

# Installation and Operation Manual

## Thermo Scientific Revco® Benchtop Ultra-Low Temperature Freezers



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## 1 Introduction

Ultra-low temperature Revco Benchtop freezers are designed for personal or clinical trial applications. They have a compact footprint (25.2 in.x 30.7 in.) with a 1 cu. ft. (28L) capacity.

Standard features include:

- Hermetically sealed industrial-grade compressors
- Foamed-in-place CFC-free urethane insulation
- All-steel cabinet with high-impact epoxy finish for easy cleaning
- Thermal interior sublid
- Heavy-duty counterbalanced lid with key lock
- Solid-state temperature control system with adjustable setpoints
- Integrated preset overtemperature safety alarm with battery backup
- Digital temperature display with 1°C resolution
- Key-operated main power switch

6-inch temperature recorders are available as optional accessories.

## 2 Safety Precautions

In this manual and on labels attached to this product, the words WARNING and CAUTION mean the following:

- **WARNING:** a potentially hazardous situation which, if not avoided, could result in serious injury or death.
- **CAUTION:** a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage to the equipment.

Before installing, using or maintaining this product, please be sure to read this manual and product warning labels carefully. Failure to follow these instructions may cause this product to malfunction, which could result in injury or damage.

Below are important safety precautions that apply to this product:

- Use this product only in the way described in the product literature and in this manual. Before using it, verify that this product is suitable for its intended use.
- Do not modify system components, especially the controller. Use OEM exact replacement equipment or parts. Before use, confirm that the product has not been altered in any way.
- Your unit must be properly grounded in conformity with national and local electrical codes. Never connect the unit to overloaded power sources.
- Disconnect the unit from all power sources before cleaning, troubleshooting, or performing other maintenance on the product or its controls.

## 3 General Recommendations

The refrigeration system is designed to maintain ultra-low temperatures with safety in a +32°C (90°F) ambient environment, **only** when the freezer is used for storage.



**WARNING!** This unit is not a “rapid-freeze” device. Freezing large quantities of liquid, or high-water content items, will temporarily increase the chamber temperature and will cause the compressors to operate for a prolonged time period. Attempting to utilize this freezer improperly may jeopardize safety or cause undue stress or damage to the refrigeration compressors.

Avoid opening the lid for extended time periods since chamber temperature air will escape rapidly. Room air, which is higher in humidity, replacing chamber air may cause frost to develop in the chamber more rapidly.

After reading and completing the Safety Considerations, Pre-Installation, Installation, and Operation sections of this manual, turn the Key Switch to the POWER ON position.

### 3.1 Initial Loading

When loading the unit with “pre-frozen” materials, the operating temperature setpoint of the freezer should be set no lower than the temperature of the “pre-frozen” material. Allow the unit to operate at the setpoint for eight hours. The setpoint may then be lowered in increments no greater than 10°C. Allow a stabilizing period of eight hours for each ten degree adjustment, until the desired setpoint is achieved.



**CAUTION!** Failure to follow these procedures or overloading the unit may cause undue stress on the compressors or jeopardize user product safety.

## 4 Pre-Installation

### 4.1 Unpacking

*At delivery, examine the exterior for physical damage while the carrier’s representative is present. If exterior damage is present, carefully unpack and inspect the unit and all accessories for damage.*

*If there is no exterior damage, unpack and inspect the equipment within five days of delivery. If you find any damage, keep the packing materials and immediately report the damage to the carrier. Do not return goods without written authorization. When submitting a claim for shipping damage, request that the carrier inspect the shipping container and equipment.*



**CAUTION!** Do not discard the sublid. The sublid is necessary to maintain correct temperature, moisture control, and economy of operation.

## 5 Installation

Do not exceed the electrical and temperature ratings printed on the dataplate located on the lower left side of the unit.



**CAUTION!** Improper operation of the equipment could result in dangerous conditions. To preclude hazard and minimize risk, follow all instructions and operate within the design limits noted on the dataplate.

### 5.1 Location

Install the unit in a level area free from vibration with a minimum of six inches of space on the sides, rear, and top. Allow enough clearance so that the lid can swing open at least 90 degrees.

Do not position the equipment in direct sunlight or near heating diffusers, radiators, or other sources of heat. The ambient temperature range at the location must be 59 to 90°F (15 to 32°C).



**CAUTION!** To allow for proper air flow, a minimum of six inches of clearance space is required behind the freezer.

### 5.2 Wiring

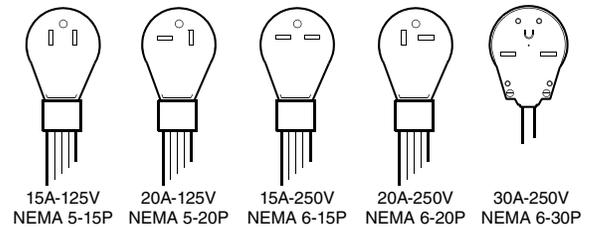


**CAUTION!** Connect the equipment to the correct power source. Incorrect voltage can result in severe damage to the equipment.



**CAUTION!** For personal safety and trouble-free operation, this unit must be properly grounded before it is used. Failure to ground the equipment may cause personal injury or damage to the equipment. Always conform to the National Electrical Code and local codes. Do not connect the unit to overloaded power lines.

Your freezer is equipped with one of five NEMA style plugs (refer to Figure 1). These plugs meet UL requirements.



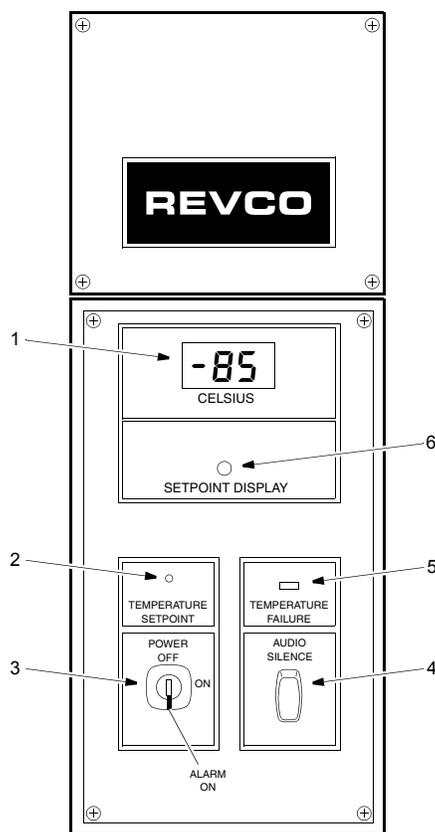
**Figure 1. NEMA Style Plugs**

Always connect the freezer to a dedicated (separate) circuit. Each freezer is equipped with a service cord and plug designed to connect it to a power outlet which delivers the correct voltage. Supply voltage must be within +10%, -5% of the freezer rated voltage.

## 6 Operation (Revco Benchtop Freezers)

### 6.1 Control Panel Features

Before the initial start up, take some time to become familiar with the controls on your freezer. Figure 2 illustrates the control panel for the -80°C Revco Benchtop Freezers.



**Figure 2. Revco Benchtop Freezer Control Panel**

1. LED digital temperature display.
2. Recessed temperature control setpoint adjustment.
3. Power On/Alarm On switch.
4. Audio Silence switch.
5. Temperature Failure LED indicator.
6. Setpoint Display button.

### 6.2 Start Up

Refer to Figure 2 as you complete the following procedures.

#### 6.2.1 Turning the Power On

To start up the Revco Benchtop Freezer, complete the following steps:

1. Plug the freezer into the power outlet (refer to Section 5.2 on page 2).
2. Turn the key switch to the POWER ON position. The digital temperature display shows the cabinet temperature.

**Note:** *The alarm function is not active at this time.*

#### 6.2.2 Setting the Cabinet Temperature

To set the cabinet temperature, complete the following steps:

1. Insert a small screwdriver into the slotted screw labeled Temperature Setpoint and simultaneously press and hold the Setpoint Display button. The temperature display changes to read the existing setpoint value.
2. Turn the setpoint screw (clockwise for a colder setting and counterclockwise for a warmer setting) until the desired setpoint shows in the digital temperature display.
3. Release the Setpoint Display button. The digital temperature display returns to the cabinet temperature.

#### 6.2.3 Warm Alarm

The alarm is preset at the factory: For units designed to operate at -80°C, the alarm setpoint is 90% of the freezer temperature setpoint.

To activate the alarm, wait until the freezer reaches operating temperature and turn the key switch to the ALARM ON position.

If the cabinet temperature rises above the alarm setpoint, the Temperature Failure light illuminates and the audio alarm sounds.

To silence the audio alarm, press the Audio Silence button. The alarm stops for 15 minutes and then sounds again until the cabinet temperature drops below the alarm setpoint or until the Alarm Silence button is pressed again.

## 7 Maintenance and Troubleshooting



**WARNING!** Unauthorized repair of your freezer will invalidate your warranty. Contact Technical Service at 1-800-438-4851 for additional information.



**CAUTION!** Maintenance should only be performed by trained personnel.

### 7.1 Condenser Maintenance

Clean the condenser at least every six months; more often if the laboratory area is extremely dust prone.

To clean the condenser, complete the following steps:

1. Pull the grill open.
2. Check the fans. If a fan is not operating, contact an Authorized Service Company immediately.
3. Vacuum the condenser.
4. Close the grill.

### 7.2 Gasket Maintenance

Periodically check the gaskets around the lid for punctures or tears. Leaks are indicated by a streak of frost which forms at the point of gasket failure. Make sure that the cabinet is level.

Keep the lid gaskets clean and frost free by wiping gently with a soft cloth.

### 7.3 Defrost Procedures

To defrost the equipment, complete the following steps:

1. Remove all products and place in another cabinet.
2. Turn off the unit and allow the interior to warm to room temperature.
3. Dispose of the ice and wipe out any water standing in the bottom of the cabinet.

If there is freezer odor, wash the interior with a solution of baking soda and warm water. Clean the exterior with any common household cleaning wax.

### 7.4 Alarm Battery Maintenance

Have a technician check the condition of the alarm battery at least once a year.

To replace the alarm battery, complete the following steps:

1. Remove the panel on the left side of the freezer. The alarm battery is located directly behind the grill. The terminals are the “push on” type.
2. Grasp the terminal with pliers and work it gently back and forth while pulling it off. The fittings are tight.
3. Remove the battery and put the new battery in place.

**Note:** *You may have to cut a strip of silicone rubber in order to remove the battery.*

4. Connect the battery terminals and replace the front grill.

## 8 Chart Recorders (Optional)

Panel-mounted six-inch seven-day recorders are available as optional accessories for benchtop models.

### 8.1 Set Up and Operation

To prepare the recorder to function properly, complete the following steps:

1. Open the recorder door to access the recorder.
2. Connect the nine volt DC battery located at the recorder's upper right corner. This battery provides backup power.
3. Install clean chart paper (refer to Section 8.3 below).
4. Remove the plastic cap from the pen stylus and close the recorder door.

Recorder operation begins when the system is powered on. The recorder may not respond until the system reaches temperatures within the recorder's range.

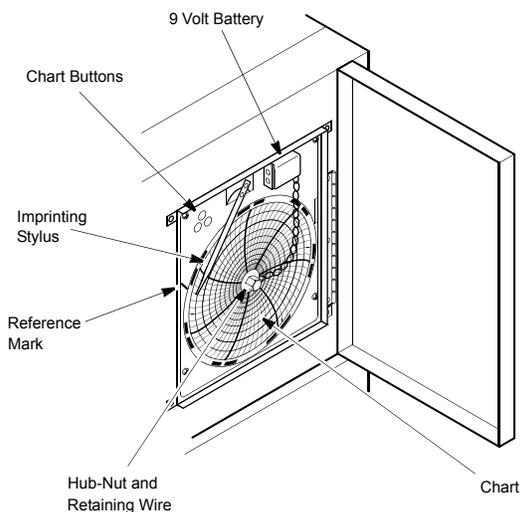


Figure 3. Chart Recorder

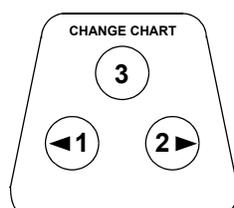


Figure 4. Chart Buttons



**CAUTION!** Do not use sharp or pointed objects to depress the chart buttons. This may cause permanent damage to the recorder.

### 8.2 Power Supply

The recorder normally uses AC power when the system is operating. If AC power fails, the LED indicator flashes to alert you to a power failure. The recorder continues sensing cabinet temperature and the chart continues turning for approximately 24 hours with back-up power provided by the nine-volt battery.

The LED indicator glows continuously when main power is functioning and the battery is charged.

When the battery is low, the LED flashes to indicate that the battery needs to be changed.

### 8.3 Changing Chart Paper

To change the chart paper, complete the following steps:

1. Locate the pressure sensitive buttons at the front, upper left of the recorder panel.
2. Press and hold the Change Chart button (#3) for one second. The pen will move off the scale.
3. Unscrew the center nut, remove the old chart paper, and install new chart paper. Carefully align the day and time with the reference mark (a small groove on the left side of the recorder panel).
4. Replace the center nut and hand tighten. Press the Change Chart button again to resume temperature recording.

### 8.4 Calibration Adjustment

This recorder has been accurately calibrated at the factory and retains calibration even during power interruptions. If required, however, adjustments can be made as follows:

1. Run the unit continuously at the control setpoint temperature. Continue steady operation for at least two hours to provide adequate time for recorder response.
2. Measure cabinet center temperature with a calibrated temperature monitor.
3. Compare the recorder temperature to the measured cabinet temperature. If necessary, adjust recorder by pressing the left (#1) and right (#2) chart buttons.

**Note:** *The stylus does not begin to move until the button is held for five seconds.*

## WEEE Compliance

**WEEE Compliance.** This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96EC. It is marked with the following symbol. Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on Thermo Fisher Scientific compliance with these Directives, the recyclers in your country, and information on Thermo Scientific products which may assist the detection of substances subject to the RoHS Directive are available at [www.thermo.com/](http://www.thermo.com/)

### Great Britain



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### Deutschland



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### Italia



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### France



## Important

For your future reference and when contacting the factory, please have the following information readily available:

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Date Purchased: \_\_\_\_\_

The above information can be found on the dataplate attached to the equipment. If available, please provide the date purchased, the source of purchase (the manufacturer or specific agent/rep organization), and purchase order number.

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### IF YOU NEED ASSISTANCE:

#### SALES DIVISION

Phone: 828/658-2711  
800/252-7100

Fax: 828/645-3368

#### LABORATORY PARTS and SERVICE

Phone: 800/438-4851

Fax: 828/658-2576

#### TECHNICAL SUPPORT

Phone: 800/438-4851

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