

# PERFORM Operating Document

## Use and Maintenance of CO<sub>2</sub> Incubator PC-POD-CA-007-v04

### Revision History

Version	Reason for Revision	Date
04	Condense version	27-April-2020

## 1. Introduction

The content of this PERFORM Operating Document (POD) provides guidelines for the use and maintenance of the CO<sub>2</sub> incubator.

Thermo Scientific™ Forma Series II Water-Jacketed 3120 CO<sub>2</sub> Incubators combine precise CO<sub>2</sub> control with an IR sensor.

These Thermo Scientific Forma incubators feature precise CO<sub>2</sub> control, unsurpassed temperature stability, and superior parameter recovery characteristics, with innovative continuous contamination control technology

## 2. Definition of Terms and abbreviations

CO <sub>2</sub>	Carbon dioxide
N <sub>2</sub>	Nitrogen
O <sub>2</sub>	Oxygen
IR	Infrared
DI	Distilled water

PERFORM Centre

### 3. Overview of CO<sub>2</sub> Incubator

#### 3.1 Performance

- Certified in-chamber HEPA air filtration system maintains Class 100 air quality
- Enviro-Scan™ microprocessor control
- Set points and calibration: temperature, over temperature, CO<sub>2</sub>, O<sub>2</sub>
- Audio/visual alarms with alarm silence
- Configure Audible On/Off, Access Code, HEPA Filter Change Reminder, RS-485 Interface, Automatic Tank Selector, Audible/Visual Alarms, Display Temp/RH (selectable), Display CO<sub>2</sub>/O<sub>2</sub> (selectable)

#### 3.2 Training requirements

Prior to using the incubator individuals should:

- Read and sign this POD.
- Undergo appropriate incubator training and/or provide a proof of an external training to the clinical analysis supervisor prior to use.

#### 3.3 General precautions

- The incubator must be installed in a well-ventilated area.
- The changeover system is connected with two CO<sub>2</sub> tanks for constant supply of CO<sub>2</sub>. Make sure both tanks are open. Change the direction of the arrow towards the CO<sub>2</sub> tank in use. The pressure settings on the regulator should be less than 15 psig +/- 5 psig. Do not change the settings on the changeover system.
- The CO<sub>2</sub> gas should have a purity of 99.5% (industrial grade). Gas cylinder have UN1013 labeled and should be secured to the wall. If higher purity CO<sub>2</sub> is desired inside the incubator, the pressure regulator should be constructed with a stainless steel diaphragm along with specifying the purity of the CO<sub>2</sub> from the gas supplier.
- The calibration is performed automatically using an Auto Zero system. Auto Zero occurs every 24 hours. If during the Auto Zero cycle, a CO<sub>2</sub> correction of more than 0.45% is detected, the IR AUTOZ ERR alarm will occur. Refer to user manual for possible problems and inform Clinical Analysis Supervisor.
- Protective equipment and clothes and other safety instructions should be used at all times.
- Verify the temperature and CO<sub>2</sub> concentration before use.
- Verify the water level in the humidity pan inside the incubator.
- Do not overload the incubator and leave enough space between the items for proper airflow.
- Gas other than CO<sub>2</sub> or N<sub>2</sub> should not be connected to this equipment.

#### 3.4 Relevant documents

Model 3100 series Forma II Water Jacket CO<sub>2</sub> Incubator Operating and Maintenance Manual.

## 4. Procedure

### 4.1 Control Panel Operation

There are 4 basic modes which allow incubator set up. The modes are as follows: Run, Setpoints, Calibration and System Configuration.

- **Run** is the default mode that the incubator will normally be in during operations.
- **Set** is used to enter system set points for incubator operation (temperature, over temp, CO<sub>2</sub>).
- **Cal** is used to calibrate various system parameters (temp offset, CO<sub>2</sub> relative humidity)
- **Config** is the system configuration mode that allows for custom set up of various options (HEPA filter replace reminder, temperature alarm limit, gas limit, water level)

Scroll for various parameter keys. The right arrow goes to the next parameter, the left arrow returns to the previous parameter. For the operation details contact Clinical Analysis Supervisor or delegate.

Refer to user manual for specific operation procedure.

### 4.2 Filling Humidity Pan

For best operation, sterilized MilliQ water (water purity resistance 18,2 Mohm) should be used in the humidity pan. Fill the humidity pan to within ½ inch of the top. Place the pan directly in the center of the incubator floor to ensure optimum humidity and temperature response.

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 as well as CO<sub>2</sub> calibration.

### 4.3 Filling Water Jacket

Water jacket has been filled with DI water (43.5 liters) at the time of installation. One bottle of rust inhibitor (part number 1900101) is added to 43.5 liters of water inside the unit at the time of shipping (one bottle of rust inhibitor per incubator or per water jacket). The rust inhibitor must be replenished every two years. The fill port has a plug that must be removed before filling and replaced after filling is complete. Refer to user manual for complete instructions.

### 4.4 Preventive maintenance

#### 4.4.1 Cleaning Humidity Pan

Clean the humidity pan with soap and water and a general use laboratory disinfectant

### **PERFORM Centre**

(Ex. mild detergent). This should be done at least every two weeks or more regularly if needed. Rinse with distilled water followed by a rinse with MilliQ water and spray with 70% alcohol. The pan can be autoclaved and fill the pan to within ½ inch of the top with sterile distilled water to control bacteria.

#### **4.4.2 Cleaning Cabinet Exterior**

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

#### **4.4.3 Cleaning the Interior**

Disconnect the power cord connector before cleaning. Use an appropriate disinfectant. Do not use bleach to clean as it may cause pitting and rusting. Remove stainless steel shelves and supports for easy cleaning or adjustment. All surfaces must be thoroughly cleaned, rinsed and rough-dried. Use 70% alcohol in a well-ventilated area that is free from open flame. Allow the alcohol to fully dry before running power on. Allow the incubator to stabilize and equilibrate for 24 hours before placing flask items inside. Refer to section 5 of the user manual for detailed procedure.

Clean door gasket with a mild detergent, water and a soft cloth or sponge. The gasket should be clean and smooth.

#### **4.4.4 HEPA Filter maintenance (pn = 760175 )**

Replace the HEPA filter when the REPLACE HEPA reminder is displayed. Follow the steps to clear the display: Press the Mode Key until Config indicator lights, press the right arrow until NEW HEPA is displayed in the message center, press Enter to restart the timer and clear the REPLACE HEPA alarm. Press the Mode key to return to run Mode. It can be set to alarm after a specified time from 1 to 12 months or more. Refer to user manual for detailed procedure.

#### **4.4.5 Replacing Air Sample Filter (pn = 770001)**

The air sample filter should be replaced whenever the HEPA filter is replaced. Refer to user manual for detailed procedure.

#### **4.4.6 Replacing Access Port Filter (pn = 770001)**

Locate the opening in the top left corner of the interior chamber; the filter is connected to the stopper. Remove the filter from the connecting tube and discard. The access port filter should be replaced whenever the HEPA and air filters are replaced. Refer to user manual for detailed procedure.

There is the option for buying the kit for 3 replacement filters (pn= 1900067).

PERFORM Centre

**4.4.7. Draining the Water Jacket**

Turn off the unit and remove the plug from the power source. Remove the front cover plate below the door. Connect the hose barb insert to the drain on the lower front of the water jacket and to the drain hose (be careful of high flow water rate, water is draining fast). After water jacket has finished draining, remove the hose barb insert (press to release). To fill the jacket, always use distilled water and add rust inhibitor to the water when filling as mentioned above in section 4.3. Refer to user manual for detailed procedure (section 5-10).

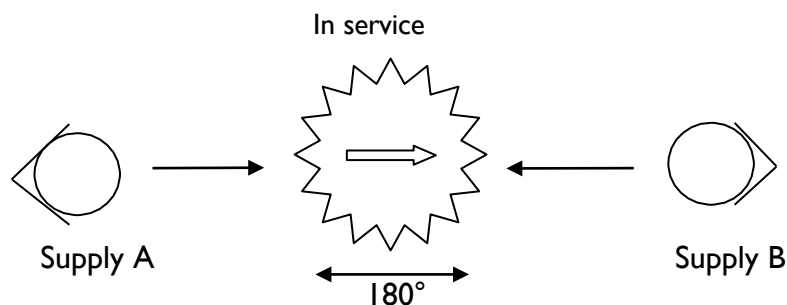
**5. Gas Changeover System**

The changeover system is designed to provide continuous gas flow for applications requiring stored gas supplies. This combines a changeover regulator, three gauges, bracket and a line regulator.

**5.1 Basic operation**

When the primary supplies to the changeover system (supply A) are consumed, the secondary supply (supply B) feeds the line regulator. By turning the changeover regulator hand knob counterclockwise 180°, supply A can then be replenished. When supply B is depleted, supply A will then begin to feed the line regulator.

**Diagram showing the set-up of changeover system**



Inspect the regulator, valve and accessories for physical damage and contamination. Do not connect the device if you detect oil, grease or damaged parts.

Do not operate a gas handling system under any circumstances if it is leaking or otherwise malfunctioning. Do not attempt to fix any leaks while the line is pressured. Damage to equipment and/or personal injury may result.

**5.2 Gas Cylinder/Tank replacement**

Close the shutoff valve for the side of the exhausted cylinder. On that side close all the cylinder valves. Disconnect exhausted cylinder and replace with a full cylinder. Close vent valve if equipped and open the cylinder valve.