

Document I	Number: SASoM/EQUIP/049.v2	
Title:	Use and maintenance of the New Brunswick I-26R Incubator Shaker	
Version:	v2	
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SOP History		
Number	Date	Reason for Change
v1	20/09/2013	Original
v2	20/09/2018	Update
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#### 1.0 Purpose -

The purpose of this SOP is to outline the principles of the routine use of the New Brunswick I-26R Incubator Shaker in Laboratory 248 at the St Andrews School of Medicine (SASoM).

#### 2.0 Scope -

This SOP applies to routine use and maintenance of the New Brunswick I-26R Refrigerated Incubator Shaker within the SASoM.

### 3.0 Responsibilities

It is the responsibility of all users of the New Brunswick I-26R Refrigerated Incubator Shaker within the SASoM to comply with this SOP.

### 4.0 Procedure -

The New Brunswick I-26R Refrigerated Incubator Shaker is a large capacity refrigerated orbital shaker with temperature control from 4°C to a maximum of +60°C.

The shaker can be operated either continuously or in a timed mode via a programmable timer for shaking periods of 0.1 to 99.9hrs.

For safe operation, the shaker is designed with a safety switch that automatically stops the shaker mechanism when the door is opened.



The shaker is equipped with visual and audible alarms that alert the user to the following conditions:

- The end of a timed run
- Deviations from speed setpoint
- Power Failure
- Door open
- Unstable operating conditions (tilt switch visual alarm only)

The shaker is equipped with a Universal Platform which will allow a wide variety of test tubes racks, flask holders etc to be used.

The incubator is generally used for the growth of bacteria.

NOTE: <u>DO NOT</u> use this incubator for growing yeast or mammalian cells!

#### 4.1 Starting the Shaker:

To initially start the shaker, close the door and turn the **ON/OFF SWITCH** on the right side panel of the shaker to the **ON** position. When the shaker begins to operate, the **LED DISPLAY** will track the speed as it accelerates to the last entered setpoint. The shaking action may be started or stopped by pressing the **START / STOP key** on the **KEYPAD**.

The Shaker will not operate if the door is open – this is indicated by the word LId appearing on the LED DISPLAY.

## 4.2 Continuous Operation:

- 1. Press **SELECT** until the **RPM INDICATOR** is illuminated.
- 2. If the display indicates that the shaker is OFF, press the START / STOP key.
- 3. Press either (UP) or (DOWN) key to enter SET MODE (the SET INDICATOR will illuminate).
- Set the speed by using the ▲ or ▼ key until the desired setpoint is displayed.
  Continued pressure on the ▲ or ▼ key will cause the setting to change more rapidly. The setpoint may be changed during a run without stopping the shaker.

### Checking any Setpoint:

- 1. Press SELECT until the desired indicator is illuminated.
- 2. Briefly press either the ▲ or ▼ key to enter the SET MODE and display the current setpoint.

### 4.3 Timer Operation:

The shaker may be programmed to automatically stop after a preset time period on 0.1 to 99.9hrs. There must be power to the shaker in order to set the timer, although a timed run can be initiated while the unit is either stopped or operating (but not switched off).



### To set the timer:

- 1. Press the **SELECT** key until the **HRS INDICATOR** is illuminated.
- 2. Press either ▲ or ▼ key to enter the **SET MODE** and set the desired run time. *If the shaker is stopped, skip to Step 5 below. If the shaker is already running:*
- 3. Press the START / STOP key. The shaker will stop and the display will read OFF.
- 4. Press the **START / STOP** key again; the **TIME INDICATOR** will light and the shaker will start the timed run.

### *If the shaker is stopped:*

- 5. Press the **START / STOP** key
- 6. Press the **START / STOP** key again. The shaker will stop and the display will read OFF.
- 7. Press the **START/STOP** key a third time; the **TIME INDICATOR** will light and the shaker will start the timed run.

To disable the visual alarm (flashing **TIME INDICATOR**), press the **SELECT** key and change to any other function.

To cancel the timer while the shaker is running:

- 1. Press the SELECT key until the HRS indicator lights.
- 2. Press the ▼ key until 0.0 is displayed, then press the START/STOP key. The TIME INDICATOR light will turn off.
- 3. Press the **START / STOP** key to continue in untimed mode.

To cancel the timer while the shaker is stopped:

- 1. Press the ▼ key until 0.0 is displayed, then press the START/STOP key. The TIME INDICATOR light will light and the shaker will run.
- 2. Press the **START / STOP** key. The shaker will stop and the **TIME INDICATOR** will turn off.
- 3. Press the **START / STOP** key a third time and the shaker will run in untimed mode.

### 4.4 Alarm Functions:

The shaker has an audible alarm which is activated at predetermined times. It can be deactivated by using the MUTE function:

- 1. Press the SELECT key until the MUTE indicator illuminates.
- 2. Press the  $\blacktriangle$  or  $\lor$  key to display **ON**, then press the **SELECT** key.

### To reactivate the audible alarm:

- 1. Press the **SELECT** key until the **MUTE** indicator illuminates.
- 2. Press the  $\blacktriangle$  or  $\checkmark$  key to display **OFF**, then press the **SELECT** key.

### 4.5 Temperature Setpoint:

1. Press the **SELECT** key until the function °C **INDICATOR** illuminates. The temperature can be set from 4°C to 60°C (the I-26R is a refrigerated unit). Increasing or decreasing the setpoint is accomplished with the ▲ or ▼ key.



2. During operation, if the temperature of the chamber is more than 1°C higher or lower than the temperature setpoint, an alarm is triggered. The alarm consists of a flashing °C INDICATOR and audible beep. The alarm will automatically deactivate as the unit achieves the set temperature.

# 4.6 Temperature Offset Calibration:

Depending on various conditions within the incubator (eg. Position of flasks, size of flasks, heat produced by organisms, heat losses due to evaporation etc), the display temperature MAY differ from the temperature within the flasks themselves.

If you wish to have the temperature display ("Indicated Temperature") match the temperature at a given point, or match the average of a series of points within the incubator ("Actual Temperature"), proceed as follows:

- 1. Let the unit equilibrate at or near the desired temperature with a separate thermometer inside the incubator. Record the "Indicated Temperature".
- 2. Record the Actual Temperature.
- 3. Calculate the Temperature correction value: Actual Temperature Indicated Temperature = Temperature Correction Value.
- 4. Press the SELECT key until the °C INDICATOR illuminates.
- 5. Simultaneously press the  $\blacktriangle$  or  $\checkmark$  keys. The display will indicate CAL.
- 6. Using the ▲ or ▼ key, enter the Temperature Correction Value calculated in Step 3 above.
- 7. Simultaneously press the A or Keys to save the Temperature Correction Value to memory.

The °C light will pulse rapidly to indicate that it is not operating in the factory default mode. It will pulse for a longer duration and less rapidly (with a frequency of approximately one second) to indicate temperature is more than one degree above or below setpoint.

### To return to the factory calibration.

- 1. Press the SELECT key until the function °C INDICATOR illuminates.
- 2. Simultaneously press the  $\blacktriangle$  and  $\triangledown$  keys. The display will indicate CAL.
- 3. Using the  $\blacktriangle$  or  $\checkmark$  key set the Temperature Correction Value to zero.
- 4. Simultaneously press the  $\blacktriangle$  and  $\checkmark$  keys. The rapid pulsing of the °C INDICATOR will stop.

# 4.7 Power Failure:

In the event of a power failure, the shaker will enter Automatic Restart mode.

If the shaker was in operation prior to power interruption, the shaker will begin to operate at its last entered setpoint. The **LED DISPLAY** will flash, indicating that a power failure has occurred. Press any key to stop the flashing of the LED Display.



# 4.8 Speed Calibration:

- 1. Set the shaker to a speed that can be easily measured. If you are using a strobe, minimum speed should be 250rpm.
- 2. Compare the reading on the display to the measured reading.

### *If an adjustment is needed:*

- 1. Press the SELECT key until the RPM indicator light illuminates .
- 2. Press the  $\blacktriangle$  and  $\blacktriangledown$  keys simultaneously. The display will indicate CAL.
- 3. Press either the ▲ or ▼ key to change the displayed value to match the measured speed.
- 4. Press the ▲ and ▼ keys simultaneously to save the adjustment
- 5. Turn unit **OFF** using the power switch, then turn it back **ON**.

### 4.9 Tilt Switch:

The shaker is equipped with an independent mechanical sensing tilt switch that shuts off the motor when it senses that the shaker is in an unbalanced condition, indicating **tLt** ("tilt") on the **LED** display.

When this happens, troubleshoot the situation to restore balance, then turn the power switch **OFF**, then **ON** again to reset the system.

### 5.0 Personal protection -

Howie coat and disposable gloves must be worn at all times.

#### 6.0 Spillages -

It the shaker is contaminated by spills it must be disinfected and cleaned *immediately* after the spill has occurred.

Wear appropriate protective clothing at all times.

Wipe up all spillages with tissues which should be placed in an autoclave bag for prior to disposal (after autoclaving). If required remove the Universal Platform containing the spring loaded clips – this is done by unscrewing the two black knobs on the front of the Universal Platform and then lifting vertically upwards. Once the platform has cleared the retaining knobs it can be withdrawn from the shaker.

All contaminated items should be cleaned using Haztabs or by autoclaving if necessary. A final wipe-down should be performed with 70% ETOH.

### 7.0 Training –

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



## 8.0 Related documents -

- 8.1 Equipment Manual
- 8.3 Risk assessments GRA29, BIO2

# 8.0 Approval and sign off -

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