Operating Instructions

VWR Air Jacketed CO_2 Incubator







VWR Catalogue Number	Manufacturer Model Number	Sensor*	Capacity (cu ft)	Voltage
10810-902	VWR51014991	T/C	6.5	115V/60Hz
10810-944	VWR51014992	IR	6.5	115V/60Hz
10811-002	VWR50114902	T/C	6.5 X 2**	115V/60Hz
10811-004	VWR50114903	IR	6.5 x 2**	115V/60Hz

*T/C is a thermal conductivity sensor.
IR is an infra-red sensor.
**Dual stack

Legal Address of Manufacturer

United States

VWR International, LLC

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Radnor, PA 19087

800-932-5000

http://www.vwr.com

Country of origin: United States

MANUAL NUMBER 751014991

REV	ECR/ECN	DATE	DESCRIPTION	By
0	40591	1/12/16	Original	ccs



Important Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

Caution All internal adjustments and maintenance must be performed by qualified service personnel. ▲

Material in this manual is for information purposes only. The contents and the product it describes are subject to change without notice. VWR International makes no representations or warranties with respect to this manual. In no event shall VWR Glrcpl_rgml_j be held liable for any damages, direct or incidental, arising out of mp related to the use of this manual.

Intended Use:

The VWR Air Jacketed CO2 Incubators are designed to maintain an optimal environment for the incubation of tissue and cell samples. These models are designed to maintain temperature and carbon dioxide levels as set by the operator as well as monitoring chamber relative humidity. CO2 is controlled using either a thermo-conductivity cell, or an infra-red sensor.

The VWR Air Jacketed Incubators are approved for general purpose use only.

Non-intended Use:

The VWR Air Jacketed Incubators are not intended for use where electrical or physical contact with the patient is established.

These incubators are not intended to be operated in potentially explosive environments and are not intended for use with flammable materials.

The VWR Air Jacketed Incubators are not intended for use as a Microbiological Incubator (21 CFR 866.2540) and are also not approved for use in assisted reproductive procedures for the incubation of ova and embryos (21 CFR 884.6120).

Warning If the incubator is not used in the manner specified in this operating manual, the protection provided by the equipment design may be impaired. ▲

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Important operating and/or maintenance instructions. Read the accompanying text carefully.



Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.



Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.



Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.

- ✔ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- ✔ Always dissipate extreme cold or heat and wear protective clothing.
- ✔ Always follow good hygiene practices.
- ✔ Each individual is responsible for his or her own safety.

Do You Need Information or Assistance on VWR International Products?

VWR can provide information on pricing and give you quotations. We can take your order and provide delivery information on major equipment items or make arrangements to have your local sales representative contact your. Our products are listed on the internet and we can be contacted through our Internet home page.

Visit VWR's website at vwr.com for:

- Complete technical service contact information
- Access to VWR's Online Catalogue, and information about accessories and related products
- Additional product information and special offers

For information or technical assistance, contact your local VWR representative, or visit vwr.com.

VWR can supply technical information about proper setup, operation or troubleshooting of your equipment. We can fill your needs for replacement parts or provide you with on-site service. We can also provide you with a quotation on our Extended Maintenance Program for your products.

Whatever VWR products you need or use, we will be happy to discuss your applications. If you are experiencing technical problems, working together, we will help you locate the problem and, chances are, correct it yourself...over the telephone without a service call.

When more extensive service is necessary, we will assist you with direct factory trained technicians or a qualified service organization for on-the-spot repair. If your service need is covered by the VWR International warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

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Section 1 Installation and Start-Up

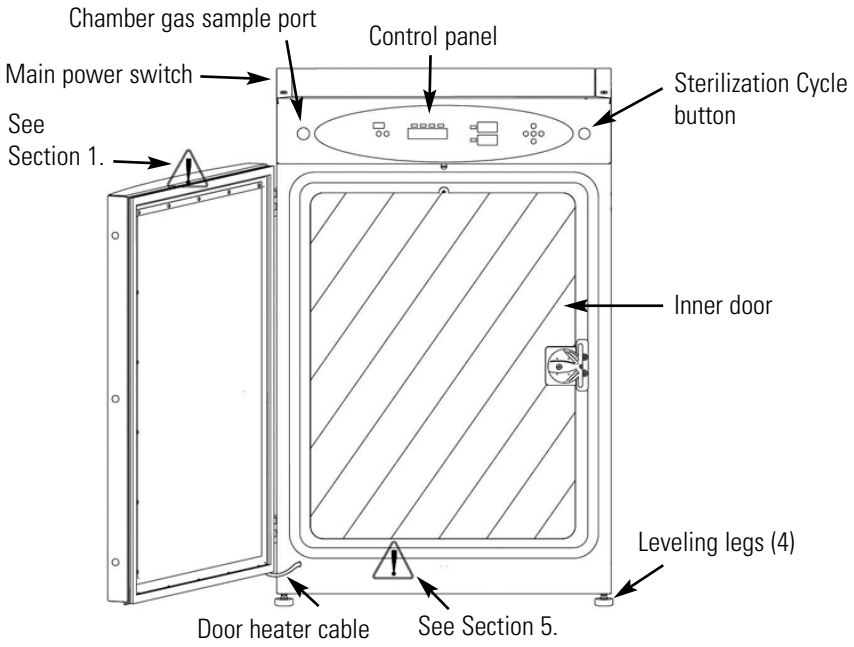


Figure 1-1. Components

- Chamber Gas Sample Port - Used for sampling chamber CO_2 content using a FYRITE or similar instrument.
- Main Power Switch - Mains Disconnect
- Control Panel - Keypad, displays & indicators (Figure 1-2)
- Leveling Legs - Used to level the unit
- Sterilization Cycle Button - Switch to initiate sterilization cycle

Note The incubators are stackable. Information follows. ▲

Silence Switch: Press to mute audible alarm. See Section 4 for alarm ringback times.

Visual Alarm Indicator - Lights pulses on/off during an alarm condition.

MODE Select - Used to select Run, Setpoints, Calibration and Configuration modes.

Message Display - Shows system status.

Mode Select Indicators -

RUN: Run Menu

SET: Set Points Menu

CAL: Calibration Menu

CON: Configuration Menu

HEAT Indicator - Lights when heaters are activated.

Injection **INJ** Indicator - Lights during CO_2 injection into chamber.

Temp [**T** (**°C**)] Display - Programmable to display temperature. See Configuration section.

CO_2 [**CO2** (%)] Display - Programmable to display CO_2 percentage. See Configuration section.

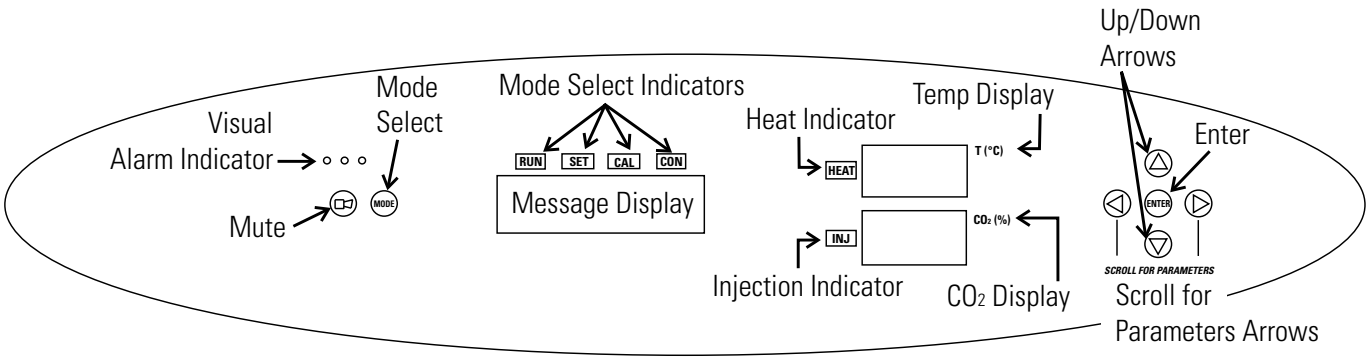


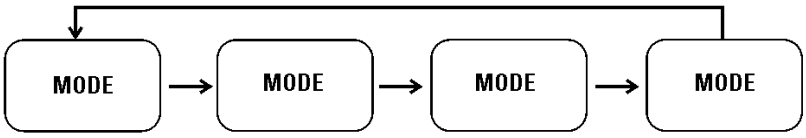
Figure 1-2. Control Panel

Keypad Operation

The VWR Air Jacketed Incubator has four basic modes for incubator setup: Run, Setpoints, Calibration and Configuration.

- Run is the default mode for normal operation.
- Set is used to enter system setpoints for incubator operation.
- Calibration is used to calibrate various system parameters.
- Configuration allows for custom setup of various options.

Table 1-1. Selections Under Each Mode



RUN	SETPOINT	CALIBRATION	CONFIGURATION
Default Mode	**Temperature**	**Temp Offset**	**Audible**
	Overtemp	**CO_2 Cal[1]**	**New HEPA Timer**
	CO_2	**IR Cal[2]**	**Replace HEPA Reminder**
			Access Code
			Temp Lo Alarm
			Temp Relay
			CO_2 Lo Alarm
			CO_2 Hi Alarm
			CO_2 Relay
			CO_2 Z & S #'s *
			Display Temp
			Display RH
[1] T/C units		**Base Unit Displays**	
[2] IR units		*Option Unit Displays*	
*T/C units only			

Scroll Keys: Steps the operator through parameters of SET, CAL and CON modes. The right arrow goes to the next parameter, the left arrow returns to the previous parameter.

Up/Down Keys: Increases/decreases or toggles the parameter value selected in SET, CAL, and CON modes.

ENTER: Must press this key to save-to-memory all changed values.

Displays

Message Display: Shows system status (Mode) at all times. Shows 'CLASS 100' or 'SYSTEM OK' during normal operation, or alarm messages if the system detects an alarm condition (see Section 4, Alarms). The message 'CLASS 100' is a timing mechanism indicating that, under normal operating conditions with the HEPA filter installed, the air inside the chamber meets the Class 100 air cleanliness standard for particulates of 0.5 micron size or larger per cubic foot of air.

Upper and Lower Displays: The 7 segment upper display shows temperature. The lower display shows CO_2.

Installing the Incubator

1. Maintain a minimum three inch clearance behind the incubator for electrical and gas hook-ups. In addition, a three inch ventilation space is needed on each side.

2. Locate the unit on a firm level surface capable of supporting the unit weight of 260 lbs (118kg).

3. Locate the unit away from doors and windows and heating and air conditioning ducts.

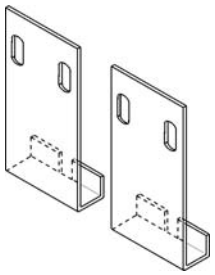
4. Lift the unit by the sides of the cabinet base. Do not attempt to lift it by the front and back. This places stress on the outer door hinges.

Stacking the Incubators

Warning Install stacked units against a wall or similar structure. ▲

Warning With incubators in a stacked configuration, do not leave both exterior doors open at the same time. ▲

Warning If the units have been in operation, turn them both off and disconnect the power source before beginning any service work. ▲



Two stacking brackets (shown at left) are included in the parts bag shipped with each incubator.

Figure 1-3. Stacking Brackets

Stacking Incubators (continued)

1. Remove the cover plate securing the door cord from the incubator to be on top. See Figure 1-4. Disconnect the plug from the connector.

2. Remove the four screws securing the door hinges to the unit. Remove the door and set it aside.

3. Unscrew the two hole plugs from the top cover of the incubator to be the bottom of the stack (Figure 1-5).

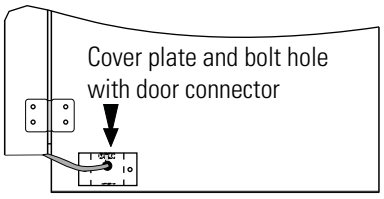


Figure 1-4. Cover Plate

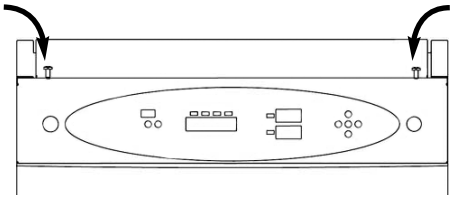


Figure 1-5. Hole Plug Locations

4. Unscrew and remove the 4 leveling feet from the unit to be stacked on top and lift it onto the bottom unit. Align all sides.

Warning This incubator weighs 260 lbs (118kg). Have sufficient personnel available when lifting. Lift the unit by the sides of the cabinet base to avoid placing stress on the outer door hinge. ▲

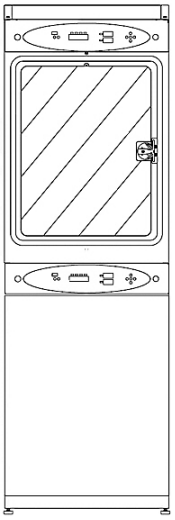


Figure 1-6. Stacked

5. Insert the stacking brackets into the slots at the back of the stacked units as shown in Figure 1-7.

6. Align the slotted holes in the brackets with the mounting holes on the back of the top incubator. Secure the brackets with the screws and washers provided in the parts bag. See Figure 1-8.

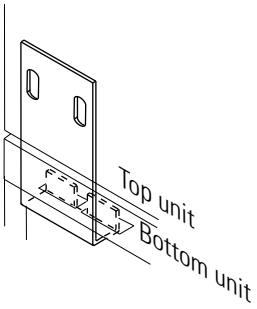


Figure 1-7. Bracket into Slot

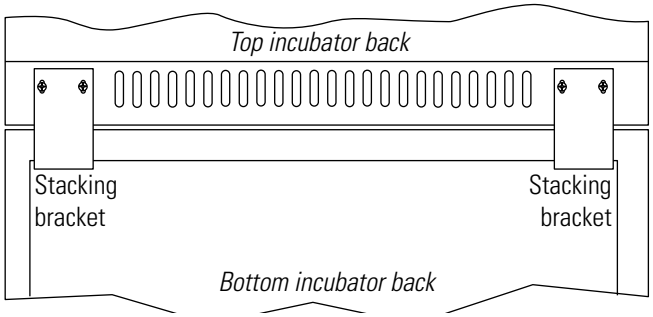


Figure 1-8. Installed Brackets on Back of Unit

Stacking Incubators (continued)

7. Thread one 1/4 x 20 bolt and washer included with the stacking brackets, into the hole behind the cover plate. Do not tighten. Refer to Figure 1-9.
8. Remove the cover plate from the same area on the other side of the top unit.

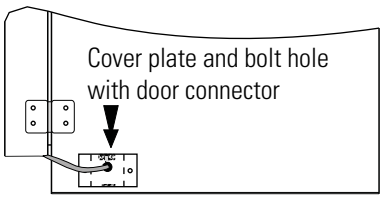


Figure 1-9. Bolt Hole

9. Thread the other 1/4 x 20 bolt and washer into this hole.
10. Tighten the bolts on both sides.
11. Assemble the door hinges to the unit. Secure with the screws.
12. Plug the door cord into the connector, as previously. Secure the cover plate.
13. Install the cover plate on the other side of the unit. The stacked incubators are ready for service.

Preliminary Cleaning

1. Remove vinyl from shelf channels, duct sheets, and air duct, if present.
2. Using a suitable laboratory disinfectant, clean all interior surfaces.

Caution Before using any cleaning or decontamination method except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment. Accidental spills of hazardous materials on or inside this unit are the responsibility of the user. ▲

Duct Sheet and Shelf Installation

1. Installed included grommets into the back flange of each duct sheet; 6 grommets per sheet. See Figure 1-10.

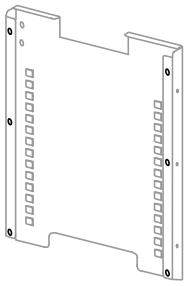


Figure 1-10. Grommets on back of duct sheet

2. Install the side ducts with the tabs facing into the center of the chamber with their slots up. There are no right side or left side ducts, simply rotate one of them to fit the opposite side. Tilt the side ducts as they are placed into the chamber so the tops fit into the top air duct, then guide them into the vertical position. Figure 1-11 shows the side duct as it would be oriented for the right side of the chamber.

Duct Sheet and Shelf Installation (continued)

3. Referring to Figure 1-11, note that there is no difference in the left and right shelf channels.

4. Install the shelf channels by placing the channel's rear slot over the appropriate rear tab on the side duct. Pull the shelf channel forward and engage the channel's front slot into the side duct's appropriate forward tab. Refer to Figure 1-12.

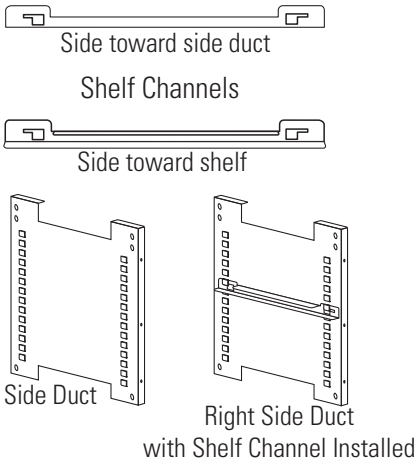


Figure 1-11. Shelf Channels & Side Ducts

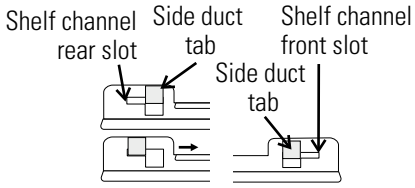


Figure 1-12. Channels and Slots

5. Figure 1-11 shows one of the channels installed on the right side duct.

6. Locate the supplied rod, spring and end pieces; 4 each. Assemble the spring to the rod by positioning the very end of the spring over the ridge at the rod. Then press the spring to the opposite side. It should snap into place. See Figures 1-13 and 1-14.

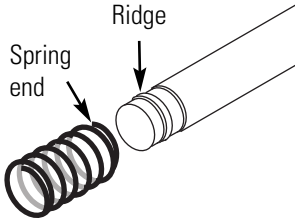


Figure 1-13. Spring End

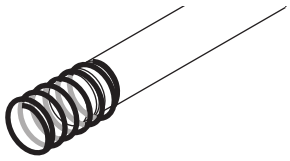


Figure 1-14. Spring Assemble to Rod

7. Slide end cap over spring (Figure 1-15).

Note When installing the rods, the spring end can be installed on either side of the chamber. The upper front rod is high in the chamber and the upper back rod is lower to allow access to the access port filter door.

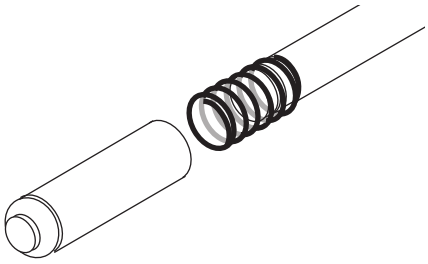


Figure 1-15. Spring End

Installing Duct Sheets and Shelves (cont.)

8. Install one end of the rod into the appropriate hole in the duct sheet.

9. Compress the spring (under the end cap) to insert the other end of the rod into the hole in the duct sheet on the opposite side.

10. Figure 1-16 shows the four rods installed.

Note Using the supplied spring rods will ensure the side ducts are the proper distance needed for shelves to move freely. ▲

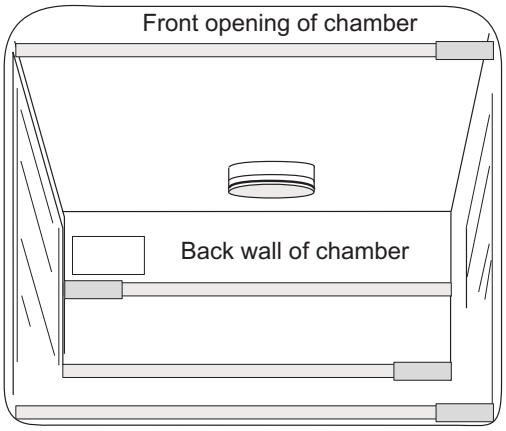


Figure 1-16. Four Rods Installed in Chamber

Access Port Filter & CO_2 Sensor Cover Plate

1. Locate the opening in the top left corner of the interior chamber. Remove the tape from the opening on the outside of the unit.

2. Locate the stopper with filter in the hardware bag. Lift the metal port cover and install the assembly in the opening inside the chamber. See Figure 1-17.

3. Also in the hardware bag is the CO2 sensor cover plate. Install, using the 1/4-turn fasteners. Refer to Figure 1-17 for the location.

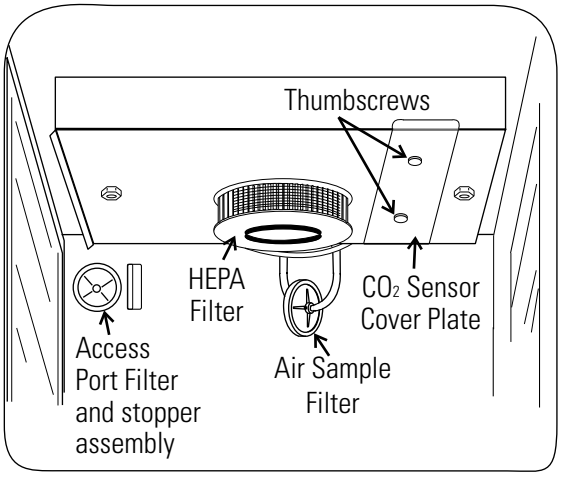


Figure 1-17. Filter and Plate

Air Sample Filter Installation

1. Remove the filter from the shipping bag.
2. Install the air sample filter assembly to the black hose barb behind the top duct.
3. Insert the other end of the filter assembly onto the metal tubing on the top duct. Refer to the Figure 1-18.

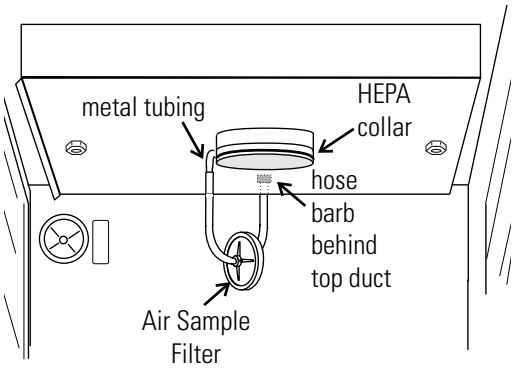


Figure 1-18. Air Sample Filter Installation

HEPA Filter Installation

Caution Be careful when the filter. The media can be damaged if it is mishandled. To avoid damage to the incubator, do not operate the unit without the HEPA filter in place. ▲

1. Remove the filter from the shipping box.
2. Remove the plastic coating from the filter, using caution not to touch the filter media.
3. Install the filter as shown in Figure 1-18. Refer to Section 5 for HEPA filter maintenance.

Caution The media of the filter can be damaged if mishandled.
To avoid damage to the incubator, do not operate the unit without the HEPA filter in place. ▲

Leveling the Unit

Check the unit for being level by placing a bubble-style level on one of the shelves. Turn the hex nut on the leveler counterclockwise to lengthen the leg or clockwise to shorten it. Level the unit front-to-back and left-to-right.

Electrical Power Connection

See the serial tag on the side of the unit for electrical specifications or refer to the electrical schematics at the end of this manual.

Caution Serial tag rating is based on amperage draw during sterilization cycle. Normal operating amperage is much less. Ensure that electrical circuit will handle amp draw of sterilization cycle.
Connect the incubator to a grounded, dedicated circuit. The power cord connector is the mains disconnect device for the incubator. Position the unit so that it can be easily disconnected. ▲

Electrical Power Connection (cont.)

Plug the provided power cord into the power inlet connector on the back of the cabinet (Figure 1-19), then into the grounded, dedicated, electrical circuit.

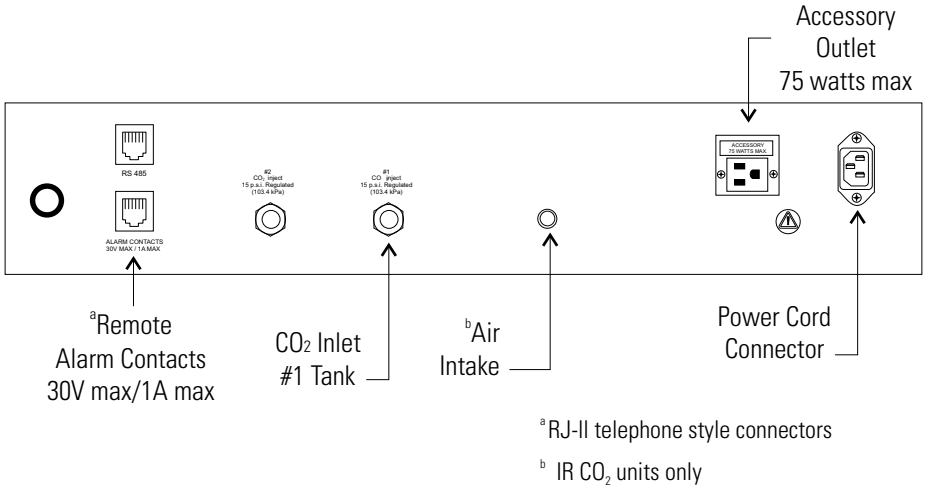


Figure 1-19. Back of Cabinet

Filling the Humidity Pan

Fill the humidity pan with sterile distilled water to within 1/2" of the top. Place the pan directly in the center of the incubator floor.

For applications requiring high humidity, the pan should be placed against the left side wall of the incubator. The side ducts have been modified to allow the pan to be placed against the wall. Optimum humidity is achieved by capping the CO_2 sample port. This will, however, cause condensation in the chamber. To enhance RH recovery from door openings, place a second humidity pan in the right side duct.

For best operation of the incubator, sterilized distilled, demineralized or de-ionized water should be used in the humidity pan. Water purity should be in the resistance range of 50K to 1M Ohm/cm, or a conductivity range of 20.0 to 1.0 uS/cm. Refer to ASTM Standard D5391-93 or D4195-88 for measuring water purity.

Distillation systems, as well as some types of reverse osmosis water purity systems, can produce water in the quality range specified. Tap water is not recommended as it may contain chlorine, which can deteriorate the stainless steel. Tap water may also have a high mineral content, which would produce a build-up of scale in the pan. High purity or ultra pure water is not recommended as it is an extremely aggressive solvent and will deteriorate the stainless steel.

Filling the Humidity Pan (continued)

High purity water has a resistance of above 1M to 18M Ohm. Even high purity water can contain bacteria and organic contaminants. Water should always be sterilized or treated with a decontaminant, safe for use with stainless steel as well as safe for the product, prior to being introduced into the humidity pan.

Check the level and change the water frequently to avoid contamination. Do not allow the water level to fluctuate significantly. "Dry-outs" will have an adverse effect on the humidity level and CO_2 calibration of the T/C units.

Caution Use of chlorinated water, or decontamination products containing chlorine, will deteriorate the stainless steel and cause rust, voiding the warranty. ▲

Connecting the CO_2 Gas Supply

Warning High concentrations of CO_2 gas can cause asphyxiation! OSHA Standards specify that employee exposure to carbon dioxide in any eight-hour shift of a 40-hour work week shall not exceed the eight-hour time weighted average of 5000 PPM (0.5% CO_2). The short term exposure limit for 15 minutes or less is 30,000 ppm (3% CO_2). Carbon dioxide monitors are recommended for confined areas where concentrations of carbon dioxide gas can accumulate. ▲

Warning This incubator is designed to be operated with CO_2 gas only. Connecting a flammable or toxic gas can result in a hazardous condition. Gases other than CO_2 should not be connected to this equipment. CO_2 gas cylinders have a UN1013 label on the cylinder and are equipped with a CGA 320 outlet valve. Check the gas cylinder for the proper identification labels. The CO_2 gas supply being connected to the incubator should be industrial grade, 99.5% pure. Do not use CO_2 gas cylinders equipped with siphon tubes. A siphon tube is used to extract liquid CO2 from the cylinder which can damage the pressure regulator. Consult with your gas supplier to ensure that the CO_2 cylinder does not contain a siphon tube. Gas cylinders should also be secured to a wall or other stationary object to prevent them from tipping.

A two-stage CO_2 pressure regulator is required to be installed on the outlet valve of the gas cylinder. Input pressure to the incubator must be maintained at 15 psig (103.4 kPa) for proper performance of the CO_2 control system. A single stage CO_2 pressure regulator will not maintain 15 psig (103.4 kPa) to the incubator as the pressure in the CO_2 cylinder decreases; therefore, a two stage regulator is recommended.

Connecting CO_2 Gas Supply (continued)

Warning If higher purity CO_2 is desired inside the incubator (greater than 99.5% pure), the pressure regulator should be constructed with a stainless steel diaphragm, along with specifying the purity of the CO_2 from the gas supplier. Follow the manufacturer's instructions to ensure proper and safe installation of the pressure regulator on the gas cylinder.
Consult your facility safety officer to ensure that the equipment is installed in accordance with the codes and regulations that are applicable in your area. ▲

The CO_2 gas supply being connected should be industrial grade 99.5% pure and should not contain siphon tubes. Install a two-stage pressure regulator at the cylinder outlet. The high pressure gauge at the tank should have 0-2000 psig range. The low pressure gauge, at the incubator inlet, should have a 0-30 psig range. Input pressure to the incubator must be maintained at 15 psig (103.4 kPa).

The incubator has serrated fittings on the back of the cabinet to connect the gas supply. Refer to Figure 1-19. The fitting is labeled CO2 Inlet #1 Tank. Make sure that the connections are secured with clamps. Check all fittings for leaks.

Incubator Start-Up

With the incubator properly installed and connected to power, the humidity pan filled, and the unit connected to gas supplies, system setpoints can be entered. The following setpoints can be entered in SET mode: Temperature, Overtemperature and CO_2. To enter SET mode, press the MODE key until the SET indicator lights. Press the right and/or left arrow keys until the proper parameter appears in the message display. See Chart 1-1 for more detail.

Setting the Operating Temperature

All VWR Air Jacketed Incubators have an operating temperature range of 10°C to 50°C, depending on ambient temperature. The incubator is shipped from the factory with a temperature setpoint of 10°C. At this setting, all heaters are turned off.

To change the operating temperature setpoint:

1. Press the MODE key until the SET indicator lights.
2. Press the right arrow until "Temp XX.X" is displayed in the message display.
3. Press the up/down arrow key until the desired temperature setpoint is displayed.

Setting the Operating Temperature (continued)

4. Press ENTER to save the setpoint.

5. Press the MODE key until the RUN indicator lights for RUN mode or press the right/left arrow keys to go to next/previous parameter.

Setting the Overtemp Setpoint

Caution The independent overtemp system is designed as a safety to protect the incubator only. It is not intended to protect or limit the maximum temperature of the cell cultures or customer's equipment inside the incubator if an overtemp condition occurs. ▲

VWR Air Jacketed Incubators are equipped with a secondary temperature monitoring system to monitor the air temperature inside the cabinet. This system is designed as a safety device to turn off all heaters in the event of a temperature control failure. Temperature control in the incubator will be ±1° of the overtemp setpoint.

The overtemperature is set by the factory (default) at 40°C. However, the overtemp can be set up to 55°C in 0.5° increments.

If the incubator's operating temperature setpoint is set above the overtemp setpoint, the overtemp setpoint will automatically update to 1°C above the temperature setpoint. It is recommended that the overtemp setpoint be maintained at 1°C over the operating temperature setpoint.

To set the Overtemp setpoint:

1. Press the MODE key until the SET indicator lights

2. Press the right arrow until Otemp XX.X is displayed in the message display

3. Press the up or down arrow key until the desired Overtemp setpoint is displayed

4. Press ENTER to save the setting

5. Press the MODE key until the RUN indicator lights or press the right or left arrow to go to the next or previous parameter.

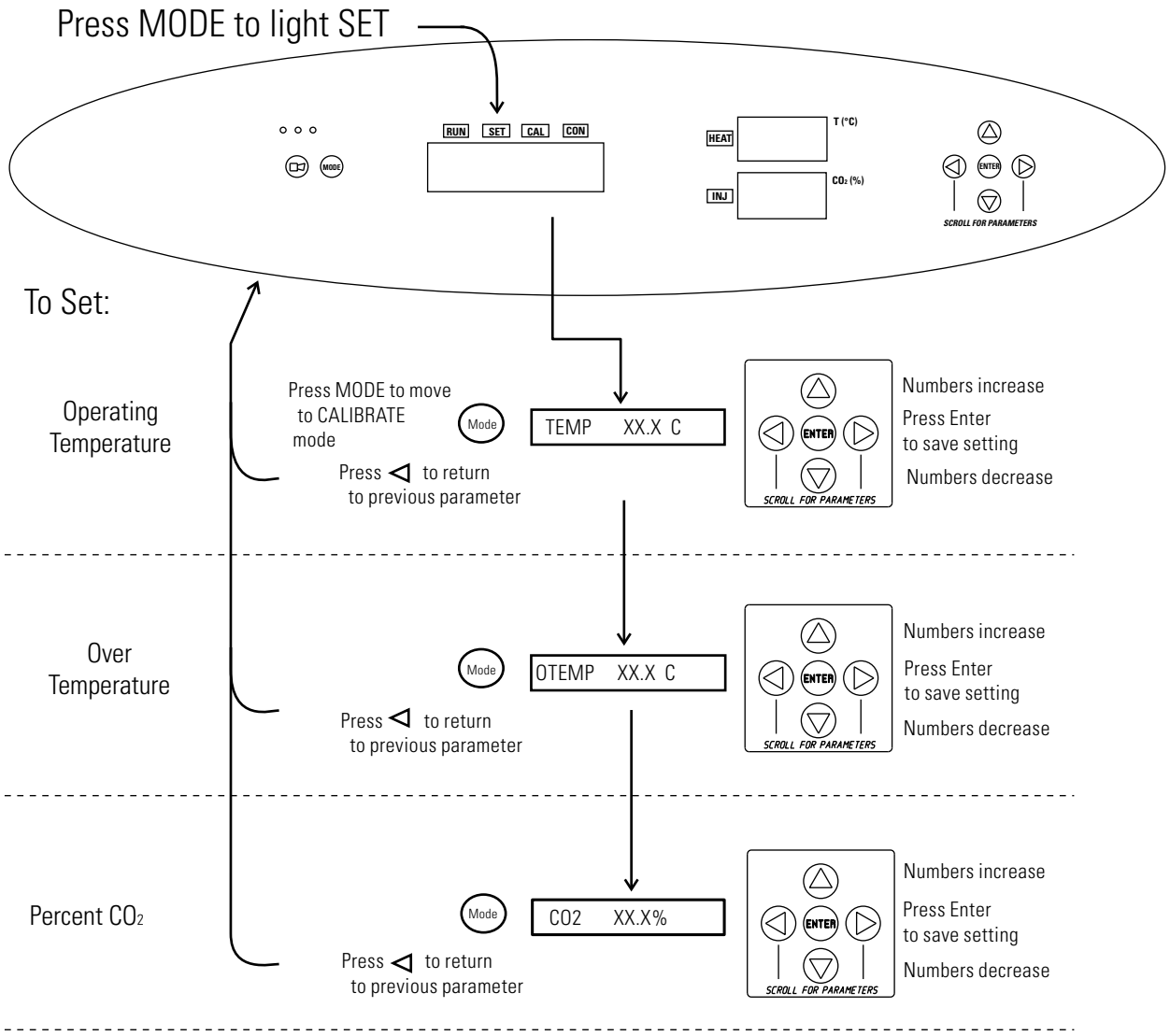
Setting the CO_2 Setpoint

All T/C CO_2 cells are calibrated at the factory at 37°C, high humidity, and 10% CO_2. Therefore, if a temperature setpoint of 37°C has been entered, the humidity pan has been filled and the CO_2 control is to run between 0-10% with a T/C CO_2 sensor, the CO_2 setpoint may be entered immediately. Otherwise, it is important to allow the unit 12 hours to stabilize at the temperature setpoint before entering the CO_2 setpoint.

Both models of the incubator have a CO_2 setpoint range of 0.0% to 20.0%. The incubator is shipped from the factory with a CO_2 setpoint of 0.0%. At this setting, all CO_2 control and alarms are turned off. To change the CO_2 setpoint:

1. Press the MODE key until the SET indicator lights.
2. Press the right arrow until "CO2 XX.X" is displayed in the message display.
3. Press the up/down arrows until the desired CO_2 setpoint is displayed.
4. Press ENTER to save the setpoint.
5. Press the MODE key until the RUN indicator lights to go to RUN mode or press the right/left arrow keys to go to next/previous parameter.

Chart 1-1. Set Mode



Section 2 Calibration

After the unit has stabilized, several different systems can be calibrated. In Calibration mode, the air temperature, CO_2 and RH levels can be calibrated to reference instruments. To access Calibration mode, press the MODE key until the CAL indicator lights. Press the right and/or left arrow until the appropriate parameter appears in the message display. See Chart 2-1 at the end of this section for more detail.

Calibration frequency is dependent on use, ambient conditions and accuracy required. A good laboratory practice would require at least an annual calibration check. On new installations, all parameters should be checked after the stabilization period.

Prior to calibration, the user should be aware of the following system functions. While the unit is in Calibration mode, all system control functions are stopped so the unit remains stable. Readout of the system being calibrated appears on the message display. If no keys are pressed for approximately five minutes while in Calibration mode, the system resets to RUN mode so control functions are reactivated.

Caution Before making any calibration or adjustments to the unit, it is imperative that all reference instruments be properly calibrated. ▲

Temperature

Before calibration, allow the cabinet temperature to stabilize. Place the calibrated instrument in the center of the chamber. The instrument should be in the airflow, not against the shelf.

Temperature Stabilization Periods

Startup - Allow 12 hours for the temperature in the cabinet to stabilize before proceeding.

Already Operating - Allow at least 2 hours after the display reaches setpoint for temperature to stabilize before proceeding.

Temperature (continued)

1. Press the MODE key until CAL indicator lights.
2. Press the right arrow until "TEMPCAL XX.X" appears in the message display.
3. Press up/down arrow to match display to calibrated instrument.
4. Press ENTER to store calibration.
5. Press the MODE key to return to RUN or the right/left arrow to go to next/previous parameter.

Thermal Conductivity CO_2 System

Model VWR51014991 (VWR catalogue number 10810-902) has a thermal conductivity (T/C) CO_2 sensor. Thermal conductivity of the incubator atmosphere is not only effected by the quantity of CO_2 present but also by the air temperature and water vapor present in the incubator atmosphere. In monitoring the effects of CO_2, air temperature and absolute humidity must be held constant so any change in thermal conductivity is caused by a change in CO_2 concentration.

Changing temperature or changing from elevated humidity to room ambient humidity levels will necessitate a re-calibration of the CO_2 control.

Some T/C CO_2 sensors go through an aging period, especially on new installations. Calibration should be checked on a weekly basis, and adjusted as necessary. When stabilization occurs, checks can become less frequent.

T/C CO_2 Sensor Stabilization Periods

Start -Up - The CO_2 sensor has been calibrated at the factory for 37°C and elevated humidity. Allow the temperature, humidity, and CO_2 levels in the chamber to stabilize at least 12 hours before checking the CO_2 concentration with an independent instrument.

Presently Operating - Make sure the chamber doors are closed. Allow at least 2 hours after the temperature and CO_2 displays reach their setpoints for chamber atmosphere stabilization.

Thermal Conductivity CO_2 System (continued)

1. Make sure the stabilization periods outlined above are followed.
2. Sample the chamber atmosphere through the sample port with an independent instrument. Sample the atmosphere at least 3 times to ensure accuracy of the instrument.
3. Press the MODE key until the CAL indicator lights.
4. Press the right arrow until “CO2 CAL XX.X” is displayed in the message display.
5. Press the up /down arrows to change the display to match the independent instrument.
6. Press ENTER to store the calibration.
7. Press the MODE key to return to RUN or the right or left arrows to go to the next/ previous parameter.

Infrared CO_2 System

Model VWR51014992 (VWR catalogue number 10810-944) has an infrared (IR) CO_2 sensor. Infrared CO_2 sensors are not effected by chamber atmosphere temperature or humidity. However, the light detector in the sensor is effected by wide temperature changes. Therefore, changing temperature setpoints could necessitate a recalibration of the CO_2. Chamber temperature should be allowed to stabilize before checking CO_2 concentrations with an independent instrument, especially on start-up.

IR CO_2 Sensor Stabilization Times

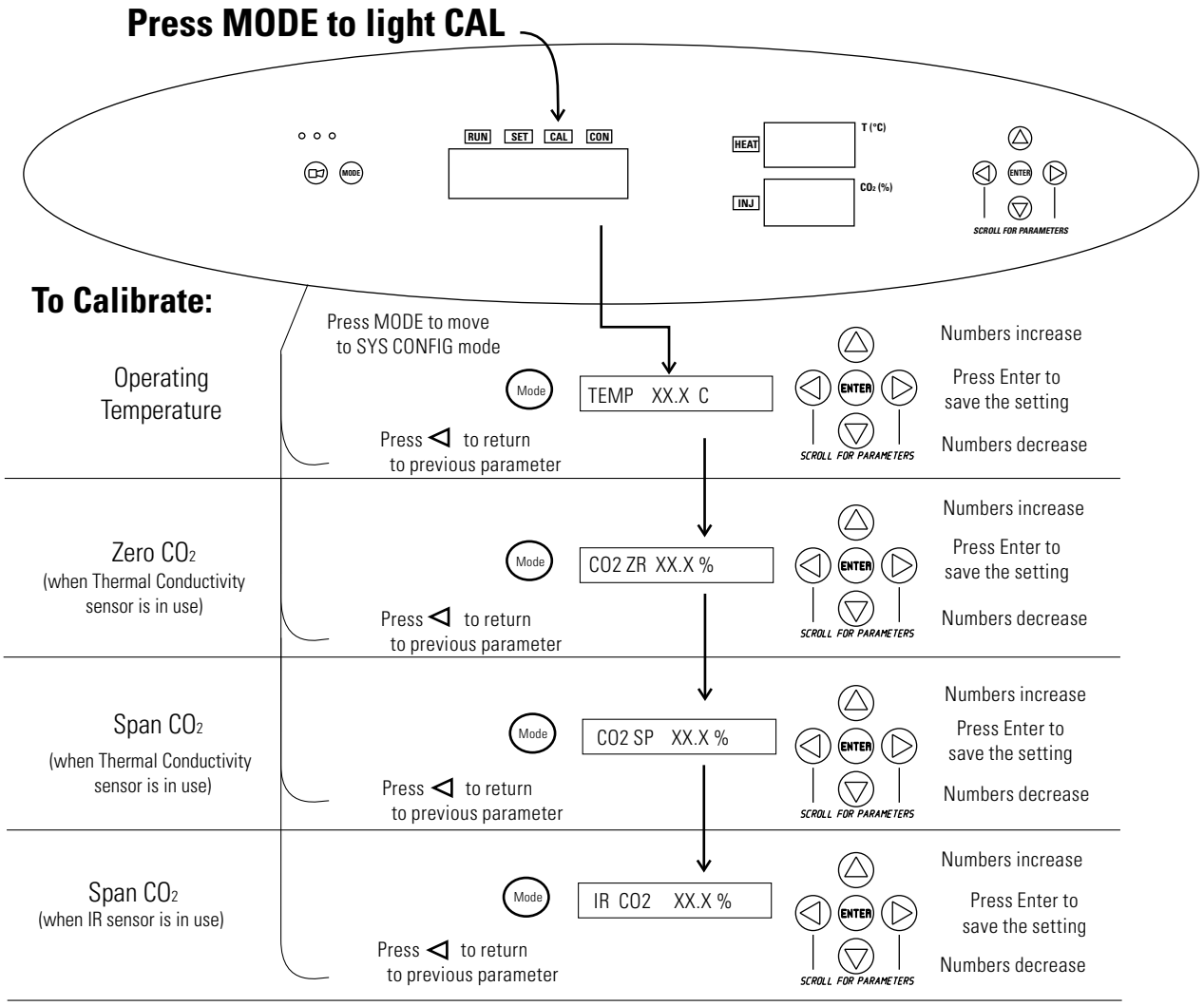
Start-Up- Allow the temperature and the CO_2 of the cabinet to stabilize at least 12 hours before proceeding.

Presently Operating - Allow CO_2 to stabilize at least 2 hours at setpoint before proceeding.

Infrared CO_2 System (continued)

1. Measure the CO_2 concentration in the chamber through the gas sample port with a Fyrite or other independent instrument. Several readings should be taken to ensure accuracy.
2. Press the MODE key until the CAL indicator lights.
3. Press the right arrow until “IR CAL XX.X” appears in the message display.
4. Press the up/down arrow to adjust the display to match the independent instrument reading.
5. Press ENTER to store the calibration.
6. Press the MODE key to return to RUN mode.

Chart 2-1. Calibration Mode



Section 3 Configuration

Several features available in Configuration mode allow custom setup of the incubator. These features are listed with descriptions below. All features may not be necessary in all applications, but are available if needed. To enter Configuration mode, press the MODE key until the CON indicator lights. Press the right and/or left arrow until the appropriate parameter appears in the message display. See Chart 3-1 for more detail.

Turn Audible Alarm ON/OFF

The audible alarm can be turned on or off. The factory setting is ON.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until AUDIBLE XXX shows in the message display.
3. Press the up/down arrow to toggle AUDIBLE ON/OFF.
4. Press ENTER to save the setting.
5. Press the MODE key to return to RUN mode or right/left arrow to go to next/previous parameter.

New HEPA Filter

When the REPLACE HEPA reminder displays and the visual alarm flashes, the specified time has elapsed and the HEPA filter should be replaced. To clear the display and reset the timer after replacing the HEPA filter with a new one, follow the steps below.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until NEW HEPA shows in the message display.
3. Press ENTER to restart the timer and clear the REPLACE HEPA alarm.
4. Press the MODE key to return to RUN mode.

Set REPLACE HEPA filter reminder

A HEPA filter replacement timer can be set for a specific amount of time, from 1 to 12 months of actual unit running time. Time will not accrue when the unit is turned off. The default time is 6 months. When the allotted time runs out, REPLACE HEPA appears in the display and the visual alarm flashes. To set the reminder, use the following procedure.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until REPL HEPA XX is displayed.
3. Press the up/down arrow to choose the number of months desired.
4. Press ENTER to save the number.
5. Press the MODE key to return to RUN mode or right/left arrow to go to next/previous parameter.

Note After the reminder has been set, check the allotted time remaining by going to Configuration mode, then pressing the right arrow until NEW HEPA XXX displays. This number is the remaining days before the filter replacement time specified runs out. For example, if 12 months was chosen in the REPL HEPA XX message display, the NEW HEPA number would be 365 days. ▲

Set Access Code

A 3-digit Access Code can be entered to avoid unauthorized personnel from changing the setpoints, calibration, or configuration. A setting of 000 bypasses the access code. The factory setting is 000.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until ACC CODE XXX shows in the message display.
3. Press up/down arrow to change the access code.
4. Press ENTER to save the access code.
5. Press the MODE key to return to the RUN mode or right/left arrow to go to next/previous parameter.

Set Low Temp Alarm Limit (tracking alarm)

The low temp alarm limit is the deviation from the temperature setpoint which causes a low temp alarm. The low temp alarm is variable from 0.5° below setpoint to 5° below setpoint. The factory setting is 1° below setpoint. A minus sign (-) in the display indicates that the alarm setting is below the setpoint.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until TEMP LO -X.X shows in the message display.
3. Press up/down arrow to change the low temp alarm limit.
4. Press ENTER to save the low temp alarm limit.
5. Press the MODE key to return to RUN mode or right/left arrow to go to next/previous parameter.

Enable Low Temp Alarm to Trip Contacts

The low temperature alarm can be programmed to trip the remote alarm contacts. A setting of ON allows this, an OFF setting blocks the low temp alarm from tripping the contacts. The factory setting is ON.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until TMP RLY XXX displays.
3. Press the up/down key to toggle the setting ON/OFF.
4. Press ENTER to save the setting
5. Press the MODE key to return to RUN mode, or the right/left arrow to go to next/previous parameter.

Set Low CO_2 Alarm Limit (tracking alarm)

The low CO_2 alarm limit is the deviation from the CO_2 setpoint which will cause a low CO_2 alarm. The setpoint is variable from 0.5% CO_2 below setpoint to 5.0% CO_2 below setpoint. The factory setting is 1.0% CO_2 below setpoint. A minus sign (-) in the display indicates that the alarm setting is below the setpoint.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until CO2 LO -X.X shows in the message display.
3. Press up/down arrow to change the low CO_2 alarm limit.
4. Press ENTER to save the low CO_2 alarm limit.
5. Press the MODE key to return to RUN mode or right/left arrow to go to next/previous parameter.

Set High CO_2 Alarm Limit (tracking alarm)

The high CO_2 alarm limit is the deviation from the CO_2 setpoint which will cause a high CO_2 alarm. The setpoint is variable from 0.5% CO_2 above setpoint to 5.0% CO_2 above setpoint. The factory setting is 1.0% CO_2 above setpoint.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until CO2 HI X.X shows in the message display.
3. Press up/down arrow to change the high CO_2 alarm limit.
4. Press ENTER to save the high CO_2 alarm limit.
5. Press the MODE key to return to RUN mode, or right/left arrow to go to next/previous parameter.

Enable CO_2 Alarms to Trip Contacts

High and Low CO_2 alarms can be programmed to trip the remote alarm contacts. A setting of ON allows this, a setting of OFF blocks CO_2 alarms from tripping the contacts. The factory setting is ON.

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until CO2 RLY XXX shows in the message display.
3. Press up/down arrow to toggle the setting ON/OFF.
4. Press ENTER to save the setting.
5. Press the MODE key to return to RUN mode or right/left arrow to go to next/previous parameter.

Set New Zero Number for T/C CO_2 Sensors

If a new T/C CO_2 sensor is being installed, the two numbers on the factory installed sticker on the T/C cell must be entered to calibrate CO_2 in the unit.

Note For the technician's convenience, a label containing the two numbers on the T/C cell is affixed inside the electronics drawer. ▲

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until T/CZ# XXXX shows in the message display.
3. Press up/down arrow to change the zero number to match the sticker.
4. Press ENTER to save the setting.
5. Press the MODE key to return to RUN mode or right/left arrow to go to next/previous parameter.

Set New Span Number for T/C CO_2 Sensors

If a new T/C CO_2 sensor is being installed, the two numbers on the factory installed sticker on the T/C cell must be entered to calibrate the CO_2 in the unit.

Note For the technician's convenience, a label containing the two numbers on the T/C cell is affixed inside the electronics drawer. ▲

1. Press the MODE key until the CON indicator lights.
2. Press the right arrow until T/CS# XXXX shows in the message display.
3. Press up/down arrow to change the span number to match the sticker.
4. Press ENTER to save the setting.
5. Press the MODE key to return to RUN mode or right/left arrow to go to next/previous parameter.

Chart 3-1. Configuration Mode Page 1 of 2

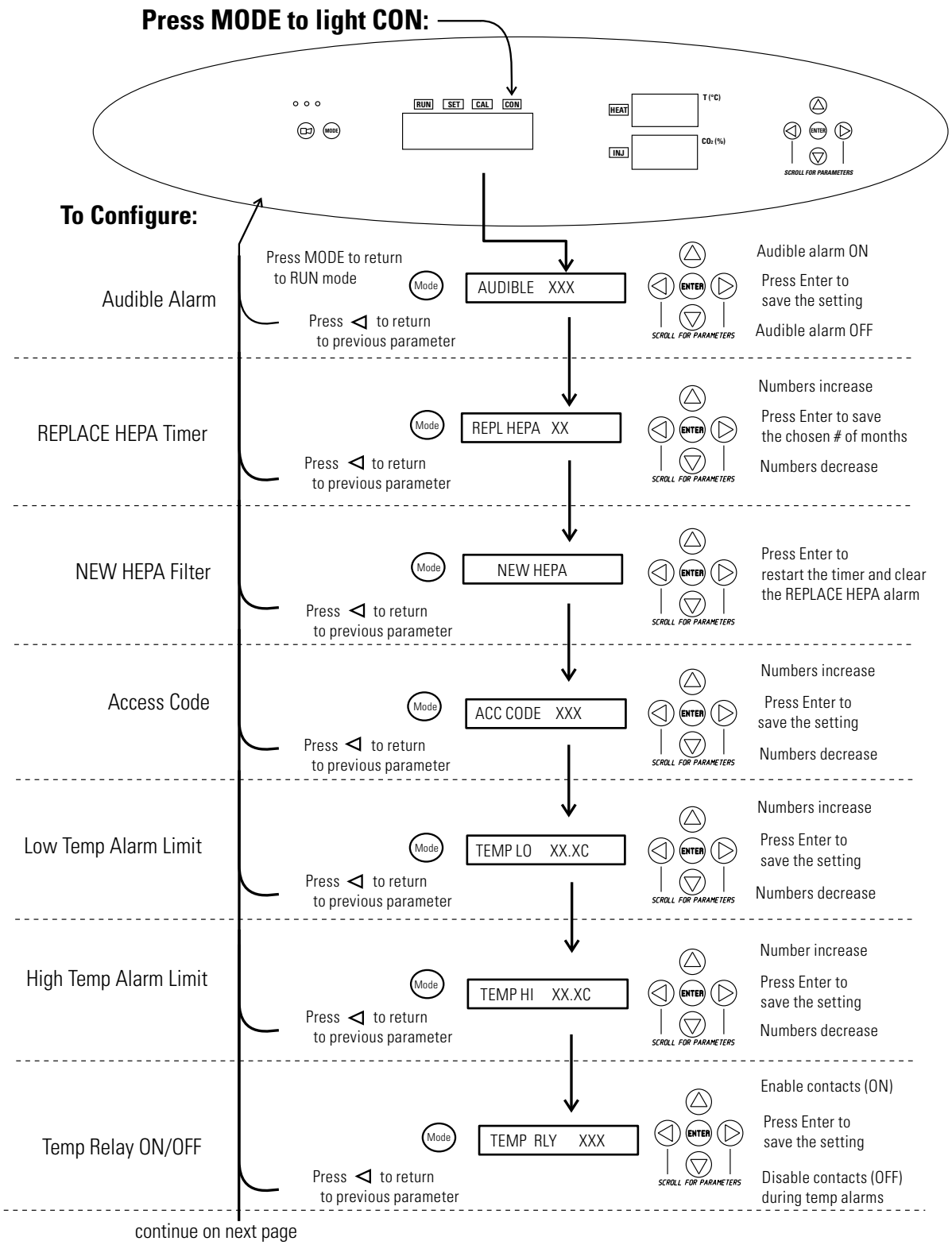
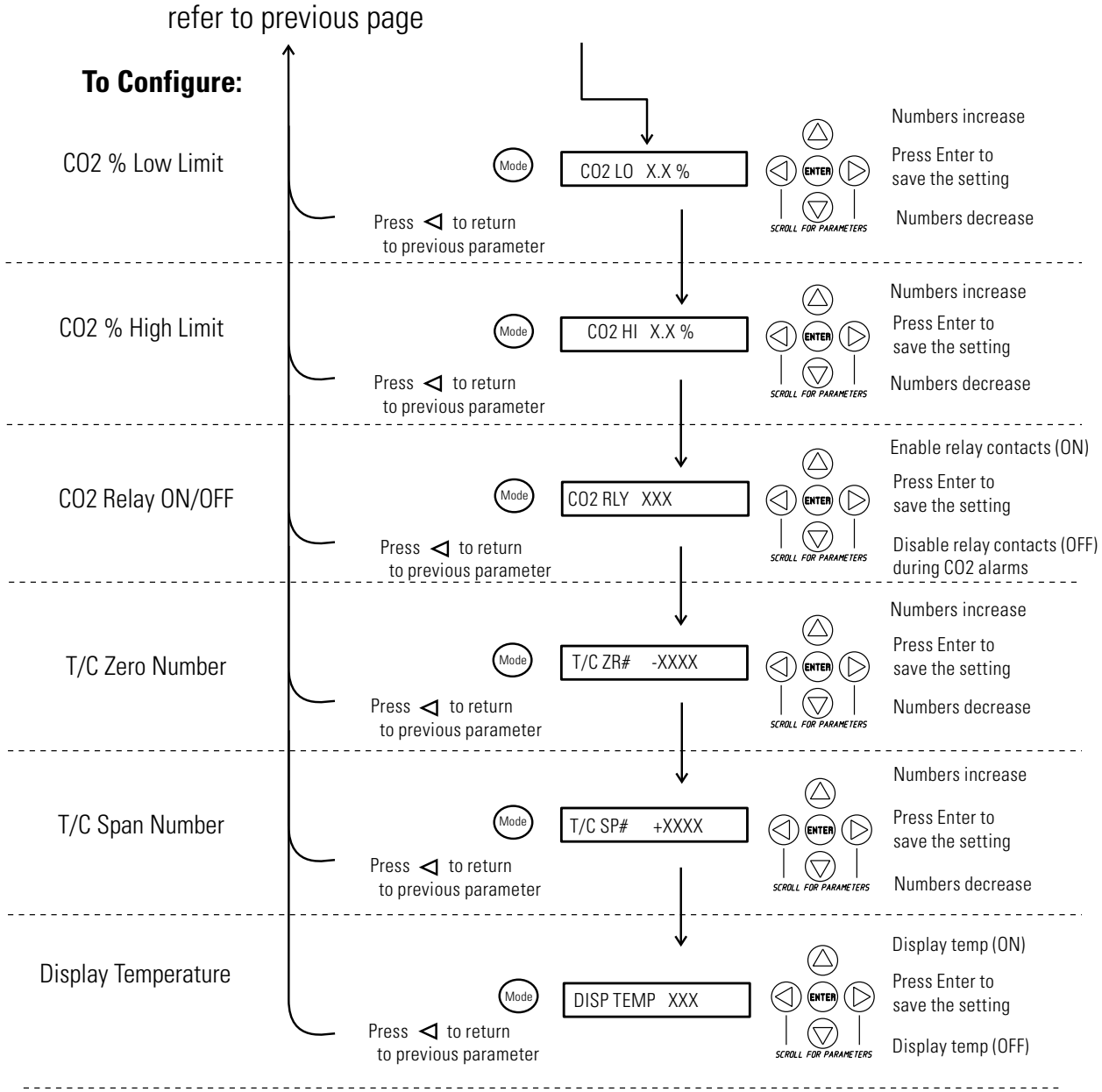


Chart 3-1. Configuration Mode Page 2 of 2



Section 4 Alarms

The VWR Air Jacketed Incubator alarm system is shown in the table below. When an alarm is active, the message appears in the LED message display. Pressing disables the audible alarm for the ringback period. However, the visual alarm continues until the incubator returns to a normal condition. The alarms are momentary alarms only. When an alarm condition occurs and then returns to normal, the incubator automatically clears the alarm condition and the message display.

Table 4-1. Alarm and Description

Description	Message	Delay	Ringback	Relay
No alarm condition exists	SYSTEM OK or CLASS 100	-----	-----	-----
Temp > Otemp Set point	SYS IN OTEMP	0 min.	15 min.	Yes
Air Temp Sensor Fault (See Section 4)	AIR SNSR ERR	0 min.	15 min.	No
Temperature Controller Failure (See Sect. 4)	TMP CTRL ERR	0 min.	15 min.	YES
CO2 Sensor Fault (See Section 4)	CO2 SNSR ERR	0 min.	15 min.	No
Replace HEPA filter reminder-set time expired (See Section 3)	REPLACE HEPA	0 min.	-----	No
Inner Door is Open	DOOR OPEN	15 min.	15 min.	No
CO2 is higher than CO2 High Tracking Alarm	CO2 IS HIGH	15 min.	15 min.	Programmable
CO2 is lower than CO2 Low Tracking Alarm	CO2 IS LOW	15 min.	15 min.	Programmable
TEMP is lower TEMP Low Tracking Alarm	TEMP IS LOW	15 min.	15 min.	Programmable

- All alarm delays and ringback times are ±30 seconds -

When multiple alarm conditions occur, active messages are shown in the message display one at a time, updating at 5 second intervals. Pressing during multiple alarms causes all active alarms to be silenced and to ring back in 15 minutes.

The TEMP IS LOW alarm is disabled when the Temp set point is 10°C. The CO_2 alarms are disabled when the CO_2 set point is 0.0%.

Temp Controller Failure TMP CNTR ERR

In addition to other safety features designed into VWR Air Jacketed Incubators, a thermostat is provided to monitor the cabinet's temperature. In the unlikely event of a temperature control failure, the thermostat will turn off all heaters at a cabinet temperature of 160°C, ±5%. This is intended to be a safety feature to protect the incubator, and is not intended to protect the cell cultures or the equipment inside the chamber should a temperature control failure occur. Should such a failure occur, contact the Technical Services Department or your local distributor.

Sensor Fault Alarms

The microprocessor in VWR Air Jacketed Incubators continually scans all available sensors to ensure that they are operating properly. Should an error be detected, the incubator sounds an alarm and shows the appropriate message. Contact your local distributor.

PREVENTIVE MAINTENANCE

Incubators

Your equipment has been thoroughly tested and calibrated before shipment. Regular preventive maintenance is important to keep your unit functioning properly. The operator should perform routine cleaning and maintenance on a regular basis. For maximum performance and efficiency, it is recommended the unit be checked and calibrated periodically by a qualified service technician.

The following is a condensed list of preventive maintenance requirements. See the specified section of the instruction manual for further details.

We have qualified service technicians, using NIST traceable instruments, available in many areas. For more information on Preventive Maintenance or Extended Warranties, please contact Technical Services.

Cleaning and calibration adjustment intervals are dependent upon use, environmental conditions and accuracy required.

Tips for all incubators:

- Do NOT use bleach or any disinfectant that has high chloros
- Use sterile, distilled or demineralized water.
- Avoid spraying cleaner on the CO_2 sensor.
- Do not use powdered gloves for tissue cultures.

Preventive Maintenance

Refer to Manual Section	Action	Daily	Weekly	Monthly	3 to 6 Months	Yearly
--	Check CO_2 tank levels.	✓				
--	Inspect door latch, hinges and door gasket seal.					✓
1	Check water level in the humidity pan, ½" from top.		✓			
2	Verify and document CO_2, humidity and temperature calibration, as applicable (See Calibration).					✓
	Disinfect the interior of the incubator (See Routine Maintenance).				✓	
1	Replace HEPA, access port filter, air sample filter, and CO_2 filters*, if applicable (or as needed).					✓
5	Perform sterilization cycle as needed.					

Section 5 Routine Maintenance

Warning If the unit has been in service, turn it off and disconnect the power cord connector before proceeding with any maintenance. ▲

Caution Before using any cleaning method except those recommended by the manufacturer, users must check with the manufacturer that the proposed method will not damage the equipment. ▲

Use an appropriate disinfectant. All articles and surfaces must be thoroughly cleaned, rinsed with sterile water, and rough-dried.

Warning Alcohol, even a 70% solution, is volatile and flammable. Use it only in a well-ventilated area that is free from open flame. If any component is cleaned with alcohol, do not expose the component to open flame or other possible hazard. Do not spray the T/C sensor with flammable solutions. The internal temperature of the CO_2 sensor is approximately 150°C when the unit is in operation. Allow sufficient time for the sensor to cool before cleaning.
Do not use strong alkaline or caustic agents. Stainless steel is corrosion resistant, not corrosion-proof. Do not use solutions of sodium hypochlorite (bleach) as they may also cause pitting and rusting. ▲

A HEPA filter replacement kit (see Parts List) should be on-hand prior to cleaning the incubator interior.

Clean Chamber Interior

1. Remove the shelves, access port filter assembly, HEPA filter, air sample filter and tubing, and the left and right duct sheets. Discard the HEPA filters and the access port filter assembly. See Figure 5-1.

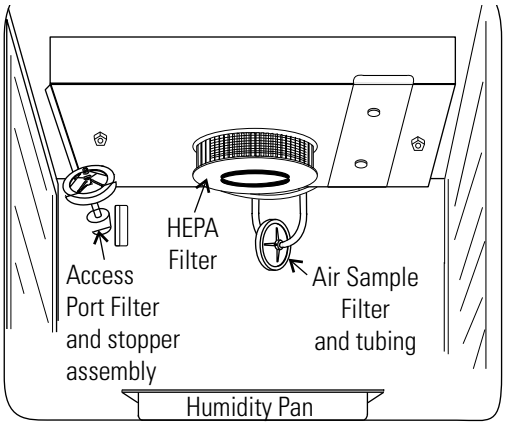


Figure 5-1. Component Locations

2. Wash the air sample filter tubing, shelves, and ducts with disinfectant, then rinse with sterile water. Optionally, the shelves and ducts may be autoclaved.

3. Wash the inner door gasket with disinfectant. This gasket may be removed to be cleaned, or replaced.

4. Wash the cabinet interior with disinfectant, starting at the top and working down. Refer to the disinfectant directions for length of time needed before rinsing. Wash the inner door both inside and out. The cabinet and door must be rinsed with sterile water until the disinfectant has been removed. After the cabinet has been rinsed, spray with 70% alcohol.

5. Install the left and right ducts, inner door gasket, access port filter assembly, and air sample filter and tubing, spraying each with 70% alcohol.

6. Install a new HEPA filter.

7. Install the shelves and spray with 70% alcohol.

Clean Cabinet Exterior

Clean the incubator exterior with a damp sponge or soft, well-wrung cloth and mild detergent dissolved in water. Dry with a soft cloth.

Clean Glass Doors

The chamber glass door and the optional independent inner glass doors may be cleaned using the same disinfectant as used on the incubator interior. It is imperative that they be rinsed with sterile distilled water to remove the disinfectant residue. The doors should then be dried with a soft cloth.

Some precautions in the cleaning and care of the incubator glass doors: Moisture leaches alkaline materials (sodium, Na) from the surface of the glass. Evaporation of the moisture concentrates the alkaline and may produce a white staining or clouding of the glass surface. Cleaning chemicals with a PH above 9 and heat (autoclaving) accelerate the corrosion process. Therefore, it is very important to rinse and dry the glass doors after cleaning. Autoclaving the glass doors should be avoided.

There is no simple method for repairing corroded glass. In most cases, the glass must be replaced.

Clean Humidity Pan

Clean the humidity pan with soap and water and a general-use laboratory disinfectant. Rinse with sterile water and spray with 70% alcohol. The pan may be autoclaved.

HEPA Filter Maintenance

Replace the HEPA filter when the REPLACE HEPA reminder is displayed. The REPLACE HEPA reminder can be set to alarm after a specified time from 1 to 12 months. The reminder default is the factory recommended setting of 6 months. For details, see Section 3.

Replace Power Fuses

To access the only replaceable fuse in the incubator:

1. Turn off the incubator's power switch and unplug the power cord.
2. Remove the two screws from the top of the control panel. Grasp the control panel on each side and pull straight outward.
4. Figure 5-3 shows the location of the fuse. See Table 5-1 following for replacement fuse specifications.
5. Secure the control panel and return the unit to service. If the fuse blows after restoring power to the incubator, contact your local distributor.

Table 5-1. Fuse Replacement Chart

Fuse Voltage	Manufacturer's P/N	Amperage Rating	Rupture Speed	IEC Letter Code
115VAC	BUSS GMC-1.0A	1.0 Amp	Time-Lag	T

Replace Air Sample Filter

1. Connect one end of the air sample filter to the hose barb on the chamber ceiling.
2. Connect the other end of the filter to the metal tubing on the HEPA filter adapter (Figure 5-2).

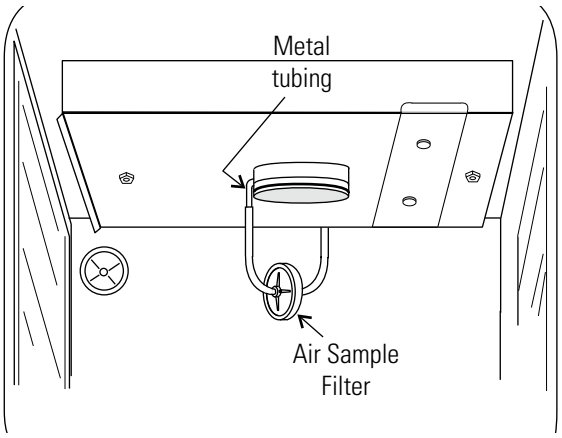


Figure 5-2. Connect to Metal Tubing

Sterilization Cycle

Information You Need to Know Before Starting a Cycle

- The Sterilization Cycle requires approximately 12 hours -
  heat-up (2-4 hours), sterilize (2 hours), and cool down (6-8 hours).
  Additional time is needed to verify the calibration of temperature and CO_2 after the cycle is complete.

- During the Sterilization Cycle, the incubator updates the temperature to the analog output board and the 1535, however CO_2 will be fixed at setpoint and RH will be fixed at RH Low Limit plus 1%.

- A HEPA filter replacement kit (see the spare parts list) should be on hand prior to initiating the Sterilization Cycle.

Information About the Cycle

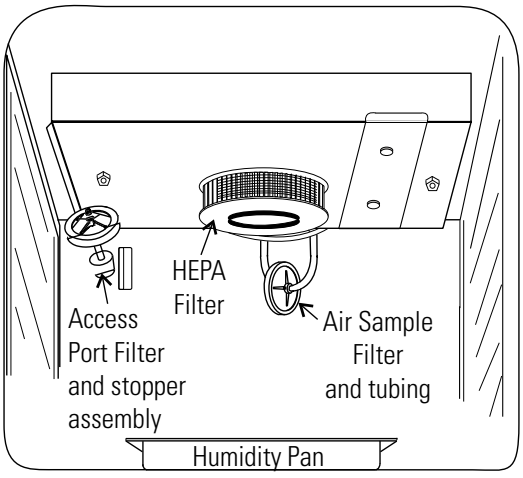
- Pre-cleaning may be required. In order to avoid odors, stains on the interior, baked-on material, etc., wipe off all visible signs of spills.

- Odor may occur during the Sterilization Cycle and is considered normal.

- The Steri Cycle is not intended to sterilize other items; instruments, etc., from the lab.

- During the cycle, the unit chamber becomes hot enough to melt samples, instruments, dishes, etc., left inside the unit. The items listed below also need to be removed.

  1) HEPA filter
  2) Air sample filter
  3) Access port filter assembly
  4) Water in the humidity pan
  5) Temp/RH recorder probe, if applicable
  6) IR sensor, if applicable



- During the Sterilization Cycle, discoloration of some materials may occur. For example, stainless steel turns a straw color after a period of exposure to high temperatures. This is normal.

Checkpoints

What if?	Then
Cycle does not initiate or terminates in mid-cycle	Check for alarms: SYS IN OTEMP, AIR SNSR ERR, TMP CTRL ERR
Units are stacked	A Sterilization Cycle performed on either unit affects performance on second unit.. Do not use second unit during Sterilization Cycle. The Sterilization Cycle may be performed on both units simultaneously, with proper electrical connection.
No action is taken within 1 minute, following display prompt	Unit returns to normal operation, SYSTEM OK
Need to cancel cycle in progress	Hold down green cycle initiation button for 3 seconds
Water is not removed from humidity pan during cycle	Steam is produced and may cause burns
Listed components are not removed before initiating cycle	Components cannot withstand the sterilization cycle temperatures and are destroyed
Unit is not powered off before removing the I/R sensor, if applicable	Damage to the sensor may result
Dummy I/R sensor is not installed	The sensor cable cannot withstand sterilization cycle temperatures and is destroyed properly
The outer door is opened during the heat or sterilization phases	An outer door alarm occurs: CLOSE DOOR in the display, plus an audible (cannot be silenced) and visual alarm.
The outer door is open longer than 20 seconds during phases listed above	Cycle is canceled, unit goes to CANCELED COOL PHASE*
The outer door is open during the cool down phase when the temp is 60°C or greater	An outer door alarm occurs
Power interruption during the HEAT PHASE	HEAT PHASE resumes if the chamber temperature was less than 90°C when power was interrupted HEAT PHASE resumes if the chamber temperature was greater than 90°C when power was interrupted, and the temperature dropped less than 1°C CANCELED COOL PHASE* starts if the chamber temp drop is more than 1°C
Power interruption during the STERILIZATION PHASE	HEAT PHASE begins if the chamber temperature has not dropped below 139°C STERILIZATION PHASE starts again when the chamber temperature reaches 140°C CANCELED COOL PHASE* starts if the chamber temp dropped below 139°C

* For further information on CANCELED COOL PHASE, see page 5-12.

Sterilization Cycle

Warning The Sterilization Cycle heats the incubator interior surfaces to 140°C. Contact with any surface inside the outer door during this cycle may result in burns. ▲

1. Empty the water from the humidity pan and place the pan back into the incubator. Remove any samples, instruments, dishes, etc. from the chamber.

2. Press and hold the large white sterilization cycle button on the right side of the unit (Figure 5-4) for approximately 3 seconds until the LED lights.

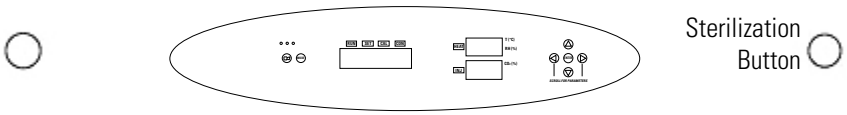


Figure 5-4. Sterilization Button Location

3. ENTER the access code, if applicable. An access code is recommended to prevent accidental cycle initiation.

4. **Pre Sterilization with T/C CO_2 sensor** - The display toggles between "REMOVE HEPAs", "REMOVE WATER" and "PRESS ENTER". If ENTER is not pressed within 1 minute, the display returns to "SYSTEM OK".

5. Remove the HEPA filter, air sample filter and access port filter assembly (Figure 5-5). Tubing can remain in the unit during the sterilization cycle. In addition, remove the temp/RH recorder probe and IR sensor, if applicable. Discard the filters.

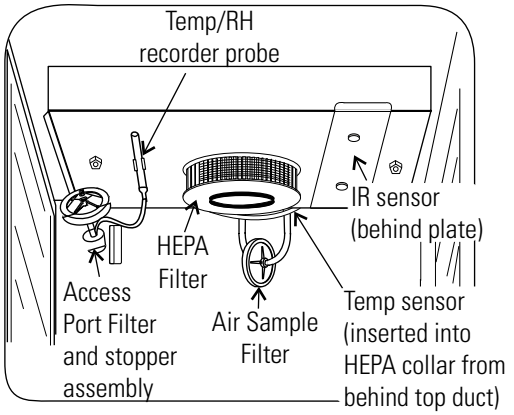


Figure 5-5. Filter Locations

6. **Pre Sterilization with IR CO_2 sensor** - If an IR sensor is connected, the display toggles between "POWER OFF" and "REMOVE IR". If power is not turned off within 1 minute, the display returns to "SYSTEM OK".

Sterilization Cycle (continued)

Note To remove the IR sensor, if applicable, first power the unit off. Then turn the two 1/4-turn fasteners on the top duct until the cover plate is disengaged. Secured on the inside of the plate is a dummy sensor (Figure 5-6). ▲

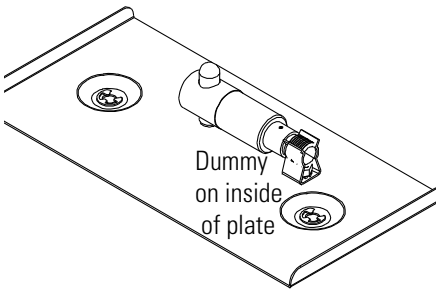


Figure 5-6. Dummy Sensor

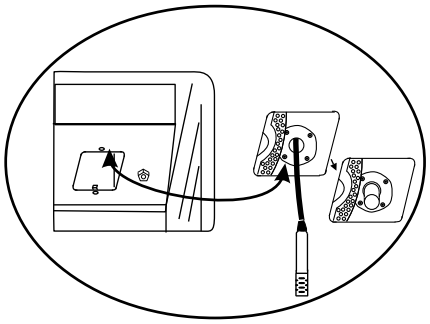


Figure 5-7. IR Sensor with Cable

Grip the IR sensor and carefully pull it downward. Unscrew the cable from IR sensor (Figure 5-13). Set the sensor aside. See Step 9 for the IR sensor disinfection procedure. Connect the dummy sensor to the cable. Fit the installed dummy sensor up into the previous sensor location.

When the power is turned on with the IR sensor removed, the display toggles between “REMOVE HEPAs”, “REMOVE WATER”, and “PRESS ENTER”. If “ENTER” is not pressed within 1 minute, the display toggles between “POWER OFF” and “REPLACE IR”. When the unit is powered back on with the IR sensor reinstalled, the display returns to “SYSTEM OK”.

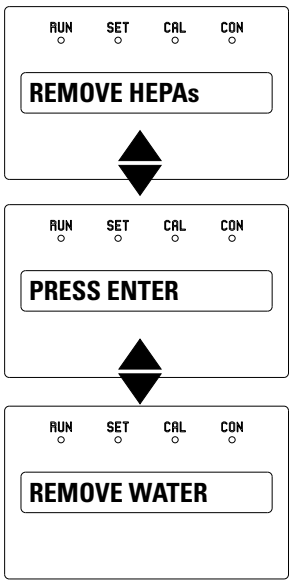


Figure 5-14. Displays with IR Sensor Removed

Sterilization Cycle (continued)

6. After ENTER is pressed, the Heat Phase initiates. The white LED flashes and the display toggles between "STERILIZING" and "HEAT PHASE". During this period, the HEAT light will be on and the cabinet heats to sterilization temperature.

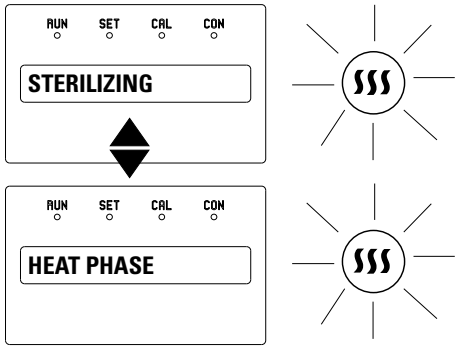


Figure 5-15. Heat Phase

7. When the air temperature in the unit reaches 140.0°C, the Sterilization Phase begins and the display changes to

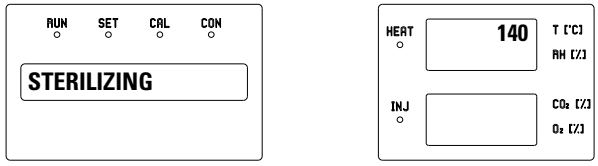


Figure 5-16. Sterilization Phase

"STERILIZING".

8. After approximately 2 hours, a 5-second audible tone sounds, signaling

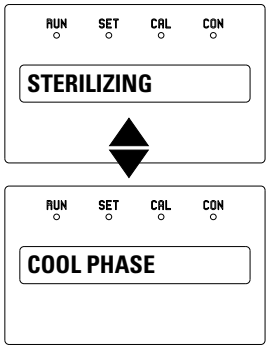


Figure 5-17. Cool Phase

Sterilization Cycle (continued)

that sterilization is complete. The Cool Phase begins. The display toggles between “STERILIZING” and “COOL PHASE”.

9. **Completed Sterilization Cycle with T/C CO_2 sensor** - When the temperature cools down to the original set operating temperature or 30°C, whichever is higher, the display toggles between “CYC COMPLETE”, “REPL HEPAs”, and “PRESS ENTER”. The white LED is lighted but no longer flashes.

   Completed Sterilization Cycle with IR CO_2 sensor - When the temperature cools down to the original set operating temperature or 30°C, whichever is higher, the display toggles between “CYC COMPLETE”, “POWER OFF”, and “REPLACE IR”. The white LED is lighted but no longer flashes.

Clean the IR sensor with isopropanol. Simply spray the sensor (do not saturate) and allow to dry.

Do not saturate the sensor or immerse the sensor in a cleaner.

Power the unit off, open the chamber, and remove the IR plate. Pull down on the dummy, unscrew the cable from the top of the dummy and press the dummy into the clip on the plate. See Figure 5-12. Screw the cable onto the top of the IR sensor. The cable is keyed and can only be inserted one way. Reinstall the sensor by pushing it as far as it will go into the hole.

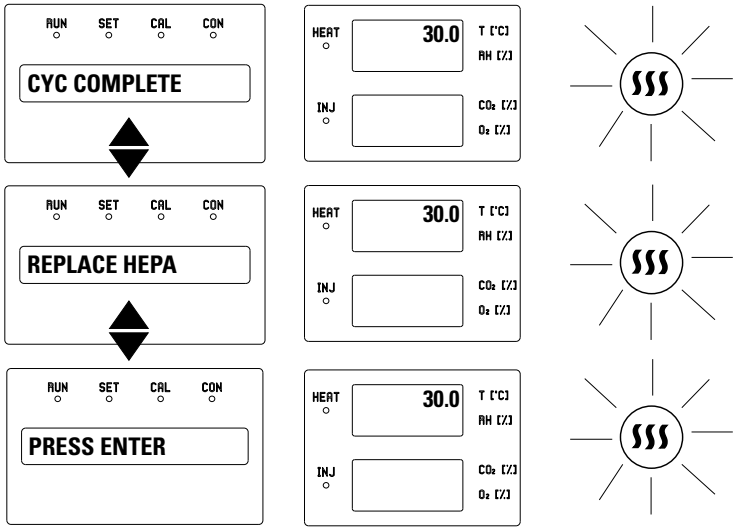


Figure 5-18. IR Sensor Reinstalled

Sterilization Cycle (continued)

After the unit is powered back on with the IR sensor reinstalled, the display toggles between “CYC COMPLETE”, “REPL HEPAs”, and “PRESS ENTER”.

10. Open the chamber and install a new HEPA filter, air sample filter and access port filter assembly. Press ENTER.

11. When ENTER is pressed, the LED goes out, the display returns to “SYSTEM OK”, and the HEPA filter replacement timer is reset.

12. Fill the humidity pan with 3 liters of sterile distilled water with the recommended purity range (See Section 1).

13. Allow to stabilize for at least 12 hours at the required temperature and CO_2 level. It is recommended that the temperature and CO_2 calibrations be verified periodically during the first week of returning the unit to service.

Caution The high temperature sterilization cycle may cause the T/C CO_2 sensor output to change significantly. (This is normal and does not indicate damage to the sensor.) Therefore it is essential that the CO_2 calibration is verified before returning the unit to service. ▲

If an independent instrument is not available to verify calibration, the following procedure may be performed. After the Sterilization Cycle and before CO_2 is allowed to enter the cabinet;

1) Fill and install the humidity pan.

2) Allow to stabilize at desired operating temperature for at least 12 hours.

3) Calibrate the display to 0.0%.

Note If the Cool Phase is canceled, the display toggles between “CYC CANCELED” and “COOL PHASE”.

- With T/C CO_2 sensor - When the temperature cools down to the original set operating temperature or 30°C, whichever is higher, the display toggles between “CYC CANCELED”, “REPL HEPAs”, and “PRESS ENTER”. The white LED is lighted but no longer flashes.

- With IR CO_2 sensor - When the temperature cools down to the original set operating temperature or 30°C, whichever is higher, the display toggles between “CYC CANCELED”, “POWER OFF”, and “REPLACE IR”. The white LED is lighted but no longer flashes. After the unit is powered back on with the IR sensor reinstalled, the display toggles between “CYC CANCELED”, “REPL HEPAs” and “PRESS ENTER”.

Section 6 Factory Options

A description of the factory option connections to external equipment follows.

Remote Alarms

A set of relay contacts is provided to monitor alarms through an RJ11 telephone style connector on the back of the cabinet. Refer to Figure 6-5 for the location of the alarm connector. The 12-foot telephone cord (P/N 190388) and RJ11-to-screw terminal conversion box (P/N 190392) are available through your local distributor.

The remote alarm provides a NO (normally open) output, an NC (normally closed) output and COM (common). Refer to Figure 6-1.

The contacts will trip on a power outage or an overtemperature condition. The contacts may also be programmed to trip or not trip on temperature alarms, CO_2 alarms, and RH alarms. See Section 3, Configuration mode.

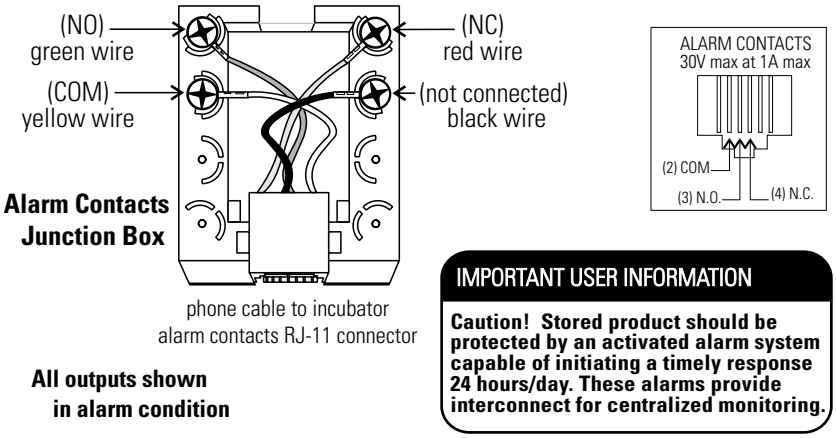


Figure 6-1. Remote Alarm Contacts



Section 7 Specifications

*Specifications are based on a nominal voltage of 115V or 230V in ambients of 22°C to 25°C.

Temperature

Control . . . . .±0.1°C Microprocessor PID Control
Setpoint . . . . . .Digital - Touch pad, 0.1°C
Range . . . . . .+5°C above ambient to 50°C
Uniformity . . . . . .±0.3°C @ +37°C
Tracking alarm..User programmable (low) indicator
Overtemp . . Tracking, user programmable, action, and indicator
Display . . . . . .Digital, LED, 0.1°C increments

Temperature Safety

Type . . . Extreme temperature safety, action, and indicator
Sensor . . Thermostat, independent of temp control system
Indicator . Message center, audible and visual alarms

Relative Humidity

Control . . . . .Humidity pan - natural vaporization
Humidity w/ pan . . . . . .95% RH at 37°C

CO_2

Control . . . . .±0.1% microprocessor PID control
Sensor . . . . . .T/C or IR
Readability 0.1%
Range . . . . . .0 to 20%
Inlet pressure . . . . . .15 psig (1 bar)
Display . . . . . .Digital LED, 0.1% increments

Shelves

Dimensions . . . . . .18.5" x 18.5" (47cm x 47cm)
Construction . . Stainless steel (belt sanded, both sides)
Surface area . . . . .2.4 sq. ft. (0.22 sq. m.) per shelf
Max. per chamber . . . . . .38.4 sq. ft (3.6 sq. m.)
Loading . . . 35 lbs (16kg) slide in and out, 50 lbs (23kg) stationary
Standard 4
Maximum 16

Construction

Interior volume . . . . . .6.5 cu. ft. (184 liter)
Interior . . . . . .Type 304 stainless steel shiny finish
Exterior . . . . . .18 gauge cold roll steel
Outer door gasket . .Four-sided molded, magnetic Santoprene
Inner door gasket . . . . . .Bulb, silicone
Insulation . . . . . .Mineral wool

Fittings

Access port . .1-1/4" (32mm) removable silicone plug
CO_2 inlet . . . . . .1/4" (6.4mm) barbed
Sample port . . . . . .Front mounted barbed

Electrical

. . . . . .115VAC, 50/60 Hz, 1PH, 9.6 FLA
(Operating range 90-125VAC)
Power switch/circuit breaker . . . 2 Pole, 12.0 Amp
Accessory outlet . . .Voltage equal to the cabinet input.
75 Watts maximum, 0.5ma leakage current
Alarm contacts . . Deviation of temperature, CO_2, power, NO and NC

Dimensions

Exterior . . . . . .26.1" W x 39.5" H x 25.0" F-B
. . . . . .(66.3cm x 100.3cm x 63.5cm)
Interior . . . . . .21.3" W x 26.8" H x 20.0" F-B
. . . . . .(54.0cm x 68.1cm x 50.8cm)

Weight

Net . . . . . .260 lbs (118kg)
Net shipping . . . . . .315 lbs (143kg)

Certifications

The Declaration of Conformity is available on request.

Safety Specifications

Indoor Use Only
Altitude . . . . . .2,000 meters
Temperature . . . . . .5°C to 40°C
Humidity . . . . . .80% RH at or below 31°C,
. . . . . .decreasing linearly to 50% RH at 40°C
Mains Supply Fluctuations
Mains supply voltage fluctuations not to exceed ±10% of nominal voltage
Installation Category II[1]
Pollution Degree 2[2]
Class of Equipment[1]

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1 Installation category (overvoltage category) defines the level of transient overvoltage which the instrument is designed to withstand safely. It depends on the nature of the electricity supply and its overvoltage protection means. For example, in CAT II which is the category used for instruments in installations supplied from a supply comparable to public mains such as hospital and research laboratories and most industrial laboratories, the expected transient overvoltage is 2500V for a 230V supply and 1500V for a 120V supply.

2 Pollution Degree describes the amount of conductive pollution present in the operating environment. Pollution degree 2 assumes that normally only non-conductive pollution such as dust occurs with the exception of occasional conductivity caused by condensation.

Section 8 Customer Installed Accessories and Parts

VWR Part Number	Description
98000-392	Stainless steel shelf and channels
10065-492	HEPA filter, 5.5” diameter
97025-844	HEPA filter replacement kit
10820-346	Roller base

VWR CO2 INCUBATOR WARRANTY - NORTH AMERICA

VWR warrants this product for a period of 3 years from date of delivery. If component parts are non-conforming in materials and workmanship VWR will repaired or replaced during the warranty period.

Installation and calibration is not covered by this warranty agreement. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. Expendable items, glass, filters, and gaskets are excluded from this warranty.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies.

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