Instructions For Use

Model J6-MI

Centrifuge

PN J6MI-IM-10AC
October 2012

Beckman Coulter, Inc.
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BECKMAN COULTER

Model J6-MI
Centrifuge
J6MI-IM-10AC (October 2012)

Find us on the World Wide Web at:
www.beckmancoulter.com

Made in the U.S.A.
Printed in the U.S.A.

Safety Notice

Read all product manuals and consult with Beckman Coulter-trained personnel before attempting to operate instrument. Do not attempt to perform any procedure before carefully reading all instructions. Always follow product labeling and manufacturer's recommendations. If in doubt as to how to proceed in any situation, contact your Beckman Coulter Representative.

Alerts for Warning, Caution, and Note

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and/or mechanical damage. It may also be used to alert against unsafe practices.

NOTE NOTE is used to call attention to notable information that should be followed during installation, use, or servicing of this equipment.

Safety During Installation and/or Maintenance

This centrifuge is designed to be installed by a Beckman Coulter Field Service representative. Installation by anyone other than authorized Beckman Coulter personnel invalidates any warranty covering it.

Be sure to use the anchoring system to secure the centrifuge in place. The anchoring system is designed to reduce the possibility of injury or damage which could result from instrument movement in the event of a major rotor mishap.

Any servicing of this centrifuge that requires removal of any covers can expose parts which involve the risk of electric shock or personal injury. Make sure that the power switch is turned off and the centrifuge is disconnected from the main power source, and refer such servicing to qualified personnel.

Do not replace any centrifuge components with parts not specified for use on this instrument.

Electrical Safety

To reduce the risk of electrical shock, this centrifuge uses a three-wire electrical cord and plug to connect this instrument to earth-ground. Make sure that the matching wall outlet receptacle is

properly wired and earth-grounded. Check that the line voltage agrees with the voltage listed on the name-rating plate affixed to the centrifuge.

Do not place containers holding liquid on or near the chamber door. If they spill, liquid may get into the centrifuge and damage electrical or mechanical components.

Safety Against Risk of Fire

Certain electrical circuits within this centrifuge are protected by fuses against overcurrent conditions. For continued protection against the risk of fire, replace fuses only with the same type and rating specified.

This centrifuge is not designed for use with materials capable of developing flammable or explosive vapors. Do not centrifuge such materials (for example, chloroform or ethyl alcohol) in this instrument nor handle or store them within the 30-cm (1-ft) clearance envelope surrounding the centrifuge.

Mechanical Safety

For safe operation of the equipment, observe the following:

- Use only the Beckman Coulter rotors and accessories designed for use in this centrifuge.
- Before starting the centrifuge, make sure that the rotor tie-down knob is securely fastened.
- Do not exceed the maximum rated speed of the rotor in use.
- NEVER attempt to slow or stop a rotor by hand.
- Do not lift or move the centrifuge while a rotor is installed.
- If a glass tube breaks inside the chamber, be careful when examining or cleaning the gasket or chamber, as sharp glass fragments may be embedded in their surfaces.
- NEVER attempt to override the door interlock system while the rotor is spinning.
- Do not lean on the centrifuge or place items on it while it is operating.
- To avoid pinching hands and fingers, do not place hands on or alongside the door hinge (to the left of the instrument) when opening or closing the door.

Chemical and Biological Safety

If pathogenic, toxic, or radioactive samples are intended to be used in this centrifuge, it is the responsibility of the user to ensure that all necessary safety regulations, guidelines, precautions, and practices are adhered to accordingly. Ask your laboratory safety officer to advise you about the level of containment required for your application and about proper decontamination or sterilization procedures to follow if fluids escape from their containers.

- Observe all cautionary information printed on the original solution containers prior to their use.
- Handle body fluids with care because they can transmit disease. No known test offers complete assurance that they are free of micro-organisms. Some of the most virulent—Hepatitis (B and C) and HIV (I–V) viruses, atypical mycobacteria, and certain systemic fungi—further emphasize the need for aerosol protection. Handle other infectious samples according to good laboratory procedures and methods to prevent spread of disease. Because spills may generate aerosols, observe proper safety precautions for aerosol containment. Do not run toxic, pathogenic, or radioactive materials in this centrifuge without taking appropriate safety precautions. Biosafe containment should be used when Risk Group II materials (as identified in the World Health Organization *Laboratory Biosafety Manual*) are handled; materials of a higher group require more than one level of protection.
- Dispose of all waste solutions according to appropriate environmental health and safety guidelines.

It is your responsibility to decontaminate the centrifuge and accessories before requesting service by Beckman Coulter.

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Certification

Beckman Coulter Model J6-MI centrifuges are manufactured in a facility that maintains certifications to both ISO 9001:2008 and ISO 13485:2003. They have been designed and tested to be compliant (when used with Beckman Coulter rotors) with the laboratory equipment requirements of applicable regulatory agencies. Declarations of conformity and certificates of compliance are available at www.beckmancoulter.com.

Scope of Manual

This manual is designed to familiarize you with the Model J6-MI centrifuge—its function, specifications, operation, and routine operator care and maintenance.

We recommend that you read this entire manual, especially the *Safety Notice* and all safety-related information, before operating the centrifuge or performing instrument maintenance.

- CHAPTER 1, *Description* contains a description of the centrifuge, including system controls, indicators, and specifications.
- CHAPTER 2, *Operation* summarizes procedures for operating the centrifuge.
- CHAPTER 3, *Troubleshooting* lists system diagnostic messages, together with probable causes and required corrective actions.
- CHAPTER 4, *Care and Maintenance* contains procedures for routine care and maintenance of the centrifuge and a brief list of supplies and replacement parts.
- APPENDIX A, *Preinstallation Requirements* contains instructions for preparing your site for installation of the centrifuge.

NOTE If the centrifuge is used in a manner other than specified in this manual, the safety and performance of this equipment could be impaired. Further, the use of any equipment other than that recommended by Beckman Coulter has not been evaluated for safety. Use of any equipment not specifically recommended in this manual and/or the applicable rotor manual is the sole responsibility of the user.

Conventions

Certain symbols are used in this manual to call out safety-related and other important information. These international symbols may also be displayed on the centrifuge and are reproduced on the inside back cover.

Typographic Conventions

Certain typographic conventions are used throughout this manual to distinguish names of user interface components, such as keys and displays.

- *Keynames*, such as **ROTOR** and **SPEED**, and *display names*, such as **TEMP° C** or **SPEED**, appear in bold type.

Recycling Label

This symbol is required in accordance with the Waste Electrical and Electronic Equipment (WEEE) Directive of the European Union. The presence of this marking on the product indicates:

1. the device was put on the European market after August 13, 2005 and
2. the device is not to be disposed via the municipal waste collection system of any member state of the European Union.

It is very important that customers understand and follow all laws regarding the proper decontamination and safe disposal of electrical equipment. For Beckman Coulter products bearing this label please contact your dealer or local Beckman Coulter office for details on the take back program that will facilitate the proper collection, treatment, recovery, recycling and safe disposal of the device.

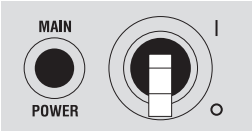
CHAPTER 1

Description

Introduction

This section describes the control panel and major instrument components.

Power



The **MAIN POWER** switch, labeled on (**I**) and off (**O**), is located below the control panel. It controls electrical power to the centrifuge. The power must be ON before the chamber door can be opened or closed.

Key Switch

A key switch is used to select one of four modes:

- **NORMAL** is selected for routine closed-door centrifugation.
- **PROGRAM LOCK** is selected for operation according to the last recalled program. Parameters cannot be changed and diagnostic messages cannot be cleared until the key is first turned to **NORMAL**.
- **LOCK** is selected to prevent use of the centrifuge.
- **ZONAL** is selected to enable open-door operation when the JCF-Z continuous flow/zonal rotor is used.

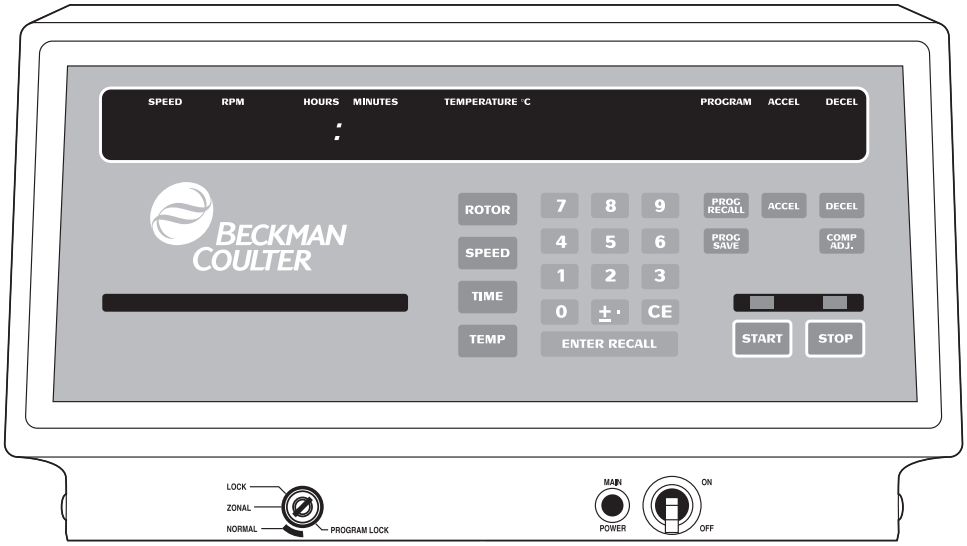
The key can be turned to any position for program selection. To lock the centrifuge mode in the desired setting, power down (**O**) the instrument, remove the active key (black) from the key switch, and insert the red key guard.

NOTE Either the active key with a black cover (B06533) or the red key guard (B06534) must be inserted in the key switch at all times when the instrument is powered on (**I**). The instrument must be powered down (**O**) before removing or inserting a key.

Control Panel

Figure 1.1 shows the control panel, which includes a video display and keys for entering run information.

Figure 1.1 The Control Panel



Parameter Keys

Parameter keys are used to enter run settings.

ROTOR	Pressed to enter the rotor code of the rotor in use (see Table 2.1). Entering the rotor code limits the speed setting to the maximum for the rotor in use.
SPEED	Pressed to enter the run speed in rpm (from 100 rpm to the maximum speed of the rotor in use).
TIME	Pressed to enter the run time (up to 99 hours 59.9 minutes; longer time entries specify continuous, or hold, operation).
TEMP	Pressed to enter the run temperature (from –20 to 40°C).
ACCEL	Pressed to enter the acceleration setting (1 through 9).
DECEL	Pressed to enter the deceleration setting (1 through 9, or 0 for a coasting stop [no brake]).

PROG RECALL	Pressed to select a program. Press **PROG RECALL** and then enter the program number (0 through 9) on the keypad.
PROG SAVE	Pressed to save run settings as a program.
COMP ADJ	Pressed to enter temperature compensation values as specified in the applicable rotor manual.

Keypad

The keypad is used to enter numerical values. It consists of the numbers 0 through 9, and **CE** and **± .** keys (described below).

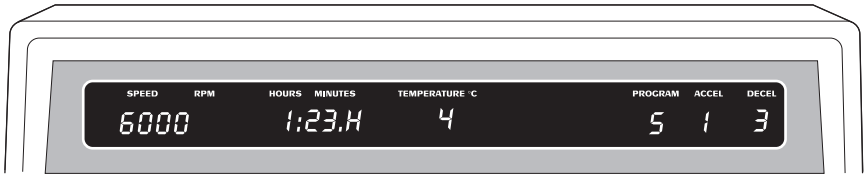
CE (clear entry key)	Used to clear the last keypad entry; to clear a parameter entry, or to clear a diagnostic message.
± . (decimal key)	This key is activated when entering **ROTOR** and **TIME** values. The minus function is activated when entering **TEMP** and **COMP ADJ** values. The minus sign is removed by pressing the **± .** key again.

System Keys

ENTER/RECALL	Pressed to store a parameter to memory (invalid entries will flash rapidly), or to display the set values for 3 seconds.
START	Pressed to start a run in **NORMAL** or **ZONAL** mode. To start a programmed run, or to repeat a run in **NORMAL** mode, press **ENTER/RECALL** then **START**.
STOP	Pressed to stop a run.

Digital Display

The digital display indicates rotor speed, run time (remaining or elapsed), temperature, program number (if selected), and acceleration and deceleration numbers. The display serves a dual purpose.



- When the power is on, the display shows the current centrifuge operating conditions.
- When a parameter key is pressed, the set values are displayed, and the display flashes to indicate that a value may be entered or changed. The display continues to flash until another parameter key or **ENTER/RECALL** is pressed.

Diagnostic Messages

Diagnostic messages are displayed on the control panel to indicate certain conditions that need attention. If an abnormal condition occurs, a diagnostic message will flash until **CE** is pressed. In certain conditions the centrifuge cannot be restarted until the condition is corrected. See CHAPTER 3, *Troubleshooting*, for detailed information on diagnostic messages and appropriate actions to take if they occur.

Drive Unit

The rotor drive spindle is belt-driven by an Ultra-Smooth induction motor. The variable frequency design of this motor provides high torque for fast acceleration rates. The brushless design and ball bearings greatly extend service life. Motor and spindle are attached to a rubber-mounted subplate to minimize noise and vibration.

If the drive belt breaks during centrifugation, the rotor will decelerate to a stop and the diagnostic message **BELT** will flash on the control panel. The centrifuge will not restart until the diagnostic message is cleared and the belt is replaced (see CHAPTER 4, *Care and Maintenance*).

NOTE Some vibration occurs as a rotor accelerates between 600 and 800 rpm. This vibration, as the rotor shifts to rotate about its center of mass, is normal. Abnormal vibration will trigger the imbalance detector.

Door Operation

The chamber door is hinged on the left and locks on the right. The door can be opened only by using the door handle and only if power is on and the rotor is stopped. The door locks when either **START** is pressed or power is turned off. The diagnostic message **DOOR** will flash on the control panel if the door is not closed when a run is started.

NOTE The door cannot be opened or closed if the power is off.

The door is opened by pulling the door latch lever forward and lifting up on the handle to open the door. Initial opening is assisted by a built-in torsion bar. When the door is about three-quarters open, a gas spring opens the door the rest of the way. The door will remain open without a support.

A small label, shown below, is located on the top left side of the chamber door above the hinge. This label indicates a potential pinch hazard if hands or fingers are placed in the hinge area when the door is being opened or closed. Operators and observers must take care to move their hands away from the hinge area when the door is opened and closed.

The rubber block on the inside of the door is provided as a hanger for a rotor windshield lid while the door is open.

In the event of a power failure, the door lock can be manually unlocked for sample recovery (see CHAPTER 3, *Troubleshooting*).

Refrigeration

The refrigeration compressor is in the lower rear of the centrifuge, and the evaporator surrounds the rotor chamber. A thermistor inside the bottom of the rotor chamber senses the temperature of the air in the chamber and causes the compressor to cycle on and off. No CFCs are used in the manufacture or operation of the Model J6-MI.

Because the system works only to cool the chamber, run temperatures above room temperature depend on frictional heating, which is a function of the rotor being used and the speed selected.

Filtered cooling air enters the system through the air intake area at the rear of the centrifuge. The airflow bracket installed on the rear of the centrifuge (Figure A.2) ensures minimum clearances for proper air flow.

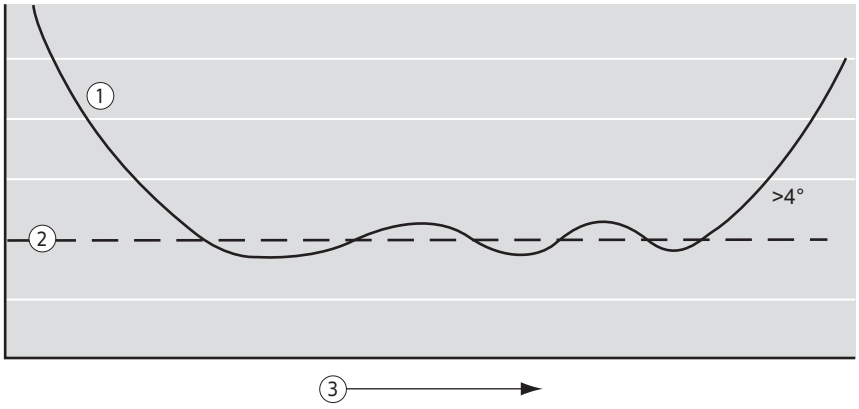
Temperature Sensing

The thermistor in the bottom of the rotor chamber continuously monitors chamber temperature. Because rotors differ in size and mass, and there is windage in the chamber, *chamber temperature* and *rotor temperature* are not the same. The microprocessor calculates the required chamber temperature to achieve the selected rotor temperature by using a set of compensation values unique to the rotor in use. During a run, the display indicates *rotor temperature* within 2°C of set temperature (after equilibration).

NOTE The **COMP ADJ** key allows the user to add to or subtract from the compensation values used by the microprocessor to calculate rotor temperature. The results of a dynamic temperature calibration may indicate that such an adjustment is necessary for temperature control within 1°C. See *Temperature Calibration* in CHAPTER 4.

The microprocessor monitors the thermistor and verifies a temperature change as the chamber cools to the required temperature (see Figure 1.2). If rotor temperature rises more than 4°C above the set temperature, or if chamber temperature exceeds 45°C, the diagnostic message **TEMP** will flash on the control panel and the rotor will decelerate to a stop.

Figure 1.2 Temperature Sensing and Control Diagram



1. Actual Temperature **2.** Set Temperature **3.** Time

Speed Control System

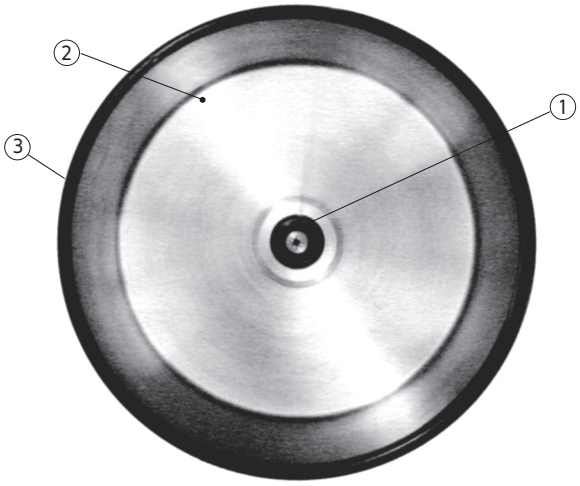
The speed control system is activated when **START** is pressed. Rotor speed is then controlled to within 20 rpm of the selected speed.

The **ROTOR** key is used to enter the rotor code into the microprocessor, which activates two additional controls: (1) speed selections greater than the rotor's maximum speed will not be accepted for the run, and (2) during the run, if the rotor exceeds its maximum speed, the diagnostic message **SPEED** will flash on the control panel and the rotor will decelerate to a stop.

Rotor Chamber

The rotor chamber is stainless steel for durability and corrosion resistance. The chamber is sealed by a silicone rubber gasket. (Instrument gaskets have not been qualified as bioseals for aerosol containment.) The rotor drive spindle and thermistor are visible in the chamber bottom (see Figure 1.3).

Figure 1.3 Interior View of the Rotor Chamber



1. Rotor Drive Spindle
2. Thermistor
3. Chamber Gasket

Specifications

Only values with tolerances or limits are guaranteed data. Values without tolerances are informative data, without guarantee.

Control Features

Description	Specification
Rotor identity	Used to limit speed to rotor maximum and provide automatic temperature control.
Speed	
Set speed	100 to 6000 rpm
Speed control	Actual rotor speed will be within 20 rpm of set speed.
Speed display	Indicates actual rotor speed in revolutions per minute in 10-rpm increments and three significant figures.
Time	
Set time	Up to 99 hours 59.9 minutes for timed runs; entries greater than 99 hr 59.9 min signal "**hold**" or continuous operation.
Time display	Indicates time remaining for timed runs, time elapsed for continuous operation.

Rotor temperature	
Set temperature	–20 to 40°C
Temperature control	±2° for temperature from 0° to ambient, after equilibration.[a] Temperature control at higher or lower temperatures depends on the rotor and speed used (some rotors have a narrower range of temperature control).
Temperature display	Indicates rotor temperature in degrees Celsius in 1-degree increments.
Acceleration	Select from 9 acceleration rates (including maximum acceleration).
Deceleration	Select from 9 deceleration rates (including maximum dynamic braking, or a coasting stop from full speed).
Operating modes	Key switch selects **NORMAL**, **PROGRAM LOCK**, or **ZONAL** operation.

a. Temperature equilibration refers to bringing the centrifuge chamber, rotor, and sample — the whole system — to the set temperature before the run begins. Equilibration is optimized by precooling or prewarming the rotor and sample and then running the system at the required run temperature at a low speed (below 2000 rpm) for at least 30 minutes. The time required to reach equilibration is based on several factors, including ambient temperature, rotor size, and centrifuge chamber and rotor starting temperatures. *The minimum system equilibration time, if the rotor is not precooled or prewarmed, is 30 minutes.*

Operational Features

Description	Specification
Diagnostic Messages	Interlocks prohibit drive operation in the event of certain malfunctions. See CHAPTER 3, *Troubleshooting*.
Drive Unit	High-torque, variable-frequency induction motor; belt-driven rotor spindle.

Physical Data

Description	Specification
Weight (uncrated)	252 kg (555 lb)
Height	
to chamber door	91.0 cm (35 1/2 in.)
to top of control panel	127.0 cm (50 in.)
to top of door (open)	160.0 cm (63 in.)
Width	71.1 cm (28 in.)
Depth	83.8 cm (33 in.)
Minimum clearances	
both sides and rear	15.0 cm (6 in.)
Diameter of rotor chamber	58.0 cm (23 in.)
Power and Fusing	See *Electrical Requirements* in APPENDIX A

Electrical Supply	Class I
Finish	Urethane paint on chamber door, acrylic baking enamel on other surfaces, Mylar[a] on control panel.
Maximum heat dissipation into the room	1.9 kW (7000 Btu/hr)
Humidity restrictions	<95% (noncondensing)
Noise level 2.4 m (8 ft) in front of instrument	<68 dBa
Installation (overvoltage) category	II
Pollution degree	2[b]

a. A registered trademark of E.I. Du Pont de Nemours & Company.

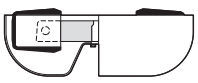
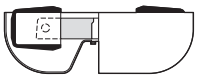
b. Normally only nonconductive pollution occurs; occasionally, however, a temporary conductivity caused by condensation must be expected.

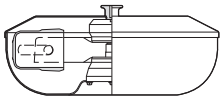
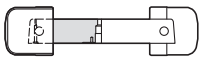
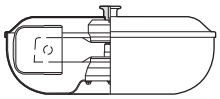
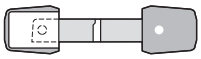
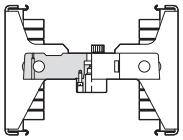
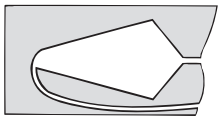
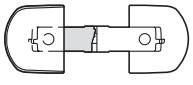
The centrifuge has been designed and tested to operate safely indoors at altitudes up to 2000 m (6252 ft).

The centrifuge will operate within specifications in a laboratory with ambient temperatures ranging from 16 to 38°C.

Available Rotors

Refer to the applicable rotor manual for complete rotor descriptions.

Rotor Profile	Description	Max RPM[a]	Max RCF ($\times g$)	Max Capacity	Rotor Manual Number
	JS-5.2 Swinging Bucket (4 place) r_{max} = 226 mm	5200	6840	4 × 1 L 4 blood bags 12 microplates 148 RIA tubes	J6-TB-006
	JS-4.2 Swinging Bucket (6 place) r_{max} = 254 mm	4200	5020	6 × 1 L 6 blood bags 18 microplates 336 RIA tubes	J6-TB-007

Rotor Profile	Description	Max RPM[a]	Max RCF (× *g*)	Max Capacity	Rotor Manual Number
	JS-4.2A Swinging Bucket (6 place) r_{max} = 254 mm	4200	5020	6 × 1 L 6 blood bags 18 microplates 336 RIA tubes	J6-TB-034
	JS-4.2SM Swinging Bucket (6 place) r_{max} = 248 mm	4200	4900	6 triple or quad pack blood bags	J6-TB-007
	JS-4.2SMA Swinging Bucket (6 place) r_{max} = 248 mm	4200	4900	6 triple or quad pack blood bags	J6-TB-034
	JS-4.0 Swinging Bucket (4 place) r_{max} = 226 mm	4000	4040	4 × 1 L 4 blood bags 12 microplates 148 RIA tubes	J6-TB-006
	JS-3.0 Swinging Bucket (6 place) r_{max} = 254 mm	3000	2560	6 × 1 L 6 blood bags 18 microplates 336 RIA tubes	J6-TB-007
	JR-3.2 Rack-Type (4 place) r_{max} = 199 mm	3200	2280	320 RIA tubes in gamma-counter racks	J6-TB-005
	JE-6B Elutriation Rotor r_{max} standard chamber = 125 mm Sanderson chamber = 126 mm	6000	5040 5080	4.2 mL 4.8 mL	JE6B-IM
	JE-5.0 Elutriation Rotor r_{max} large chamber = 168 mm standard chamber = 125 mm Sanderson chamber = 125 mm	5000	2410	40 mL 4 mL 5.5 mL	JE5-IM

a. Maximum speeds are based on a solution density of 1.2 g/mL with the following exceptions: the JE-5.0 and JE-6B rotors are rated for a density of 3 g/mL.

CHAPTER 2

Operation

Introduction

This section contains detailed centrifuge operating procedures. If you are an experienced user of this centrifuge, you may turn to the summary provided at the end of this section for a quick review of operating steps.

Refer to the applicable rotor manual for instructions on preparing the rotor and labware for centrifugation.

⚠ WARNING

Normal operation may involve the use of solutions and test samples that are pathogenic, toxic, or radioactive. Handle infectious samples according to good laboratory procedures and methods to prevent spread of disease. Because spills may generate aerosols, observe proper safety precautions for aerosol containment. Do not run toxic, pathogenic, or radioactive materials in this centrifuge without taking appropriate safety precautions. Biosafe containment should be used when Risk Group II materials (as identified in the World Health Organization *Laboratory Biosafety Manual)* are handled; materials of a higher group require more than one level of protection.

⚠ WARNING

The centrifuge must not be run near flammable liquids or vapors, and such materials should not be run in the centrifuge. Do not lean on the centrifuge or place items on it while it is operating.

Preparation and Loading

For fast temperature equilibration, cool or warm the rotor to the required operating temperature before the run.

1 Turn the power switch on (**I**).

2 Install the rotor according to the instructions in the applicable rotor manual.

a. Always run the rotor with a balanced load.

b. Do not install a cold rotor on a wet hub; the rotor may stick to the hub.

3 Close the chamber door.

⚠ CAUTION

Do not drop the rotor onto the drive hub. The shaft can be bent if the rotor is forced sideways or dropped onto the hub. Install the rotor by centering it over the hub and carefully lowering it straight down.

Normal and Program Lock Modes

The Model J6-MI can operate in the **NORMAL**, **PROGRAM LOCK**, or **ZONAL** modes. The modes are selected by turning the key to the required position. To lock the centrifuge mode in the desired setting, power down (**O**) the instrument, remove the active key (black) from the key switch, and insert the red key guard.

- **NORMAL** mode is used for routine operation. Entering run settings in the **NORMAL** mode is discussed on the following pages.
- In **PROGRAM LOCK** mode, the control panel is disabled and the centrifuge operates according to settings in the last recalled program. See the description of the **PROG RECALL** and **PROG SAVE** keys, later in this section, for instructions on setting up, saving, and recalling programs.
- **ZONAL** mode enables open-door operation for loading and unloading the JCF-Z Continuous Flow/Zonal rotor while the rotor is spinning.

Entering Run Parameters

If necessary, turn the active key (black) to the **NORMAL** position. Then enter the run parameters, following the instructions below.

ROTOR

To enter the rotor code for the installed rotor:

1 Press **ROTOR**.

The "**ROTOR**" display flashes.

2 Use the keypad to enter the rotor code for the installed rotor (Table 2.1).

> **Example:** To enter the JS-4.2 rotor,
> press **4** and "**4**" flashes
> press **±.** and "**4.**" flashes
> press **2** and "**4.2**" flashes

3 Check the display.

a. If the entry is incorrect, press **CE** and reenter the rotor code.

4 Press **ENTER/RECALL** or press another parameter key to save the rotor code.

Table 2.1 Rotor Codes

J6 Series Rotors	ROTOR Entry Code	Maximum Speed (rpm)
JE-6B	6.0	6000
JE-5.0	5.2	5000
JS-5.2	5.2	5200
JS-4.2	4.2	4200
JS-4.2A	4.2	4200
JS-4.2SM	4.2	4200
JS-4.2SMA	4.2	4200
JS-4.0	4.0	4000
JR-3.2	3.2	3200
JS-3.0	3.0	3000

SPEED

To enter or modify the run speed:

1 Press **SPEED**.

The **SPEED** display flashes.

2 Use the keypad to enter the required run speed (100 to 6000 rpm)

> **Example:** To enter 5200 rpm,
> press **5** and "**5**" flashes
> press **2** and "**52**" flashes
> press **0** and "**520**" flashes
> press **0** and "**5200**" flashes

3 Check the **SPEED** display.

a. If the entry is incorrect, press **CE** and enter the correct value.

4 Press **ENTER/RECALL** or press another parameter key to save the run speed.

If the run speed is greater than that permitted for the selected rotor, the digits will flash rapidly to indicate the error.

a. Press **CE** and enter a valid run speed.

The run speed can be changed at any time during the run (except when the key switch is in the **PROGRAM LOCK** position), and the rotor will accelerate or decelerate to the new speed.

TIME

To enter or modify the run time:

1 Press **TIME**.

The **TIME** display flashes.

2 Use the keypad to enter the required run time (0 to 99 hours 59.9 minutes).

a. For a continuous (hold) run, enter 9999. Tenths of minutes are entered by first pressing **±.**

> **Example:** To enter 1 hr, 20 min,
> press **1** and ": **1.0**" flashes
> press **2** and ":**12.0**" flashes
> press **0** and "**1:20**" flashes
> press **0** and "**1:20.0**" flashes
> To add 0.5 min to this time,
> press **±. 5** and "**1:20.5**" flashes

> **Example:** To designate a hold run,
> press **9 9 9 9** and "**99.99.0**" flashes

3 Check the **TIME** display. If the entry is incorrect, press **CE** and enter the correct value.

4 Press **ENTER/RECALL** or press another parameter key to save the run time.

In a timed run, the **TIME** display will show the time remaining in the run. (The display counts down in tenths of minutes, changing every 6 seconds.) The time begins counting down after **START** has been pressed, and the run ends when the time value reaches zero.

In a hold run, the **TIME** display will show the time elapsed in the run. (The display counts up in minutes, changing every minute.) The time begins counting up after **START** is pressed; a capital **H** is displayed in the "tenths" position. Press **STOP** to end a hold run.

TEMP

To enter or modify the run temperature:

1 Press **TEMP**.

The **TEMPERATURE** display flashes.

2 Use the keypad to enter the required run temperature (-20 to 40°C).

a. Press **±.** for a minus sign.

b. (Press **±.** again to remove the minus sign.)

> **Example:** To enter –4°C,
> press **±.** and "**–0**" flashes
> press **4** and "**–4**" flashes

3 Check the **TEMPERATURE** display.

a. If the entry is incorrect, press **CE** and enter the correct value.

4 Press **ENTER/RECALL** or press another parameter key to save the run temperature.

During the run, the display will indicate *rotor* temperature after equilibration. To verify the accuracy of the temperature control system, perform a temperature calibration procedure as described in CHAPTER 4, *Care and Maintenance*.

ACCEL and DECEL

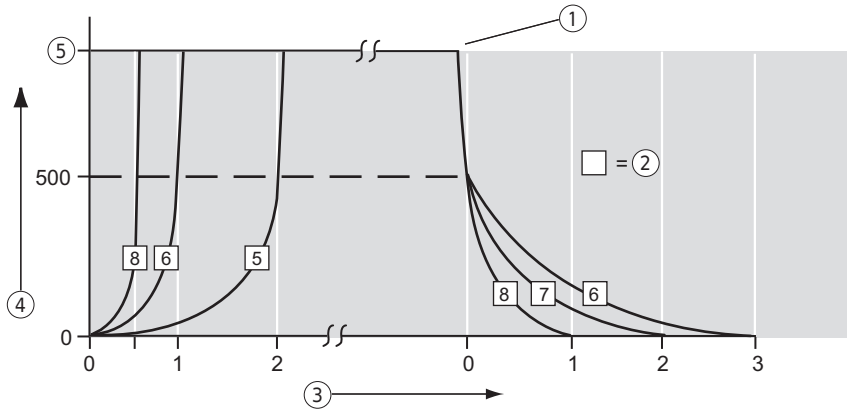
The acceleration and deceleration settings 1 through 9 are described in Table 2.2 and are depicted graphically in Figure 2.1. The selected acceleration and deceleration rates are displayed in the **ACCEL** and **DECEL** displays. If no rates are selected, the maximum rates will be selected automatically and *no numbers will appear in the displays.*

Table 2.2 Acceleration and Deceleration Settings

ACCEL/DECEL Settings	ACCEL time from 0 to 500 rpm (maximum ACCEL used above 500 rpm)	DECEL time from 500 to 0 rpm (full brake used from set speed to 500 rpm)
1	10 min	15 min
2	6 min	12 min
3	4 min	9 min
4	3 min	6 min
5	2 min	4 min
6	1 min	3 min
7	45 sec	2 min
8	30 sec	1 min
9[a]	15 sec	30 sec

a. Not achieved with heavy rotors.

Figure 2.1 Examples of ACCEL and DECEL Settings



1. Run Terminates
2. Keypad Digit
3. Time (minutes)
4. Speed (rpm)
5. Set Speed

To enter or modify an acceleration setting:

1. Press **ACCEL**.

   The **ACCEL** display flashes.

2. Use the keypad to enter an acceleration setting (1 through 9).

3. Check the **ACCEL** display.

   a. If the entry is incorrect, press **CE** and reenter the setting.

4. Press **ENTER/RECALL** or press another parameter key to save the acceleration setting.

To enter or modify a deceleration setting:

1. Press **DECEL**.

   The **DECEL** display flashes.

2. Use the keypad to enter a deceleration setting (1 through 9).

   a. For a coasting stop (no brake) from maximum speed, select "**0**".

3. Check the **DECEL** display.

   a. If the entry is incorrect, press **CE** and reenter the setting.

4. Press **ENTER/RECALL** or press another parameter key to save the deceleration setting.

   NOTE To clear an **ACCEL** or **DECEL** setting, press **ACCEL** or **DECEL**, **CE** and **ENTER/RECALL**. The number will disappear from the display, and the maximum rate will be used for the run.

COMP ADJ

The **COMP ADJ** key is used to add to or subtract from the temperature compensation values used by the microprocessor to calculate rotor temperature. Its use is optional.

If the results of a dynamic temperature calibration (described in CHAPTER 4, *Care and Maintenance*) indicate that the rotor is warmer or cooler than the displayed temperature, use the **COMP ADJ** key to adjust the temperature compensation values. For example, if a dynamic calibration shows that the rotor is –6°C and the display showed –4°C, the rotor was too *cold* and 2°C should be added to the compensation values (that is, +2 is the **COMP ADJ** value). If the rotor is too *warm*, subtract the temperature difference (that is, use negative **COMP ADJ** digits).

To add or subtract from the temperature compensation value:

1 Press **COMP ADJ**.

The word "**COMP**" flashes below the **TEMPERATURE** display and the display flashes.

2 Use the keypad to enter the digit(s) representing the temperature compensation adjustment.

a. Press **±.** for a minus sign.

The plus sign is not displayed.

b. (Press the key a second time to remove the minus sign.)

3 Check the **TEMPERATURE** display.

a. If the entry is incorrect, press **CE** and reenter the digit(s).

4 Press **ENTER/RECALL** or press another parameter key to save the temperature compensation adjustment.

NOTE To clear a **COMP ADJ** entry, press **COMP ADJ**, **0**, and **ENTER/RECALL**.

PROG RECALL and PROG SAVE

Up to ten sets of run parameters, called programs, can be stored in instrument memory. Programs are stored and recalled by keypad number. Programs are retained when the power is turned **OFF**, and are NOT cleared by pressing **CE**.

To recall a stored program:

1 Press **PROG RECALL**.

2 Use the keypad to enter the program number (0 through 9).

The run parameters for that program will be displayed for 3 seconds.

a. The program can then be displayed by pressing **ENTER/RECALL**.

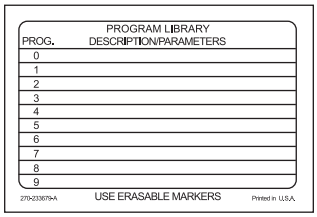
b. (You must press **ROTOR** and **COMP ADJ** to display those entries.)

c. To start the run using the program, press **START**.

- If run parameters have not been entered for a selected program number, the number will continue to flash in the **PROGRAM** display.

- Zeros will be displayed for all of the parameters except temperature, which will show 25°C (the default value).
- See below for instructions on entering or modifying run parameters in a program.

NOTE Erasable labels are provided to record the program library. The labels may be affixed to the centrifuge next to the control panel.



To enter or modify a program:

1 Press **PROG RECALL**.

2 Use the keypad to enter a program number (0 through 9).

3 Press a parameter key (for example, **SPEED**).

Both the **PROGRAM** display and the display corresponding to the key pressed will flash.

4 Use the keypad to enter the required setting.

NOTE DO NOT press **ENTER**/**RECALL** to save the setting. Pressing **ENTER**/**RECALL** will enter the setting into the microprocessor but NOT into the program memory.

a. If you change the **ROTOR** selected, you must reenter a speed.

5 Press the next parameter key (for example, **TEMP**).

By doing so, the previously entered setting is saved, and the microprocessor is ready for the next setting.

a. Repeat step 4.

6 When all the run parameters have been entered, press **PROG SAVE**.

- The number in the **PROGRAM** display flashes twice as the settings are stored in the program.
- The run parameters appear in the displays for 3 seconds and can then be recalled by pressing **ENTER**/**RECALL**.

7 To start the run using the program, press **START**.

The procedure above discusses how to modify a program and save the changes. The instructions below describe how to change one or more run program settings for a single run, without saving the changes.

To modify a program for a single run:

1 Press **PROG RECALL**.

2 Use the keypad to enter the program number (0 through 9).

3 Press a parameter key (for example, **SPEED**).

Both the **PROGRAM** display and the display corresponding to the key pressed will flash.

4 Use the keypad to enter the required setting.

a. If you change the **ROTOR** selected, you must re-enter a speed.

5 Press **ENTER/RECALL.**

- The setting will be accepted by the microprocessor but will not be saved to the program memory.
- The parameters for the run will be displayed for 3 seconds. The **PROGRAM** display then clears, indicating that the centrifuge is not running from program memory.

6 Repeat steps 3 through 5 to change any other settings.

7 To start the run using this set of parameters, press **START.**

START

1 Press **START** to start a run.

The green light above the switch indicates that the rotor is accelerating or at speed.

a. (For repeat runs and all runs in the **PROGRAM LOCK** mode, press **ENTER/RECALL** then **START** to start the run.)

STOP

1 Press **STOP** to end a run.

- The green light above the switch indicates that the rotor is decelerating.
- The light goes out and a tone sounds when the rotor stops.

Summary of Model J6-MI Operating Steps

To operate in the NORMAL mode:

1 Using the active key (black) in the key switch, turn the key to the **NORMAL** position.

2 Enter the required settings for **ROTOR**, **SPEED, TEMP**, and **TIME**.

3 Select **ACCEL**, **DECEL**, and **COMP ADJ** settings as required.

4 Press **START**. Press **STOP** to end a hold run.

Timed runs will end when the **TIME** display reaches zero.

5 After the rotor stops, as signaled by the audible tone, open the chamber door and remove or empty the rotor.

a. To repeat the run, press **ENTER**/**RECALL**, then **START**.

Enter program run settings following the directions for use of the **PROG RECALL** and **PROG SAVE** keys, earlier in this section. Then put the centrifuge in **PROGRAM LOCK** mode and recall and run the program as follows.

To operate in the PROGRAM LOCK mode:

1 Press **PROG RECALL**.

2 Use the keypad to enter a program number (0 through 9).

3 Turn the key switch to **PROGRAM LOCK**.

If required remove the active key (black) and replace it with the red key guard.

NOTE Either the active key with a black cover (B06533) or the red key guard (B06534) must be inserted in the key switch at all times when the instrument is powered on (**I**). The instrument must be powered down (**O**) before removing or inserting a key.

- In the **PROGRAM LOCK** mode, **ENTER**/**RECALL**, **START**, and **STOP** are the only functional control panel keys.
- Run parameters cannot be changed and diagnostic messages cannot be cleared until the key is turned to **NORMAL**.

NOTE If **STOP** is used to end a **PROGRAM LOCK** run, the diagnostic message **RESET** will flash on the control panel. To clear the message, first turn the active key (black) to **NORMAL**, then press **CE**.

CHAPTER 3

Troubleshooting

Introduction

This section discusses diagnostic messages, together with probable causes and recommended actions. Other troubleshooting procedures are also provided.

Diagnostic Messages

In the event of certain abnormal conditions, one of the diagnostic messages shown in Figure 3.1 will flash on the control panel. The message will flash until the **CE** key is pressed (see Table 3.1). In the case of the **BELT**, **DOOR**, **IMBAL**, and **SPEED** diagnostics, the drive cannot be restarted until the condition is corrected.

If the key switch is in the **PROGRAM LOCK** position, turn the active key (black) to **NORMAL** and then press **CE** to clear a flashing message.

Figure 3.1 Location of the Diagnostic Messages on the Control Panel

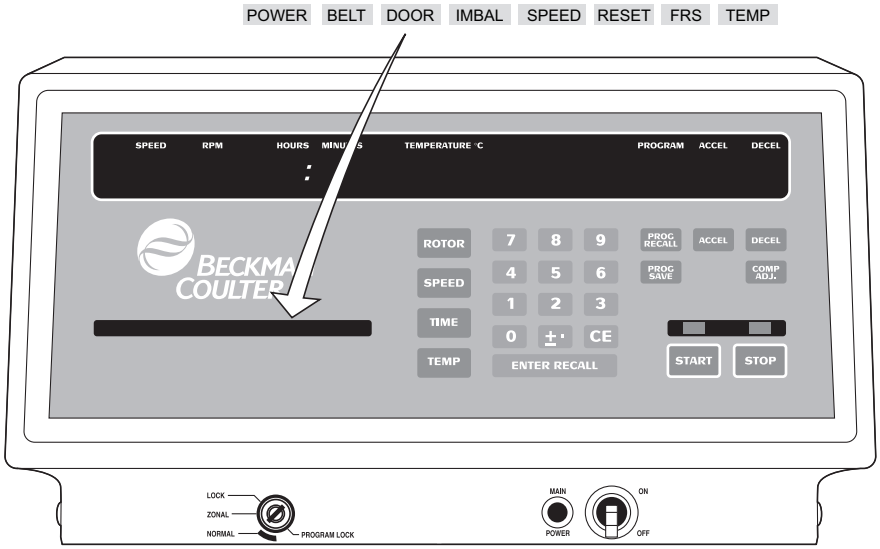


Table 3.1 Diagnostic Messages

Message	Problem	Recommended Action
POWER	There was a power failure.	If facility power failed only momentarily, the rotor will accelerate back to speed and the run will continue. The **POWER** message flashes until **CE** is pressed, alerting the operator of the interruption. If the power failure was long enough to allow the rotor to coast to a stop, the run will not continue when power is restored. Press **CE**, **ENTER**/**RECALL**, and **START** to restart the run.
BELT	The drive belt is broken.	Allow the rotor to coast to a stop (wait at least 20 minutes). The drive belt must be replaced before the centrifuge will operate again. Instructions are provided in *Maintenance* in CHAPTER 4. Press **CE** and turn **POWER OFF.**
DOOR	The chamber door is open.	Close the chamber door. Press **CE**, **ENTER**/**RECALL**, and **START**.
IMBAL	The rotor is not loaded symmetrically.	Allow the rotor to brake to a stop. Then open the door and check the rotor for proper loading. Do not restart the run until you are sure the rotor is symmetrically loaded. To restart the run, press **CE**, **ENTER**/**RECALL**, and **START**.
SPEED	There is an electronics malfunction.	Call Beckman Coulter Field Service.
RESET	The **STOP** key was pressed while operating in **PROGRAM LOCK** mode.	The rotor will decelerate according to the program. Refer to *Normal and Program Lock Modes* in CHAPTER 2 for instructions on using the active key and key guard to change the program mode. To clear the message, turn the key to **NORMAL**, then press **CE**. To start the next run, turn the key back to **PROGRAM LOCK**, then press **ENTER**/**RECALL** and **START**.
TEMP	The refrigeration system is not cooling and the chamber temperature has exceeded 50°C.	The rotor will decelerate to a stop. Press **CE** and turn **MAIN POWER** off. Call Beckman Coulter Field Service; there has been a refrigeration malfunction.

Other Problems

Table 3.2 lists other problems and the recommended actions to take to correct them. If the problem persists, contact the Beckman Coulter Customer Technical Support Center* for assistance.

* Call 1-800 742-2345 (USA or Canada) or contact your local Beckman Coulter Representative.

Table 3.2 Other Problems

Problem	Recommended Action
Rotor seems too warm or too cold.	To verify the accuracy of temperature control, perform a dynamic temperature calibration (described in *Maintenance* in CHAPTER 4). It may be necessary to adjust the automatic temperature compensation when using the rotor at the selected speed and temperature. Low temperatures cannot be achieved with all rotors at all speeds.
Centrifuge will not start.	1. Check the key switch. The centrifuge will not operate with the key in the **LOCK** position. Refer to *Normal and Program Lock Modes* in CHAPTER 2 for instructions on using the active key and key guard to change the program mode. 2. Press **ENTER/RECALL**, then **START.** 3. Clear any flashing messages. 4. Be sure to enter **ROTOR**, then **SPEED**, **TIME**, and **TEMP**. (When **ROTOR** is entered, the run speed automatically resets to zero.)
Rotor is stuck to drive spindle hub.	Allow the rotor to come to room temperature and then try to remove it. If a J6 rotor is still stuck, call Beckman Coulter Field Service. If a J2 series rotor is stuck, use the T-bar removal tool (338896). First remove the rotor lid. Then screw the removal tool into the center of the rotor to separate the rotor from the spindle. To avoid this problem, keep the rotor spindle hub lightly lubricated with Spinkote.

To Access the Centrifuge in Case of Power Failure

⚠ WARNING

Any maintenance procedure requiring removal of a panel exposes the operator to the possibility of electrical shock and/or mechanical injury. Therefore, turn the power off (O) and disconnect the centrifuge from the main power source, and refer such maintenance to qualified service personnel.

⚠ WARNING

Before performing this procedure, verify that the rotor is not spinning by listening carefully for any noise coming from the chamber. Proceed only if the centrifuge is quiet. Never attempt to override the door interlock system while the rotor is spinning.

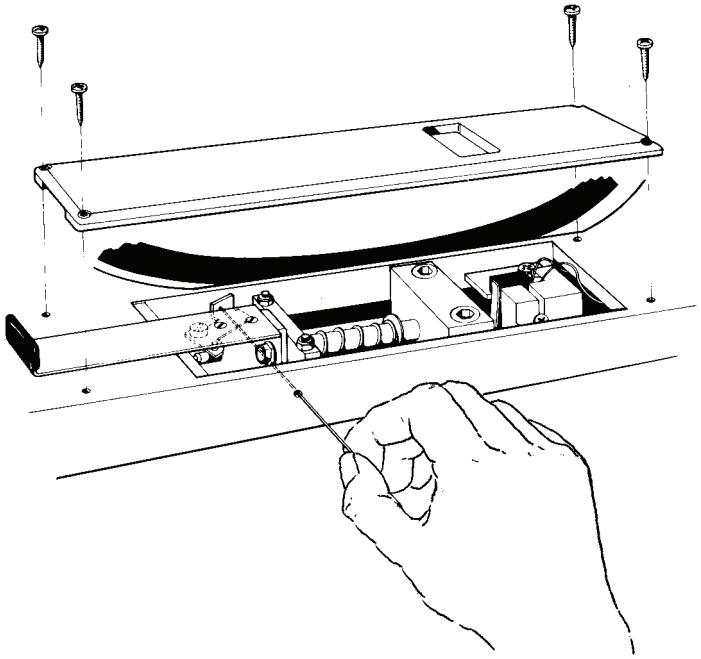
If the facility power fails only momentarily, the centrifuge will resume operation when the power is restored and the rotor will return to the set speed. In the event of an extended power failure, it may be necessary to override the door-locking mechanism manually to remove the rotor and retrieve your sample.

⚠ WARNING

Never try to slow or stop the rotor by hand.

Allow at least 20 minutes for the rotor to coast to a stop. (The digital display and the brake will be inoperative with the power off.) To trip the door lock, insert a thin wire such as a straightened paper clip one inch *straight* through the hole below the chamber door handle (see Figure 3.2). While holding the wire in the hole, pull the door latch lever forward and then lift up on the handle. Remove your sample.

Figure 3.2 Tripping the Door Lock



CHAPTER 4

Care and Maintenance

Introduction

This section describes routine care and maintenance procedures that you should perform regularly or as required. For maintenance not covered in this manual, contact the Beckman Coulter Customer Technical Support Center Refer to the applicable rotor manual and to* Rotors and Tubes for J Series Rotors *(publication JR-IM) for instructions on the care of rotors and accessories.*

NOTE It is your responsibility to decontaminate the centrifuge, as well as any rotors and accessories, before requesting service by Beckman Coulter.

⚠ WARNING

Do not use alcohol or other flammable substances in or near operating centrifuges.

Maintenance

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

1 Regularly inspect the interior of the centrifuge chamber for accumulations of sample, dust, or glass particles from broken sample tubes.

a. Clean as required (see *Cleaning* below).

* Call 1-800 742-2345 (USA or Canada) or contact your local Beckman Coulter representative.

Defrosting

Perform the following steps to minimize icing in and remove condensation from the rotor chamber.

1. Clean the chamber door between runs to reduce condensation.

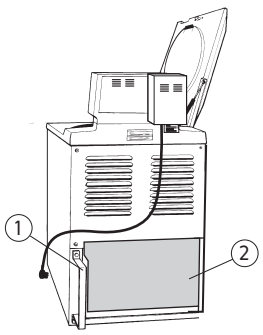
2. Use a clean cloth or sponge to wipe condensation out of the chamber between runs to prevent icing.

3. Defrost the chamber *daily* by leaving the door open with the power off (**O**) overnight.
   a. Wipe moisture from the chamber before use.

4. To remove icing quickly, set the temperature to 40°C and run a rotor at maximum speed for 5 minutes.
   a. Remove the rotor and sponge up the moisture.

Replacing the Filter

1. Check the air filter regularly and replace it every three months or as required.
   - Efficiency of the refrigeration system may be seriously reduced by buildup of dust on the filter.
   - The air filter is not fastened to the centrifuge, so no tools are required for removal or installation.



1. Airflow Bracket

2. Air Intake Filter

2. To remove the air filter, hold the side edges and lift the filter straight up until the bottom edge is above the centrifuge bottom retaining strip.
   a. Pull the filter out, bottom edge first, and discard it.

3 Install a new filter (885218) or use any commercially available filter (400 × 600 mm; 16 × 25 in.).

- **a.** The filter has a directional arrow on one of its edges; install the filter with this arrow pointing toward the centrifuge.
- **b.** Holding the filter by the side edges, insert the top half behind the frame edge and lift up until the bottom half clears the lower frame edge.
- **c.** Then set the bottom edge down.

Cleaning

Frequent cleaning is recommended to prolong the life of the centrifuge. Always clean up spills when they occur to prevent corrosives or contaminants from drying on component surfaces.

NOTE Before using any cleaning or decontamination methods except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment.

1 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.

- **a.** For thorough cleaning, wash the chamber using a mild detergent such as Solution 555.
  Dilute the detergent with water (10 parts water to 1 part detergent).
- **b.** Rinse thoroughly and dry completely.
- **c.** Clean the chamber gasket regularly but do not lubricate it.

2 Clean the centrifuge exterior surfaces by wiping with a cloth dampened with Solution 555.
Dilute the detergent with water (10 parts water to 1 part detergent).
Do not use acetone.

3 The control panel is coated with a mylar finish. Use only a cloth dampened with water on the control panel.

4 Clean the drive spindle hub regularly using Solution 555 and a soft brush.

- **a.** Dilute the detergent with water (10 parts water to 1 part detergent).
- **b.** Rinse thoroughly and dry completely.
- **c.** Lubricate the hub with Spinkote to prevent rotors from sticking.

Tube Breakage

If a glass tube breaks, and all the glass is not contained in the bucket or rotor, carefully clean the interior of the chamber.

⚠ WARNING

Be careful when examining or cleaning the chamber and chamber gasket, as sharp glass fragments may be embedded in their surfaces.

1 Examine the chamber gasket to make sure that no glass particles are retained in it.

a. Carefully remove any glass particles that may remain.

2 Carefully wipe away any glass particles that remain in the chamber.

Decontamination

If the centrifuge and/or accessories are contaminated with radioactive or pathogenic solutions, follow appropriate decontamination procedures as determined by your laboratory safety officer. Refer to *Chemical Resistances* (publication IN-175) to be sure the decontamination method will not damage any part of the instrument.

Sterilization and Disinfection

The centrifuge door is finished with urethane paint; other surfaces are finished with vinyl paint. Ethanol (70%) may be used on these surfaces. See publication IN-175 for chemical resistances of centrifuge and accessory materials.

⚠ CAUTION

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

While Beckman Coulter has tested these methods and found that they do not damage the centrifuge, no guarantee of sterility or disinfection is expressed or implied. When sterilization or disinfection is a concern, consult your laboratory safety officer regarding proper methods to use.

Replacing the Drive Belt

1 If the diagnostic message **BELT** is flashing on the control panel, replace the drive belt.

a. When the **SPEED** display indicates 0 rpm, turn the power off.

⚠ WARNING

Any maintenance procedure requiring removal of a panel exposes the operator to the possibility of electrical shock and/or mechanical injury. Therefore, turn the power off (O) and disconnect the centrifuge from the main power source, and refer such maintenance to qualified service personnel.

2 Remove the lower front panel by unscrewing the two nuts under the bottom edge of the panel with a 12-mm (7/16-in.) wrench.

a. Visually confirm that the pulleys have stopped turning (see Figure 4.1).

3 Find the broken belt and remove it.

4 Locate the gray cable labeled "**R**" under the spindle pulley (see Figure 4.1).

a. Squeeze the tabs on the plastic connector labeled "**RTR**" and pull the connector apart.

5 To install a new belt (878821), first put the gray cable through the belt and then fit the belt into the spindle pulley groove.

Keep the serrated surface of the belt to the outside.

a. With your left hand, hold the belt taut, stretching it toward the motor pulley.

b. With your right hand, push against the motor to extend the spring, then fit the belt into the groove around the motor pulley.

c. Gradually release the motor, and spring tension will tighten the belt.

6 Turn the motor pulley three or four turns to the right (clockwise) to be sure the belt is in the groove and not twisted.

7 Reconnect the "**RTR**" plastic connector.

8 Locate the drive belt safety interlock.

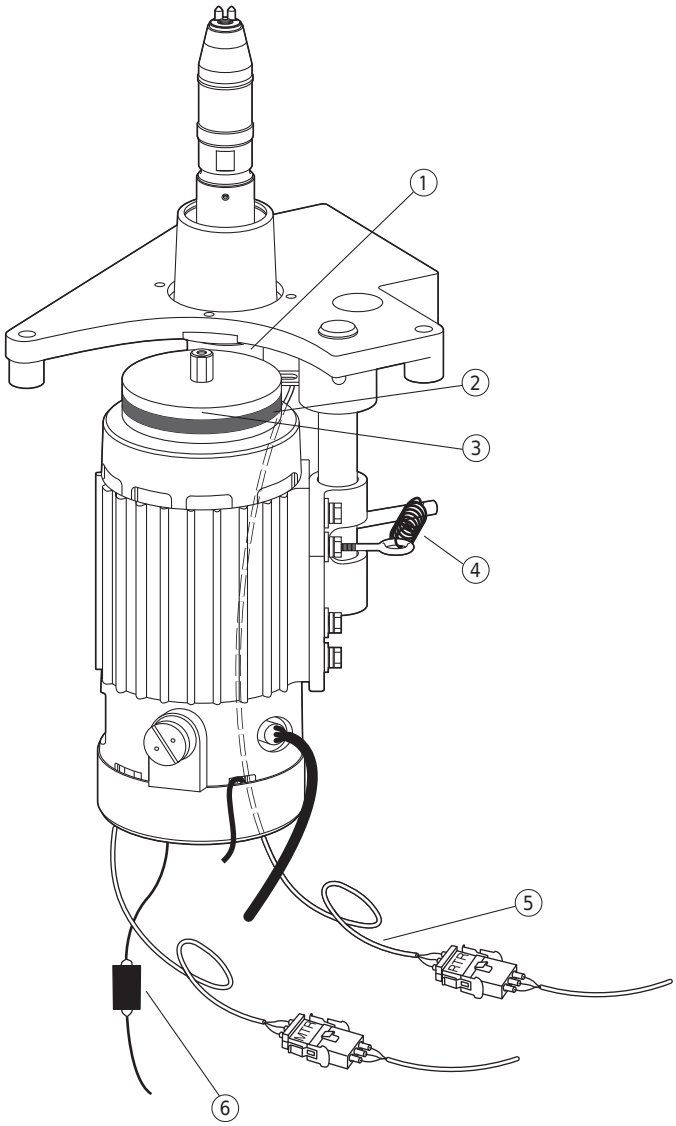
a. Reconnect it.

9 Install the front panel and then reconnect the centrifuge to the power source.

10 Turn the power on (**I**), press **CE**, and make a brief test run—accelerate to speed and then decelerate—to verify that the centrifuge functions normally.

If a problem persists, contact Beckman Coulter Field Service for assistance.

Figure 4.1 Replacing the Drive Belt



1. Spindle Pulley
2. Drive Belt
3. Motor Pulley
4. Spring
5. Grey Cable (labeled R)
6. Belt Safety interlock

Temperature Calibration

The following dynamic temperature calibration procedure will verify the accuracy of the temperature sensing and refrigeration systems. Perform this procedure when temperature control within ±1°C is required.

Test the rotor at the run speed and temperature required for sample separation. You will need a thermometer calibrated in 0.2°C, and two large bottles or tubes of water. *Precool* the rotor and water to the run temperature.

1. Turn the power on (I), and turn the key switch to **NORMAL**.

   Refer to *Normal and Program Lock Modes* in CHAPTER 2 for instructions on using the active key and key guard to change the program mode.

2. Open the chamber door and install the precooled rotor.
   - **a.** Load two tubes or bottles containing equal volumes of water into opposing rotor positions.
   - **b.** Then close the chamber door.

3. Enter the **ROTOR** code.

4. Enter values for **SPEED** and **TEMP**.
   - **a.** Enter **9999** for **TIME**.

5. Press **START**.

6. After about one hour of centrifugation record the temperature in the digital display.
   - **a.** Then press **STOP**.

7. As soon as the **STOP** light goes out, open the chamber door and immerse the thermometer into one of the water-filled containers to precool it.
   - **a.** Then measure and record the temperature of the second water-filled container.

8. Compare the two recorded temperatures.
   - **a.** If the rotor temperature is warmer or cooler than the *displayed* temperature, add or subtract the temperature difference using the **COMP ADJ** key when repeating these run conditions.
   - **b.** If the rotor is warmer, enter negative digits.

c. If the rotor is cooler, enter positive digits. (A plus sign is not displayed.)

d. Refer to the discussion under ***COMP ADJ*** in CHAPTER 2, *Operation*.

This calibration procedure should be performed for each rotor at run speed and temperature before using the **COMP ADJ** key. Once determined, enter the **COMP ADJ** digits each time a run is repeated using the same rotor and run conditions.

Moving and Storing the Centrifuge

If it is necessary to move the centrifuge, do the following.

1 Make sure that the power is turned off (**O**), then disconnect the centrifuge from the main power source.

2 Use a 19-mm (3/4-in.) wrench to raise the two front feet.

As the feet screw into the centrifuge, the caster foot lowers until the centrifuge will roll freely.

3 Roll the centrifuge back-first to the new location.

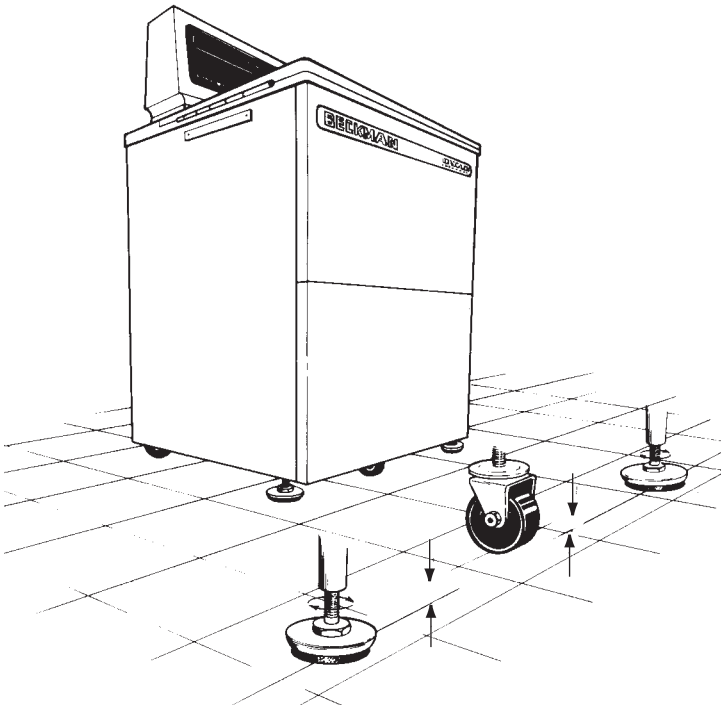
a. *Push against the front of the instrument only; do not push on the control panel.*

The rear casters do not swivel.

4 Readjust the front feet until the front caster is off the floor and the centrifuge is level to the eye (seeFigure 4.2).

a. Be sure both front feet are firmly in contact with the floor, and have equal pressure.

Figure 4.2 Adjusting the Leveling Feet



Returning a Centrifuge

Before returning a centrifuge or accessory for any reason, prior permission (a return form) must be obtained from Beckman Coulter, Inc. Contact your local Beckman Coulter office to obtain the form and instructions for packaging and shipping.

To protect our personnel, it is the customer's responsibility to ensure that all parts are free from pathogens and/or radioactivity. Sterilization and decontamination must be done before returning the parts.

All parts must be accompanied by a note, plainly visible on the outside of the box or bag, stating that they are safe to handle and that they are not contaminated with pathogens or radioactivity. ***Failure to attach this notification will result in return or disposal of the items without review of the reported problem.***

Supply List

NOTE Publications referenced in this manual can be obtained by calling Beckman Coulter Customer Service at 1-800-742-2345 (USA or Canada) or by contacting your local Beckman Coulter representative. They may also be available on the web at www.beckmancoulter.com

Call Beckman Coulter Customer Service at 1-800-742-2345 (USA or Canada) or contact your local Beckman Coulter representative for information about ordering parts and supplies. For your convenience, a partial list is given below.

NOTE For MSDS information, go to the Beckman Coulter website at www.beckmancoulter.com.

Description	Part Number
Air filter (1)	885218
Drive belt	878821
Solution 555 (1 qt)	339555
Rotor Cleaning Kit	339558
Spinkote lubricant (2 oz)	306812
Silicone vacuum grease (1 oz)	335148
Instrument anchor kit	362712
Tie-down assembly	368518
Tie-down bar	368521
Active key (black)	B06533
Red key guard	B06534

APPENDIX A

Preinstallation Requirements

Preinstallation Requirements

Do not attempt to install this centrifuge. Its purchase price includes installation by Beckman Coulter personnel. Installation by anyone other than an authorized Beckman Coulter representative invalidates any warranty covering the centrifuge.

Preinstallation requirements have been sent prior to shipment of the centrifuge. The following information is provided in case the centrifuge must be relocated. The equipment listed is required for installation:

- Voltmeter
- Two 30-ampere circuit breakers
- Power receptacle
- Drill for drilling holes in the floor for installation of anchoring kit bolts (described later in this section). A 9.5 mm (3/8-in.) drill is required for concrete floors. A 6.4-mm (1/4-in.) drill is required for wood floors.

Electrical Requirements

The voltage indicated on the name rating plate on the back of the centrifuge should agree with the measured line voltage. A Beckman Coulter Field Service representative can rewire the centrifuge, if necessary, to adapt it to the available voltage, and provide a new rating plate indicating the new voltage.

The Model J6-MI requires 208- or 240-V power, fused for 30 A.

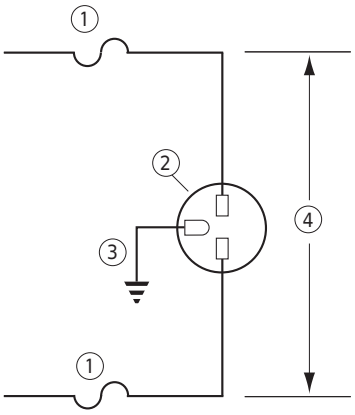
Range for 208 V, 60 Hz (p/n 360291)	187 to 223 V
Range for 240 V, 60 Hz (p/n 360292)	224 to 264 V
Range for 220 V, 50 Hz (p/n 360293)	210 to 224 V

To reduce the risk of electrical shock, this centrifuge uses a three-wire electrical cord (1.8 m; 6 ft) and plug to connect the instrument to earth-ground. In regions where the centrifuge is supplied with an unterminated cord, a plug that meets local electrical and safety requirements must be supplied. (Your local Beckman Coulter office can provide specific information.) See Table A.1 for the required wire connections. Make sure that the matching wall outlet receptacle is properly wired and earth-grounded (see Figure A.1).

Table A.1 Required Wire Connections

Wire Insulation Color	Terminal	Symbol	
		Harmonized	North American
Green/Yellow	Earth ground	⏚	⏚
Light Blue	Neutral or Live or Line	N	L
Brown	Live or Line	L	L

Figure A.1 Electrical Requirements



1. 30-ampere Circuit Breaker
2. Wall Outlet: Hubell 9930, Bryant 96-30-FR, or Equivalent (NEMA 6-30 R)
3. Earth-Ground
4. Measured Line Voltage

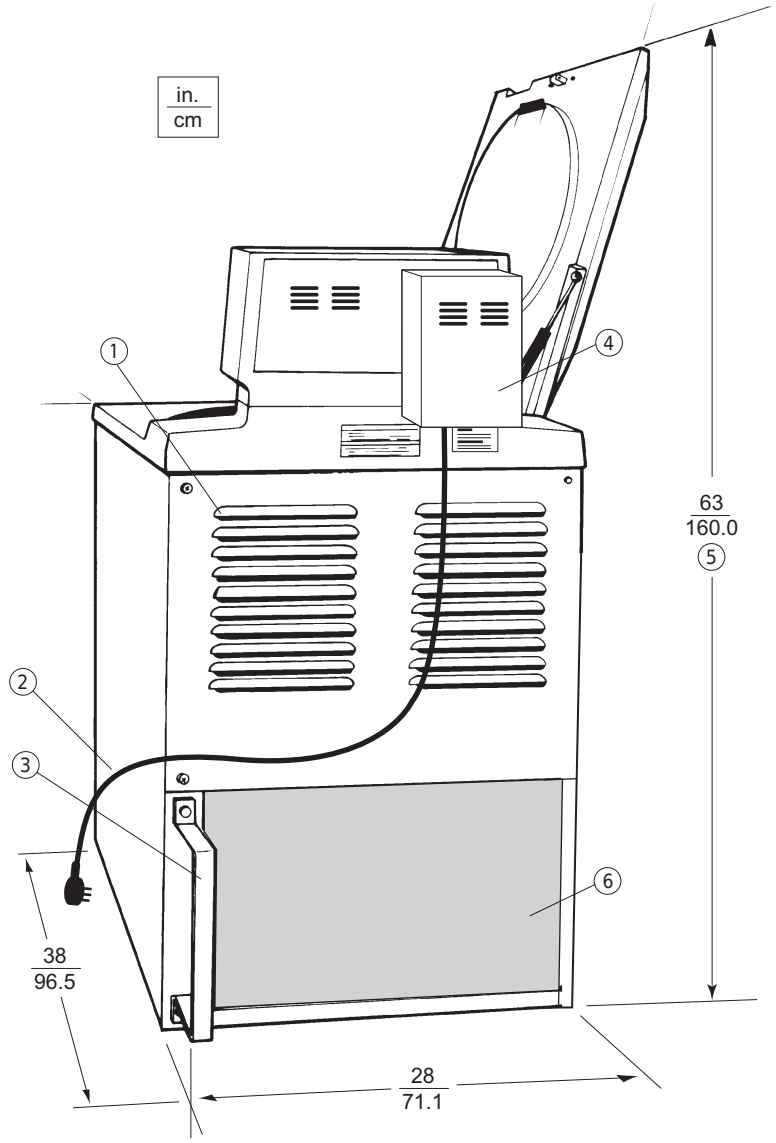
To ensure safety, the centrifuge should be wired to a remote emergency switch (preferably outside the room where the centrifuge is housed, or adjacent to the exit from the room), in order to disconnect the centrifuge from the main power source in case of a malfunction.

Space

Locate the Model J6-MI in a clean, safe, uncluttered environment. Be sure to provide 15.2-cm (6-in.) clearances on each side and at the rear of the centrifuge for servicing and air circulation (See Figure A.2). The centrifuge must have adequate air ventilation to ensure compliance to local requirements for vapors produced during centrifuge operation.

An airflow bracket will be installed on the back of the centrifuge to ensure the minimum clearances required. A filter bracket and a disposable filter will be installed to keep the air intake area clean.

Figure A.2 Rear View and Dimensions



1. Air Exit
2. Power Cable [6.0 ft (1.8 m) long]
3. Airflow Bracket
4. Power Filter
5. To Floor
6. Air Intake Filter

Anchoring Kit

⚠ WARNING

Do not place the centrifuge near areas containing flammable reagents or combustible fluids.

To comply with regulatory requirements, the Model J6-MI must be secured to the floor using the anchoring kit shipped with the centrifuge. The anchoring hardware prevents the centrifuge from moving in the unlikely event of a rotor mishap. Installation instructions (J2HC-TB-003) are provided as part of the kit. Two steps are required for installation as follows.

1 Drilling holes in the laboratory floor where the centrifuge will be located.

- The anchoring instructions include a full-size template, which shows where these holes must be drilled in relation to the wall behind the centrifuge.
- *This step must be done by the customer.*

2 Attaching the mounting brackets to the floor, and inserting the shackles through the floor brackets and the brackets on the centrifuge frame.

This step will be done by the Beckman Coulter Field Service representative during installation.

NOTE Beckman Coulter representatives are not equipped to drill holes in your floor. The holes must be drilled *before* installation.

Beckman Coulter, Inc.
Model J6-MI Centrifuge Warranty

Subject to the exceptions and upon the conditions specified below, Beckman Coulter, Inc. agrees to correct, either by repair, or, at its election, by replacement, any defects of material or workmanship which develop within one (1) year after delivery of the Model J6-MI Centrifuge (the product), to the original Buyer by Beckman Coulter or by an authorized representative provided that investigation and factory inspection by Beckman Coulter discloses that such defect developed under normal and proper use.

Some components and accessories by their nature are not intended to and will not function for one (1) year. If any such component or accessory fails to give reasonable service for a reasonable period of time, Beckman Coulter will repair or, at its election, replace such component or accessory. What constitutes either reasonable service and a reasonable period of time shall be determined solely by Beckman Coulter.

Replacement

Any product claimed to be defective must, if requested by Beckman Coulter, be returned to the factory, transportation charges prepaid, and will be returned to Buyer with the transportation charges collect unless the product is found to be defective, in which case Beckman Coulter will pay all transportation charges.

Conditions

Beckman Coulter makes no warranty concerning products or accessories not manufactured by it. In the event of failure of any such product or accessory, Beckman Coulter will give reasonable assistance to the Buyer in obtaining from the respective manufacturer whatever adjustment is reasonable in light of the manufacturer's own warranty.

Beckman Coulter shall be released from all obligations under all warranties either expressed or implied, if the product covered hereby is repaired or modified by persons other than its own authorized service personnel, unless such repair by others is made with the written consent of Beckman Coulter, or unless such repair in the sole opinion of Beckman Coulter is minor, or unless such modification is merely the installation of a new Beckman Coulter plug-in component for such product.

Disclaimer

IT IS EXPRESSLY AGREED THAT THE ABOVE WARRANTY SHALL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND OF THE WARRANTY OF MERCHANTABILITY AND THAT BECKMAN COULTER, INC. SHALL HAVE NO LIABILITY FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER ARISING OUT OF THE MANUFACTURE, USE, SALE, HANDLING, REPAIR, MAINTENANCE, OR REPLACEMENT OF THE PRODUCT.

English / Deutsch / Español / Français / Italiano / Português / Русский / 中文 / 日本語 / 한국어		
Symbol **Simbole** **Symbol** **символ** **Simbolo** 符号 **Symbole** **記号** **Simbolo** 상징	**Title / Titel / Titulo / Titre / Titolo / Titulo / Название / 标题 / タイトル** / 제목	
	Dangerous voltage Gefährliche electrische Spannung Voltaje peligroso Courant haute tension Pericolo: alta tensione	Tensão perigosa Опасное напряжение тока 危险电压 危険な電圧 위험한 전압
	Caution, consult accompanying documents Vorsicht, konsultieren Begleitdokumente Atención, consulta documentos adjuntos Attention, consultent des documents d'accompagnement Attenzione, consulta i documenti di accompagnamento	Cuidado, ulta documentos adjuntos Внимание, советует с сопроводительными документами 注意, 咨询附属单证 注意, 伴う文書に相談しなさい 주의, 동반 문서를 상담하십시오
	Biohazard Potentiell infektiösem Material Riesgo biológico Risque biologiqu Pericolo biologico	Material infeccioso potencial биологической опасности 可能的传染性物 潜在的な感染性物質 전염하는 물자
	On (power) Ein (Netzverbindung) Encendido Marche (mise sous tension) Acceso (sotto tensione)	Fora (o poder) На (мощности) 开（电源） ン（電源） 에 (힘)
	Off (power) Aus (Netzverbindung) Apagado Arrêt (mise sous tension) Spento (fuori tensione)	Fora de (poder) С (сила) (电源) ン（電源） 떨어져 (힘)
	Protective earth (ground) Schutzleiteranschluß Puesta a tierra de protección Liaison à la terre Collegamento di protezione a terra	Terra de proteção (terra) Защитное заземление (земля) 保护接地 保護アース（接地） 방어적인 지구 (지상)
	Earth (ground) Erde (Masse) La tierra (suelo) Terre (sol) Scarica a terra	Terra Земли 接地 アース（接地） 지구 (지상)
	Manufacturer Hersteller Fabricante Fabricant Fabbricante	Fabricante производитель 制造商 メーカー 제조자
	Consult Instructions for Use Konsultieren Sie Anwendungsvorschriften Consulte las instrucciones para el uso Consultez les instructions pour l'usage Consulti le istruzioni per uso	Consulte instruções para o uso Советуйте с инструкциями для пользы 咨询使用说明书 使用説明に相談しなさい 사용 설명을 상담하십시오

Related Documents

Rotors and Tubes for Beckman Coulter J2, J6,and Avanti J Series Centrifuges
PN JR-IM-10

- Rotors
- Tubes, Bottles, and Accessories
- Using Tubes and Accessories
- Using Fixed-Angle Rotors
- Using Swinging-Bucket Rotors
- Using Vertical-Tube and Rack Type Rotors
- Care and Maintenance
- Chemical Resistances
- Temperature Compensation Tables
- Gradient Materials
- Blood Component Separation

Available in electronic pdf or CD-ROM by request.

Chemical Resistances for Beckman Coulter Centrifugation Products
PN IN-175M

Available in hard copy or electronic pdf by request.

Available at www.beckmancoulter.com

www.beckmancoulter.com

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