**Purpose**

The purpose of this SOP is to inform the operator of the correct use of the Avanti JXN series centrifuge and explain how to clean and maintain the machine effectively.

**Scope of policy**

This centrifuge should only be operated by those who are qualified to do so and lab personnel. Correct PPE should be worn when operating and cleaning the machine to avoid injury.

**Introduction**

The Avanti JXN series is a refrigerated centrifuge that generates centrifugal forces required for a wide variety of applications including:

* Routine processing such as sample preparations, pelleting, extractions, purifications, concentrations, phase separations, and spin column and spin filter centrifugation.
* Rapid sedimentation of protein precipitates, large particles, and cell debris.
* Preparation of subcellular organelles such as mitochondria, nuclei, chloroplasts, and crude microsomes.
* Separation of blood cell and cellular components.
* Pelleting of prokaryotic and eukaryotic cells.
* Nucleic acid precipitation.
* Virus isolation
* Bacteriophage isolation

The Avanti J-XN is a high volume centrifuge with a maximum capacity of 4.0L. The temperature can be set from -20˚C to 40˚C and can be altered in 1˚C increments. It can also reach a maximum speed of 30,000 rpm with particular rotors.

**Safety information**

Chemical and biological safety: handle body fluids with care because they can transmit disease, handle all infection samples according to good laboratory procedures and methods to prevent spread of disease, do not run toxic, pathogenic, or radioactive materials, in a rotor without taking appropriate safety precautions, handle all spills with proper safety precautions as they may generate aerosols, dispose of all waste solutions according to appropriate environmental health and safety guidelines.

Precaution with liquids: risk of instrument damage. Do not place containers holding liquid on or near the chamber door. Liquid, if spilled, may get into the instrument and damage electrical or mechanical components.

Volatile liquids: this instrument is not designed for use with materials (for example chloroform or ethyl alcohol) in this instrument nor handle or store them near the centrifuge.

Safety Features:

An electromechanical door lock system prevents operator contact with spinning rotors and prevents run initiation unless the door is closed and locked. The door locks when START is pressed or when POWER is turned off. The exception to this is the ZONAL mode, in which open-door operation up to 3000 RPM is allowed.

A steel casing surrounds the rotor chamber to provide operator protection in the unlikely event of a rotor mishap.

Dynamic Rotor inertia check (DRIC): as the rotor accelerates, rotor inertia is measured and the rotor energy is calculated for the speed set by the user. If the calculated rotor energy is determined to be excessive, the instrument will stop and run and issue a diagnostic message.

An imbalance detector monitors the system during operation, causing automatic shutdown if rotor loads are severely out of balance.

**Operation**

When inserting the rotors into the drum of the centrifuge, ensure the blue lid does not lay flush with the rest of the rotor. The blue lid should be tightly secured after full turns and if it is not, it has not been correctly placed on the spindle.

Manual operation is a simple procedure you can do from the **home** page (on touchscreen interface). Operating the Run manually:

1. Start on the home page
2. Set the speed and rotor- select the Select Rotor button and go to the Select Rotor page. Select the rotor you require for the run from the library, if the rotor you require is not on the lost, a system administrator must add it. In order to set a speed in terms of RCF/RPM, you must select a rotor first. Use the keypad to set the desired speed. Note that speed is in 10-rpm increments. Select OK to accept your entry and dismiss the page.
3. Set the acceleration and deceleration profiles- select the desired Acceleration and Deceleration profiles. Select the OK key to accept your entries and dismiss the page.
4. Set the time- go to the Set Time page and use the keypad to set the desired time in hours and minutes. You can use the Delay Start button to set a future star or stop time. Select Delay Start. Select Start At or Stop At to set an appropriate starting or stopping time. You can then go on to enter the date and time in the fields. Select OK to proceed.
5. Set the temperature- use the keypad to set the desired temperature in degrees Celsius. Select the OK key to accept your entry and dismiss the page.
6. Start the run- Prepare your samples and place them in the rotor following all proper procedures, including balanced weight distribution. Preheat or precool the rotor and samples, if necessary. Mount the rotor in the instrument following all the procedures in the rotor manual and observing all safety procedures and cautions. Close the chamber door. Select the start button.

Stopping the run: when you have completed all the defined unloading steps, select the Stop Button to bring the rotor to a halt.

Finishing the Run: when the rotor comes to a halt, unmount it and perform all the clean-up and follow up steps given in the rotor manual. The instrument exits Zonal mode when the rotor comes to a stop.

Adding Users: to add users to the system, select the Menu Button on the Header Bar to display the Menu Page. Select the options to display the Systems Options Page. Select the Users Tab, then select Manage Users. Select Add. Select the User ID field to display the Edit User ID page. Use the keypad to enter the new User ID. Select OK to return to the Add User page. Repeat the procedure for the remaining fields. The PIN and Full Name fields are required. Select Save to add the user to the system.

**Maintenance and Cleaning**

Perform the following procedures regularly to ensure continued performance and long service life of the centrifuge.

1. Inspect the centrifuge chamber for an accumulations of sample, dust, or glass particles from broken sample tubes.
2. Check the air filter on the back panel for obstruction.
3. Wipe condensation out of the chamber between runs with a sponge or clean cloth to prevent chamber icing.
4. If chamber icing occurs, defrost the system and wipe moisture out of the chamber before use. To defrost the system, install a rotor, set the temperature to 30˚C, and start the run for 2o minutes. Make sure that the chamber, chamber gasket, and door are dry before each run.

Cleaning:

* Clean the centrifuge frequently (always clean up spills when they occur to prevent corrosives or contaminants from drying on component surfaces)
* To prevent accumulations of sample, dust, and/or glass particles from broken sample tubes, keep the chamber clean and dry by frequent wiping with a cloth or paper towel
* Clean the centrifuge exterior surfaces by wiping with a cloth dampened with solution 555, dilute the detergent with 10 parts water to 1 part detergent. Do not use acetone.
* Clean the drive hub regularly using solution 555 and a soft brush
* Do not put the polycarbonate bottle in an autoclave, they are best washed by hand.

Tube breakage: if a glass tube breaks, and all the glass is not contained in the bucket or rotor, be sure to thoroughly clean the chamber. Examine the chamber basket to make sure that no glass particles are retained in it. Carefully remove any glass particles that may remain. Carefully wipe away any glass particles that remain in the chamber.

Decontamination: if the instrument or accessories are contaminated with radioactive or pathogenic solutions, follow appropriate decontamination procedures as determined by your laboratory safety officer. Contact your Beckman Coulter representative to ensure that the decontamination method does not damage any part of the instrument.

Sterilisation and disinfection: Ethanol (70%) may be used to clean any exterior surface of the centrifuge. While Beckman Coulter has tested ethanol (70%) and found that it does not damage the centrifuge, no guarantee of sterility or disinfection is expressed or implied. When sterilisation or disinfection is a concern, consult your laboratory safety officer regarding proper methods to use.

**WARNING**: Ethanol is a volatile liquid that cannot be used on or near an operating instrument due to fire hazard.

**CAUTION**: Ethanol is a flammability hazard. Do not use it in or near operating centrifuges.