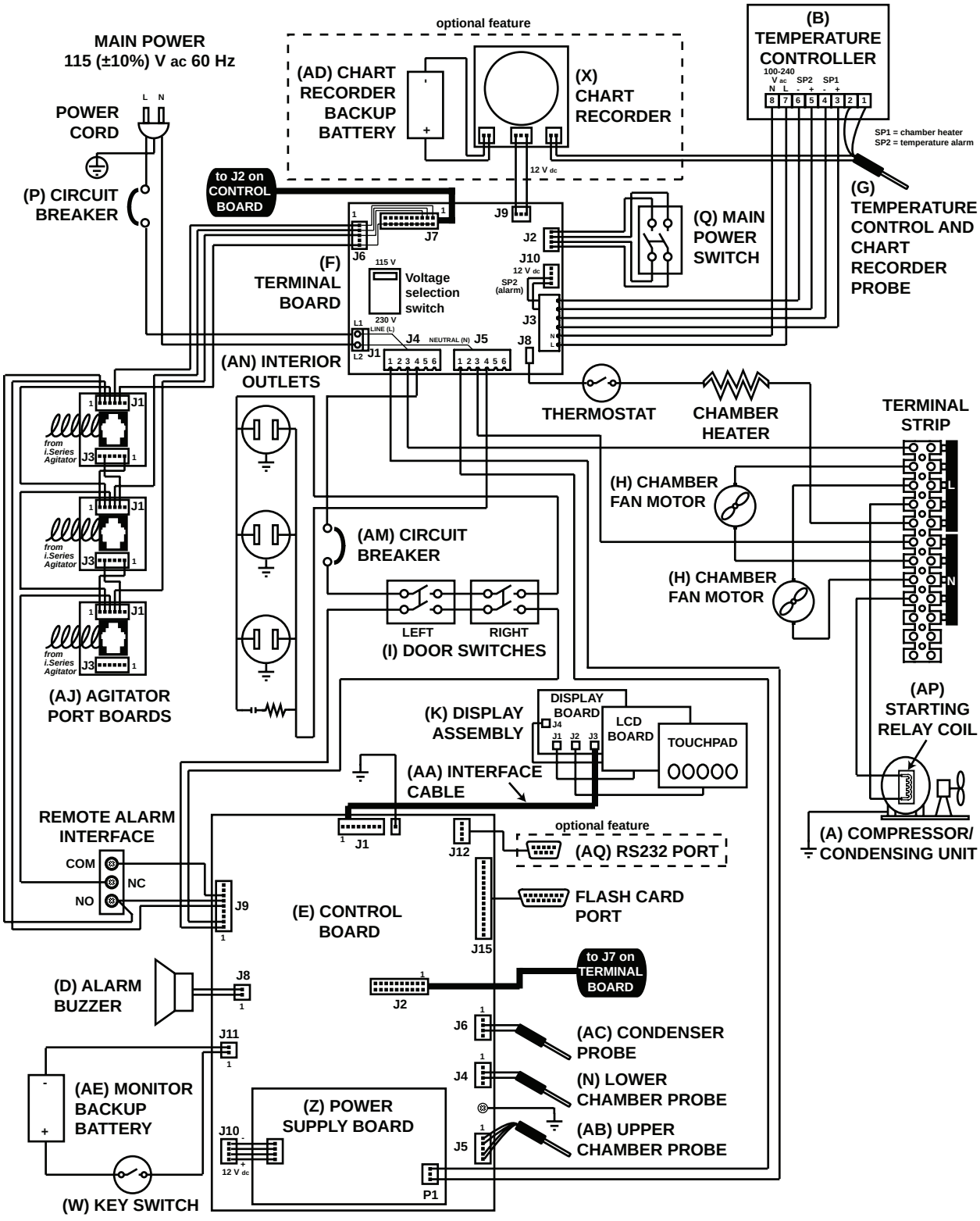
8.3 PC2200i (115 V)



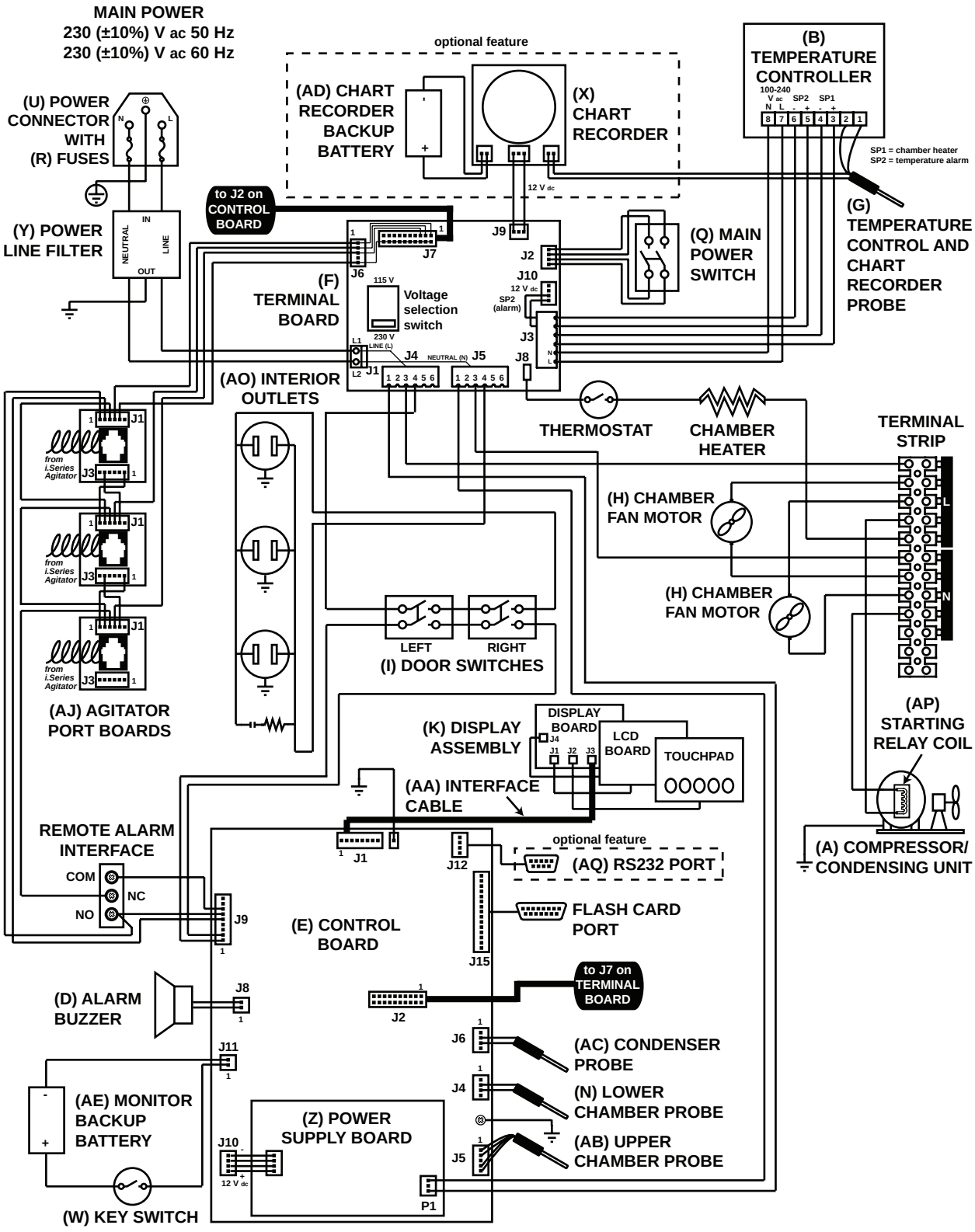
8.4 PC2200i (230 V)



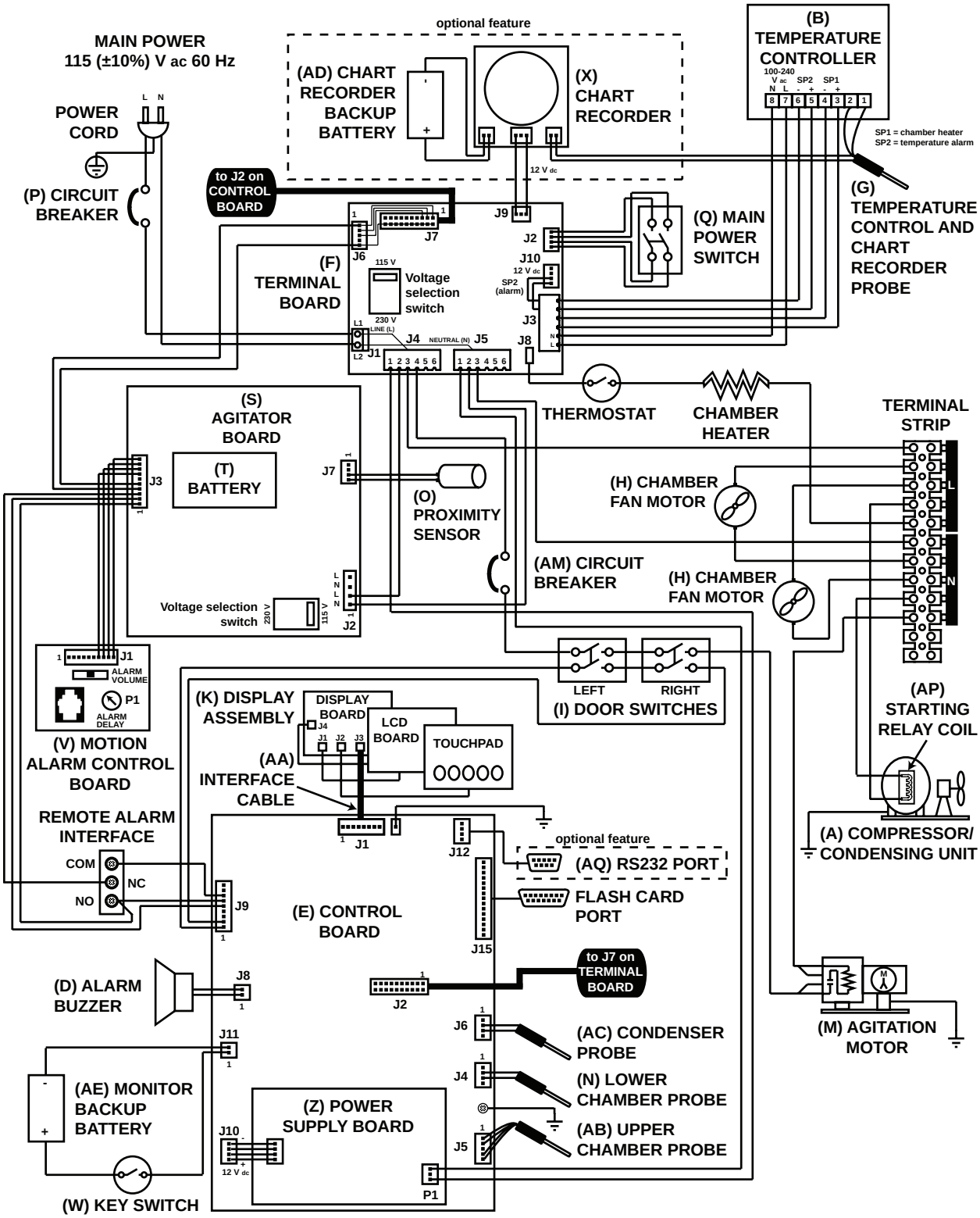
8.5 PC3200i (115 V)



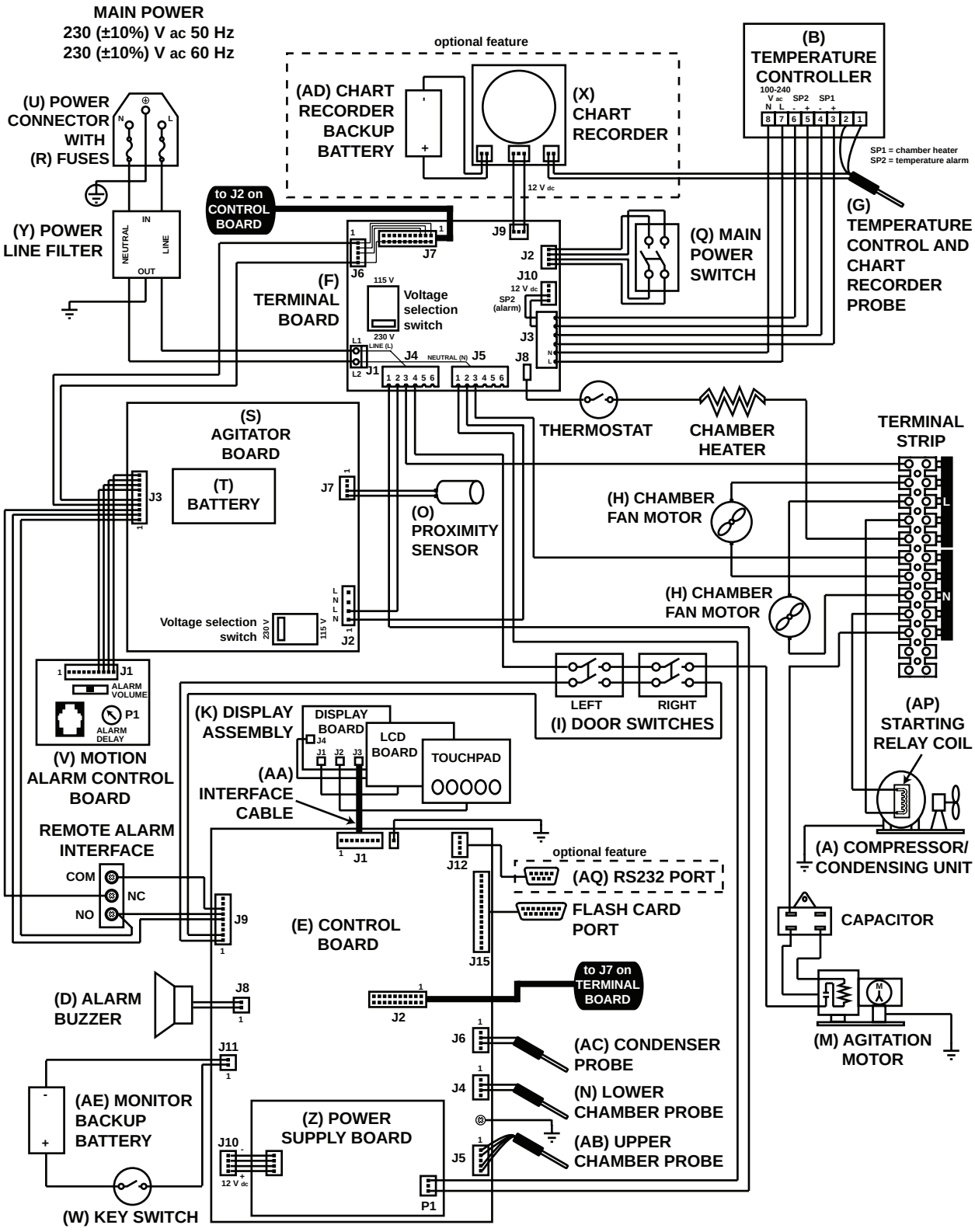
8.6 PC3200i (230 V)



8.7 PC4200i (115 V)



8.8 PC4200i (230 V)



9 i.Center Screen Reference

HOME screen

- **MAIN** button
  - **MAIN** screen
- **MUTE** button (changes mute timer)

MAIN screen

- **Event Log** option
  - (Press the **SELECT** button)
  - **EVENT LOG** screen
    - **EVENT LOG DETAIL** screen
- **System Alarm Test & Status** option
  - **SYSTEM ALARM TEST & STATUS** screen
    - **Start High Alarm Auto Test** option
    - **Start Low Alarm Auto Test** option
    - **Cancel High or Low Test** option
    - **Chart Paper Days Left** or **Chart Paper Timer** display
    - **Door Status** display
    - **Condenser Temp** display
- **Edit Configuration** option
  - (Enter the password)
  - **CONFIGURATION** screen
    - **Set Date & Time** option
      - **SET DATE & TIME** screen
    - **System Options** option
      - **SYSTEM OPTIONS** screen
        - **Language** option
        - **Alarm Volume** option
        - **Alarm Pulse** option
        - **Temperature Units** option
        - **Temperature Graph** option
        - **Chart Paper Timer** option
    - **Alarm Setpoints** option
      - **SET ALARM SETPOINT** screen
        - **High Alarm Setpoint** option
        - **Low Alarm Setpoint** option
        - **Cond. Alarm Setpoint** option
        - **Door Ajar Timeout** option
        - **Power Failure Timeout** option
        - **Agitator Alarm Setpoints** option
          - **AGITATOR ALARM SETPOINT** screen
            - **Agitator 1 Setpoint** option
            - **Agitator 1** option
            - **Agitator 2 Setpoint** option
            - **Agitator 2** option
            - **Agitator 3 Setpoint** option
            - **Agitator 3** option
    - **Temperature Calibration** option
      - **TEMPERATURE CALIBRATION** screen
        - **Select Temp Probe** option or **Upper Temperature Probe** display
        - **Temperature** option
    - **Factory Default Settings** option
      - **FACTORY DEFAULT SETTINGS** screen
    - **Change Password** option

(Enter a new password)
View Configuration option
VIEW CONFIGURATION screen
Clock Mode display
Date Format display
Door Ajar Timeout display
Pwr Failure Timeout display
High Alarm Setpoint display
Low Alarm Setpoint display
Cond. Alarm Setpoint display
Alarm Volume display
Alarm Pulse display
Chart Paper Days Left or **Chart Paper Timer** display
Agitator Alarms display
Temperature Graph display
Product/Company Information option
INFORMATION screen
i.Help option
i.Help screen
Agitator Information option
AGITATOR INFORMATION screen
Agitator RPM option
AGITATOR RPM screen
Agitator Cycles option
AGITATOR TOTAL CYCLE COUNT screen
Reset option
RESET AGITATOR screen
Agitator Count Logs option
AGITATOR COUNT LOGS screen

Horizon Series™ Models

10 Installation and Configuration

10.1 Install Battery for Backup Power

The monitoring and control system and the chart recorder each have a battery system, enabling a period of continuous operation if power is lost.

Battery life varies by manufacturer as well as voltage level remaining. The power failure backup battery provides power to the power failure alarm in the event of an AC power failure. Backup battery power for the chart recorder is available for up to 14 hours.

CAUTION

Before installing or replacing the battery, switch the power **OFF**. Disconnect the platelet incubator from AC power.

NOTICE

Use battery meeting manufacturer's specifications.

The battery is located behind the control door.

Battery is disconnected for shipping. Reconnect the battery to provide power failure alarm with backup power in the event of AC power failure.

10.2 Platelet Agitator and Platelet Incubator Compatibility

i.Series countertop platelet agitators (PF15i, PF48i, and PF96i) have a built-in motion alarm system and may be placed in either i.Series or Horizon Series platelet incubators. When agitation motion is not detected, the alarm sounds.

An i.Series platelet agitator placed in a Horizon Series platelet incubator cannot be monitored by the platelet incubator. If the agitation motion stops, the alarm on the i.Series platelet agitator sounds inside the platelet incubator, so the sound may not be apparent. An extension to the alarm system is desirable for this configuration.

Note

Horizon Series platelet incubators cannot monitor i.Series platelet agitators.

Platelet Incubator	Compatible Helmer Platelet Agitator
PC100h	PF15h
PC900h	PF48h
PC1200h, PC2200h, PC3200h	PF96h

10.3 Install a Platelet Agitator in the Platelet Incubator

Note

This chapter is not applicable to the PC4200h platelet incubator, which has a built-in platelet agitator.

PC900h platelet incubator with a PF48h platelet agitator installed.

Helmer platelet agitators can be installed inside Helmer platelet incubators. PC2200h and PC3200h platelet incubators hold one agitator per shelf. Each shelf features a corresponding power connector.

When installing a platelet agitator on a shelf, use the power connector for that shelf to prevent the power cord from obstructing the agitation motion.

Horizon Series platelet agitators (PF15h, PF48h, and PF96h) are not equipped with motion alarms, but may be placed in any Series platelet incubator. Without motion alarms, Horizon Series platelet agitator motion cannot be detected by the AgiTrak system in i.Series platelet incubators.

Note

For additional instruction in configuring a platelet agitator in a platelet incubator, refer to the platelet agitator service manual.

10.4 External Monitoring Devices

The remote alarm interface is a relay switch with three terminals:

- Common (COM)
- Normally Open (NO)
- Normally Closed (NC)

Terminals are dry contacts and do not supply voltage. Interface circuit is either normally open or normally closed, depending on terminals used.

Requirements for your alarm system determine which alarm wires must connect to terminals.

CAUTION

- The interface on the remote alarm monitoring system is intended for connection to the end user's central alarm system(s) that uses normally-open or normally-closed dry contacts.
- If an external power supply exceeding 30 V (RMS) or 60 V (DC) is connected to the remote alarm monitoring system's circuit, the remote alarm will not function properly; may be damaged; or may result in injury to the user.

The terminals on the remote alarm interface have the following maximum load capacity:

- 0.25 A at 30 V (RMS)
- 0.25 A at 60 V (DC)

Connect to Remote Alarm Interface

1. Switch the Alarm ON/OFF key switch **OFF**. Switch the AC ON/OFF switch **OFF**.
2. On the alarm panel, locate the remote alarm terminals.

Remote alarm interface.

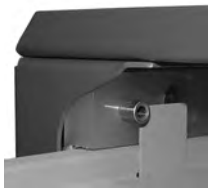
3. Connect remote alarm wires to appropriate terminals, according to requirements for your alarm system.
4. Use a cable tie to relieve strain on alarm wires (as necessary).
5. Switch the AC ON/OFF switch **ON**. Switch the Alarm ON/OFF switch **ON**.
6. Press the **MUTE** button to disable the high temperature alarm while platelet incubator reaches operating temperature.

10.5 Configuring Drawers (PC4200h)

⚠ CAUTION

- Before moving drawers, ensure they are completely empty for safe lifting.
- Open the drawer using the drawer handle; not the label holder.

Remove / Install a Drawer



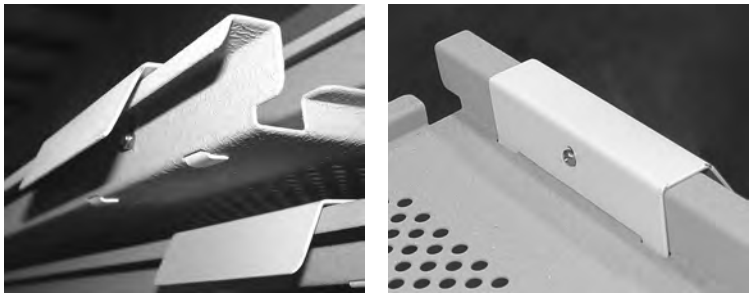
Drawer in the full open position.

Drawer with the tab in front of the drawer stop.

1. Pull drawer out until it stops (when the tabs on the drawer contact the spring-loaded stops).
2. Depress the spring-loaded drawer stops.
3. Pull the drawer outward until the tabs on the drawer have passed the drawer stops.
4. Pull drawer free of the drawer slides.
5. Align drawer with the drawer slides.
6. Push drawer in until it stops (when the tabs on the drawer contact the spring-loaded stops).
7. Depress the spring-loaded drawer stops.
8. Push the drawer into the storage frame until it stops.

10.6 Drawer Labels

Drawer label holders may be installed on platelet agitator drawers.



Installed label holder.

Install label holders:

1. Insert the tabs on the label holder into the slots on the drawer.
2. Pivot the holder around the drawer handle. Align the hole on the label holder with the corresponding hole on the drawer.
3. Insert a screw through the hole in label holder and through the hole in the drawer.
4. Install the nut on the screw, on the back side of the label holder.

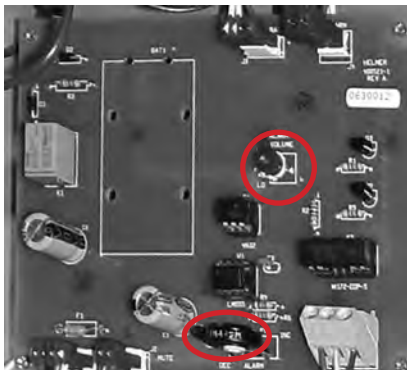
11 Alarm Settings

11.1 Temperature and Power Failure Alarm Volume

The alarm volume control and alarm delay control are located on top of the platelet incubator under the access panel.

NOTICE

Protect items in the platelet incubator from extended exposure to adverse temperatures.



Top: Alarm volume control for temperature and power failure alarms.
Bottom: Alarm delay control for power failure alarms.

Alarm Volume

The alarm volume for high chamber temperature, low chamber temperature, and power failure is set with the alarm volume control. The default alarm volume is set at the halfway point between low and high setting (medium). The volume can be adjusted by rotating the control from left (quietest) to right (loudest).

Change Alarm Volume:

1. Switch the AC ON/OFF switch **OFF**. Disconnect the platelet incubator from AC power. The power failure alarm will sound.
2. On top of the platelet incubator, remove the access panel. Locate the alarm volume control on the alarm board.
3. Using a small, flat-head screwdriver, rotate the control to the left (counterclockwise) to decrease the alarm volume, or right (clockwise) to increase the alarm volume
4. Reinstall the access panel on the top of the platelet incubator.
5. Reconnect the platelet incubator to AC power. Switch the AC ON/OFF switch **ON**.

Alarm Delay

The delay period controls the high temperature alarm and low temperature alarm. The default alarm delay is set at the halfway point between low and high setting (approximately four to five minutes). The delay period can be changed from five seconds to eight minutes. The delay period also sets the mute timer for audible high and low temperature alarms.

Note

If the delay period is set to 0 minutes, the mute button will have no effect.

Change Alarm Delay:

1. Disconnect the power failure alarm backup battery.
2. Switch the AC ON/OFF switch **OFF**. Disconnect the platelet incubator from AC power.
3. On top of the platelet incubator, remove the access panel. Locate the alarm delay control on the alarm board.
4. Using a small, flat-head screwdriver, rotate the control to the left (counterclockwise) to decrease the alarm delay to five seconds.
5. Using the screwdriver, rotate the control to the right (clockwise) to increase the alarm delay to eight minutes.
6. Reinstall the access panel on the top of the platelet incubator.
7. Reconnect the platelet incubator to AC power. Switch the AC ON/OFF switch **ON**.
8. Reconnect the power failure alarm backup battery.

11.2 Motion Alarm (PC4200h)

Unlike other Horizon Series models, the PC4200h platelet incubator has a motion alarm delay control. When the platelet agitator motion stops, this control delays when alarm information is sent to the remote alarm interface on the platelet incubator.

Note

The delay control for the motion alarm is located on the rear of the platelet incubator.

Top: Motion alarm volume control. Bottom: Alarm delay control for the motion alarm.

The default motion alarm delay is set at the halfway point (approximately four (4) minutes). To change the motion alarm delay, use a small flat-head screwdriver. The maximum alarm delay is eight (8) minutes.

The default alarm volume is set at the middle position (medium).

Note

Do not set the alarm delay to 0 minutes.

Change Motion Alarm Delay:

Using a small, flat-head screwdriver, rotate the control to the left (counterclockwise) to shorten the motion alarm delay, or to the right (clockwise) to extend the motion alarm delay.

Change Motion Alarm Volume:

1. On back of the platelet incubator, locate the alarm volume control.
2. Position the switch to correspond with the desired motion alarm volume.

11.3 Alarm Tests

Test alarms to ensure they are working correctly. The platelet incubator has alarms for chamber temperature, power failure, and agitation motion (for built-in PC4200h platelet agitator).

NOTICE

Before testing alarms, protect items in the platelet incubator from extended exposure to adverse temperature.

Chamber Temperature Alarm Test (PC100h)

NOTICE

- Perform the low alarm test before the high alarm test to control the temperature more closely and complete the testing more quickly.
- Calibrate the chamber temperature probe prior to performing the manual chamber alarm test.
- Temperature probes are fragile; handle with care.

Notes

- To perform the manual chamber alarm test on PC100h platelet incubators, obtain the alarm check tube.
- Do not remove the chamber probe from PC100h platelet incubators; fill the tube with 2” (51 mm) of hot or cold water as noted in the instructions below.
- Place the filled alarm check tube over the chamber probe to perform the test.

Test Low Alarm

1. Identify the current setting for the low alarm setpoint.
2. Remove the installed platelet agitator(s) to allow access to the to the chamber probe.
3. Fill the alarm check tube with cold water.
4. Place the alarm check tube in the holding bracket. Slide the tube upward to immerse the probe tip.
5. When the low temperature alarm sounds, note the temperature on the monitoring and control system display.
6. Compare the temperature at which the alarm sounds to the low alarm setpoint. If the values do not match, refer to Troubleshooting.

Test High Alarm

1. Identify the current setting for the high alarm setpoint.
2. Fill the alarm check tube with hot water.
3. Place the alarm check tube in the holding bracket. Slide the tube upward to immerse the probe tip.
4. When the high temperature alarm sounds, note the temperature on the monitoring and control system display.
5. Compare the temperature at which the alarm sounds to the high alarm setpoint. If the values do not match, refer to Troubleshooting.
6. Reinstall the platelet agitator in the chamber.
7. Slide the alarm check tube down so the probe is no longer immersed.

Chamber Temperature Alarm Test (PC900h, PC1200h, PC2200h, PC3200h, PC4200h)

NOTICE

- Perform the low alarm test before the high alarm test to control the temperature more closely and complete the testing more quickly.
- Calibrate the chamber temperature probe prior to performing the manual chamber alarm test.
- Temperature probes are fragile; handle with care.

Note

Place the filled alarm check tube over the chamber probe to perform the test.

Test Low Alarm

1. Identify the current setting for the low alarm setpoint.
2. Remove the installed platelet agitator(s) to allow access to the to the chamber probe.
3. Loosen the screws securing the chamber probe bracket to the chamber wall. Slide the bracket up and away from the wall.
4. Unscrew and remove the fitting securing the probe to the bracket.

5. Slide the probe tip upward and free the probe from the bracket.

6. Immerse the probe in cold water. Ensure the probe is at the bottom of the glass.
7. When the low temperature alarm sounds, note the temperature on the monitoring system display.
8. Compare the temperature at which the alarm sounds to the low alarm setpoint. If the values do not match, refer to Troubleshooting.

Test High Alarm

1. Identify the current setting for the high alarm setpoint.
2. Immerse the probe in hot water. Ensure the probe is at the bottom of the glass.
3. When the high temperature alarm sounds, note the temperature on the monitoring system display.
4. Compare the temperature at which the alarm sounds to the high alarm setpoint. If the values do not match, refer to Troubleshooting.
5. Remove the probe from the warm water.
6. Install the probe in the chamber probe bracket.
7. Install the fitting to secure the probe to the probe bracket, leaving approximately 1” (25 mm) of the probe exposed beyond the fitting.
8. Install the probe bracket in the chamber and tighten the screws.
9. Reinstall the platelet agitator(s) in the chamber.

Power Failure Alarm Test

During a power failure, the power failure alarm sounds and the battery provides power to the power failure alarm.

Test Power Failure Alarm

1. Ensure the power failure alarm backup battery is connected.
2. Behind the control door on the front of the platelet incubator, enable the temperature and power failure alarms.
   - **PC4200h:** Switch the alarm key switch to position **2** to enable the audible temperature and power failure alarms but disable the motion alarm.
   - **PC100h, PC900h, PC1200h, PC2200h, PC3200h:** Switch the alarm key switch **ON**.
3. Disconnect unit from AC power. The power failure alarm will activate immediately. If the power failure alarm does not activate, replace the power failure alarm battery.
4. Connect unit to AC power. The power failure alarm should clear.
5. Switch the alarm key switch to the original setting.

Motion Alarm Test (PC4200h)

1. Confirm the platelet incubator is connected to AC power.
2. Ensure the Motion Alarm key switch is switched to position **1**.
3. Switch the AC ON/OFF switch **ON**.
4. Open the door. Agitation motion will stop and the motion alarm will activate after the delay period elapses.
5. Close the door. Agitation motion will resume. The motion alarm will clear and the audible alarm will cease.

12 Temperature Controller Setpoints

Temperature controller setpoints are programmed at the factory. Setpoints can be viewed and changed through the temperature controller. Parameter values reside in four program levels.

Temperature controller display.

Changeable Parameters

Parameter	Program Level	Function
ZEro	3	Calibrate the temperature controller readout
AL.hi	1	Set high temperature alarm value: Horizon Series
AL.Lo	1	Set low temperature alarm value: Horizon Series

View / Change Parameter Values:

NOTICE

Changing parameter values affects platelet incubator operation. Do not change parameter values unless instructed in product documentation or by Helmer Technical Service.

Note

When there is no interaction for 60 seconds, the temperature controller exits program mode.

1. Press and hold the **UP** and **DOWN** buttons simultaneously for approximately three seconds. “tunE” and “oFF” flash on the display. The temperature controller is now in Level 1 program mode.
2. Press and release the **UP** or **DOWN** buttons until the desired parameter flashes on the display.
3. Change a parameter value by pressing and holding the ✱ button.
4. Press the **UP** or **DOWN** buttons to change the parameter value.
   - ♦ To access Level 2 parameters, change the value for the “LEVL” parameter to **2**.
   - ♦ To access Level 3 parameters, change the value for the “LEVL” parameter to **3**.
5. Release all buttons to exit the parameter. New settings are saved. If the “LEVL” parameter value is changed, the temperature controller returns to the selected program level.
6. Repeat steps 2 through 4 to access another program level, or to view or change parameter values in the selected level.
7. Access Level 4 parameters by navigating to Level 3 program mode.
8. Select the “UEr” parameter.
9. Press and hold the **UP** and **DOWN** buttons simultaneously for approximately 10 seconds. The “LOCK” parameter flashes on the display.
10. Exit program mode by pressing and holding the **UP** and **DOWN** arrow buttons simultaneously for approximately three seconds, or until the current chamber temperature is displayed.

12.1 Level 1 Parameters and Values

Notes

- Parameters are listed in order of appearance.
- SP1 refers to the chamber heater.
- SP2 refers to the temperature alarm for Horizon Series models.
- Default values for AL.Lo and AL.hi may vary: the values listed are for temperature controllers programmed at the factory with a platelet incubator setpoint of 22 °C.

Parameter	Description	Default Value (Countertop Models)	Default Value (Floor Models)
tunE	Autotune selection	oFF	oFF
bAnd	SP1 proportional band (gain) or hysteresis (in °C)	7.5	3.2
, nt.t	SP1 integral time/reset (in minutes)	7.5	15
dEr.t	SP1 derivative time/rate	oFF	oFF
dAC	SP1 derivative approach control	0.5	0.5
CyC.t	SP1 proportional cycle-time	0.5	0.5
oFSt	SP1 offset (manual reset)	0.5	0.5
SP.LY	Lock main setpoint	oFF	oFF
SPrr	Ramp rate (if ramp is on)	0	0
SPrn	Ramp selection	oFF	oFF
SoAt	Soak time selection	--	--
AL.Lo	SP2 low alarm setpoint (in °C)	20.0 (see note above)	20.0 (see note above)
AL.hi	SP2 high alarm setpoint (in °C)	24.0 (see note above)	24.0 (see note above)
bnd.2	SP2 hysteresis or proportional band (in °C)	0.1	0.1
CyC.2	SP2 mode selection (ON/OFF or proportional cycle-time)	on.oF	on.oF
LEUL	Parameter level currently selected	1	1

12.2 Level 2 Parameters and Values

Parameter	Description	Default Value (Countertop Models)	Default Value (Floor Models)
SP 1.P	Display of SP1 output power percentage (read-only)	(read only)	(read only)
hAnd	Selection for manual control of power for SP1	oFF	oFF
PL.1	SP1 power limit percentage	100	100
PL.2	SP2 power limit percentage (cooling)	0	0
SP2.A	Main SP2 operating mode (alarm strategy)	bAnd	bAnd
SP2.b	Subsidiary SP2 mode	nonE	nonE
d, SP	Display resolution	0.1°	0.1°
hi.SC	Full scale	35.0	35.0
Lo.SC	Minimum scale	15.0	15.0
, nPt	Input sensor type	rtd	rtd
uni t	Units (°C / °F)	°C	°C
LEUL	Parameter level currently selected	2	2

12.3 Level 3 Parameters and Values

Parameter	Description	Default Value (Countertop Models)	Default Value (Floor Models)
SP 1.d	SP1 output device type	SSd1	SSd1
SP2.d	SP2 output device type (read only)	SSd2	SSd2
burn	Sensor burn-out protection type (upscale or downscale)	uP.SC	uP.SC
rEU.d	Output mode (reverse or direct)	1r.2r	1r.2r
rEU.L	LED indicator modes for SP1 and SP2 (normal or inverted)	1n.2n	1n.2n
SPAn	Sensor span adjust	0.0	0.0
2Ero	Zero sensor error (calibration across full scale)	(varies)	(varies)
ChEY	Selection for the control accuracy monitor	oFF	oFF
rEAd	Read control accuracy monitor results (variance)	UAr°	UAr°
tECh	Read autotune tuning cycle data	Ct A	Ct A
UEr	Software version (select this parameter to access Level 4 parameters)	392b	392b
rSEt	Function reset	nonE	nonE
LEUL	Parameter level currently selected	3	3

12.4 Level 4 Parameters and Values

Parameter	Description	Default Value (Countertop Models)	Default Value (Floor Models)
LoCK	Program security lock	nonE	nonE
dEr.S	Derivative sensitivity	0.5	0.5
di.SS	Display sensitivity (or direct display of input)	dir	dir
no.AL	Disable SP2 alarm annunciator	oFF	oFF
ProG	Program mode auto-exit switch (returns display to normal mode if no activity for one minute)	Auto	Auto

12.5 Change the Platelet Incubator Setpoint

The default setpoint is 22.0 °C. The temperature controller adjusts chamber temperature around the setpoint. When chamber temperature is below setpoint, the controller activates the heater to warm the chamber. When temperature rises above setpoint, the controller activates the compressor to cool the chamber.

NOTICE

Do not change the setpoint to a value outside the temperature control range.

Open the control door to access the temperature controller. The current chamber temperature is displayed. The temperature may be different from the setpoint, especially if the chamber temperature has not yet stabilized.

Temperature controller display.

1. Press and hold the ✱ button to access the setpoint adjustment function. The controller displays current setpoint value.
2. Press and hold the ✱ button to change the setpoint.
3. Press the **UP** or **DOWN** buttons to increase or decrease setpoint in increments of 0.1 °C.
4. Release all buttons to exit the setpoint parameter. New settings are saved.

12.6 Calibrate the Temperature Controller Display

The temperature controller senses chamber temperature through a probe in the chamber. The chamber setpoint typically varies from the measured temperature, so an offset value is used by the control system to compensate for the difference.

NOTICE

Do not change the control sensor offset unless instructed in product documentation or by Helmer Technical Service.

Notes

- Value is factory-preset and varies for each unit
- Offset value can be changed from -10.0 °C to +10.0 °C
- If the variance is within acceptable limits for your organization, changing the offset value is optional.

Determine New Offset Value

1. Use the zip tie to attach a calibrated independent thermometer traceable per national standards to the control probe.
2. Close door and allow chamber temperature to stabilize for 30 minutes.
3. Observe independent thermometer temperature for 10 minutes and determine temperature range.
4. From the range, calculate the average temperature.
5. Remove the thermometer from the control probe.
6. Determine the change in value to reach desired setpoint.

Example
- Current setpoint is 22.0 ºC
- Average temperature is 23 ºC
- Offset adjustment value is +1.0 ºC

Enter New Offset Value

Note
When there is no interaction for 60 seconds, the temperature controller exits program mode.

1. Press and hold the **UP** and **DOWN** buttons simultaneously for approximately three seconds. “tunE” and “oFF” flash on the display. The temperature controller is now in Level 1 program mode.
2. Press and release the **UP** or **DOWN** buttons until “LEVL” flashes on the display.
3. Press and hold the ✱ button.
4. Press the **UP** or **DOWN** buttons to change the parameter value to **3**.
5. Release the ✱ button.
6. Press and release the **UP** or **DOWN** buttons until “ZEro” flashes on the display.
7. Press and hold the ✱ button.
8. Press the **UP** or **DOWN** buttons to change the value to the calculated offset adjustment value.
9. Release the ✱ button.
10. Release all buttons to exit the parameter. New settings are saved. If the “LEVL” parameter value is changed, the temperature controller returns to the selected program level.
11. Press and hold the **UP** and **DOWN** arrow buttons simultaneously for approximately three seconds, or until the current chamber temperature is displayed.

13 Maintenance

NOTICE

- Before performing maintenance, protect items in platelet incubator from extended exposure to adverse temperature.
- Allow platelet incubator temperature to stabilize at setpoint after performing service or after extended door opening.

Note

Refer to the operation manual for the preventive maintenance schedule.

13.1 Recharge Refrigerant

CAUTION

Review all safety instructions prior to recharging refrigerant. Refer to chapter **2** (Safety).
Maintenance should only be performed by trained refrigeration technicians.

NOTICE

Use only non-CFC R-134A refrigerant.

Full initial refrigerant charge varies by model.

Model	Volts	Initial Charge
PC100h, PC900h, PC1200h	115	5.0 oz (142 g)
PC100h, PC900h, PC1200h (serial numbers prior to 2054189)	230	5.0 oz (142 g)
PC100h, PC900h, PC1200h (serial number 2054189 and after)	230	3.3 oz (94 g)
PC2200h, PC3200h, PC4200h (serial numbers prior to 2042392)	115	8.0 oz (227 g)
PC2200h, PC3200h, PC4200h (serial number 2042392 and after)	115	4.0 oz (113 g)
PC2200h, PC3200h, PC4200h (serial numbers prior to 2046319)	230	8.0 oz (227 g)
PC2200h, PC3200h, PC4200h (serial number 2046319 and after)	230	12.0 oz (340 g)

Add refrigerant:

Note

Pressure varies depending on ambient air temperature.

1. Attach calibrated pressure gauge (0 lbs/in² to 60 lbs/in² (0 kPa to 400 kPa)) to the fittings on the refrigeration lines.
2. Measure the low side (suction) pressure.
3. Add refrigerant so the peak low side pressure corresponds to pressure (at the stated ambient temperature) in the table below.

Ambient Temperature		Low Side Pressure		
°C	°F	lbs/in²	kPa	bar
18	64.4	29.0	200	2.00
19	66.2	29.5	203	2.03
20	68.0	30.0	207	2.07
21	69.8	30.5	210	2.10
22	71.6	31.0	214	2.14
23	73.4	31.5	217	2.17
24	75.2	32.0	221	2.21

Ambient Temperature		Low Side Pressure		
°C	°F	lbs/in²	kPa	bar
25	77.0	32.6	225	2.25
26	78.8	33.3	230	2.30
27	80.6	33.5	231	2.31
28	82.4	34.3	236	2.36
29	84.2	34.8	240	2.40
30	86.0	35.4	244	2.44

4. Remove pressure guage.

13.2 Power Failure Alarm Battery

If the backup battery for the Power Failure alarm is depleted, the Power Failure alarm will not activate.

Test Power Failure Alarm Backup Battery

1. Disconnect the platelet incubator from AC power. The Power Failure alarm will sound immediately. If the alarm does not sound, replace the battery.
2. Reconnect the platelet incubator to AC power.

Replace the Power Failure Alarm Battery

NOTICE

Use battery which meets manufacturer's specifications (9 V non-rechargeable alkaline battery or equivalent).

1. Open the control door on the front of the platelet incubator. Switch the AC ON/OFF switch **OFF**.
2. Disconnect the platelet incubator from AC power.
3. Disable the Power Failure alarm:
   - **PC100h, PC900h, PC1200h, PC2200h, PC3200h:** disconnect the power failure alarm battery.
   - **PC4200h:** Turn alarm key to position **3**.
4. Remove the battery. Replace with a new battery.
5. Enable the Power Failure alarm:
   - **PC100h, PC900h, PC1200h, PC2200h, PC3200h:** reconnect the power failure alarm battery.
   - **PC4200h:** Turn alarm key to the original position.
6. Reconnect the platelet incubator to AC power.
7. Switch the AC ON/OFF switch **ON** and close the control door.

13.3 Motion Alarm Battery (PC4200h)

Test the motion alarm battery to ensure it can provide power to the motion alarm in the event agitation motion stops.

Notes

- The motion alarm battery is applicable to the PC4200h platelet incubator only.
- If the agitation motion alarm sounds, the battery does not need to be replaced.
- If the agitation motion alarm does not sound, replace the motion alarm backup battery.

Test Motion Alarm Battery

1. Ensure the Motion Alarm ON/OFF switch is switched **ON**.
2. Ensure the monitoring system backup battery is switched **ON**.
3. Using a small flat-head screwdriver, rotate the Motion Alarm Delay control to the left (counterclockwise) to shorten the motion alarm delay to five seconds.
4. Open the door to disable agitation. Motion alarm will activate after five seconds.
5. Close the door to enable agitation. Agitation motion alarm will clear and audible alarm will cease.
6. Using a small flat-head screwdriver, rotate the Motion Alarm Delay control to the right (clockwise) to change the motion alarm delay to the original setting.

Replace the Motion Alarm Battery (PC4200h)

NOTICE

Use battery which meets manufacturer's specifications (9 V nickel-metal hydride rechargeable battery (or equivalent).

1. Open the control door on the front of the platelet incubator and disconnect the motion alarm battery.
2. Switch the AC ON/OFF switch **OFF**.
3. Disconnect the platelet incubator from AC power.
4. Remove the battery. Replace with a new battery.
5. Reconnect the platelet incubator to AC power.
6. Switch the AC ON/OFF switch **ON**.
7. Reconnect the motion alarm battery and close the control door.

13.4 Clean the Platelet Incubator

WARNING

Disconnect platelet incubator from AC power when cleaning.

Condenser Grill

In environments where platelet incubator is exposed to excessive lint or dust, condenser grill may require cleaning more frequently than stated in preventive maintenance schedule.

Clean the condenser grill using a soft brush and a vacuum cleaner.

Exterior

Clean glass surfaces with soft cotton cloth and glass cleaner. Clean exterior surfaces with soft cotton cloth and non-abrasive liquid cleaner.

CAUTION

The condensate evaporator and water evaporation tray are hot.

NOTICE

For PC4200h platelet incubators, clean the vents in the base as needed.

Interior

Clean painted surfaces with mild detergent. Clean stainless steel surfaces with a general-purpose laboratory cleaner suitable for stainless steel. For PC4200h models, clean textured drawer surfaces with a soft brush.

Door Gaskets

Clean with soft cloth and mild soap and water solution.

13.5 Lubricate the Drawer Slides (PC4200h)

CAUTION

- Before moving drawers, ensure they are completely empty.
- Open the drawer using the drawer handle; not the label holder.
- Do not open more than one drawer at a time.

Clean the slots in the drawer guides with a clean, dry cloth. Apply a thin film of petroleum jelly to the bottom of each drawer where it contacts the drawer guide.

13.6 Lubricate and Service Internal Parts (PC4200h)

WARNING

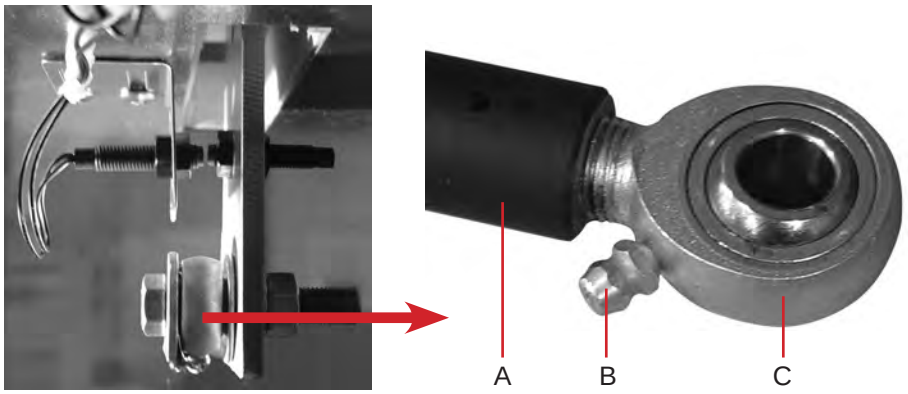
Disconnect platelet incubator from AC power when lubricating internal parts.

Drive Rod Bearings

Clean drive rod end bearings, wheels, and components according to the preventive maintenance schedule in the operation manual.

Lubricate the drive rod bearings:

1. Using grease gun, inject bearing grease into the grease fitting on the bearing.



Label	Description
A	Drive rod
B	Grease fitting
C	Rod end bearing

Drive rod and rod end bearing detail.

Wheels

NOTICE

Do not use oil or aerosol lubricant.

Lubricate wheel axles with a light machine oil. Remove the cover to access the front wheels for inspection, cleaning, and lubrication.

Replace wheels as necessary. The hole in each wheel should be circular. If the hole is out-of-round, replace the wheel. If the wheels need to be replaced, contact Helmer Technical Service.

14 Troubleshooting

⚠ CAUTION

Review all safety instructions prior to troubleshooting.

14.1 General Operation Problems

Problem	Possible Cause	Action
Roll-out shelf does not slide easily (PC2200h and PC3200h).	Debris in the shelf slides.	Pull the shelf out and confirm the slides are free of debris. Clean if necessary.
	Shelf slides are not lubricated.	Using a lightweight oil, lubricate the bearings in the slides.
	Shelf slide is faulty.	Contact a qualified service technician.
Drawer does not slide easily (PC4200h).	Debris in slots of drawer guides.	Pull the drawer out and confirm the slots are free of debris. Clean if necessary.
	Drawers are not lubricated.	Clean and lubricate the drawer slots.
Door does not open easily (PC100h and floor models).	Debris in hinges.	Confirm the hinges are free of debris. Clean the hinges if necessary.
	Door hinges are not lubricated.	Using a general-purpose grease, lubricate the pivots in the hinges.
	Hinge cam is faulty.	Contact a qualified service technician.
Hood does not open easily (PC900h and PC1200h).	Damping cylinder or hood hinge is faulty.	Contact a qualified service technician.
Platelet incubator does not roll easily (floor models).	One or more casters are locked.	Unlock the casters. Push the platelet incubator from the sides, not from the front or back.
Platelet incubator is connected to AC power, and doors are closed, but built-in platelet agitator is not moving (PC 4200h).	Platelet agitator is obstructed.	Verify the platelet agitator is free of obstructions.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Agitation is noisy or rough (PC4200h).	Platelet incubator is not level.	Verify the platelet incubator has been set up appropriately.
	Moving parts are grinding against each other.	Verify that moving parts are lubricated and in good condition. Lubricate or replace if necessary.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Main power switch is on, but nothing is working.	Outlet connection is faulty.	Verify power at the outlet. Repair original outlet or connect to a different outlet if necessary.
	Power cord is faulty.	Check condition of the power cord. Replace if in poor condition. Check that voltage through the cord is appropriate. If not, replace cord.
	Power connector is faulty (all models except 115 V floor models).	Check that connections between power cord and power connector are secure. Check that voltage through power connector is appropriate. If not, replace power connector.
	Circuit breaker was tripped (230 V countertop models, all 100/115 V models).	Confirm that all circuit breakers are seated. Push circuit breaker to reset if necessary.
	One or both fuses have blown (230 V floor models).	Verify fuse has not blown. Replace fuse if necessary.
	Power line filter is faulty (230 V floor models).	Verify power output from the filter. Replace power line filter if necessary.
	Power switch is faulty.	Verify power output from the switch. Replace switch if necessary.
	Terminal board is faulty.	Confirm terminal board is supplying power to other components. Replace terminal board if necessary.
Main power switch is on, but temperature controller is not working.	Connection between terminal board and temperature controller is loose or a part is faulty.	• Check connections between terminal board and temperature controller. Secure connections if necessary. • Confirm terminal board is supplying power to temperature controller. Replace temperature controller or terminal board if necessary.

Problem	Possible Cause	Action
Main power switch is on, but compressor is not running.	Connection between terminal board and the compressor is loose or a part is faulty.	• Check connections between the terminal board and compressor. Secure connections if necessary. • Confirm terminal board is supplying power to compressor by checking whether condensing unit fan is working. • Replace terminal strip if necessary (floor models only). • Replace starting relay coil, compressor/condensing unit, or terminal board if necessary.
Main power switch is on, but chart recorder is not working.	Connection between terminal board and chart recorder is loose or a part is faulty.	• Check connections between terminal board and chart recorder. Secure connections if necessary. • Confirm terminal board is supplying power to chart recorder. • Replace chart recorder or terminal board if necessary. Refer to the temperature chart recorder operation and service manual.
Main power switch is on, and the doors are closed, but built-in platelet agitator is not agitating (PC4200h).	Doors are not closing completely.	• Confirm hinge cams are not damaged. Replace if necessary. • Confirm door gaskets are sealing completely. Replace door gasket if necessary.
	One or both door switches are faulty.	Check connections for door switches. Replace one or both door switches if necessary.
	Secondary circuit breaker has tripped (100/115 V models).	Confirm that all circuit breakers are seated. Push circuit breaker to reset it if necessary.
	Agitation motor is faulty.	Check connections for agitation motor. Replace motor if necessary. On 230 V models, replace motor capacitor if necessary.
	Terminal board is faulty.	• Confirm terminal board is supplying power to door switch(es). Replace terminal strip if necessary (floor models only). • Replace terminal board if necessary.
Main power switch is on, and door/hood/doors is closed, but platelet agitators installed inside platelet incubator are not agitating (all models except PC4200h).	Door(s) are not closing completely (PC100h and floor models only).	Confirm hinge cams (floor models) or hinge bearings (PC100h) are not damaged.
	Hood is not closing completely (PC900h and PC1200h).	Confirm damping cylinder is not damaged. Replace it if necessary. On chamber wall in the hinge area, check nutsert for looseness. Replace nutsert if necessary.
	One or both door switches are faulty.	Check connections for door switch(es). Replace door switch(es) if necessary.
Main power switch is on, and door/hood/doors is closed, but platelet agitators installed inside platelet incubator are not agitating (all models except PC4200h).	Terminal board is faulty.	Confirm terminal board is supplying power to door switch(es). Replace terminal strip if necessary (floor models only). Replace terminal board if necessary.
	Secondary circuit breaker has tripped (100/115 V models).	Confirm that all circuit breakers are seated. Push circuit breaker to reset it if necessary.
	One or more interior outlets are faulty.	Check connections for interior outlets. Replace outlets as necessary.
	Platelet agitator component is faulty or internal connections are loose.	Refer to the platelet agitator service manual.
Main power switch is on, but one or both chamber fans are not running.	Chamber fan is faulty (PC100h).	Check connections for the fan. Replace fan if necessary.
	One or both chamber fan motors are faulty (all models except PC100h).	Check connections for the fan. Replace fan motor if necessary.
Roll-out shelf does not slide easily (PC2200h and PC3200h).	Slide is faulty.	Confirm slide is operating correctly. Replace slide if necessary.
Door does not open easily (PC100h and floor models).	Hinge cam is faulty (floor models only).	Confirm hinge cam is not damaged. Replace if necessary.
	Hinge bearing is faulty (PC100h).	Confirm bearings are not damaged. Replace if necessary.
Hood does not open or close easily or slams shut instead of gradually closing (PC900h and PC1200h).	Damping cylinder is faulty.	Replace damping cylinder.
	Hinge hardware is loose or faulty.	On chamber wall, check nutsert for looseness. Replace nutsert if necessary.

Problem	Possible Cause	Action
Agitation is noisy or rough (PC4200h).	One or more wheels are worn.	Check hole through each wheel for wear. If a wheel is out-of-round, replace wheel or wheel assembly.
	Drive rod is loose or disconnected.	Check connections from drive rod to drive plate on the storage frame, and to the crank block on the motor. Secure connections if necessary.
	Bearing on drive rod assembly is grinding or worn.	On drive rod assembly, check bearing on end connected to the drive plate. Lubricate bearing by injecting grease through grease fitting. If bearing is worn, replace drive rod assembly.
	Crank block on the motor is worn.	Check crank block on the motor for wear. Replace crank block if worn.
	Motor is faulty.	Replace motor.
Agitation of installed platelet agitators is noisy or rough (all models except PC4200h).	One or more feet on platelet incubator are worn (countertop models).	Check feet for wear. Replace feet if necessary.
	Platelet agitator component is faulty or internal connections are loose.	Refer to the platelet agitator service manual.

14.2 Chamber Temperature Problems

Problem	Possible Cause	Action
Chamber temperature does not stabilize at platelet incubator setpoint.	Condenser grill is dirty.	Check condenser grill. Clean if necessary.
	Air circulation at top of chamber is not adequate.	Check for items that may obstruct air flow and remove necessary.
	Ambient air temperature around platelet incubator is too high.	Confirm platelet incubator is placed appropriately.
	Refrigerant level is too low.	Contact a qualified service technician.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.

14.3 Alarm Activation Problems

Problem	Possible Cause	Action
Platelet incubator is in an alarm condition, but alarms are not audible.	Audible alarms have been muted.	Verify audible alarms are not muted.
	Audible alarms have been disabled.	• Verify audible alarms are not disabled. • Check the alarm key switch position.
	Audible alarm time delay has not elapsed.	Allow the alarm time delay to elapse or change the alarm delay.
	Volume is set too low.	Check volume and change if necessary.
	Alarm is not communicated audibly, visually, or through remote alarm interface.	Verify whether active alarm should be communicated audibly.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
All alarms are activating sporadically.	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Platelet incubator meets a high or low temperature alarm condition, but appropriate alarm is not active.	Alarm setpoint was changed.	Check current setpoints for alarms. Change setpoints if necessary.
	End of delay period for alarm has not been reached.	Wait until delay period has ended. Alarm should activate.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
High or low temperature alarm activated, but temperature recorded at activation does not match alarm setpoint.	Temperature changed slightly around time of activation.	No action needed.

Problem	Possible Cause	Action
Platelet incubator is not receiving AC power, but power failure alarm is not active.	Component is faulty or internal connections are loose.	Contact a qualified service technician.
	Alarm backup battery is low.	Replace the alarm backup battery.
Platelet incubator is connected to power, but AC Power Failure alarm is active.	Circuit breakers have tripped or are not seated correctly (115 V floor models, all countertop models).	Confirm circuit breakers are seated. Push circuit breaker(s) to reset if necessary. If breaker(s) cannot be reset or trip again, contact a qualified service technician.
	Fuses have blown (230 V floor models).	Contact a qualified service technician.
	No AC power to platelet incubator.	• Verify power cord is connected securely to platelet incubator and outlet. Tighten connections if necessary. • Verify outlet is operational and meets power requirements for platelet incubator. Repair original outlet or connect to a different outlet if necessary.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Motion alarm is active, but platelet agitator is moving (PC4200h).	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Agitation has stopped, but motion alarm is not active (PC4200h).	Delay period for motion alarm is set too low.	Verify delay period control is set to a value greater than platelet agitator alarm setpoint.
	End of delay period for the motion alarm has not been reached.	Wait until delay period has ended. Alarm should activate.
	Motion alarm system is not receiving power.	• Check that there is AC power to platelet incubator. • Test backup battery. If battery is not functioning, replace battery.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Motion alarm is activating sporadically while platelet agitator is moving (PC4200h).	Alarm system is not receiving power consistently.	• Check that there is AC power to platelet agitator. • Test backup battery. If battery is not functioning or has been in use for one year, replace battery.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.
Motion alarm is activating immediately when agitation is started (PC4200h).	Delay period is set to 0 minutes, which activates alarm before motion can be sensed.	Change delay period to a value greater than 0 minutes.
	Component is faulty or internal connections are loose.	Contact a qualified service technician.

14.4 Condensation Problems

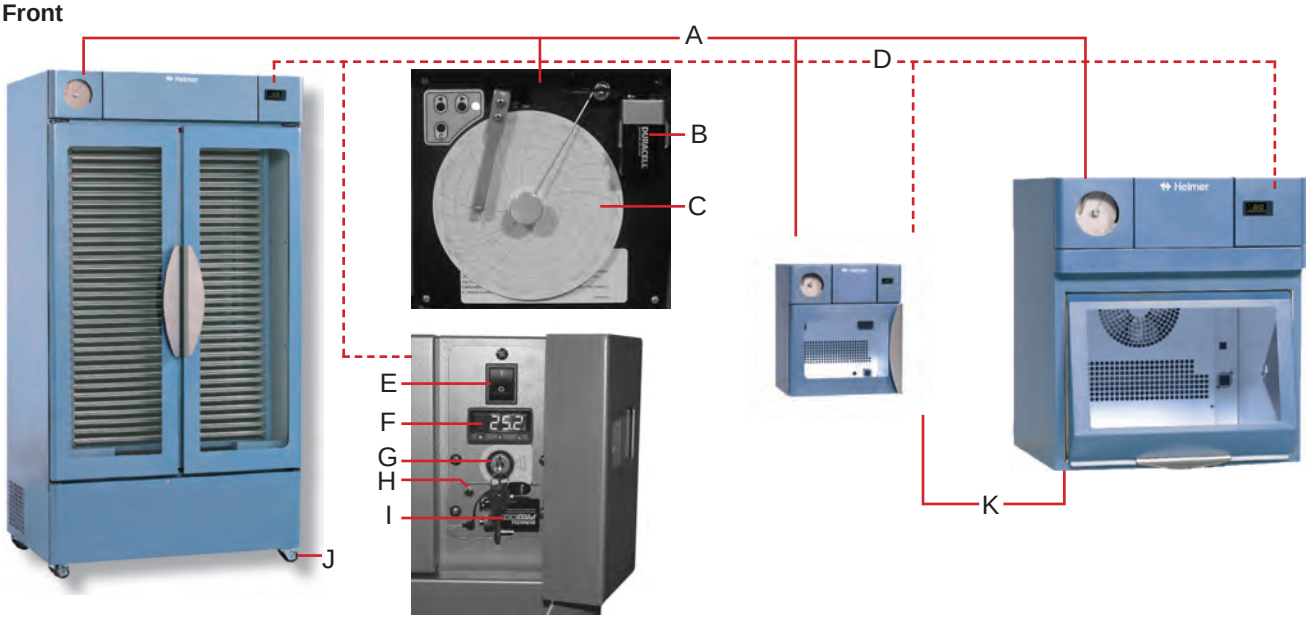
Problem	Possible Cause	Action
Excessive water in water evaporation tray (countertop models).	Humid air is entering chamber.	Confirm platelet incubator is level and doors are aligned, closing tightly, and sealing correctly. Contact a qualified service technician if necessary.
	Heater in evaporation tray is faulty.	Confirm heater is hot. Contact a qualified service technician to confirm heater is drawing the appropriate current.
	Connections between terminal board and condensate evaporator are loose or a part is faulty.	• Check connections between terminal board and condensate evaporator (heater). Secure connections if necessary. • Confirm condensate evaporator is working correctly. It should be hot and drawing appropriate current: • For 100/115 V models, current should be approximately 0.43 A to 0.55 A. • For 230 V models, current should be approximately 0.21 A to 0.35 A. • Replace condensate evaporator or terminal board if necessary.
Excessive water in chamber.	Humid air is entering chamber.	Confirm platelet incubator is level and doors are aligned, closing tightly, and sealing correctly. Contact a qualified service technician if necessary.
Excessive humidity on doors.	Humid air is entering chamber.	Confirm platelet incubator is level, and the doors are aligned, closing tightly, and sealing correctly. Contact a qualified service technician if necessary.
	Relative humidity around the platelet incubator is too high.	Confirm platelet incubator is placed appropriately.

15 Horizon Parts

NOTICE

- Before replacing parts, protect items in platelet incubator from extended exposure to adverse temperature.
- Allow platelet incubator temperature to stabilize at setpoint after replacing parts or after extended door opening.

Front

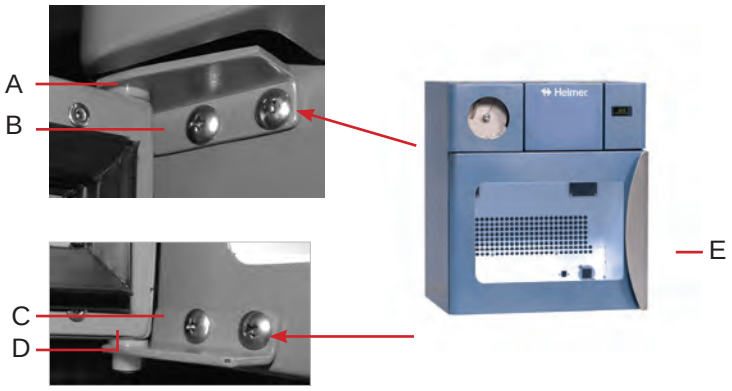


Front parts (multiple models shown)

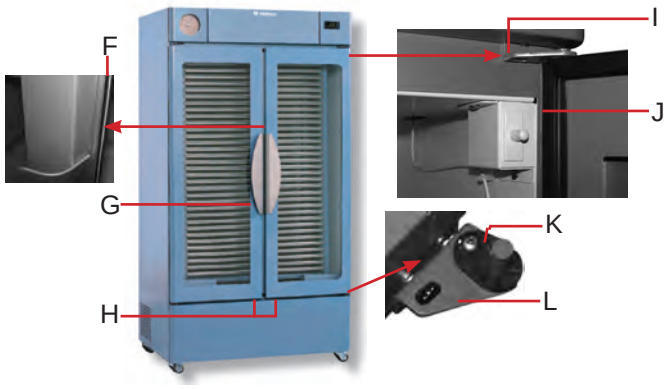
Label	Description	Part Number
A	Chart recorder	400409
B	Chart recorder backup battery	120218
C	Chart paper	220273
D	Control Door	
E	Main power switch	120478
F	Temperature controller (countertop)	400600-1
	Temperature controller (floor model)	400601-1

Label	Description	Part Number
G	Key switch, 2-way (all models except PC4200h)	120227
	Key switch, 3-way (PC4200h)	120489
H	Mute button	120197
I	Power failure battery	120218
J	Caster (swivel with brake; floor models)	220261
K	Foot (countertop models)	220432

Door and Hinges



Door and Hinge (PC100h)



Door and Hinge (PC2200h, PC3200h, and PC4200h)

Label	Description	Model	Part Number
A	Hinge bearing		220295
B	Upper hinge bracket	100	320846-1
C	Lower hinge bracket	100	310846-2
D	Door seal kit	100	400785-1
E	Door handle		320865-1
Not shown	Door lock		220374
F	Door brush seal	2200	320920-2
	Door brush seal	3200/4200	320920-1

Label	Description	Model	Part Number
G	Door handle		320865-1
H	Door lock		220374
I	Upper hinge bracket (left)	2200/3200/4200	400647-2
	Upper hinge bracket (right)	2200/3200/4200	400647-1
J	Door seal kit	2200	400787-1
		3200/4200	400788-1
K	Hinge cam		320742-1
L	Lower hinge bracket (left)	2200/3200/4200	400647-1
	Lower hinge bracket (right)	2200/3200/4200	400647-2

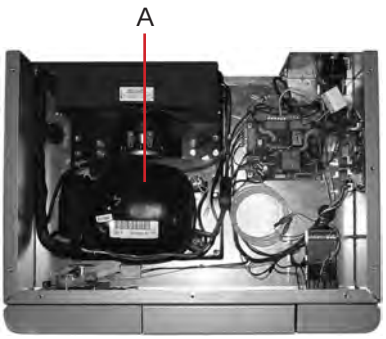
Hood

(PC900h and PC1200h)

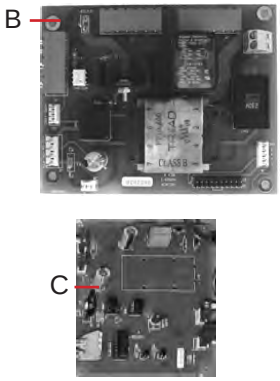
Label	Description	Model	Part Number
A	Hood assembly	900	800098-1
		1200	800099-1
B	Damping cylinder		220210

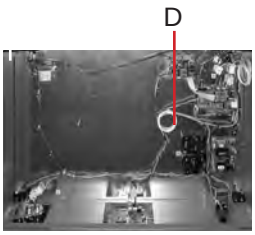
Label	Description	Model	Part Number
C	Hood lock		220272
Not Shown	Hood seal kit	900	400786-1
		1200	400786-2

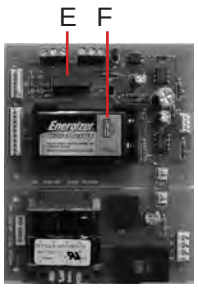
Top / Side



PC100h





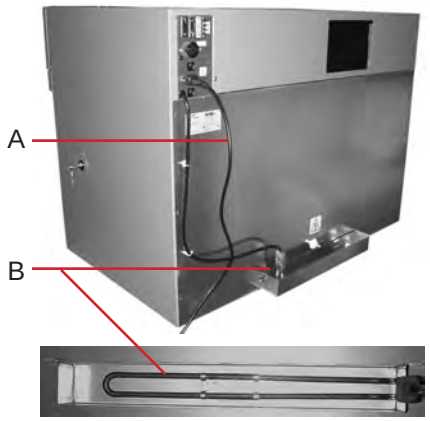


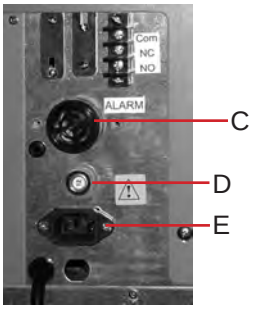
PC2200h, PC3200h and PC4200h

Label	Description	Model	Volts	Part Number
A	Compressor/condensing unit	100/900/1200	115	400668-1
			230	400668-2
B	Terminal board		115/230	800285-1
			100	800292-1
C	Alarm Board			400521-1

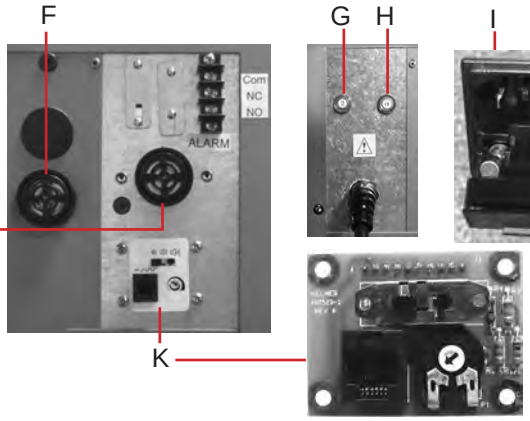
Label	Description	Model	Volts	Part Number
D	Power line filter		230	120400
E	Agitator board			400516-1
F	Motion alarm battery	4200		120232
Not Shown	Compressor relay		100/115	120528
			230	120523

Rear - All Models





PC100h, PC900h, and PC1200h



PC2200h, PC3200h, and PC4200h

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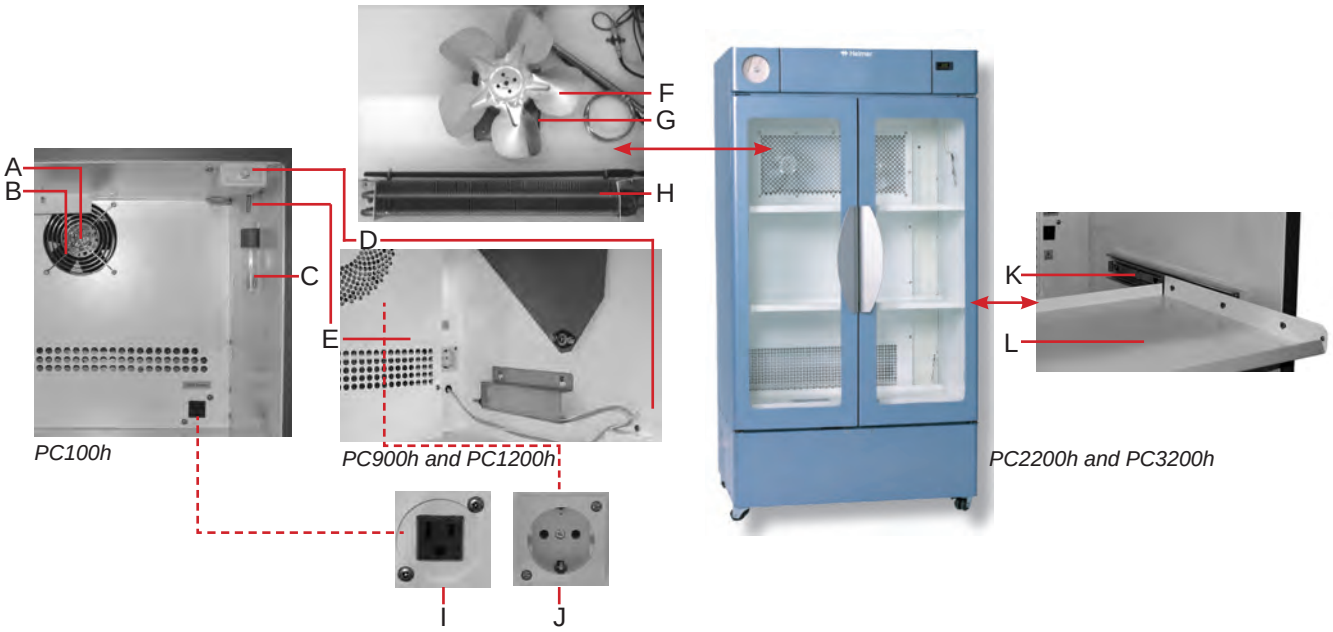
Label	Description	Model	Volts	Part Number
A	Power cord	100, 900, 1200	100/115	120630
		all models	230	120156
		2200, 3200	115	120130
		4200	115	110040
B	Condensate evaporator kit (includes tray)		100/115	400791-1
			230	400791-2
C	Alarm buzzer			120160
D	Circuit breaker (6 A)		230	120288
E	Power connector (includes power line filter)			120299

Label	Description	Model	Volts	Part Number
F	Motion Alarm buzzer	4200		120160
G	Circuit breaker (secondary, 2 A)	2200, 3200	115	120252
	Circuit breaker (secondary, 5 A)	4200	115	120514
H	Circuit breaker (primary, 15 A)	2200, 3200	115	120259
	Circuit breaker (primary, 20 A)	4200	115	120191
I	Power connector with fuse holder		230	120379
J	Fuse (10 A)		230	120174
K	Motion alarm control board	4200		400523-1

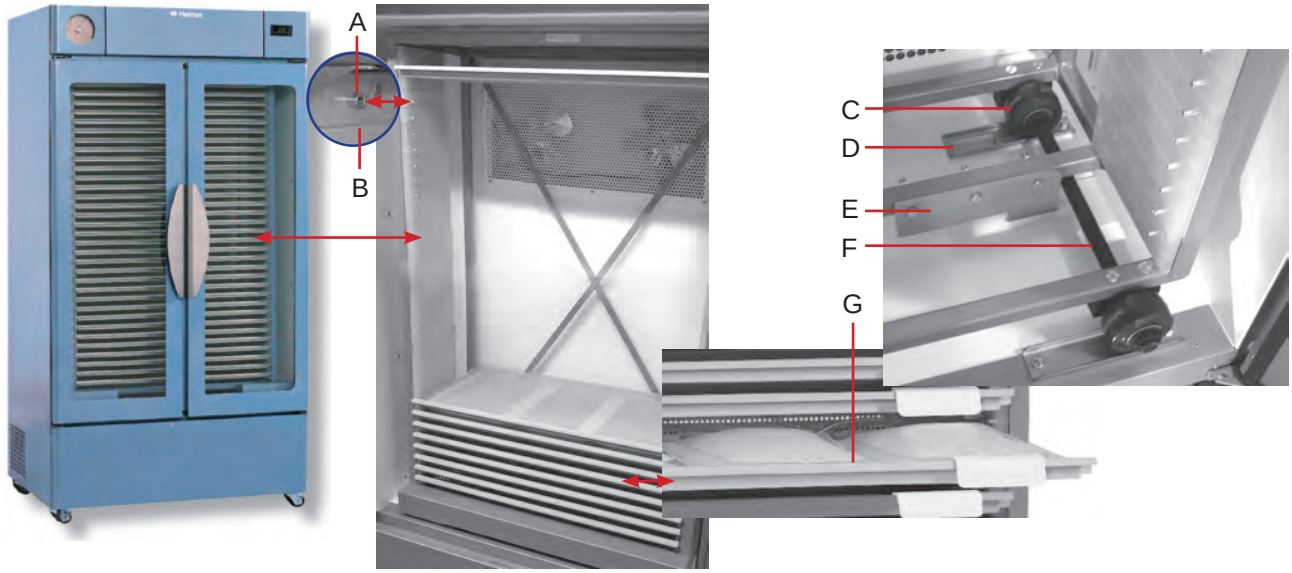
Interior - All Models



Label	Description	Volts	Part Number
A	Chamber fan	100/115	120009
		230	120010
B	Chamber fan guard		220122
C	Alarm check tube		220299
D	Door switch		120490
E	Control probe / chart recorder probe		120315
F	Chamber fan blade		220177

Label	Description	Volts	Part Number
G	Chamber fan motor	100/115	120170
		230	120171
H	Chamber heater	100/115	120313
		230	120314
I	Interior outlet	100/115	120499
J	Interior outlet	230	120097
K	Shelf slide		400717-1
L	Roll-out shelf (excludes bumpers and slides)		320971-1

Agitation Parts

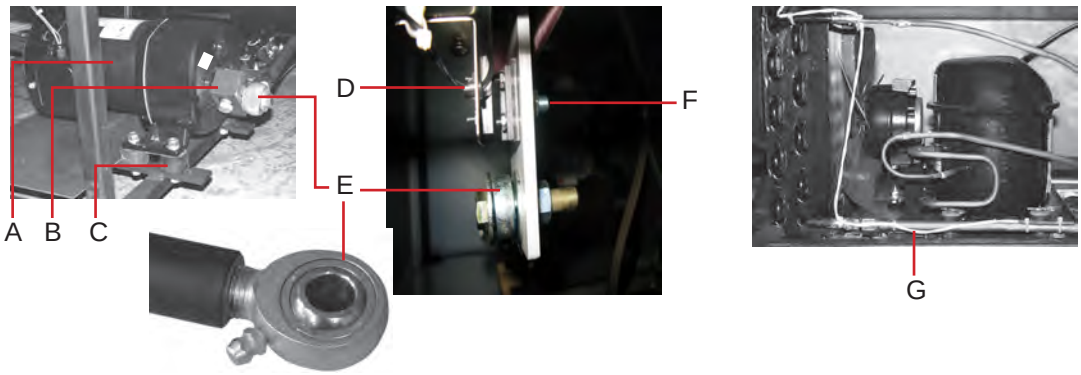


PC4200h

Label	Description	Part Number
A	Drawer stop	400174-1
B	Drawer guide (Top left)	320540-1
	Drawer guide (Top right)	320540-2
	Drawer guide (Bottom left)	320541-1
	Drawer guide (Bottom right)	320541-2
C	Wheel (included in wheel assembly)	320566-1

Label	Description	Part Number
D	Wheel track	320215-1
E	Drive plate	321005-1
F	Wheel assembly (includes two wheels, axle, mounting bracket)	400159-1
G	Drawer assembly (includes label holder kit.) * = (silver drawer - standard) ** = (red drawer) *** = (black drawer)	400616-1* 400617-1** 400615-1***

Base (PC4200h)



Label	Description	Volts	Part Number
A	Agitation motor (includes capacitor) *for serial numbers 968995 and lower ** for serial numbers 968996 and greater	115	400305-1
		230	400306-1*
		230	400638-1**
B	Crank block	115	320222-1
		230	321032-1
C	Motor mount		220079
D	Proximity sensor		400694-1

Label	Description	Model	Volts	Part Number
E	Drive rod assembly			400111-1
F	Proximity actuator			120125
G	Compressor/condensing unit * = units with serial # 2046319 above ** = units with serial # 2046318 and prior	2200, 3200 and 4200	115	400669-1
			230	800977-1*
			230	800978-1**
Not Shown	Starting relay coil		115	120524
			230	120525

Accessories

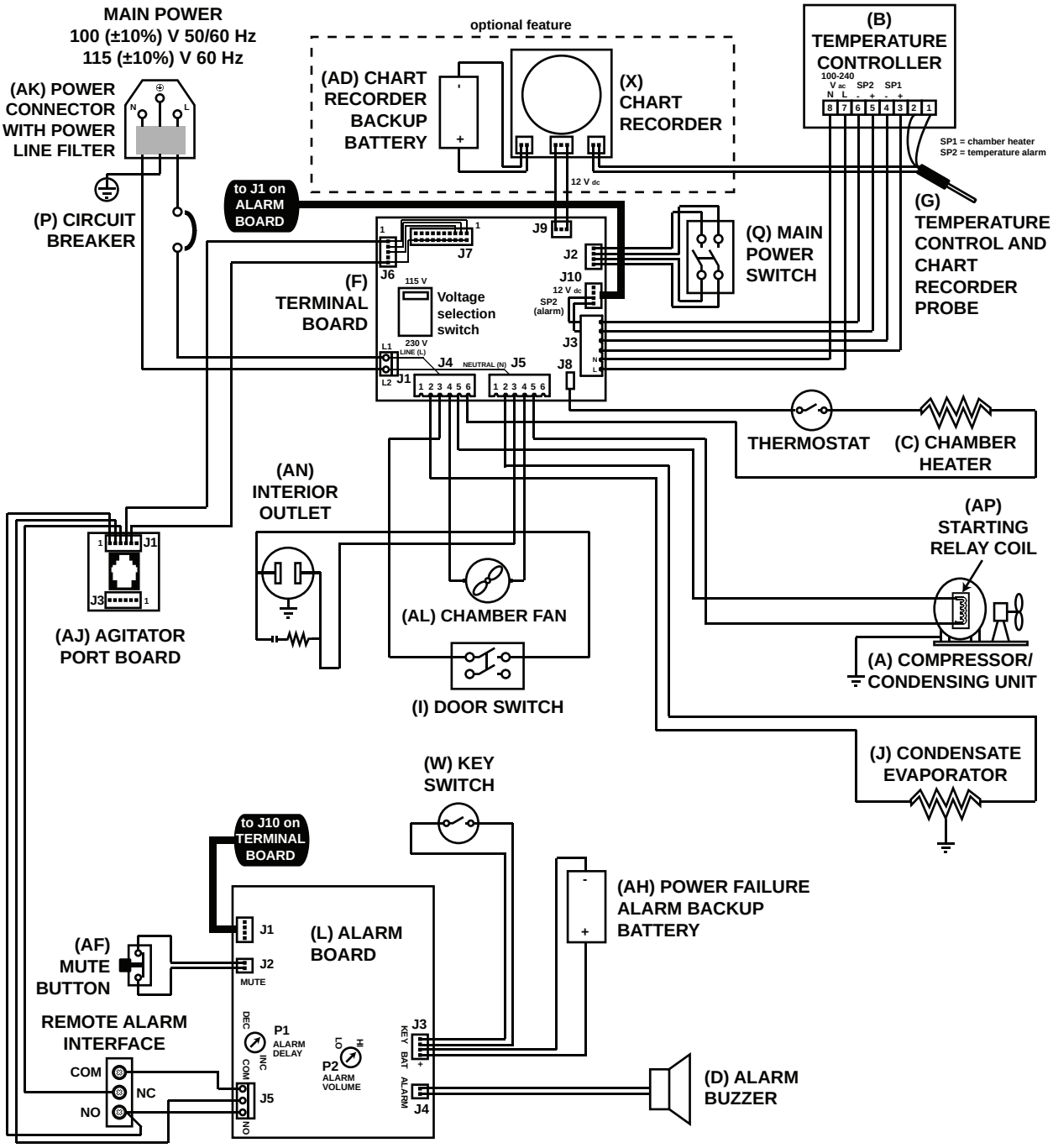
Label	Description	Model	Volts	Part Number
A	Fan airflow deflector	100		320967-1
Not shown	Bypass plug			400657-1
	Power cord, short (For all models except PC4200h.)		110/115	120316
			230	120317

Label	Description	Model	Part Number
Not shown	Shelf for platelet rotator	900	400618-1
		1200	400619-1
	Label holder kit	4200	400620-1*

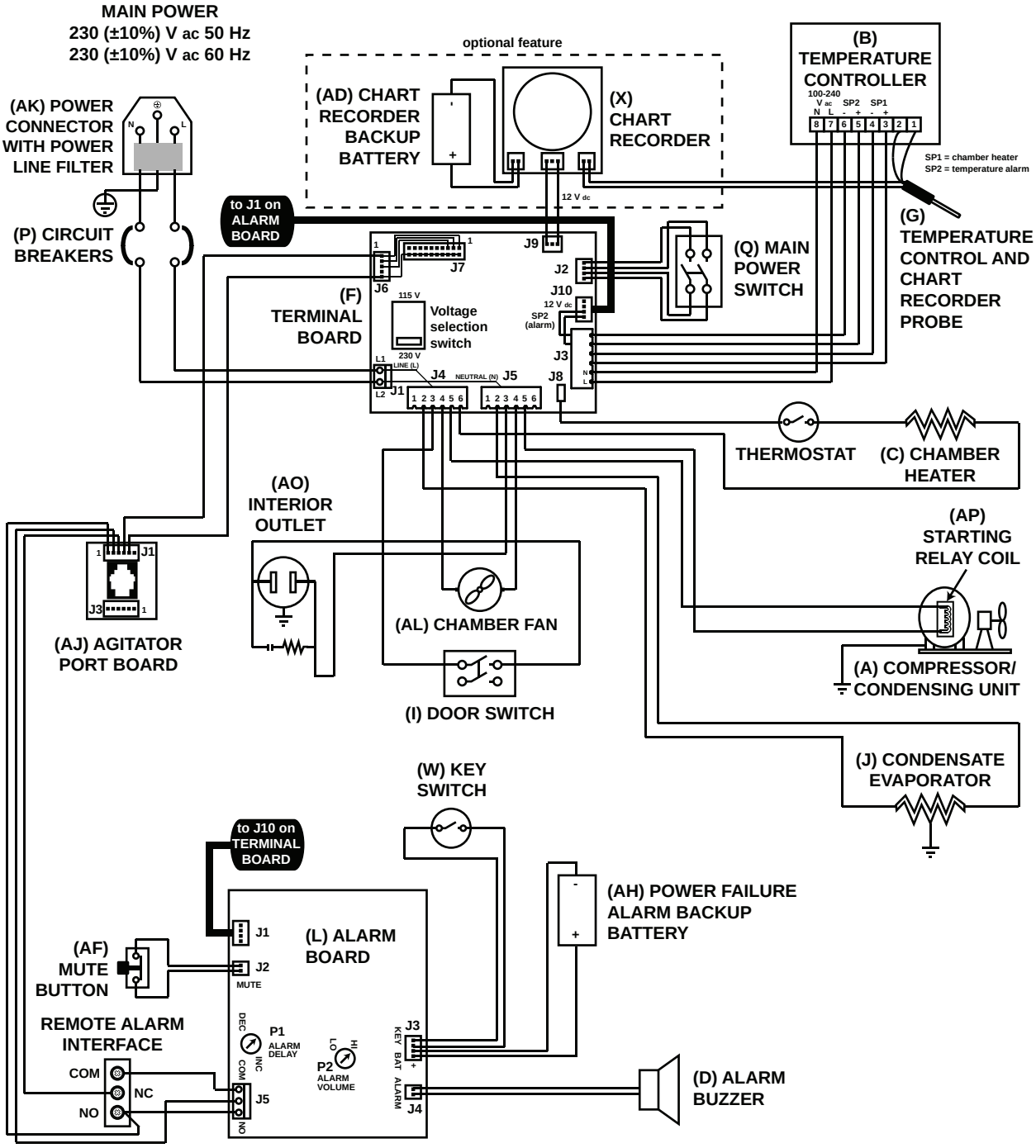
** Label holder kit if for PC4200h and includes label, label holder, hardware and installation tool. Also included in drawer assembly*

16 Schematics

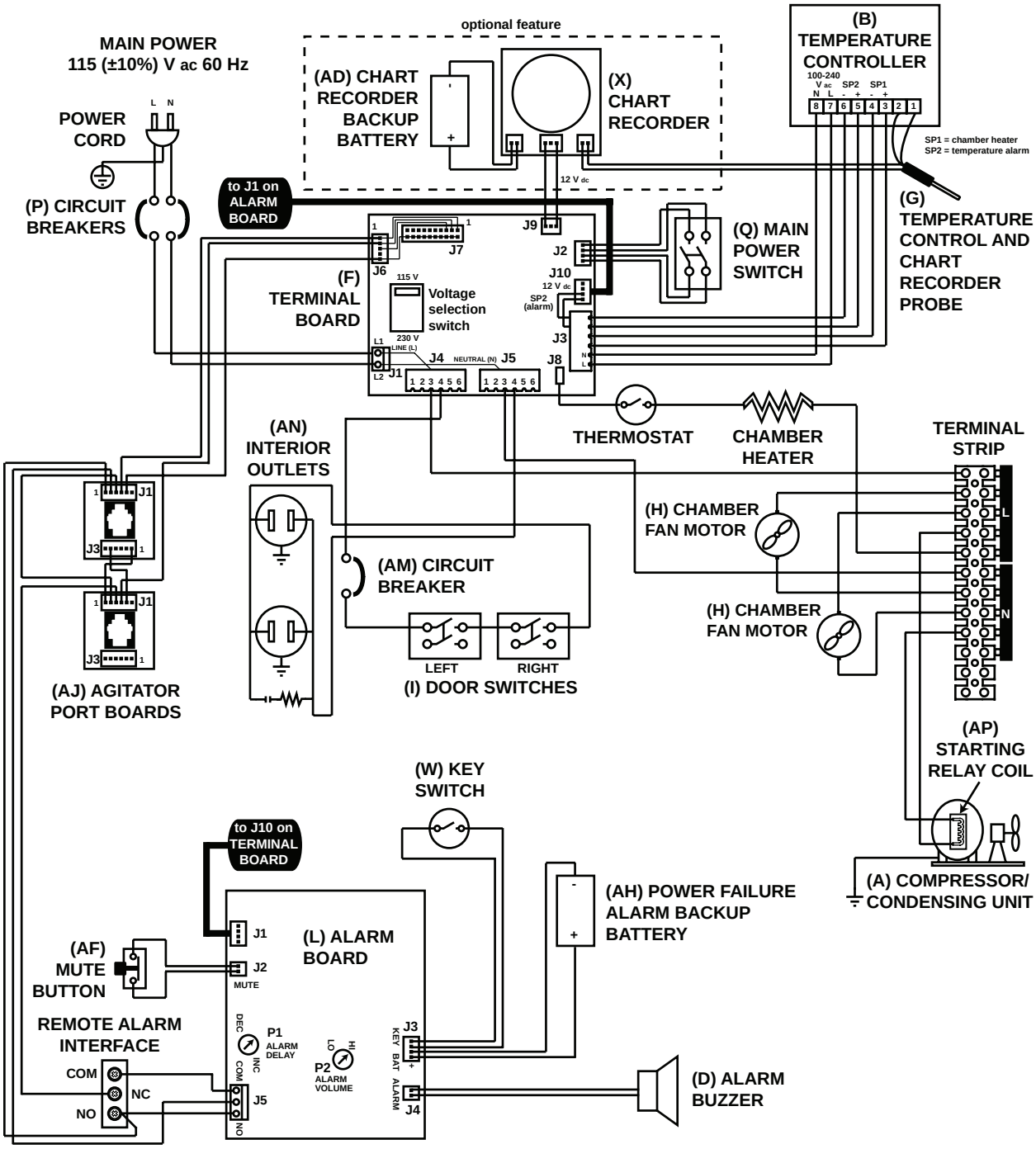
16.1 PC100h, PC900h, PC1200h (100/115 V)



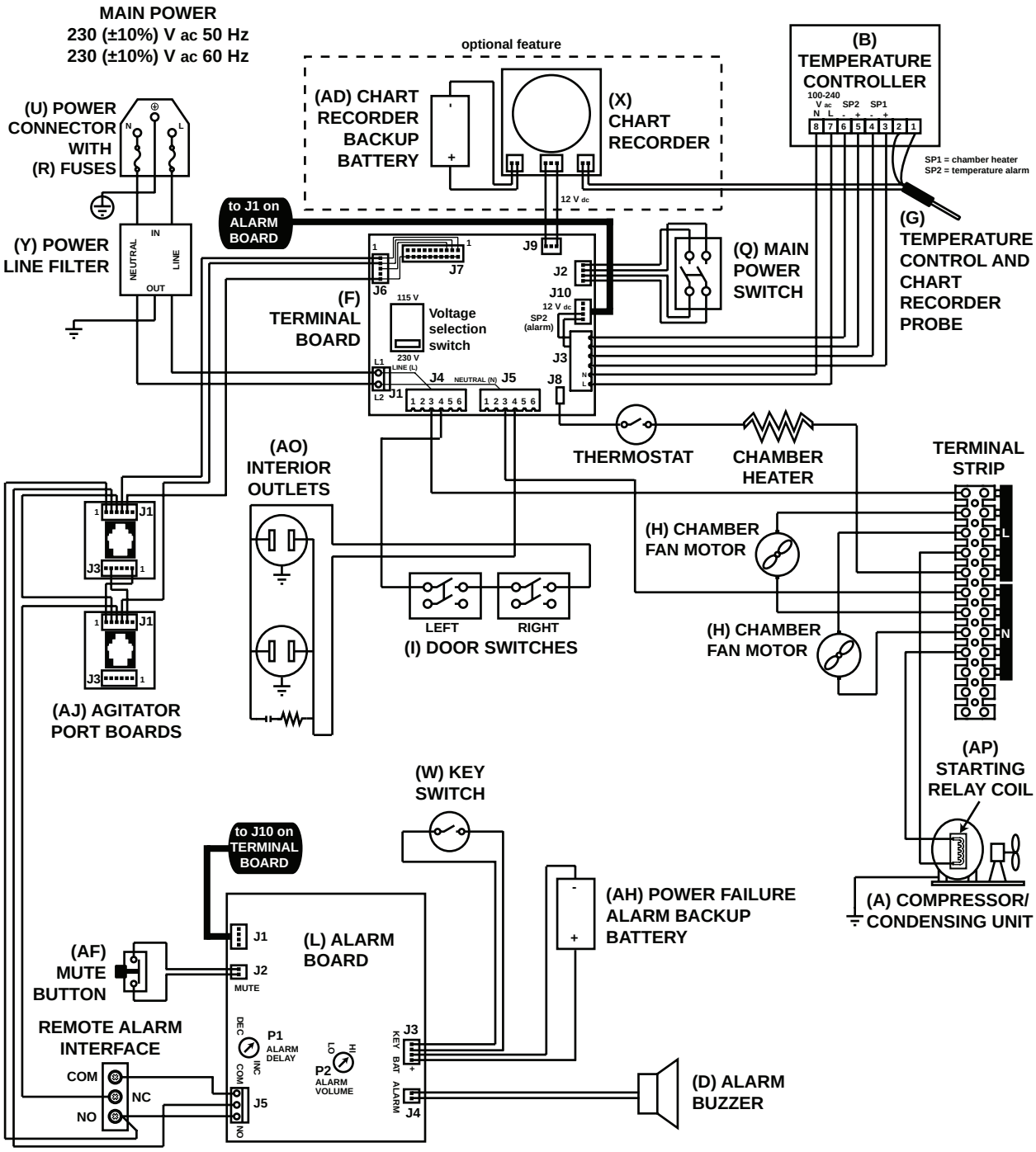
16.2 PC100h, PC900h, PC1200h (230 V)



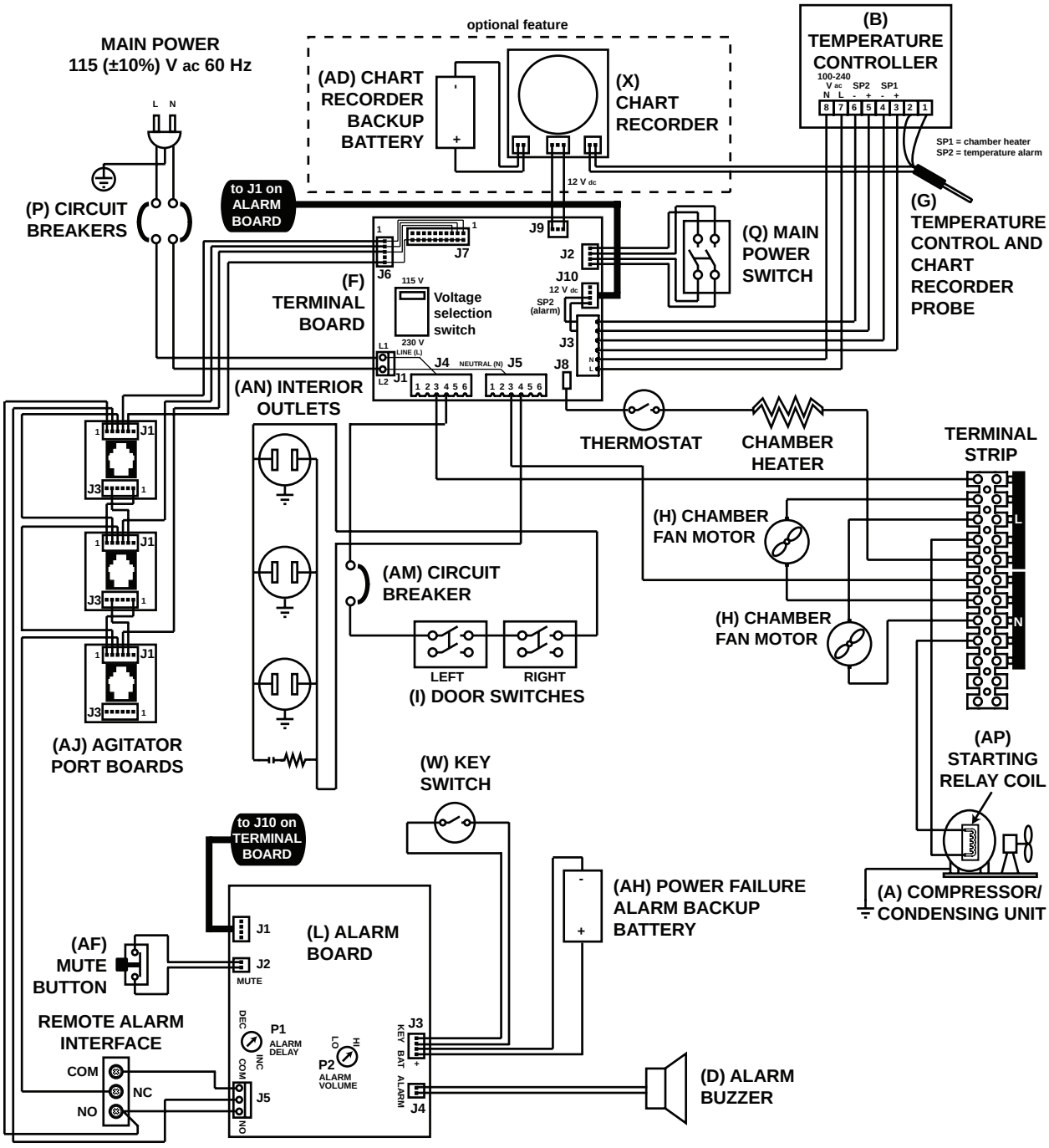
16.3 PC2200h (115 V)



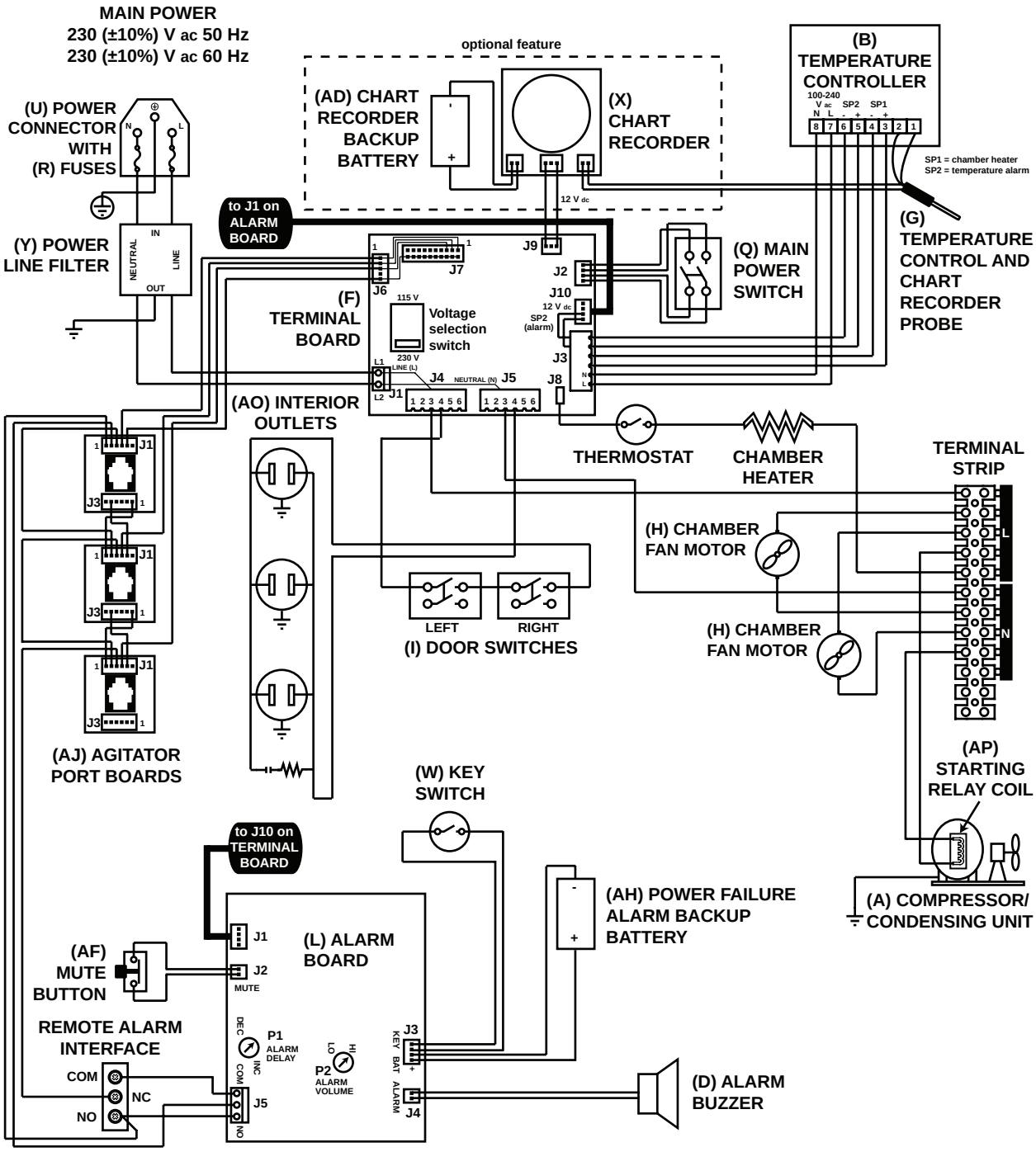
16.4 PC2200h (230 V)



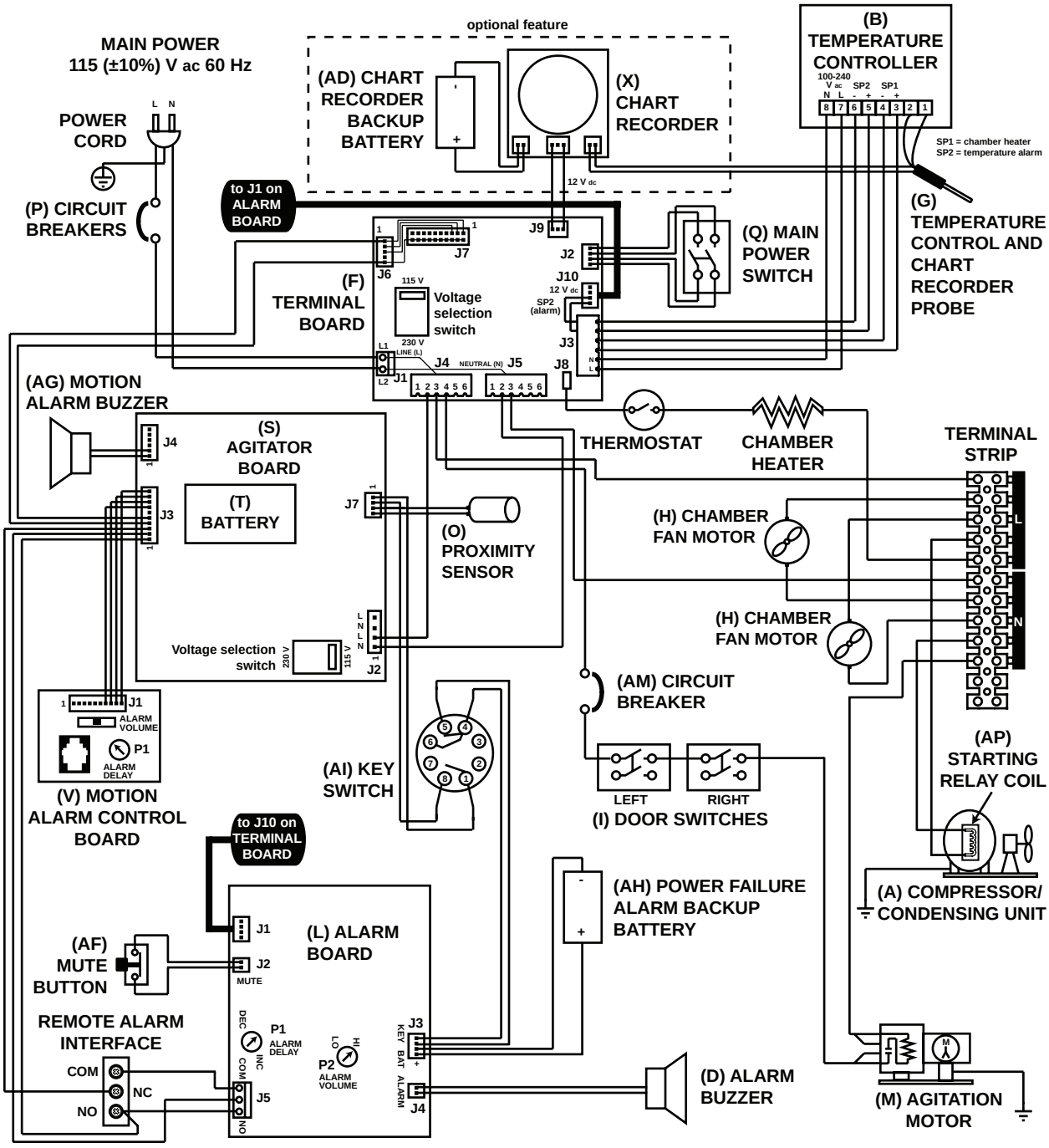
16.5 PC3200h (115 V)



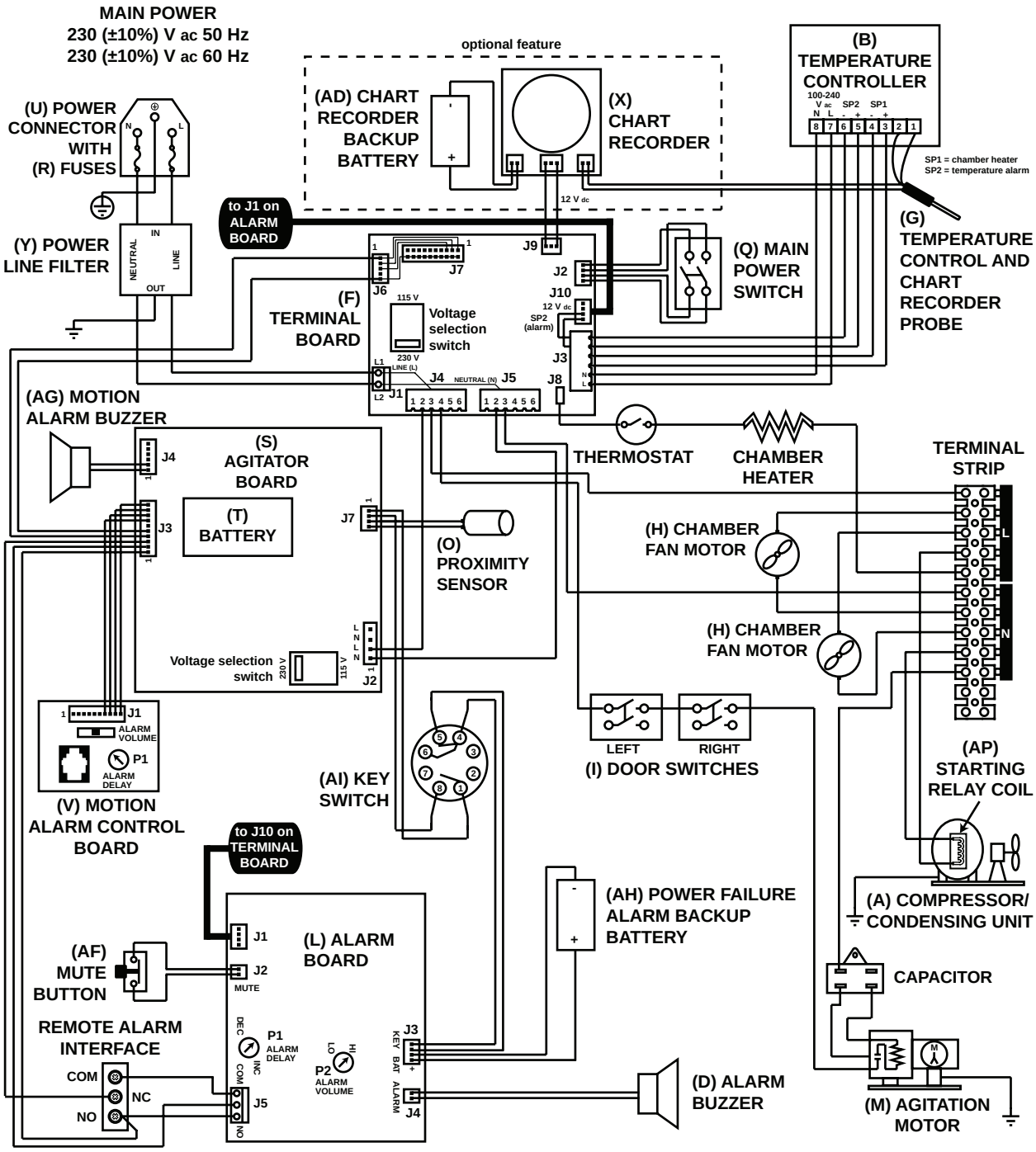
16.6 PC3200h (230 V)



16.7 PC4200h (115 V)



16.8 PC4200h (230 V)



END OF MANUAL

Appendix A: Compliance

Regulatory Compliance

CE 0086

This device complies with the requirements of directive 93/42/EEC concerning Medical Devices, as amended by 2007/47/EC.

FC

This device complies with FCC Radiated and Conducted Emissions Approval to CFR47, Part 15; Class A levels

Sound level is less than 70 dB(A).

EC REP

Emergo Europe
Prinsessegracht 20
2514 AP The Hague
The Netherlands

WEEE Compliance

The WEEE symbol (right) indicates this product falls under the scope of the WEEE (Waste Electrical and Electronic Equipment) directive.

When disposing of this product in countries affected by this directive:

- Do not dispose of this product as unsorted municipal waste.
- Collect this product separately.
- Use collection and return systems available locally.

For more information on the return, recovery, or recycling of this product, contact your local distributor.

Appendix B: Warranty

For technical service needs, please contact Helmer at 800-743-5637 or www.helmerinc.com. Have the model and serial number available when calling.

Rapid Resolution

When a warranty issue arises it is our desire to respond quickly and appropriately. The service department at Helmer is there for you. Helmer will oversee the handling of your warranty service from start to finish. Therefore, Helmer must give advance authorization for all service calls and/or parts needs relating to a warranty issue. Any repeat service calls must also be authorized as well. This allows for proper diagnosis and action. Helmer will not be responsible for charges incurred for service calls made by third parties prior to authorization from Helmer. Helmer retains the right to replace any product in lieu of servicing it in the field.

Compressor

For the warranty period listed below, Helmer will supply the refrigeration compressor, if it is determined to be defective, at no charge, including freight. Helmer will not be liable for installation, refrigerant, or miscellaneous charges required to install the compressor beyond the first year of the warranty period.

- i.Series model compressor warranty period is five (5) years.
- Horizon Series model compressor warranty period is three (3) years.

Parts

For a period of two (2) years, Helmer will supply at no charge, including freight, any part that fails due to defects in material or workmanship under normal use, with the exception of expendable items. Expendable items include glass, batteries, and door gaskets. Inspection of defective parts by Helmer will be final in determining warranty status. Warranty procedures must be followed in all events.

Labor

Floor Models

For a period of one (1) year, Helmer will cover repair labor costs (including travel) and the cost of refrigerant and supplies necessary to perform authorized repairs. Repair service must be performed by an authorized Helmer service agency following the authorization process detailed above. Alternatively, your facility's staff may work with a Helmer technician to make repairs. Labor costs for repairs made by unauthorized service personnel, or without the assistance of a Helmer technician, will be the responsibility of the end user.

Countertop Models

For a period of one (1) year, Helmer will cover repair labor costs, provided the product is returned to Helmer for warranty service. Alternatively, your facility's staff may work with a Helmer technician to make repairs on site. Labor costs for repairs performed at a location other than Helmer, or for repairs made without the assistance of a Helmer technician, will be the responsibility of the end user.

Additional Warranty Information

The time periods set forth above begin two weeks after the original date of shipment from Helmer. Warranty procedures set forth above must be followed in all events.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY.

THE LIABILITY, IF ANY, OF HELMER FOR DIRECT DAMAGES WHETHER ARISING FROM A BREACH OF ANY SALES AGREEMENT, BREACH OF WARRANTY, NEGLIGENCE, OR INDEMNITY, STRICT LIABILITY OR OTHER TORT, OR OTHERWISE WITH RESPECT TO THE GOODS OR ANY SERVICES IS LIMITED TO AN AMOUNT NOT TO EXCEED THE PRICE OF THE PARTICULAR GOODS OR SERVICES GIVING RISE TO THE LIABILITY. IN NO EVENT SHALL HELMER BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES, INCLUDING WITHOUT LIMITATION DAMAGES RELATED TO LOST REVENUES OR PROFITS, OR LOSS OF PRODUCTS.

This warranty does not cover damages caused in transit, during installation by accident, misuse, fire, flood, or acts of God. Further, this warranty will not be valid if Helmer determines the failure was caused by a lack of performing recommended equipment maintenance (per Helmer manual) or by using the product in a manner other than for its intended use. Installation and calibration are not covered under this warranty agreement.

Outside of USA and Canada

Consult your local distributor for warranty information.

Helmer Scientific
14400 Bergen Boulevard, Noblesville, IN 46060 USA

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