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| **Document Number:** | **SASoM/EQUIP/085.v2** |
| **Title:** | **Use and maintenance of the NU-5510E Direct Heat NuAire $CO_2$ Incubator** |
| **Version:** | **v2** |
| **Author:** | **Peter Mullen** |

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| Effective from: | 14/05/2019 |
| Valid to: | 13/05/2024 |

| **SOP History** | | |
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| Number | Date | Reason for Change |
| v1 | 14/05/2014 | Original |
| V2 | 14/05/2019 | Five Year Update |
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## 1.0 Purpose –

The purpose of this SOP is to outline the principles of the routine use of NU-5510E Direct Heat NuAire $CO_2$ incubator in Laboratory 248 at the St Andrews School of Medicine (SASoM).

## 2.0 Scope –

This SOP applies to routine use and maintenance of the NU-5510E Direct Heat NuAire $CO_2$ incubator within the SASoM.

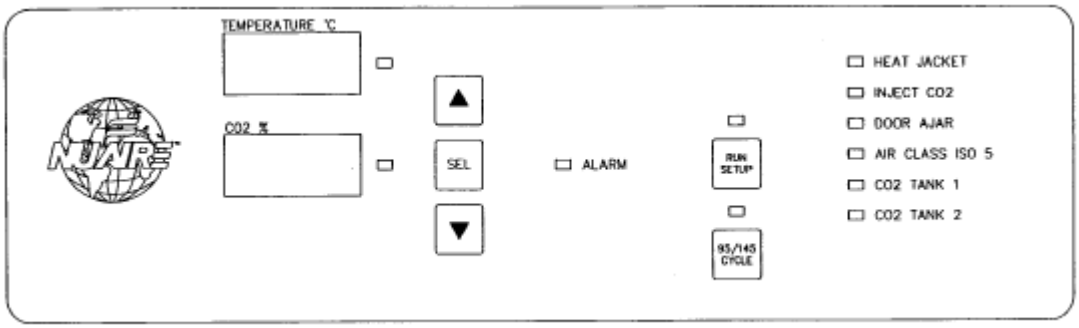
## 3.0 Responsibilities –

It is the responsibility of all users of the NU-5510E Direct Heat NuAire $CO_2$ incubator within the SASoM to comply with this SOP.

## 4.0 Procedure –

**Principles of Operation:**

The CO2 incubator is a laboratory device for preparing and cultivating cell and tissue cultures. The device allows the simulation of the special physiological ambient conditions for these cultures due to the exact control of: temperature, CO2 content and the setting of an increased relative humidity.




**Operator Controls:**

The Control panel is operated using 5 keys. The keypad switches and their functions are as follows:

Run/Setup: Switches between "Run" mode and the "Setup" mode when pressed for 3 seconds.

> Run Mode: The green LED above the switch pad is lit continuously and incubator is fully functional. Systems calibrations are performed in this mode.
>
> Setup Mode: The green LED is blinking with the Temperature & Co2 displays flashing alternating between set point values are performed in this mode by pressing the "SEL" key to choose the system indicated by lighting the green LED next to the display and using the up/down arrows to change the value in the display. The incubator is in a "standby" condition and heat and gas functions are not active.

NUAIRE Logo: When pressed for 3 seconds it gives access to the "tSt," "Opt" & Master reset menus.

Up and Down Arrows: Increases or decreases the value in the display during a calibration in 'run mode'. Also used for changing the system set points in 'setup mode'. They are also used for advancing to the "tSt", "Opt" and "master reset" menus after the logo key is pressed. These keys are also used to change state of systems in the "tSt" menus and adjust values of the systems in the "Opt" menu.

SELect key: Advances between and selects the active system displays for calibration functions in run mode and changing set points in setup mode. The lit green LED indicates selection. This key also advances between systems in the "tSt" & "Opt" menus.

95/145 cycle: Starts the heated decontamination cycle when pressed for 3 seconds. It also advances through the phases of the decontamination cycle.

**Setting up the incubator:**

1. Fill the water tray with up to max 3.0 l of autoclaved water. Do not exceed the upper level mark.
2. Make sure that the CO2 supply system valves are open, located on the wall behind the incubator.
3. Turn the device on using the power switch.
4. Set nominal values for temperature and CO2 content at the operating panel.
5. Ventilate work space by leaving both device doors open until acoustic alarm sounds.
6. Start device using auto-start routine.
7. Close device doors.
8. The temperature control adjusts the temperature to the set nominal value, humidity rises.
9. When temperature and relative humidity are constant, the automatic adjustment of the CO2 measuring system is performed.

**Incubating cultures:**

1. Open the outer and inner doors.
2. Place plates/flasks/dishes on the shelves.
3. Close inner and outer doors

**Door Switch:**

A door switch is installed at the upper edge of the work space opening. If the door switch is activated by opening the glass door, the gas supply and the heating of the work space are interrupted and the display shows a corresponding message. If the door remains open for more than 30 seconds, a short acoustic alarm sounds. If the door remains open for more than 10 minutes, the acoustic alarm sounds continuously.

**Decontamination features:**

There are two decontamination cycles that are a 95° C humidified cycle and a 145° C dry cycle. To choose select the 95/145 button (for 3 seconds) until the incubator displays show the following:

• TEMP. display H2O flashing
• CO2 display “ftr”/out alternating
• The LED over the 95/145 button will flash on /off.

Indicates that user should:

• Open the inner and outer doors
• Remove top shelf and shelf brackets. These can be left on the next shelf down.
• Remove the top plenum by unscrewing the knurled nuts at each end of the plenum. Set it on the shelves being careful not to damage the temperature sensors mounted on the plenum.
• Remove the chamber fan Hepa filter by unscrewing the knurled nuts holding it to the top of the chamber.
• Replace the top plenum.
• Empty water pan disinfect it and refill with 300 ml of distilled water
• Close the inner and the outer doors

The Full decontamination cycle is 13.75 hours. The cycle is complete when

Temperature display H2O flashing
*CO2 display Ftr / In* flashing

This indicates the user should:

• Remove top plenum. Install HEPA filter. The disk filters for the chamber sample port and the air pump in the control centre can also be replaced at this time if desired.
• Press the 95/145 button to resume normal operation.

**5.0 Personal protection –**

Howie coat must be worn at all times.

Gloves as specified in the appropriate COSHH RA.

**6.0 Spillages -**

Identify the spill and determine appropriate response.

Spillages should be covered with disposable paper towels.

Disinfectant should be poured on the towel to soak them thoroughly.

Leave for a 10-15 minutes.
Place the contaminated material into an autoclave bag for autoclaving.

Wash the site of spillage with water & detergent.

**7.0 General maintenance -**

The incubator should be stripped down and cleaned on a monthly basis using Detergent and then 70% ETOH.

**8.0 Training –**

All users have to be trained before using the Instrument by a designated person.

## 9.0 Related documents –

9.1 Equipment manual

9.2 Risk assessments – RA/GEN/021

## 10.0 Approval and sign off –

**Author:**

Name: Peter Mullen

Position: Research Fellow

Signature: Date:

**Management Approval:**

Name: Peter Mullen

Position: SOP Administrator

Signature: Date:

**QA release by:**

Name: Alex MacLellan

Position: QA Manager

Signature: Date:

# STANDARD OPERATING PROCEDURE

Please sign below to indicate you have read this S.O.P and understand the procedures involved.

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