5800 Sampler
Power Supply Module

Removal and Replacement Instructions

TELEDYNE ISCO
Everywhereyoulook™

Instruction Sheet 60-4702-059
Revision F, December 7, 2017

Overview

This power supply module is a component of the Teledyne Isco 4700 and 5800 refrigerated samplers. These instructions cover removal and replacement of the module in both 115 VAC and 230 VAC models. When necessary, the steps will specify the model to which the instructions apply.

Before attempting to remove and replace a module, observe the following precautions:

⚠ WARNING

Removing a module exposes you to electrical and mechanical hazards. Always disconnect the AC power cord before attempting to remove any module. Only trained service personnel may remove or replace these modules.

⚠ CAUTION

Modules contain circuit boards and sensitive electronics that can be damaged by a discharge of static electricity. Avoid touching the internal components. Only handle the module by the edges or exterior surfaces.

⚠ CAUTION

Electrical connectors and wires can be damaged if improperly handled. Electrical connectors must only be handled by the connector body. Never grasp the wires or use tools to disconnect a connector. Never allow a module to hang by its wiring.

⚠ CAUTION

Earth ground bonding conductor. Do not remove or disconnect. If this conductor must be disconnected to remove a module, it must be reconnected when installing the replacement module.

Required Parts and Tools

- Replacement power supply module:
  - 115 VAC sampler (P/N 60-4704-165) or
  - 230 VAC sampler (P/N 60-4704-166)
  - Clear silicone sealant (Serial Number 216B and Older only)
  - Nylon cable tie (P/N 489-0110-00)
  - #2 and #3 Phillips screwdrivers
- $^{15}/_{16}$" open-end wrench
- $^{11}/_{32}$" nut driver or socket wrench
- Wire cutters

Removing the Module - Serial Number 216B and Newer

Complete the following to remove the existing refrigerator module.

1. Unplug the line cord to remove the AC power.
2. Remove the coil shield, back cover, and insulation panel (Figure 1). When removing the foam insulation panel, take precautions not to damage the foam around the tubing (see inset, Figure 1).

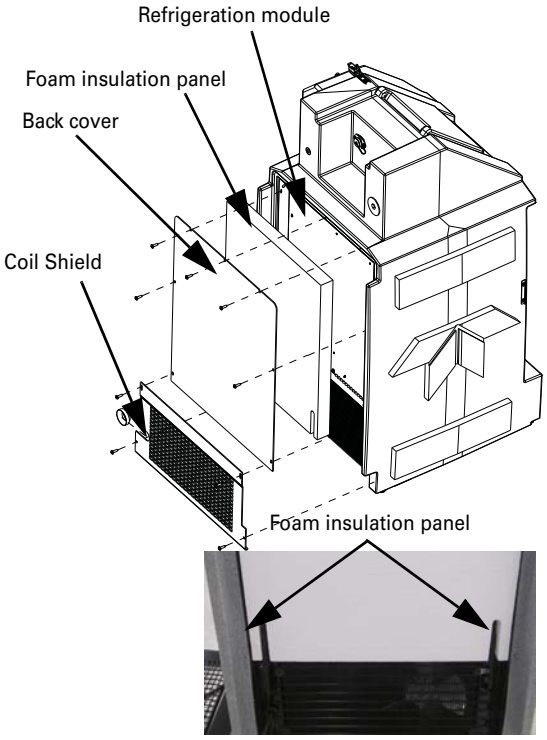

Figure 1: Open rear compartment

3. Cut the cable tie holding the power cord that runs through the refrigeration assembly (Figure 2).

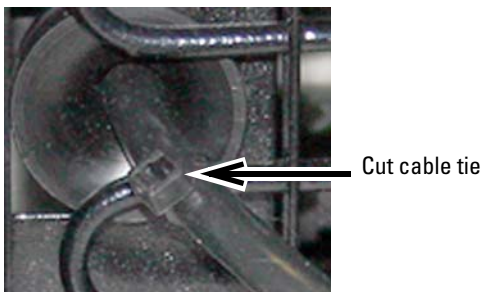

Figure 2: Cut cable tie to free line cord

4. Remove the refrigeration module mounting screws (Figure 3).
5. Carefully pull the module out and rotate clockwise to expose the wiring connectors. The bushing holding the AC line cord in place should slide along the cord (see inset, Figure 3). During reinstallation, the slack created in this step must be removed.

⚠ CAUTION

Keep the module as close to the refrigerator body as possible to avoid pulling the wiring taut and damaging the connectors.

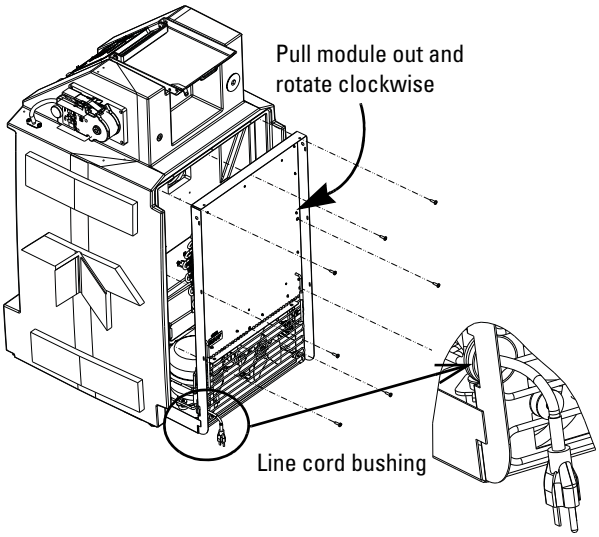

Figure 3: Remove refrigeration module mounting screws

6. Remove the power cord and complete the following steps.
   a. **230 VAC Models Only –** Remove the AC Plug adapter from the end of the power cord by first cutting away the plastic heat shrink tubing. Pull the adapter off, leaving just the North American 115 VAC plug (Figure 4).

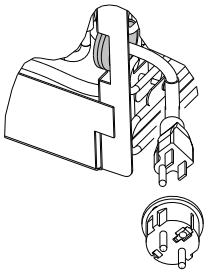

Figure 4: Remove adapter from power cord (230 VAC models Only)

   b. Slide the bushing sideways away from the refrigeration module until it is free (Figure 5). Avoid bending the refrigeration tubing.
   c. Pull the power cord through the refrigeration module.

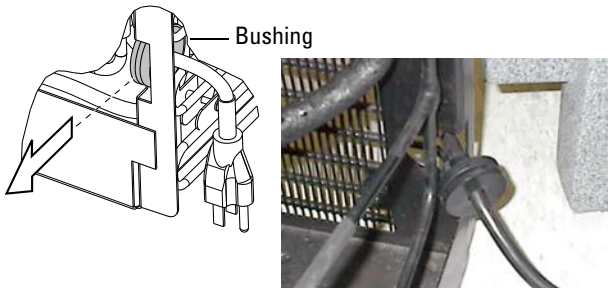

Figure 5: Remove power cord

7. For 115V wire connections, remove the terminal cover of the compressor (Figure 6). For 230V wire connections, skip to step 10.

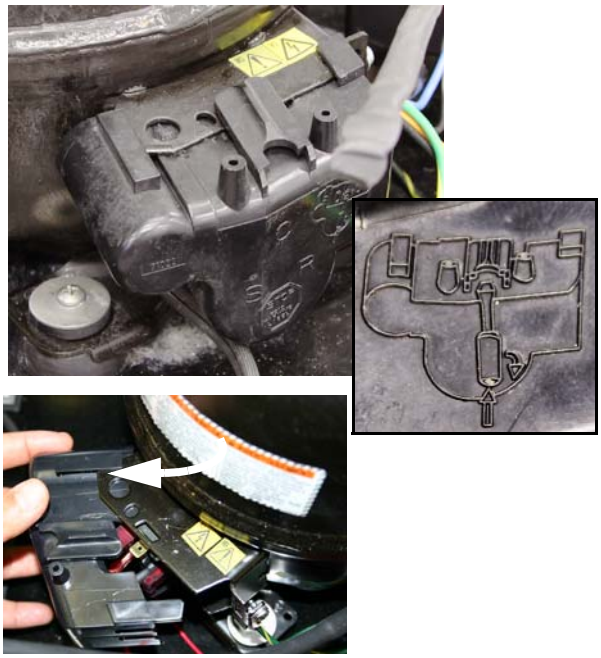

Figure 6: Access compressor overload and relay8.A screwdriver may be used to release the latch.

9. Disconnect the four (4) compressor wires from the power supply cable (Figure 7).
   a. While holding the overload relay in place, disconnect the brown wire.
   b. Disconnect the blue wire from the capacitor and relay assembly from the gray wire on the power supply cable.
   c. Disconnect the black heater wire from the black wire on the power supply cable.

d. With the $^{11}/_{32}$" nut driver or socket wrench, remove the nut holding the green/yellow ground wire on the module chassis.

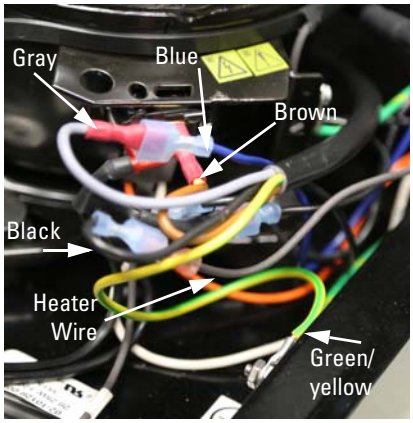

Figure 7: Electrical connections on 115V compressor

10. For 230V wiring, remove the terminal cover off the compressor (Figure 8).

Figure 8: Access compressor overload A screwdriver may be used to release the latch.

11. Disconnect the four (4) compressor wires from the power supply cable (Figure 9).
    a. Disconnect the brown wire from the compressor terminal.

Note

Note the terminal location for the re-installation process. Do not hook the brown wire to the same terminal that the green wire connects to.

b. Disconnect the blue wire from the capacitor and relay assembly from the gray wire on the power supply cable.
c. Disconnect the black heater wire from the black wire on the power supply cable.
d. With the $^{11}/_{32}$" nut driver or socket wrench, remove the nut holding the green/yellow ground wire on the module chassis.

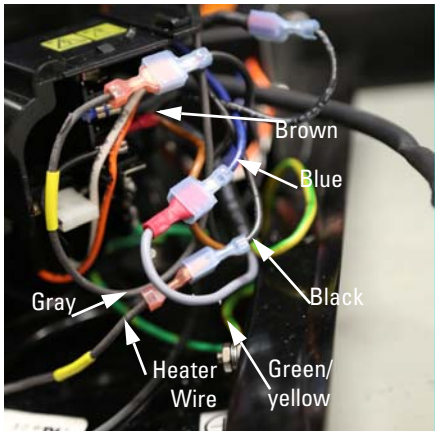

Figure 9: Electrical connections on 230V compressor

12. Open the top cover of the sampler and remove the control panel mounting screws (see Figure 10).

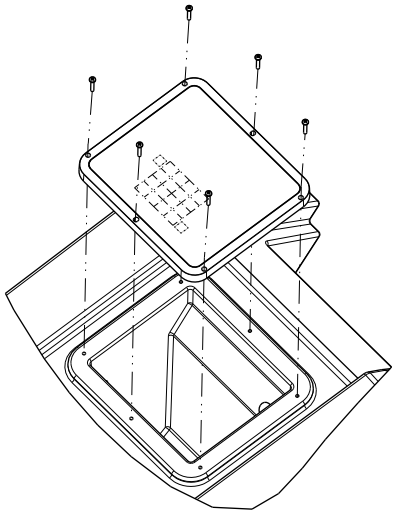

Figure 10: Remove control panel

13. Lift the control panel away from the refrigerator body to expose the wiring connectors.
14. Disconnect the wiring connectors.
    a. 5800: Connectors **P1 and P10**
    b. 4700: Connectors **P11 and P14**
15. Place the control panel back on the refrigerator body and start at least two screws to

temporarily hold the panel until the new harness is in place.

16. With a $^{15}/_{16}$" wrench, unscrew the black cord-grip fitting from the bulkhead fitting in the rear wall above the upper right corner of the fan. With #2 Phillips, remove the nylon cable clip. Pull the control panel power cable out through the threaded opening.

☑ *Note*

Turn the connector sideways to fit through the hole.

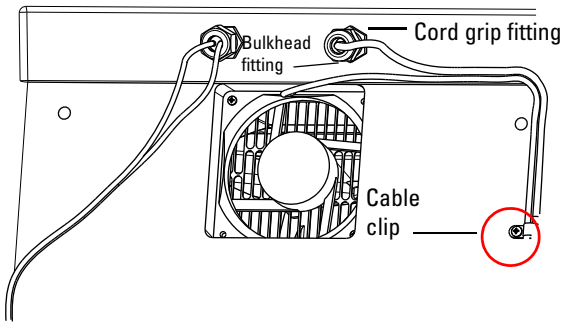

Figure 11: Cord grip fitting on refrigerator rear wall

17. From the front interior of the refrigerator, remove the two Phillips screws holding the fan in place and disconnect the fan's power cable (Figure 12).

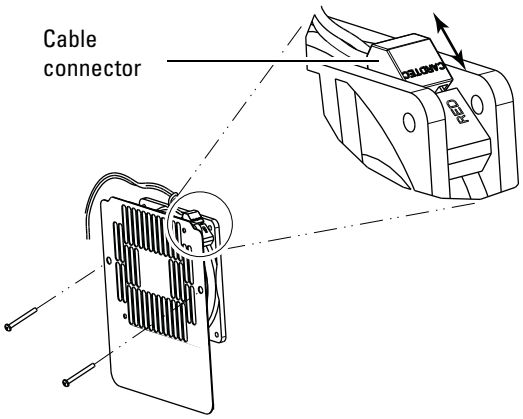

Figure 12: Remove fan mounting screws and disconnect cable (view from inside refrigerator)

18. Inserting the #3 screwdriver through the holes in the heater plate, remove the two Phillips screws from the power supply back plate and remove the power supply (Figure 13).

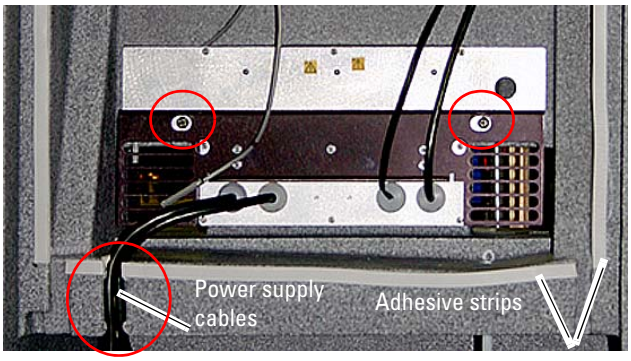

Figure 13: Power supply back plate

Replacement

1. Mount the replacement power supply with the two Phillips screws.

⚠ CAUTION

Earth ground bonding conductor. Ensure that the green/yellow wire is reconnected to this terminal.

2. Route the line cord through the refrigeration module and secure it in place with the bushing. Hold the line cord taut to remove any slack, and attach a cable tie 489-0110-00 (Figure 35).

⚠ CAUTION

When installing/replacing the refrigeration unit, the line cord MUST be properly secured. This is to ensure that the cord cannot be pushed into the enclosure and be caught in the fan.

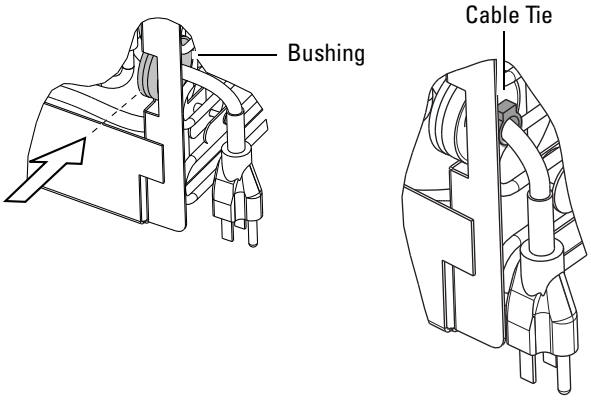

Figure 14: Secure AC Power Cord (Full length of line cord not depicted)

a. **230V/50 Hz Systems Only —** Attach the 230V plug adapter to the end of the power cord. Slide the piece of plastic heat shrink tubing over the plugs. Then apply heat of at least 80°C (176°F) to shrink the tubing.

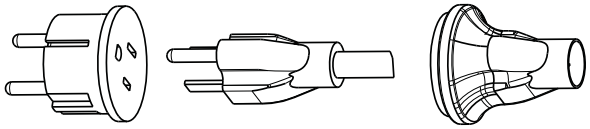

Figure 15: 230V line cord plug adaptor

3. Reconnect the cable connectors of the replacement power supply to the fan, and reinstall the fan with its two mounting screws.
4. Route the CPU CBA connector cable up through the refrigerator and into the top compartment. Connect the harnesses to the back of the control panel.
   a. 5800: Connectors **P1 and P10**
   b. 4700: Connectors **P11 and P14**
5. Hand tighten the cord-grip. Use pipe sealing tape on the threads.

Module Replacement

Complete the following to reinstall the refrigerator module:

1. Ensure that the control wiring runs through the channel in the refrigerator body (Figure 16).

Note

Two thick, black cables connect the power supply with the AC and compressor (Figure 16). **Ensure that cables are side by side and not crossed during reassembly.**

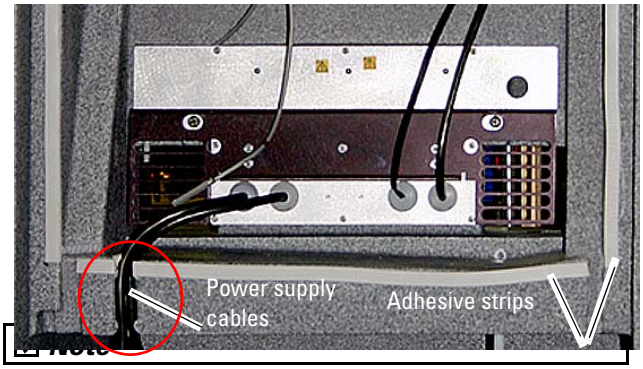

Figure 16: Rear view with module removed

2. Reconnect the four (4) compressor wires to the power supply cable (Figure 9):
   a. Connect the brown wire to the compressor terminal.
   b. Connect the gray wire from the power supply to the blue wire from the capacitor and relay assembly.
   c. Connect the black wire from the power supply to a black wire from the heater.
   d. With the $^{11}/_{32}$" wrench, connect the green/yellow ground wire with the nut to the threaded standoff on the frame.
3. Reinstall the terminal cover on the compressor.

⚠ CAUTION

Earth ground bonding conductor. Ensure that the green/yellow wire is reconnected to this terminal.

4. Slide the refrigeration module to the rear of the refrigerator and place the drain tube in the drip pan on the module (Figure 17).

Figure 17: Position drain tube in front half of the drip pan

5. Ensure the black gasket is aligned and gasket nubs are inserted in corresponding holes on the frame of the refrigerator module (Figure 18).

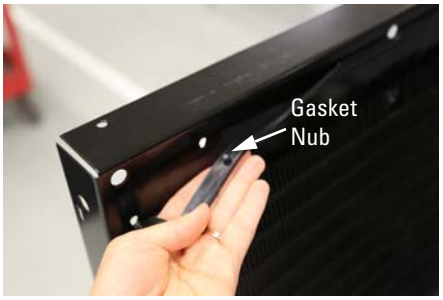

Figure 18: Position gasket on refrigeration module frame and ensure each gasket nub is inserted in corresponding hole

6. Route the AC power cord through the refrigeration module and secure it in place with the bushing (Figure 19).

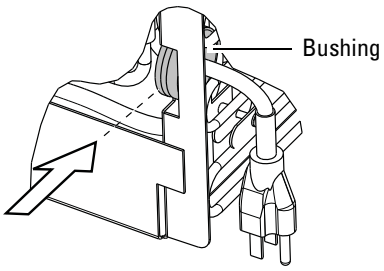

Figure 19: Secure AC Power Cord (Full length of line cord not depicted)

⚠ CAUTION

When reinstalling the refrigeration module, do not pinch the sensor wiring.

7. Install the module, tipping the top back while sliding the bottom forward. When the bottom of the system is in place, push the top into place (Figure 20). Ensure the slack in the power cord is removed before securing refrigeration module frame.

Figure 20: Slide module into place

⚠ CAUTION

When reinstalling all self-tapping screws, avoid destroying the plastic threads. First seat each screw in its hole and, without pressing down, rotate the screw counter-clockwise until it falls into its thread groove with a "click." Then tighten the screw.

8. Reinstall the refrigeration module mounting screws (Step 4).
9. Install the cable tie to secure the power cord that runs through the refrigeration assembly (Figure 21).

⚠ CAUTION

During reinstallation, ensure the slack in the power cord is removed before fastening the cable tie.

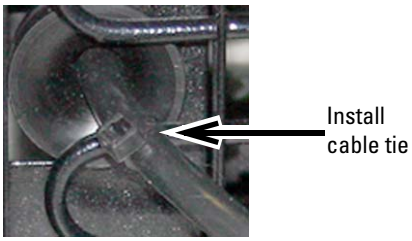

Figure 21: Install cable tie to secure power cord

10. Reinstall the coil shield, back cover, and insulation panel (Figure 1). When installing the foam insulation panel, take precautions not to damage the foam around the tubing (see inset, Figure 1).
11. Attach the adapter to the AC power cord's North American connector. Place the adhesive heat shrink tubing equally over the connection. Apply heat using a heat gun until the shrink tubing evenly conforms to the connector and adapter.

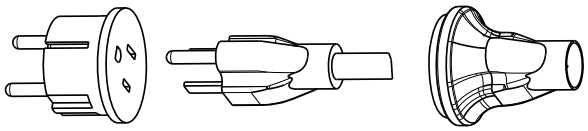

Figure 22: 230V line cord plug adapter

12. Restore AC power to the 5800 refrigerator.
13. Review the refrigerator temperature diagnostic test, as described in the following section.
14. Reinstall the refrigeration module mounting screws (8), insulation panel/back cover screws (5), and cover brace screws (2).

Removing the Module - Serial Number 216B and Older

Complete the following to remove the existing refrigerator module.

1. Unplug the line cord to remove the AC power.
2. Remove the cover brace, back cover, and insulation panel (Figure 23).

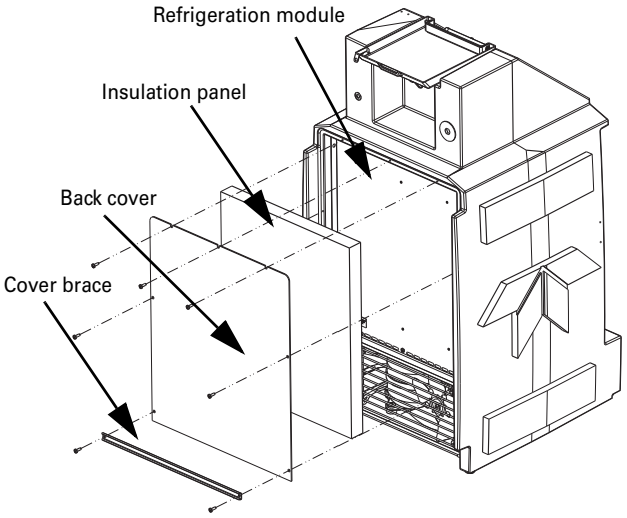

Figure 23: Open rear compartment

3. Cut the cable tie holding the power cord that runs through the refrigeration assembly (Figure 24).

Figure 24: Cut cable tie to free line cord

4. Remove the refrigeration module mounting screws (Figure 25).

☑ *Note*

Note that the refrigeration module has an adhesive strip just above the rear coils. The bottom center screw may be slightly hidden by this.

5. Carefully pull the module out and rotate clockwise to expose the wiring connectors. The bushing holding the AC line cord in place should slide along the cord (see Figure 25, inset). During reinstallation, the slack created in this step must be removed.

⚠ CAUTION

Keep the module as close to the refrigerator body as possible to avoid pulling the wiring taut and damaging the connectors.

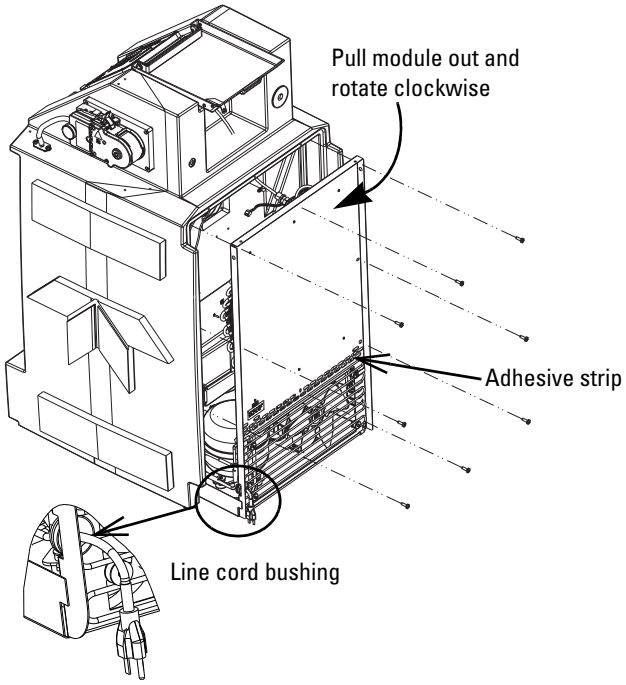

Figure 25: Remove refrigeration module

6. Remove the power cord.
   a. **230 VAC Models Only –** Remove the AC Plug adapter from the end of the power cord by first cutting away the plastic heat shrink tubing. Then pull the adapter off, leaving just the North American 115 VAC plug (Figure 26).

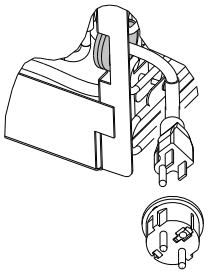

Figure 26: Remove adapter from power cord
(230 VAC models Only)

   b. Slide the bushing sideways away from the refrigeration module until it is free (Figure 27). Avoid bending the refrigeration tubing.

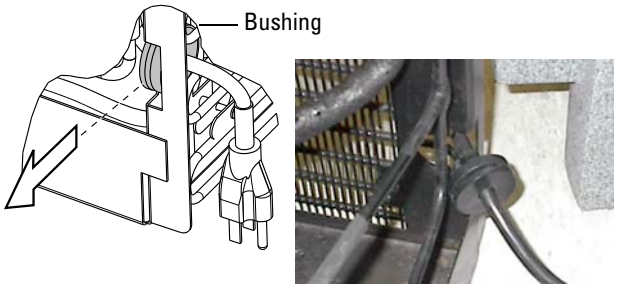

Figure 27: Remove power cord

c. Pull the power cord through the refrigeration module.

7. Remove the terminal cover of the compressor (Figure 28).

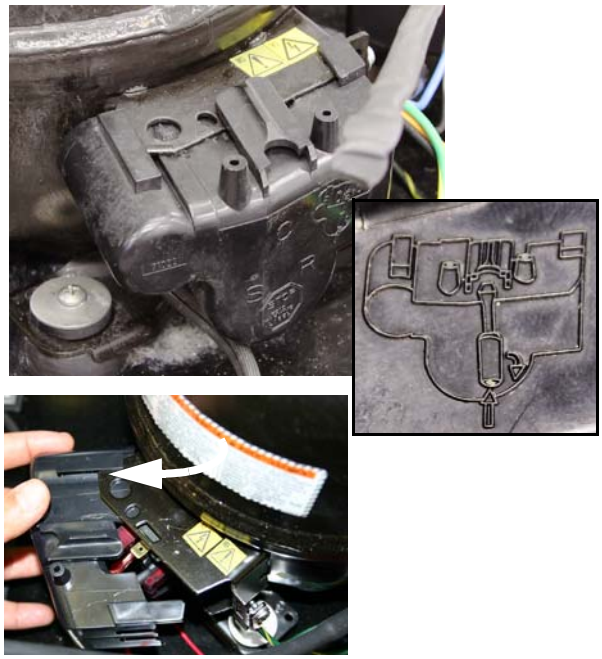

Figure 28: Access compressor overload and relay

A screwdriver may be used to release the latch.

☑ *Note*

The following connections are from the power supply on the rear of the cabinet and will vary according to the type of capacitor. If the power supply was replaced after 216B (February of 2016) refer to 216B and newer wiring instructions

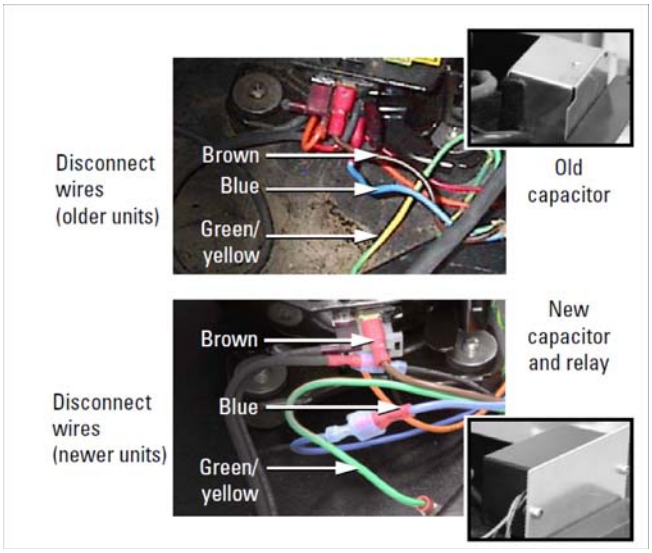

Figure 29: Electrical connections on 115V compressor

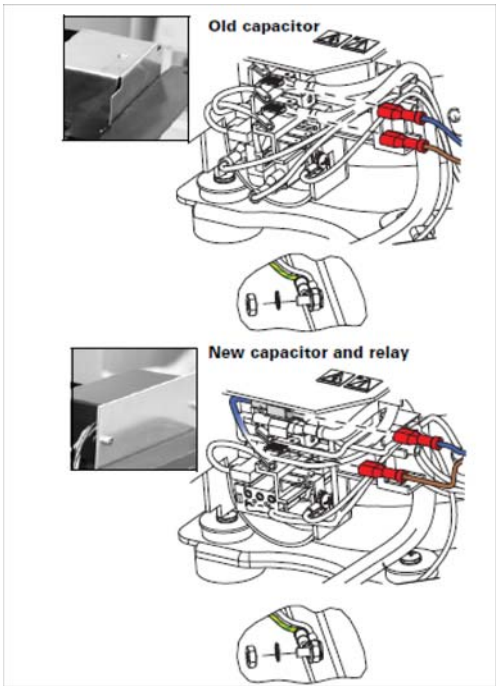

Figure 30: Electrical connection in 230V compressor

8. Open the top cover of the sampler and remove the control panel mounting screws (see Figure 31).

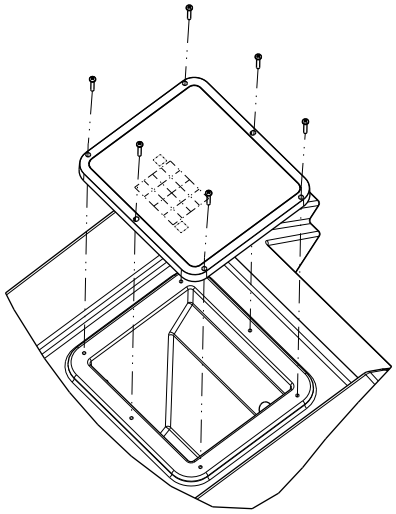

Figure 31: Remove control panel

9. Lift the control panel away from the refrigerator body to expose the wiring connectors.
10. Disconnect the wiring connectors.
    a. 5800: Connectors **P1 and P10**
    b. 4700: Connectors **P11 and P14**
11. Place the control panel back on the refrigerator body and start at least two screws to temporarily hold the panel until the new harness is in place.
12. Unscrew the black cord-grip fitting from the bulkhead fitting in the rear wall above the upper right corner of the fan. With #2 Phillips, remove the nylon cable clip. Pull the control panel power cable out through the threaded opening.

Note

Turn the connector sideways to fit through the hole.

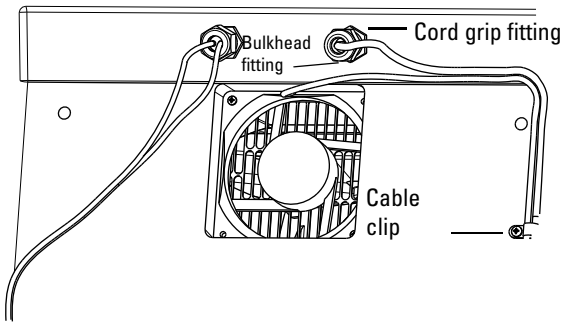

Figure 32: Cord grip fitting on refrigerator rear wall

13. From the front interior of the refrigerator, remove the two Phillips screws holding the fan in place and disconnect the fan's power cable (Figure 33).

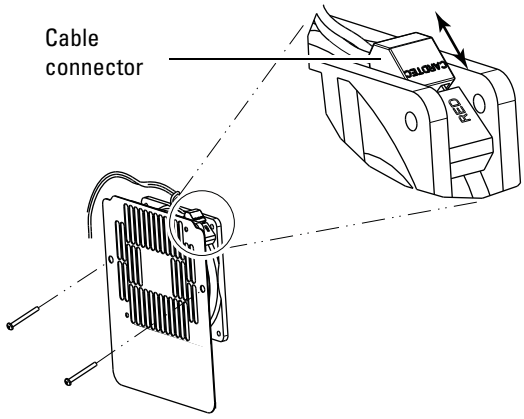

Figure 33: Remove fan mounting screws and disconnect cable (view from inside refrigerator)

14. Inserting the screwdriver through the holes in the heater plate, remove the two Phillips screws from the power supply back plate and remove the power supply (Figure 34).

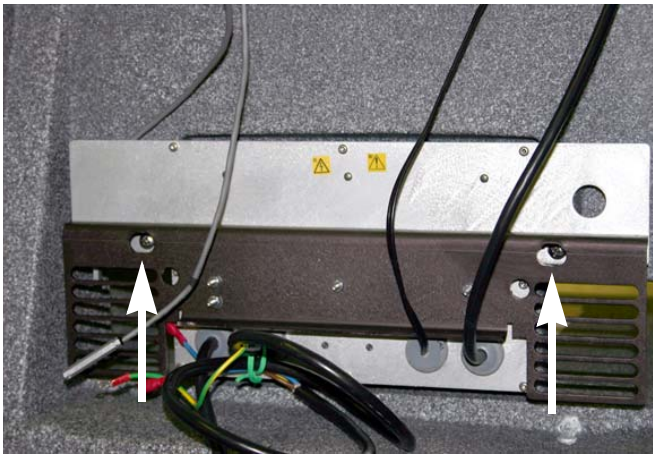

Figure 34: Power supply back plate

Replacement

1. Mount the replacement power supply with the two Phillips screws.
2. Reconnect the wires to the compressor and replace its cover.

⚠ CAUTION

Earth ground bonding conductor. Ensure that the green/yellow wire is reconnected to this terminal.

3. Route the line cord through the refrigeration module and secure it in place with the bushing. Hold the line cord taut to remove any slack, and attach a cable tie 489-0110-00 (Figure 35).

⚠ CAUTION

When installing/replacing the refrigeration unit, the line cord MUST be properly secured. This is to ensure that the cord cannot be pushed into the enclosure and be caught in the fan.

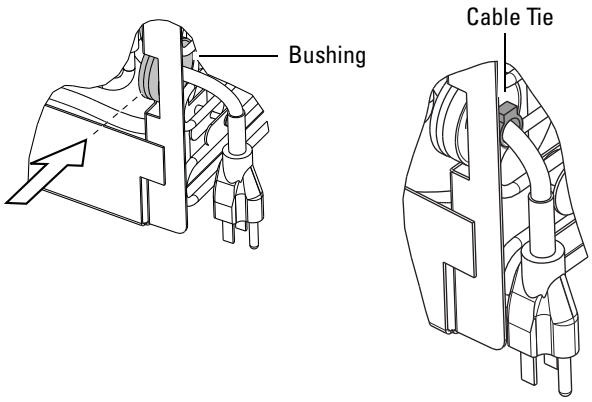

Figure 35: Secure AC Power Cord (Full length of line cord not depicted)

a. **230V/50 Hz Systems Only —** Attach the 230V plug adapter to the end of the power cord. Slide the piece of plastic heat shrink tubing over the plugs. Then apply heat of at least 80°C (176°F) to shrink the tubing.

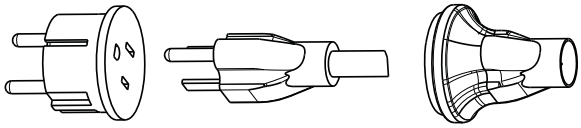

Figure 36: 230V line cord plug adaptor

4. Reconnect the cable connectors of the replacement power supply to the fan, and reinstall the fan with its two mounting screws.
5. Route the CPU CBA connector cable up through the refrigerator and into the top compartment.
6. Coat the threads of the black bulkhead connector with 737 RTV sealant (800-1002-03). Screw the bulkhead connector into the refrigerator cabinet by hand until the threads bottom out. Smooth the RTV out to cover the joint.
7. Connect the harnesses to the back of the control panel.
   a. 5800: Connectors **P1 and P10**
   b. 4700: Connectors **P11 and P14**

Closing the Rear Compartment

Ensure that the control wiring runs through the notches in the plastic refrigerator body.

The refrigeration module and rear compartment of the cabinet have adhesive strips and Permagum[1] (caulking cord sealant) protecting the components (Figures 37 and 38). **Ensure that all adhesive strips and Permagum are still in place before reassembly**. The adhesive strips and Permagum are required to prevent air flow between the condenser coil and the evaporator plate. Without this protection, water condensation on the coil will cause ice build-up, resulting in poor refrigerator performance.

☑ Note

Two thick, black cables connect the power supply with the AC and compressor (see Figure 37). **Ensure that these cables are side by side and not crossed during reassembly.**

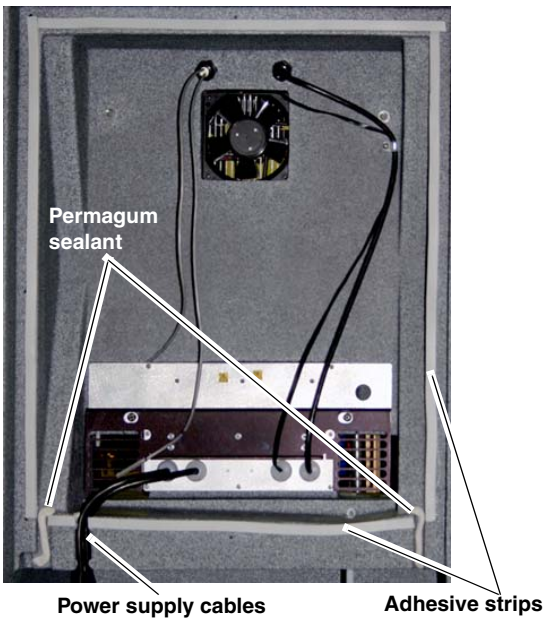

Figure 37: Rear view with module removed (Adhesive strips, Permagum sealant, power cables)

1. Permagum is a registered trademark of the Presstite Engineering Company.

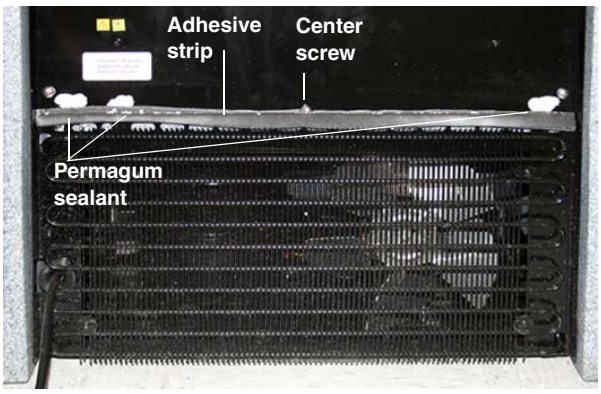

Figure 38: Rear view of refrigeration module
(Adhesive strip, Permagum sealant)

8. Move the refrigeration module up to the rear of the refrigerator and replace the drain tube in the drip pan on the module.

Figure 39: Position the drain tube in front half of the drip pan

9. Reinstall the refrigeration module, tipping the top back while sliding the bottom forward. When the bottom is in place, push the top into place.

Figure 40: Slide refrigeration module into place

⚠ CAUTION

When reinstalling all self-tapping screws, avoid destroying the plastic threads. First seat each screw in its hole and, without pressing down, rotate the screw counter-clockwise until it falls into its thread groove with a "click." Then tighten the screw.

10. Reinstall the refrigeration module mounting screws (8), insulation panel/back cover screws (5), and cover brace screws (2).

Last modified December 7, 2017

Teledyne Isco
P.O. Box 82531, Lincoln, Nebraska, 68501 USA
Toll-free: (866) 298-6174 • Phone: (402) 464-0231 • Fax: (402) 465-3001
E-mail: IscoService@teledyne.com