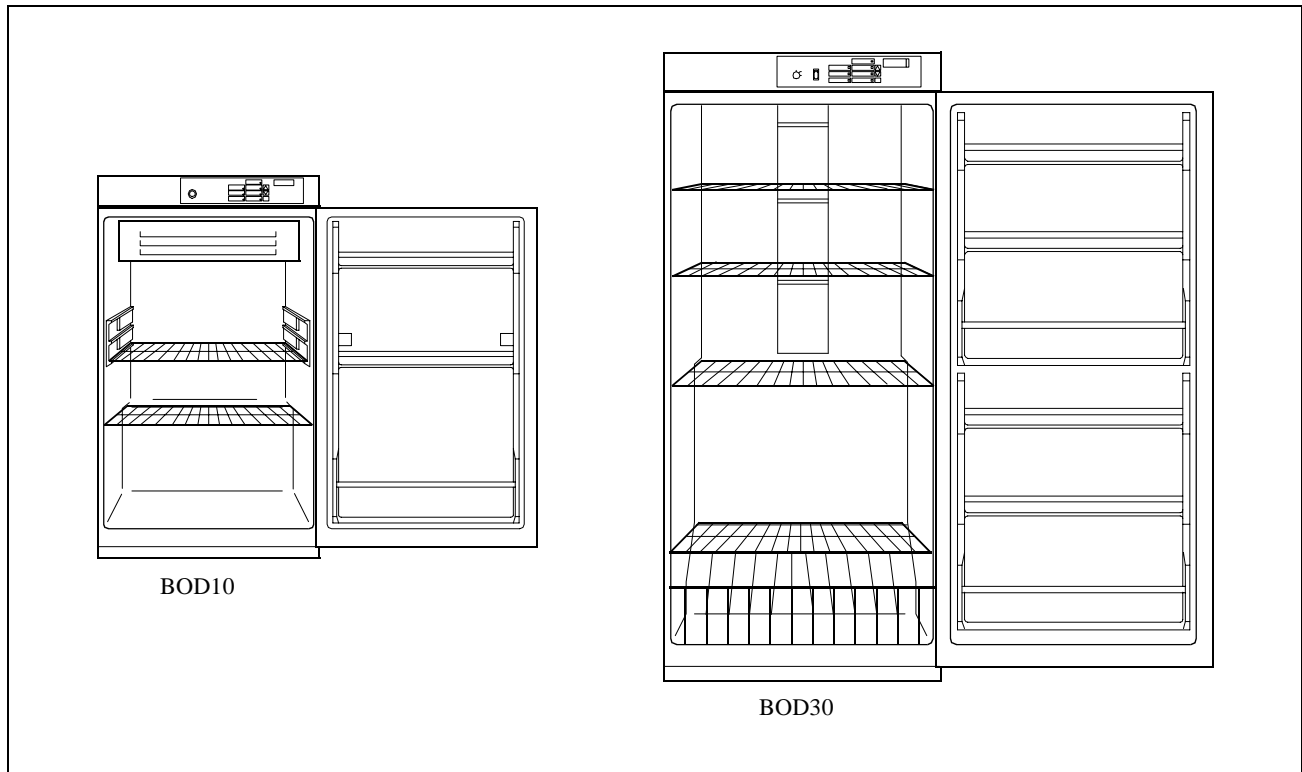


## 1 Introduction



### 1.1 Specifications

Model	BOD10	BOD30
<b>Capacity</b>	6.1 cu. ft.	20.0 cu. ft.
<b>BOD Bottle Capacity</b>	92 Standard BOD Bottles	400+ Standard BOD Bottles
<b>Temperature</b>		
<b>Range</b>	0 to +50°C	-20 to +60°C
<b>Control</b>	Micro (Single Set Point)	Micro (Single Set Point)
<b>Uniformity</b>	+/-0.5°C Typical	+/-0.5°C Typical
<b>Solid-State Electronic</b>	Yes - High and Low	Yes - High and Low
<b>Insulation</b>	CFC-Free Foamed-in-place	CFC-Free Foamed-in-place
<b>Interior</b>	ABS Thermoplastic	ABS Thermoplastic
<b>Shelves</b>	1 Fixed/1 Adjustable	4 Fixed Shelves/1 Basket
<b>Voltage</b>	115/1/60	115/1/60
<b>Dimensions</b>		
<b>Exterior</b>	23 7/8 in. W x 25.5 in. D x 35.75 in. H	33 in. W x 29 in. D x 69.8 in. H
<b>Interior</b>	21 in. W x 20 in. D x 24 in. H	28 in. W x 22 in. D x 56 in. H
<b>Shipping Weight</b>	115 lbs (52 kg.)	300 lbs. (136 kg.)

## 2 Safety Considerations



**WARNING!** Do not modify or change system components. Replacement parts must be O.E.M. exact replacement equipment. Modification or use of the equipment in a manner other than expressly intended may cause death or serious injury. This includes use of user-supplied components and materials not specifically designed for the unit. Reconfiguring the controller may cause death or serious injury.

The manufacturer shall not be liable for any damages, including incidental and/or consequential damages, regardless of the legal theory asserted, including negligence and/or strict liability.

Before using, user shall determine the suitability and integrity of the product for the intended use and that the unit has not been altered in any way. User assumes all risk and liability whatsoever therewith.



**WARNING!** 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 unit to already overloaded power lines.



**WARNING!** Disconnect unit from main power before attempting any maintenance to equipment or controls.

## 3 Pre-Installation

### 3.1 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 to the manufacturer without written authorization. When submitting a claim for shipping damage, request that the carrier inspect the shipping container and equipment.*

### 3.2 Included Parts

The shelves are packaged and secured inside the cabinet. The control key, door key, and this manual are also shipped inside the incubator.

## 4 Installation

Do not exceed the electrical and temperature ratings printed on the dataplate located inside 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.

### 4.1 Location

Install the unit in a level area free from vibration with a minimum of three inches of space on the sides and rear and 12 inches at the top.

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).

### 4.2 Wiring



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



**DANGER!** 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.

Always connect the refrigerated incubator to a dedicated (separate) circuit. Electrical codes require fuse or circuit breaker protection for branch circuit conductors. Use time delay fuses for #12 AWG circuits.

### 4.3 Leveling

The unit must be leveled right to left and front to back. On the BOD30, rotate the leveling feet, located under the front corners of the unit, until the unit is level. The BOD10 does not have leveling feet; shims should be used where necessary.

#### 4.4 Shelves

For safety during shipping, the shelves are packaged and secured inside the cabinet.

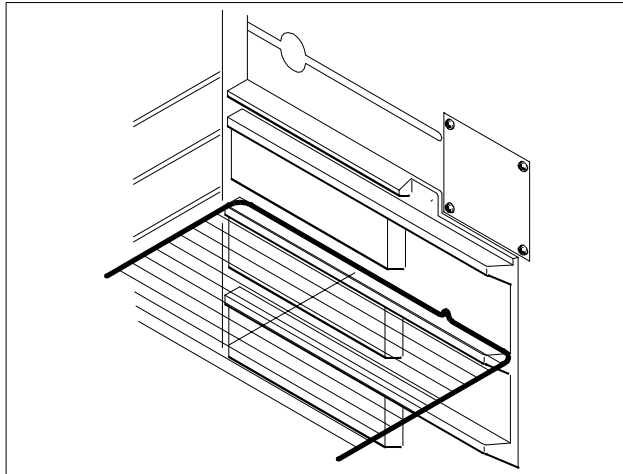


Figure 1. Shelving Detail

##### 4.4.1 6.1 cu. ft. Models

The compact 6.1 cu. ft. models have two shelves, one is fixed and the other is adjustable. Place the adjustable shelf on the shelf brackets inside the incubator and push the shelf down and toward the back of the incubator.

##### 4.4.2 20.0 cu. ft. Models

The 20.0 cu. ft. models have 4 shelves. The two shallower shelves fit in the bottom section of the incubator, the two wider shelves in the top section of the incubator. Place a shelf on the shelf brackets inside the incubator and push the shelf down and toward the back of the incubator.

#### 4.5 Door Seal

To check the door seal, complete the following steps:

1. Open the door.
2. Insert a strip of paper (8.5 x 11 in.) between the door gasket and the cabinet flange and close the door.
3. Slowly pull the paper strip from the outside. You should feel some resistance.
4. Repeat this test at 4 inch intervals around the door. If the door does not seal properly, the gasket must be replaced.



**CAUTION!** Door seal integrity is critical. A loose fitting gasket allows moist air to be drawn into the cabinet, resulting in quicker frost buildup on the evaporator coil, longer running time, poor temperature maintenance, and increased operation cost. The full Hermetic motor-compressors in these units have solid hold-down nuts. **Do not loosen the visible mounting nuts.**

#### 4.6 Remote Alarm Terminals

The BOD30 incubator has connections for freestanding alarms. These terminals are located at the back of the incubator. The terminals are: Common, Normally Closed, and Normally Open.

## 5 Operation

### 5.1 Control Panel Features

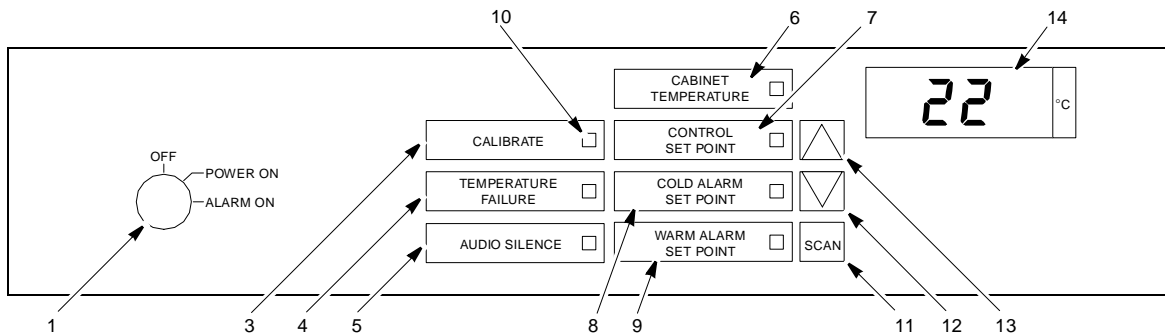


Figure 2. Control Panel (6.1 cu. ft. model)

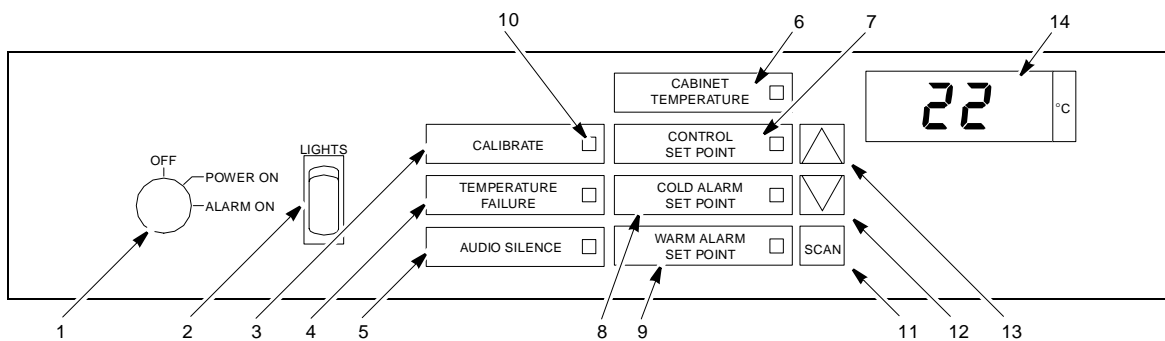


Figure 3. Control Panel (20.0 cu. ft. model)

Before the initial start up, take some time to become familiar with the controls on your refrigerated incubator. Figure 2 and Figure 3 illustrate the control panel.

1. Three position keyed Power On Switch.
2. Interior light switch (20.0 cu ft models only).
3. Calibrate. Press this pad to calibrate the cabinet temperature (refer to Section 5.4.1 on page 6).
4. Temperature failure. This indicator lights when the incubator temperature deviates above or below the alarm temperature settings.
5. Audio Silence. Press this pad to silence the alarm.
6. Cabinet Temperature Indicator. This indicator lights when the temperature display window is showing the actual cabinet temperature (refer to Section 5.4.1 on page 6).
7. Control Set Point. This indicator lights when the temperature display window is showing the cabinet temperature set point (refer to Section 5.3.1 on page 5).
8. Cold Alarm Set Point. This indicator lights when the temperature display window is showing the cold alarm set point (refer to Section 5.3.2 on page 5).
9. Warm Alarm Set Point. This indicator lights when the temperature display window is showing the warm alarm setpoint (refer to Section 5.3.3 on page 5).
10. Warning indicator lights.
11. Scan key. Use this pad to select the Control, Cold Alarm, or Warm Alarm Set Point function.
12. Decrement Pad ( $\nabla$ ). Use this pad to decrease temperature values.
13. Increment Pad ( $\triangle$ ). Use this pad to increase temperature values.
14. Digital Temperature Display Window. This window displays chamber temperature, alarm values, etc. depending on the operating status of the refrigerated incubator and the procedure being performed.
15. Circuit breaker (not shown). The circuit breaker is located on the back of the control on a BOD30. The BOD10 does not have a circuit breaker.

## 5.2 Initial Start Up

Turn the key switch to the POWER ON position. The Power On LED and the Cabinet Temperature LED illuminate.

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

The display cycles through an initialization mode for a few seconds, then the Temperature Display Window shows the current cabinet temperature. The indicator light next to Cabinet Temperature is green.

Do not turn the key to ALARM ON until all start-up procedures are complete and the incubator is stabilized.

**Table 1. Factory Temperature Settings**

<b>Cabinet Temperature:</b>	22°C
<b>Cold Set Point:</b>	12°C
<b>Warm Set Point:</b>	32°C

## 5.3 Set Point Operation



**CAUTION!** If the Control Set Point is 4°C or below in 20.0 cu ft models, the control automatically initiates a defrost cycle every eight hours. There will be a slight elevation in cabinet temperature during this cycle.



**CAUTION!** If the Control Set Point is above 40°C in the 20.0 cu ft models or above 30°C in the 6.1 cu ft models, the incubator compressor is automatically disabled.

### 5.3.1 Control Set Point

**IMPORTANT NOTE:** *When the control set point is changed, the cold alarm and warm alarm set points automatically reference the new control set point. For example, control set point = 3°C, cold alarm set point = 2°C, and warm alarm set point = 4°C. If the control set point is changed to 10°C, the cold alarm automatically changes to 9°C and the warm alarm set point changes to 11°C. Since the incubator temperature is less than 9°C, the cold alarm will sound.*

*To prevent activation of the alarms, manually adjust the cold alarm set point 1° below the current incubator temperature and the warm alarm set point 1° above the new control set point. When the temperature stabilizes to the new control set point, adjust the alarm set points accordingly (refer to Section 5.3.2 and Section 5.3.3).*

To change the control set point temperature, complete the following steps:

1. Press the Scan key until the LED indicator light next to the Control Set Point pad is yellow. The display shows the current set point.

**Note:** *If no keys are pressed within ten seconds, the temperature display reverts to the cabinet temperature.*

2. Press and hold  $\triangle$  or  $\nabla$  to adjust the set point temperature.



**CAUTION!** You must turn the three-position key switch to the ALARM ON position to activate the alarm.

### 5.3.2 Cold Alarm Set Point

To change the cold alarm set point, complete the following steps:

1. Press the Scan key until the LED indicator light next to the Cold Alarm Set Point pad is yellow. The display shows the current set point.

**Note:** *If no keys are pressed within ten seconds, the temperature display reverts to the cabinet temperature.*

2. Press and hold  $\triangle$  or  $\nabla$  to adjust the set point temperature.

**Note:** *To avoid nuisance alarms due to door opening, etc., we recommend that the set point be no closer than 1° to the Control Set Point.*



**CAUTION!** You must turn the three-position key switch to the ALARM ON position to activate the alarm.

### 5.3.3 Warm Alarm Set Point

To change the warm alarm set point, complete the following steps:

1. Press the Scan key until the LED indicator light next to the Warm Alarm Set Point pad is yellow. The display shows the current set point.

**Note:** *If no keys are pressed within ten seconds, the temperature display reverts to the cabinet temperature.*

2. Press and hold  $\triangle$  or  $\nabla$  to adjust the set point temperature.

**Note:** *To avoid nuisance alarms due to door opening, etc., we recommend that the set point be no closer than 1° to the Control Set Point.*



**CAUTION!** You must turn the three-position key switch to the ALARM ON position to activate the alarm.

### 5.3.4 Alarm Operation

When the alarm system is activated, warm and cold alarm conditions cause the heating and cooling systems to shut down. This is to protect the contents of the incubator from extreme temperature conditions.

If the control display indicates an alarm condition, verify that the temperature and alarm setpoints are correct for your application. Also check the power supply and door seal. If the setpoints are correct and there is nothing visibly wrong with your unit, call Technical Service.

## 5.4 Calibration

If it is necessary to verify incubator operation, complete the following steps:

1. Place a thermometer, graduated in 0.1°C increments, inside the incubator.



**CAUTION!** Do not allow the thermometer bulb to touch the shelves. If the bulb touches any part of the incubator or shelves, the temperature reading will not be accurate. We recommend that the thermometer be *hung* inside the incubator with air circulating freely around the sensing bulb.

2. Allow the incubator to run undisturbed for at least eight hours so that the temperature can stabilize.
3. After the temperature is stabilized, read the thermometer temperature.



**CAUTION!** Look at the thermometer temperature quickly, do not remove the thermometer from the incubator. The thermometer temperature starts to change as soon as the incubator door is opened.

### 5.4.1 Control Temperature Calibration

To calibrate the control temperature, complete the following steps:

1. Press Calibrate. The LED indicator next to Control Temperature glows red. The Temperature Display Window shows the current control temperature.

**Note:** *If no keys are pressed within ten seconds, the temperature display reverts to the cabinet temperature.*

2. Press and hold  $\triangle$  or  $\nabla$  to display the desired value.



**CAUTION!** The calibration of the control is now changed permanently.

3. Allow the incubator to stabilize for one to two hours.
4. Make any necessary changes to the set points after the incubator stabilizes at the new temperature.

## 5.5 Operation

After the Control Temperature and set points are set to your specifications and the incubator temperature is stabilized, turn the control key to ALARM ON.

You can now load product into the incubator.



**CAUTION!** Allow sufficient air space around the product to maintain airflow for temperature uniformity.

**Note:** *When the door is opened, the evaporator fan shuts down to prevent warmup of samples and the interior light turns on (BOD30 units only).*



**CAUTION!** If a short power failure occurs and power goes off and immediately on again, the built-in compressor overload device functions to take the compressor off-line. This process is normal and the overload device restarts the compressor within a few minutes.

## 6 Maintenance



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

### 6.1 Defrost Water Pan (BOD30 only)

When the unit automatically defrosts in freeze mode, defrost water is collected in a pan, located above the motor compressor in the back of the unit. This water is evaporated by heat from the motor compressor which leaves a residue in the pan. Clean the defrost water pan with warm water and soap approximately every 90 days.

### 6.2 Cabinet Interior

The inside of the cabinet should be cleaned whenever necessary with one of the following solutions:

- Amphyl solution, mixed according to the manufacturer's directions.
- Roccal II solution, mixed according to the manufacturer's directions.
- Two tablespoons of baking soda per quart of warm water.

Stubborn smudges can be cleaned with mild soap and water.



**CAUTION!** Do not use detergent or any detergent-containing mixture. Detergent will discolor the interior plastic parts. **Do not use solvents.**

Shelves can be removed for washing.

Be careful with the sealing gasket on the door. If the gasket is damaged, it will not seal properly and will require replacement.

**Note:** *Dry all interior surfaces before restarting the unit.*

### 6.3 Cabinet Exterior

Every three to six months, sweep around the base, underneath, and behind the incubator.

**Note:** *Remove the kickplate located on the lower front on the 20.0 cu. ft. models before sweeping.*

## 7 Troubleshooting

### 7.1 Troubleshooting Procedures



**WARNING!** Troubleshooting procedures involve working with high voltages which can cause injury or death. Troubleshooting should only be performed by trained personnel.

Symptom	Problem	Solution
No lights on control panel	No power	Check the service cord at the electrical outlet for proper fit. The plug should be tight in the socket. If the outlet is defective, replace the outlet.
	Circuit breaker	Check to see if the breaker is tripped. Reset the breaker if necessary. The circuit breaker is located on the back of the control (BOD30 only).
	Power switch	Check the incubator control panel main power switch. Refer to Section 5.2 on page 5.
	House electrical power	Check the branch circuit feeding the incubator. Refer to Section 4.2 on page 2.
Unit does not maintain set point temperature	Stabilization	Unit has not had time to stabilize after the last temperature selection. Refer to Section 5.4.1 on page 6.
	External heat	Unit is in direct sunlight or located in the discharge from a heating/air conditioning outlet. Refer to Section 4.1 on page 2.
	Condenser	Check that the rear condenser coil is clear of dust accumulation (6.1 cu. ft. model only).
Overtemperature Alarm sounding	Alarm set point	The set point temperature is too close to the cabinet temperature setting. Refer to Section 5.3 on page 5.
	Interior fan	Check that the fan is operating.
	Door switch	The door switch is stuck (20.0 cu. ft. models only).
	Condenser	Check that the rear condenser coil is clear of dust accumulation (6.1 cu. ft. model only).
Undertemperature indicator on	Set Point	The set point temperature is too close to the cabinet temperature setting. Refer to Section 5.3 on page 5.

## 8 Accessories

Part No.	Description
6314	Roccal II, 3.5 liter bottle
6315	Amphyl Spray, disinfecting agent, 12 cans/case
6316	O-Syl, 3.5 liter bottle

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 (specific agent/rep organization), and purchase order number.

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### **If You Need Assistance**

#### REVCO SALES DIVISION

Phone: 828/658-2711  
Toll Free (U.S.): 800/252-7100  
FAX: 828/645-3368

#### LABORATORY PARTS and SERVICE

Phone: 800-438-4851  
FAX: 828-658-2576

#### TECHNICAL SUPPORT

Toll Free (U.S.): 800-438-4851

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