

	Environmental Analysis Teaching and Research Laboratory	Date: 8/11/2016	Number: 15
	Standard Operating Procedure	Title: MySpin12 Microcentrifuge	
	Approved By: Los Huertos	Revision Date: February 16, 2018	

1. Scope and Application

1.1 The MySpin12 is a microcentrifuge designed to spin down centrifuges XX mL centrifuge tubes.

1.2 As a researcher, the microcentrifuge is an essential part of the lab. This device will allow for the spinning of relatively small amounts of liquid samples at speeds reaching tens of thousands of g-force.

2. Summary of Methods

2.1 This SOP provides instructions on how to use the Thermo Scientific mySPIN 12 Microcentrifuge.

2.2 This SOP also provides some guidance on how to troubleshoot an issue should any problems arise.

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3. Acknowledgements

3.1 As usual we acknowledge the students who have tried to follow and made suggestions on how to improve this guide. In particular, Edinam E, etc.

4. Health and Safety

4.1 Improper use can result in

4.2 Spillage left unclean may pose a threat of the substance is hazardous and most important for unsuspecting individuals.

5. Personnel & Training Responsibilities

5.1 Researchers using this SOP should be trained for the following SOPs:

- SOP01 Laboratory Safety

When the training is completed, the training documentation form should be completed.

6. Definitions

6.1 When looking at the display of the microcentrifuge there are several terms that will be displayed on the front panel. They are as follows.

- Lid Open: Indicates the lid is open
- Ready: Unit is ready to centrifuge
- Spin Up: The centrifuge cycle is starting and is increasing in speed
- Spinning: The centrifuge is running in Standard mode
- Spin Down: The centrifuge cycle is slowing down
- Stopped: The centrifuge cycle has stopped
- Completed: The centrifuge cycle has finished
- Quick Spin: When the quick spin sign flashes on the panel the centrifuge is running in quick spin mode
- Error: The centrifuge has encountered an error

7. Required Materials

MySpin 12 (Cat #)

PPE

8. Estimated Time

- 8.1** The MySpin12 takes less than a minute to use, but is not designed for constant and high intensity use.

9. Procedure

Prior to Using

- 9.1** Turn the power switch on the rear to the ON position. The unit will initialize.
- 9.2** Press the OPEN button. The lid should pop up slightly. Lift the front of the lid and gently up and backward until approximately 90 degrees vertical.
- 9.3** Remove any remaining packaging materials.
- 9.4** Verify that the rotor is installed correctly. Do not run without the rotor being installed. Close the lid.
- 9.5** Press the START/STOP button, the rotor should spin up to the present speed. If there is a smooth whirring sound and the unit accelerates with little or no vibration, the minicentrifuge is ready to use. If there are loud or unusual sounds, or excessive vibration, DO NOT OPERATE. Contact Thermo Fisher Scientific service.
- 9.6** At the set time, the rotor will spin down, stop and the unit will emit a beep when the cycle is complete.

General Operation

- 9.7** The following steps are for general usage of the microcentrifuge
- 1. Turn the power switch on the back of the unit ON. The unit initialize.
 - 2. To open the lid, press the OPEN button. The lid should pop up slightly. Lift the front of the lid gently up and backward until approximately 90 degrees vertical.
 - 3. On benchtop, prepare samples tubes in a rack so that tubes are filled to equal levels. Close tube lids.
 - 4. Install tubes in the rotor in a balanced manner. Instructions on proper balancing are to follow.

- 5. Set the appropriate time by pressing the TIME UP/DOWN button.
- 6. Set the appropriate rpm by pressing the SPEED UP/DOWN button.
- 7. Place the standard rotor cover on the rotor to limit noise and aspiration of liquids that may escape from tubes.
- 8. Close Lid and press down until locked. The Display should read "READY".
- 9. Press START/STOP. The rotor should spin up to the user set speed.
- 10. At a determined time the rotor will spin down and stop at the present time.
- 11. The unit will then emit a beep when the cycle is complete.
- 12. To open the lid, press the OPEN button.

Quick Spin Operation

9.8 The following are instructions on how to use the Quick Spin operation

- 1. Prepare the unit for centrifugation as in the General Operation section
- 2. Press QUICK SPIN button with the rotors speed set previously
- 3. The timer will begin counting
- 4. Once enough time has elapsed for your needs, release the QUICK SPIN button. The rotor will spin down, stop and the unit will emit a beep when the cycle is complete.
- 5. To open the lid, press the OPEN button.

Other Functions

9.9 To change between RPM and RCF, prior to a spin cycle, press both the SPEED UP and DOWN buttons simultaneously. This will convert the speed setting to the other.

9.10 If for any reason you need to stop the cycle quickly, press and hold the START/STOP button. The cycle will stop more rapidly than normal. CAUTION this may disturb the contents of the tube during the quick stop process.

10. Data Analysis and Calculations

10.1 The relative centrifugal force (RCF) or G-force can be calculated using the following equation

$$RCF = 1.12R \cdot (RPM/1000)^2 \quad (1)$$

where R is the rotor radius, which is 55mm for the MySpin12.

Table 1: RPM to G-Force Table Conversion Reference

RPM	RCF
1000	62.7
3000	564
5000	1570
7000	3070
9000	5080
11000	7590
12500	9800

11. Error Status

11.1 If an error happens, the unit will beep and the display will indicate the error. The following delineates the possible error statuses.

Motor Overload

11.2 If you receive a Motor Overload error, this means something is interfering with the rotor. To fix this, clear the rotor and reset.

User Stop

11.3 If you receive a User Stop error, this means you have held down the START/STOP and implemented a quick stop.

Balance

11.4 If you receive a Balance error, inspect the tubes for equal tube filling or improper placement. Once you have determined everything is correct, rerun the microcentrifuge.

11.5 If the balance error continues to happen, remove the tubes and determine if the balance error still persists with an empty rotor.

11.6 If the error continues to persist, inspect the rotor for improper installation.

Temperature

11.7 If you receive a Temperature error the unit has exceeded the normal operating temperature.

11.8 To rectify this, turn off the unit and allow it to cool.

Excessive Tilt

11.9 If you receive a Excessive Tilt error the unit has experienced a non-normal tilt event. In this case, make sure the unit is placed on a level surface. Once corrected, rerun.

Lid Fail

11.10 If you receive a Lid Fail error this means the lid has opened during the cycle.

11.11 To rectify this check for proper operation of the lid lock mechanism. The lid should stay locked during the entire cycle.

Rotor Lock

11.12 If you receive a Rotor Lock error this means the unit has experienced a problem with the rotor.

11.13 To rectify this, correct the rotor interference. Once corrected, rerun.

12. Trouble Shooting

No Power Present

12.1 If there is no power present verify that the AC adapter is fully plugged into the wall and rear of the unit. Additionally, verify that the power switch is turned on.

Unit not operating normally

12.2 In the case where the unit or display is not functioning normally, turn off the unit, wait for 2 minutes, and turn the power back on.

Excessive vibration/ noise

12.3 If your unit is making excessive vibrations or noise, inspect the tubes for equal fill or improper placement. Inspect the rotor for improper installation. Finally, remove the tubes and determine if the noise persists with an empty rotor.

Lid will not close

12.4 If the lid of the unit will not close, verify that nothing is blocking the lid from fully closing. After which, verify that nothing has fallen into the lock mechanism opening.

Lid will not open

12.5 If you for any reason you need to manually open the lid to access tubes due to an error or power loss, please perform the following:

12.6 1. Turn off the unit and remove the power cord.

12.7 2. Make sure the rotor has stopped completely.

12.8 3. Use a thin rod and insert it into the opening on the button.

12.9 4. Press gently but firmly. You will feel a mechanical movement within the unit and the lid will release.

12.10 5. Remove the rod, set the unit on the feet.

12.11 6. Remove your tubes and reclose the lid.

13. Balancing the Rotor

13.1 Tubes of equal weight and size should be placed opposite each other. Use additional sample or water in other tubes to provide a balanced rotor. Examples of proper sample balancing are shown in the figures below.

14. Rotor Installation and removal

14.1 To remove the rotor do as follows.

- 1. With one hand, grasp the rotor. With the other hand, unscrew the center knob counter clockwise until it disengages from the motor shaft.
- 2. Pull up on the center knob firmly. The rotor should easily lift off of the motor drive.

14.2 To install the rotor do as follows.

- 1. Check to make sure the bands on the rotor are in the slots.
- 2. Set rotor onto the motor drive and push down until seated.
- 3. With one hand, grasp the rotor. With the other hand, screw the center knob clockwise until it engages the motor shaft. Keep turning the knob until it tightens.
- 4. Do not overtighten the knob.

15. References

- 15.1** APHA, AWWA. WEF. (2012) Standard Methods for examination of water and wastewater. 22nd American Public Health Association (Eds.). Washington. 1360 pp. (2014).