

# Instructions For Use

## **JS-4.2, JS-4.2SM, and JS-3.0 Swinging-Bucket Rotors**

JS-4.2 Rotor for Use in Beckman Coulter  
Avanti J-HC and J6 Series Centrifuges

JS-4.2SM Rotor for Use in  
Beckman Coulter J6 Series Centrifuges

JS-3.0 Rotor for Use in Beckman Coulter  
J6 Series Centrifuges



JS-4.2SM



JS-4.2



JS-3.0

J6-TB-007SE  
September 2016



Beckman Coulter, Inc.  
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Brea, CA 92821 U.S.A.



**S-4.2, JS-4.2SM, and JS-3.0 Swinging-Bucket Rotors**  
J6-TB-007SE (September 2016)

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# Revision History

*This document applies to the latest software listed and higher versions. When a subsequent software version changes the information in this document, a new issue will be released.*

## **Revision SD, February 2014**

Changed Polyallomer to polypropylene:

- [Available Tubes and Bottles for the JS-4.2 and JS-3.0 Swinging-Bucket Rotors](#)
- [Thickwall Tubes](#)
- [Polycarbonate and Polypropylene Bottles](#)
- [Microfuge Tubes](#)
- [Labware for Use with Microplate Carriers](#)

## **Revision SE, September 2016**

Changes were made to:

- [Available Tubes and Bottles for the JS-4.2 and JS-3.0 Swinging-Bucket Rotors](#)
- [Temperature Limits](#)



# Safety Notice

Read all product manuals and consult with Beckman Coulter-trained personnel before attempting to use this equipment. 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.



This safety notice summarizes information basic to the safe use of the rotors described in this manual. The international symbol displayed to the left is a reminder to the user that all safety instructions should be read and understood before operation or maintenance of this equipment is attempted. When you see the symbol on other pages of this publication, pay special attention to the safety information presented. Observance of safety precautions will also help to avoid actions that could damage or adversely affect the performance of the rotor. These rotors were developed, manufactured, and tested for safety and reliability as part of a Beckman Coulter ultracentrifuge/rotor system. Their safety or reliability cannot be assured if used in an ultracentrifuge not of Beckman Coulter's manufacture or in a Beckman Coulter ultracentrifuge that has been modified without Beckman Coulter's approval.

## Alerts for Danger, Warning, Caution, and Note

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### **DANGER**

**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



### **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. 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 Information for the JS-4.2, JS-4.2SM, and JS-3.0 Rotors

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Handle body fluids with care because they can transmit disease. No known test offers complete assurance that such fluids are free of micro-organisms. Some of the most virulent—Hepatitis (B and C) viruses, HIV (I–V), atypical mycobacteria, and certain systemic fungi—further emphasize the need for aerosol protection. Handle other infectious samples according to good laboratory

## Safety Notice

Safety Information for the JS-4.2, JS-4.2SM, and JS-3.0 Rotors

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 these rotors 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.

The rotors and accessories are not designed for use with materials capable of developing flammable or explosive vapors. Do not centrifuge such materials in nor handle or store them near the centrifuge

Components or accessories designed for other rotors may cause rotor mishap if used in these rotors. Use only components and accessories that have been designed for use in these rotors. *The safety of rotor components and accessories made by other manufacturers cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the rotors may void the rotor warranty and should be prohibited by your laboratory safety officer.* If tubes, microplates, or other labware made by manufacturers other than Beckman Coulter are used, reduce rotor speed to prevent breakage. The strength of glass and plastic tubes can vary between lots, and will depend on handling and usage; we highly recommend that you pretest labware in the rotor using water samples to determine optimal operating conditions. Scratches (even microscopic ones) significantly weaken glass tubes.

All six positions on the rotor yoke must contain either a bucket or a carrier (loaded or unloaded) during a run. Never run the rotor without all of the positions being filled.

If disassembly reveals evidence of leakage, you should assume that some fluid escaped the rotor. Apply appropriate decontamination procedures to the centrifuge and accessories.

Never exceed the maximum rated speed of the rotor and labware in use. Refer to the section on [Run Speeds](#), and derate the run speed as appropriate.

Do not use sharp tools on the rotor that could cause scratches in the rotor surface. Corrosion begins in scratches and may open fissures in the rotor with continued use.

# Contents

Revision History, iii

Safety Notice, v

Alerts for Danger, Warning, Caution, and Note, v

Safety Information for the JS-4.2, JS-4.2SM, and JS-3.0 Rotors, v

JS-4.2, JS-4.2SM, and JS-3.0  
Swinging-Bucket Rotors, 1

Specifications for the JS-4.2 Rotor, 1

Specifications for the JS-4.2SM Rotor, 2

Specifications for the JS-3.0 Rotor, 3

Description, 4

Preparation and Use, 4

Prerun Safety Checks, 5

Rotor Preparation, 5

Buckets and Accessories, 6

Tubes and Bottles, 7

Microplate Carriers, 13

Operation, 14

Installing the Rotor, 14

Installing the Buckets or Microplate Carriers, 17

Loading the Buckets and Carriers, 17

Loading Buckets, 18

Loading Microplate Carriers, 23

Run Speeds, 24

Run Temperature, 26

Care and Maintenance, 28

Inspection, 28

Maintenance, 29

Cleaning, 30

Decontamination, 32

Sterilization and Disinfection, 32

Returning a Rotor, 32

Supply List, 33

Replacement Rotor Parts, 33

Other, 34

Beckman Coulter, Inc.

J-Series Swinging-Bucket Rotor Warranty



# Illustrations

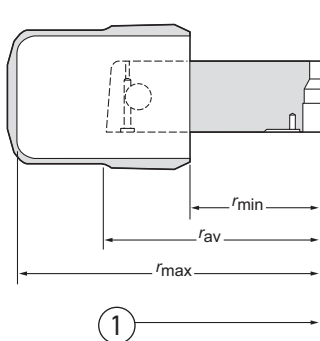
- 1 Rotor Drive Pin Location and Orientation, 15
- 2 Centrifuge Drive Spindle Hub Configuration, 15
- 3 Using the Tie-Down Bolt and Tie-Down Tool to Tighten the Rotor onto the Drive Hub, 16
- 4 Using the Tie-Down Screw and Torque Bar to Tighten the Rotor onto the Drive Hub (Older Rotors), 16
- 5 Examples of Correctly and Incorrectly Loaded Buckets and Carriers, 19
- 6 Arranging Loads in the Rotor in a J6 Series Centrifuge, 20
- 7 Arranging Loads in the JS-4.2 Rotor in the Avanti J-HC Centrifuge, 20
- 8 Examples of the Effects on the Horizontal Swing of Buckets Caused by Proper and Improper Weight Distribution, 20
- 9 Assembling a Multi-Disc Adapter, 21
- 10 Brackets (Vertical Supports) for the JS-4.2-Style Multi-Disc Adapters and the GH-3.8-Style Modular Disk Adapters, 22

# Tables

1	Available Tubes and Bottles for the JS-4.2 and JS-3.0 Swinging-Bucket Rotors, 8
2	Multi-Disc Adapters Used with Tubes and Bottles, 11
3	Blood Bag Cups, 11
4	Blood Bag Cup (polypropylene) for the JS-4.2SM Oval Buckets, 11
5	Labware for Use with Microplate Carriers, 13
6	Relative Centrifugal Fields (JS-4.2 and JS-3.0 Rotors with Buckets), 24
7	Relative Centrifugal Fields (JS-4.2SM Rotor with Buckets), 24
8	Relative Centrifugal Fields for the JS-4.2 and JS-3.0 Rotors When Microplate Carriers are Used, 26
9	<i>J6 Series Centrifuge Temperature Compensation Settings</i> , 27

# JS-4.2, JS-4.2SM, and JS-3.0 Swinging-Bucket Rotors

## Specifications for the JS-4.2 Rotor



### 1. Axis of Rotation

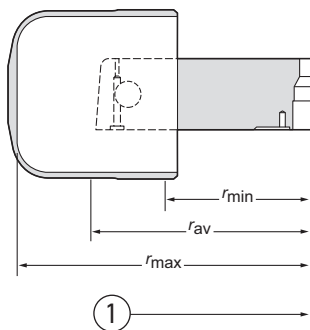
U.S. Patent No. 4,090,824  
U.S. Pat. No. 4,010,890  
Canadian Pat. No. 1,063,989  
British Pat. No. 1,514,141  
German Pat. No. 2,702,268  
French Pat. No. 7,700,732  
Japanese Util. Mod. No.  
U.M. 1,462,551

Maximum speed .....	4200 RPM
Critical speed range <sup>a</sup> .....	600 to 800 RPM
Maximum solution density.....	1.2 g/mL
Maximum allowable imbalance of opposing loads	
in J6 series centrifuges .....	10 grams
in the Avanti J-HC centrifuge.....	5 grams
Relative Centrifugal Field <sup>b</sup> at maximum speed	
At $r_{max}$ (254 mm) .....	$5020 \times g$
At $r_{av}$ (184 mm) .....	$3640 \times g$
At $r_{min}$ (114 mm) .....	$2250 \times g$
Number of buckets .....	6
Nominal capacity per bucket .....	1 liter bottle or 1 quad pack blood bag <sup>c</sup>
Nominal capacity of rotor.....	6 liters, 6 blood bags, <sup>c</sup> 18 microplates 336 RIA tubes
Approximate acceleration time to maximum speed	
(rotor fully loaded) .....	2 1/2 min
Approximate deceleration time from maximum speed	
(rotor fully loaded) .....	3 min
Weight of fully loaded rotor .....	26 kg (46 lb)
Rotor and bucket material .....	anodized aluminum
Conditions requiring speed reductions .....	see <a href="#">Run Speeds</a>
Rotor entry code for microprocessor-controlled	
J6 series instruments.....	4.2

- a. The critical speed range is the range of speeds over which the rotor shifts so as to rotate about its center of mass. Passing through the critical speed range is characterized by some vibration.
- b. Relative Centrifugal Field (RCF) is the ratio of the centrifugal acceleration at a specified radius and speed ( $r\omega^2$ ) to the standard acceleration of gravity ( $g$ ) according to the following formula:  $RCF = r\omega^2/g$  — where  $r$  is the radius in millimeters,  $\omega$  is the angular velocity in radians per second ( $2\pi \text{ RPM}/60$ ), and  $g$  is the standard acceleration of gravity ( $9807 \text{ mm/s}^2$ ). After substitution:  $RCF = 1.12r (\text{RPM}/1000)^2$
- c. Blood bags and microplates can be run in J6 series centrifuges only. Do not run blood bags or microplates in this rotor in the Avanti J-HC centrifuge.

## Specifications for the JS-4.2SM Rotor

**NOTE** The JS-4.2SM rotor is for use in Beckman Coulter J6 series centrifuges only. It cannot be used in the Avanti J-HC centrifuge.



1. Axis of Rotation

U.S. Pat. No. 4,010,890  
German Pat. No. 2,702,268

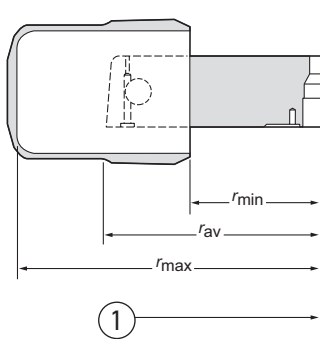
Maximum speed .....	4200 RPM
Critical speed range <sup>a</sup> .....	600 to 800 RPM
Maximum solution density .....	1.2 g/mL
Maximum allowable imbalance of opposite loads .....	10 grams
Relative Centrifugal Field <sup>b</sup> at maximum speed	
At $r_{max}$ (248 mm) .....	$4900 \times g$
At $r_{av}$ (182 mm).....	$3600 \times g$
At $r_{min}$ (116 mm).....	$2290 \times g$
Number of buckets .....	6
Nominal capacity per bucket .....	1 quad or triple blood bag pack with filter
Nominal capacity of rotor .....	6 quad or triple blood bag packs
Approximate acceleration time to maximum speed	
(rotor fully loaded).....	2 1/2 min
Approximate deceleration time from maximum speed	
(rotor fully loaded).....	3 min
Weight of fully loaded rotor .....	23.6 kg (52 lb)
Rotor and bucket material.....	anodized aluminum
Conditions requiring speed reductions.....	see <a href="#">Run Speeds</a>
Rotor entry code for microprocessor-controlled instruments .....	4.2

a. The critical speed range is the range of speeds over which the rotor shifts so as to rotate about its center of mass. Passing through the critical speed range is characterized by some vibration.

b. Relative Centrifugal Field (RCF) is the ratio of the centrifugal acceleration at a specified radius and speed ( $rw^2$ ) to the standard acceleration of gravity ( $g$ ) according to the following formula:  $RCF = \omega^2 r / g$  — where  $r$  is the radius in millimeters,  $\omega$  is the angular velocity in radians per second ( $2\pi \text{ RPM} / 60$ ), and  $g$  is the standard acceleration of gravity ( $9807 \text{ mm/s}^2$ ). After substitution:  $RCF = 1.12r (\text{RPM}/1000)^2$

## Specifications for the JS-3.0 Rotor

**NOTE** The JS-3.0 rotor is for use in Beckman Coulter J6 series centrifuges only. It cannot be used in the Avanti J-HC centrifuge



1. Axis of Rotation

U.S. Pat. No. 4,090,824

Maximum speed .....	3000 RPM
Critical speed range <sup>a</sup> .....	600 to 800 RPM
Maximum solution density .....	1.2 g/mL
Maximum allowable imbalance of opposite loads .....	10 grams
Relative Centrifugal Field <sup>b</sup> at maximum speed	
At $r_{max}$ (254 mm) .....	$2560 \times g$
At $r_{av}$ (184 mm).....	$1850 \times g$
At $r_{min}$ (114 mm) .....	$1150 \times g$
Number of buckets .....	6
Nominal capacity per bucket .....	1 liter bottle, or 1 quad-pack blood bag
Nominal capacity of rotor .....	6 liters, 6 blood bags, 18 microplates, 336 RIA tubes
Approximate acceleration time to maximum speed (rotor fully loaded).....	2 min
Approximate deceleration time from maximum speed (rotor fully loaded).....	1 1/2 min
Weight of fully loaded rotor .....	22 kg (48 lb)
Rotor and bucket material.....	anodized aluminum
Conditions requiring speed reductions.....	see <a href="#">Run Speeds</a>
Rotor entry code for microprocessor-controlled instruments .....	3.0

a. The critical speed range is the range of speeds over which the rotor shifts so as to rotate about its center of mass. Passing through the critical speed range is characterized by some vibration.

b. Relative Centrifugal Field (RCF) is the ratio of the centrifugal acceleration at a specified radius and speed ( $rw^2$ ) to the standard acceleration of gravity ( $g$ ) according to the following formula:  $RCF = rw^2/g$  — where  $r$  is the radius in millimeters,  $w$  is the angular velocity in radians per second ( $2\pi \text{ RPM}/60$ ), and  $g$  is the standard acceleration of gravity ( $9807 \text{ mm/s}^2$ ). After substitution:  $RCF = 1.12r (\text{RPM}/1000)^2$

## Description

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*These Beckman Coulter rotors have been manufactured in an ISO 9001 or 13485 facility for use with the specified Beckman Coulter ultracentrifuges.*

The JS-4.2 and JS-3.0 swinging bucket rotors are rated for maximum speeds of 4200 and 3000 RPM, respectively. These rotors share a common six-place rotor yoke; the JS-4.2 has a windshield around the yoke and buckets, and the JS-3.0 has no windshield. Each rotor holds six buckets or six microplate carriers that hook over stainless steel pins set in the yoke and swing out to horizontal position during centrifugation. The buckets hold a wide variety of sample containers, including tubes, bottles, and blood bag cups. The microplate carriers are used to perform serial dilution of small liquid volumes.

The JS-4.2SM swinging bucket rotor is rated for a maximum speed of 4200 RPM. It uses the same windshielded yoke and lid assembly as the JS-4.2 rotor. The JS-4.2SM uses oval buckets that carry oval blood bag cups designed to hold one quad or triple blood bag pack per cup. The cups slip easily into the buckets, which hook over the stainless steel pins in the rotor yoke. The JS-4.2SM rotor develops centrifugal forces that quickly separate platelet-rich plasma and red blood cells from whole blood.

The JS-3.0 and JS-4.2SM rotors can be used in J6 series centrifuges only; they cannot be used in the Avanti J-HC.

Rotor assemblies, buckets, and lids are made of anodized aluminum. The rotors are each warranted for 7 years (see the Warranty at the back of this manual).

**NOTE** Before using the JS-4.2 rotor in the Avanti J-HC centrifuge, do the following:

- Check the rotor's date of manufacture, which is engraved on the rotor. If the date is prior to January, 2000, *do not run the rotor*. If the date is between January 1997 and January 2000, the rotor can be modified for use in the Avanti J-HC. Contact your local Beckman Coulter office for additional information. Rotors manufactured prior to January 1997 cannot be modified.
- If you purchase a JS-4.2 rotor for use in the Avanti J-HC centrifuge, you must also purchase rotor tie-down kit (367045).

## Preparation and Use

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*Specific information about the JS-4.2, JS-4.2SM, and JS-3.0 rotors is given here. Use the J Series Rotors and Tubes Manual (publication JR-IM) along with this rotor manual for complete rotor and accessory information.*



**Although rotor components and accessories made by other manufacturers may fit in the JS-4.2, JS-4.2SM, and JS-3.0 rotors, their safety in these rotors cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in these rotors may void the rotor warranty and should be prohibited by your laboratory safety officer. Only the components listed in this publication should be used in these rotors.**

## Prerun Safety Checks



Read the [Safety Notice](#) section at the front of this manual before using the rotor.

- 1 Make sure that the rotor and lid, if applicable, are clean and show no signs of corrosion or cracking.
- 2 Verify that the tubes, bottles, and other labware being used are listed in [Table 1](#) through [Table 5](#).
- 3 Check the chemical compatibilities of all materials used.
  - Refer to *Chemical Resistances* (publication IN-175), included in the *Rotors and Tubes* CD.

## Rotor Preparation

For runs at other than room temperature refrigerate or warm the rotor beforehand for fast equilibration.

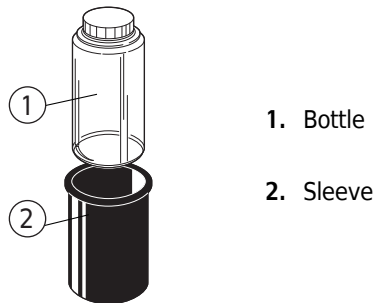
- 1 Before installing the rotor, lightly coat the centrifuge drive hub with Spinkote lubricant (306812).
- 2 Load the filled containers symmetrically into the rotor.
  - a. If you are running fewer than six containers, place containers opposite each other on the yoke.
    - Opposing containers must be filled to the same level with liquid of the same density.
  - b. If you are running three containers, leave an empty bucket on the yoke between each container and fill all containers to the same level with liquid of the same density.
- 3 All six positions on the rotor yoke must contain a bucket or a microplate carrier, loaded or unloaded, during each run.
  - Never run the rotor without all six positions being filled.
  - (Microplate carriers cannot be used in the Avanti J-HC centrifuge.)
- 4 JS-4.2 rotors used in the Avanti J-HC centrifuge must contain three, four, or six loads.
  - Do not run two loads in this rotor in the Avanti J-HC.

## Buckets and Accessories

The round buckets used in the JS-4.2 and JS-3.0 rotors can hold bottle adapters, Multi-Disc adapters to accommodate tubes of various sizes, and blood bag cups. The JS-4.2SM oval bucket holds blood bag cups only.

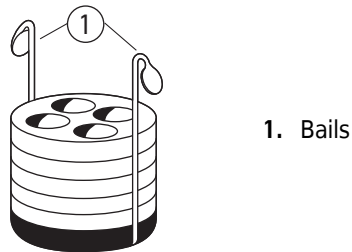
### Bottle Adapters

Bottles are supported in polypropylene adapters that fit inside round buckets. Bottles and bottle adapters available for use in the JS-4.2 and JS-3.0 round buckets are listed in [Table 1](#).



### Multi-Disc Adapters

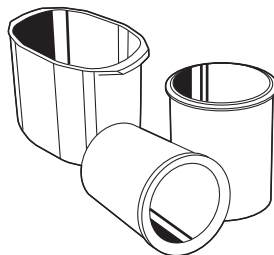
The Multi-Disc adapters are made up of polypropylene discs, which are stacked and snapped together to accommodate a particular size bottle or tube. The number of adapters required depends on the length of the tube or bottle. The discs are color-coded for identification. See [Table 2](#) for the appropriate adapter discs for use with different size tubes and bottles





## Blood Bag Cups

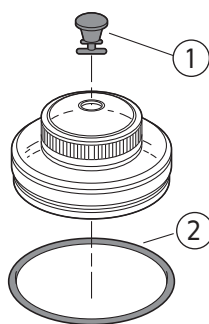
Polypropylene cups provide support for blood bags in the rotor buckets. A single or double pack blood bag cup, and a triple or quad pack cup, are available for the round buckets; these are listed in [Table 3](#). A triple or quad pack blood bag cup is available for use in the oval buckets and is listed in [Table 4](#). Blood bag cups for the round buckets and the oval buckets *are not interchangeable*.



## Aeroseal Covers for Buckets

The Aeroseal covers\* (343686) are designed to minimize leakage of aerosol particles from the round JS-4.2 and JS-3.0 buckets during centrifugation. Aeroseal covers can be used with Multi-Disc adapters (with modified bracket 343369) but not with blood bag cups. For more information, refer to publication J6-TB-017, which is shipped with the covers.

**NOTE** The 1000-mL bottles 355675 and 355676 (see [Table 1](#)) cannot be used with the Aeroseal covers because the bottles are too tall.



1. Plug
2. O-ring

## Tubes and Bottles

The JS-4.2 and JS-3.0 rotors use the tubes and bottles listed in [Table 1](#). Be sure to use only those items listed, and to observe the maximum speed limits and fill volumes shown. Refer to Appendix A in *Rotors and Tubes* for chemical compatibilities of tube, bottle, and accessory materials.

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\* U.S. Pat. No. 4,342,419.

**Table 1** Available Tubes and Bottles for the JS-4.2 and JS-3.0 Swinging-Bucket Rotors<sup>a</sup>

Tube			Max Fill Volume <sup>b</sup> (mL)	Required Accessory		No. Tubes per Adapter	Max Speed <sup>c</sup>
Dimensions/ and Volume/	Description	Part Number		Description	Part Number		
97 × 167 mm 1000 mL	polycarbonate bottle w/screw cap	355675 <sup>d</sup>	1000	polypropylene sleeve	356096	1	4200 RPM
97 × 167 mm 1000 mL	polypropylene bottle w/screw cap	355676 <sup>d</sup>	1000	polypropylene sleeve	356096	1	4200 RPM
96 × 130 mm 750 mL	polycarbonate bottle w/screw cap	358299	750	polypropylene sleeve	356096	1	4200 RPM
96 × 130 mm 750 mL	polypropylene bottle w/screw cap	356855	750	polypropylene sleeve	356096	1	4200 RPM
69 × 160 mm 500 mL	polycarbonate bottle w/screw cap	355664	500	adapter	339109	1	4200 RPM
69 × 160 mm 500 mL	polycarbonate wide-mouth bottle w/cap assy	355605	500	adapter	339109	1	4200 RPM
69 × 160 mm 500 mL	polypropylene wide-mouth bottle w/cap assy	355607	500	adapter	339109	1	4200 RPM
69 × 160 mm 500 mL	polycarbonate bottle, no cap	355649	500	adapter	339109	1	4200 RPM
69 × 159 mm 500 mL	polypropylene bottle w/screw cap	355665	500	adapter	339109	1	4200 RPM
69 × 159 mm 500 mL	polypropylene bottle, no cap	355650	500	adapter	339109	1	4200 RPM
62 × 136 mm 250 mL	polycarbonate round-bottom bottle w/screw cap	355673	250	adapter	339108	1	4200 RPM
62 × 122 mm 250 mL	polycarbonate wide-mouth bottle	358275	250	adapter	339108	1	4200 RPM
62 × 122 mm 250 mL	polypropylene wide-mouth bottle	358326	250	adapter	339108	1	4200 RPM
62 × 120 mm 250 mL	polypropylene wide-mouth bottle w/cap assy	356011	250	adapter	339108	1	4200 RPM
62 × 120 mm 250 mL	polycarbonate wide mouth bottle w/cap assy	356013	250	adapter	339108	1	4200 RPM

**Table 1** Available Tubes and Bottles for the JS-4.2 and JS-3.0 Swinging-Bucket Rotors<sup>a</sup> (Continued)

Tube			Max Fill Volume <sup>b</sup> (mL)	Required Accessory		No. Tubes per Adapter	Max Speed <sup>c</sup>
Dimensions/ and Volume/	Description	Part Number		Description	Part Number		
60 × 120 mm 230 mL	conical polycarbonate bottle w/screw cap	356987	230	adapter (polypropylene, pkg/4)	356983/339108	1	4200 RPM
60 × 120 mm 230 mL	conical polypropylene bottle w/screw cap	356989	230	adapter (polypropylene, pkg/4)	356983/339108	1	4200 RPM
38 × 102 mm 70 mL	polycarbonate bottle w/cap assy	355620	70	adapter	339104	2	4200 RPM
38 × 102 mm 70 mL	polycarbonate bottle, no cap	355655	70	adapter	339104	2	4200 RPM
29 × 104 mm 50 mL	polypropylene bottle assy w/snap-on cap	361694	50	adapter (polypropylene)	356997	1	4200 RPM
29 × 104 mm 50 mL	polycarbonate open-top tube	363647	50	adapter (polypropylene)	356997	1	4200 RPM
29 × 104 mm 50 mL	polycarbonate bottle assy, liquid-tight cap assy	357000	45	adapter	339103	7	4200 RPM
29 × 104 mm 50 mL	polypropylene bottle assy, liquid-tight cap assy	357001	45	adapter	339103	7	4200 RPM
29 × 104 mm 50 mL	polycarbonate bottle w/screw cap	357002	40	adapter	339103	7	4200 RPM
29 × 104 mm 50 mL	polypropylene bottle w/screw cap	357003	40	adapter	393103	7	4200 RPM
29 × 104 mm 50 mL	polycarbonate tube w/snap-on cap	363664	36.5	adapter (polypropylene)	356997	1	4200 RPM
29 × 104 mm 50 mL	polypropylene thickwall tube, snap-on cap	357005	36.5	adapter	393103	7	4200 RPM
				white 29-mm cap red 29-mm cap green 29-mm cap yellow 29-mm cap blue 29-mm cap	356264 <sup>e</sup> 357359 <sup>e</sup> 357360 <sup>e</sup> 357361 <sup>e</sup> 357362 <sup>e</sup>		
29 × 104 mm 50 mL	polypropylene thickwall tube, no cap	357007	34	adapter	393103	7	4200 RPM
18 × 98 mm 15 mL	polypropylene, open top	342082 <sup>f</sup>	15	adapter	339102	14	4200 RPM

**Table 1** Available Tubes and Bottles for the JS-4.2 and JS-3.0 Swinging-Bucket Rotors<sup>a</sup> (Continued)

Tube			Max Fill Volume <sup>b</sup> (mL)	Required Accessory		No. Tubes per Adapter	Max Speed <sup>c</sup>
Dimensions/ and Volume/	Description	Part Number		Description	Part Number		
18 × 98 mm 15 mL	polyethylene tube, open top	342081 <sup>f</sup>	15	adapter	339102	14	4200 RPM
18 × 98 mm 15 mL	polycarbonate tube, open top	342080 <sup>f</sup>	15	adapter	339102	14	4200 RPM
17 × 119 mm 15 mL	conical polypropylene open-top tube	355663	15	adapter (polypropylene)	339102	14	4200 RPM
16 × 80 mm 10 mL	polycarbonate bottle w/cap	355672	10	adapter (EPDM rubber)	341977	19	4200 RPM
16 × 76 mm 10 mL	stainless steel tube, open top	301108	10	adapter (EPDM rubber)	341977	19	4200 RPM
16 × 76 mm 10 mL	polycarbonate tube, open top	355630	10	adapter (EPDM rubber)	341977	19	4200 RPM
16 × 76 mm 10 mL	polypropylene tube, open top	355640	10	adapter (EPDM rubber)	341977	19	4200 RPM
14 × 55 mm 4 mL	polypropylene Bio-vial	566353	4	adapters	339101/	24	4200 RPM
11 × 39 mm 1.5 mL	polypropylene tube w/snap-on cap	357448	1.5	adapters	339100/ 354511	26	4200 RPM
11 × 39 mm 1.5 mL	polypropylene tube w/snap-on cap	343169	1.5	adapters	339100/ 354511	26	4200 RPM
11 × 39 mm 1.5 mL	polyethylene tube w/snap-on cap	340196	1.5	adapter	339100/ 354511	26	4200 RPM

- Use only the items listed here and observe fill volumes and maximum run speeds.
- Above 20°C fill polypropylene tubes at least half full.
- Maximum speeds listed are for the JS-4.2 rotor, and are guidelines only. These speeds have been achieved in reliability tests at Beckman Coulter, but, because of manufacturing variances, no guarantee of performance or fit is expressed or implied. The maximum speed of all tubes and bottles in the JS-3.0 rotor is 3000 RPM.
- Cannot be used with Aeroseal covers (343686).
- Polypropylene package of 25.
- To order caps for 15-mL tubes 342080, 342081, and 342082, use part number 343656 for a package of 50. Caps 343656 are made of Hytrel thermoplastic polyester elastomer. Hytrel is a registered trademark of E.I. Du Pont de Nemours & Co. Note that Hytrel does not provide the same chemical resistance as the tube materials. Before using the caps, check with the manufacturer to verify Hytrel's ability to withstand exposure to the chemicals you will be using.

**Table 2** Multi-Disc Adapters Used with Tubes and Bottles

Typical Tube/ Bottle Sizes Used	Max Tube Dimensions <sup>a</sup>		Number of Tubes per Adapter	Number of Tubes per Rotor	Adapter Part Number	Color
	Diameter	Length				
3 and 5 mL	12 mm	133 mm	37	222	339100	blue
10 mL	14 mm	133 mm	24	144	339101	orange
12 mL	16 mm	133 mm	19	114	341977	purple
20 mL	18 mm	133 mm	14	84	339102 <sup>b</sup>	green
50 mL	28 mm	136 mm	7	42	339103	yellow
50 mL (conical)	30 mm	136 mm	4	24	345386	lt. green
50 mL	35 mm	136 mm	4	24	341794	dark blue
100 mL	44 mm	165 mm	2	12	339104	brown
230 mL (conical)	62 mm	141 mm	1	6	339108	red
250 mL	62 mm	160 mm	1	6	339108	red
500 mL	70 mm	160 mm	1	6	339109	yellow
Double-Stacking Adapter <sup>c</sup>						
3 and 5 mL	12 mm	75 mm	19	114	339119	blue/white

a. Additional discs can be added.

b. This adapter also holds 15-mL conical tubes.

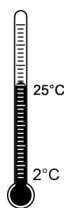
c. To run 148 RIA tubes, use six of the 37-hole adapters (339100) plus six of the 19-hole adapters (339119). Tube retaining device 343108 is required; use of this device is described in publication IN-174, which ships with 343108.

**Table 3** Blood Bag Cups

Description	Blood Packs per Cup	Number of Cups per Rotor	Part Number (set of 2)
Blood bag cups (yellow) 88 mm inside diameter	1 single or double pack	6	339127
Blood bag cups (red) 98 mm inside diameter	1 triple or quad pack	6	339129

**Table 4** Blood Bag Cup (polypropylene) for the JS-4.2SM Oval Buckets

Description	Blood Packs per Cup	Number of Cups per Rotor	Part Number (set of 2)
Blood bag cup (gray)	1 triple or 500-mL quad pack plus filter	6	363651



### Temperature Limits

- Plastic tubes have been centrifuge tested for use at temperatures between 2 and 25°C. For centrifugation at other temperatures, pretest tubes under anticipated run conditions.
- If plastic containers are frozen before use, make sure that they are thawed to at least 2°C prior to centrifugation.



### Thickwall Tubes

Thickwall polypropylene and polycarbonate tubes can be run partially filled with or without caps, but all opposing tubes for a run must be filled to the same level with liquid of the same density. Do not overfill capless tubes.

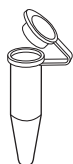
### Polycarbonate and Polypropylene Bottles

Capped polycarbonate and polypropylene bottles may be run completely filled, or partially filled. All opposing containers for a run must be filled to the same level.



### Stainless Steel Tubes

Stainless steel tubes offer excellent resistance to organic solvents and heat, but should not be used with most acids or bases. They offer only marginal resistance to most gradient-forming materials other than sucrose and glycerol. Stainless steel tubes are very strong and can be centrifuged when filled to any level. Stainless steel tubes can be used indefinitely if they are undamaged and not allowed to corrode. They may be autoclaved as long as they are thoroughly dried before storage.

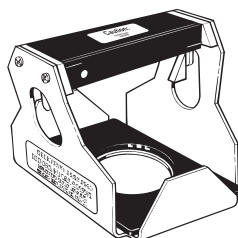


### Microfuge Tubes

Microfuge tubes, 1.5-mL tubes with attached caps, are made of clear polypropylene or of colored polypropylene. They are used in microplate carriers. The number and arrangement of microfuge tubes in opposing carriers should be balanced.

## Microplate Carriers

Microplate carriers (358682) are installed on the rotor pivot pins in place of the buckets normally used with the rotor. The carriers are made of aluminum and are black-anodized for corrosion resistance. Each microplate carrier can accommodate up to three 96-well multiwell plates (when more than one plate is run, up to three plates are placed directly on top of one another).



**NOTE** Microplate carriers cannot be used in the Avanti J-HC centrifuge.

Refer to [Table 5](#) for a list of labware that can be used with the microplate carriers. Rotor speed must not exceed 2500 RPM when microplate carriers are run. For complete microplate carrier information, see publication J6-TB-009, included with the carriers.

**Table 5** Labware for Use with Microplate Carriers

Description	Volume	Part Number	Required Accessory		Rack
			Description	Part Number	
Multiwell plate, 96-well, nonsterile, without caps	300 $\mu$ L/well	609844	—	—	—
Microfuge tube, polypropylene, clear	1.5 mL	357448	Rack insert, white	373696	373661 (holds 24 tubes)
Microfuge tube, polypropylene, clear	1.5 mL	356090	Rack insert, white	373696	373661 (holds 24 tubes)
Microfuge tube, polypropylene, blue	1.5 mL	356091	Rack insert, white	373696	373661 (holds 24 tubes)
Microfuge tube, polypropylene, green	1.5 mL	356092	Rack insert, white	373696	373661 (holds 24 tubes)
Microfuge tube, polypropylene, yellow	1.5 mL	356093	Rack insert, white	373696	373661 (holds 24 tubes)
Microfuge tube, polypropylene, orange	1.5 mL	356094	Rack insert, white	373696	373661 (holds 24 tubes)

## Operation

*For low-temperature runs, precool the rotor in the centrifuge or in a refrigerator before use—especially before short runs—to ensure that the rotor reaches the set temperature. A suggested precooling cycle is a minimum of 30 minutes at 2000 RPM at the required temperature.*

- 1 If fluid containment is required, use capped tubes or bottles.
  - It is strongly recommended that all containers carrying physiological fluids be capped to prevent leakage.
- 2 If you are using a microprocessor-controlled J6 series centrifuge, enter rotor code **4.2** for the JS-4.2 or the JS-4.2SM rotors, or code **3.0** for the JS-3.0 rotor.
- 3 If you are using the Avanti J-HC centrifuge, select the JS-4.2 rotor.
  - The JS-3.0 and JS-4.2SM rotors are not used in the Avanti J-HC.
- 4 Apply a thin film of Spinkote lubricant to the centrifuge drive spindle hub.
- 5 Refer to the centrifuge instruction manual for additional operating instructions.

## Installing the Rotor

Two drive pins inside the rotor drive hole (see [Figure 1](#)) engage with teeth on the centrifuge drive spindle hub to prevent the rotor from slipping during acceleration and deceleration. When the rotor is properly installed, the pins sit in the drive hub grooves or next to the drive hub teeth (see [Figure 2](#)).

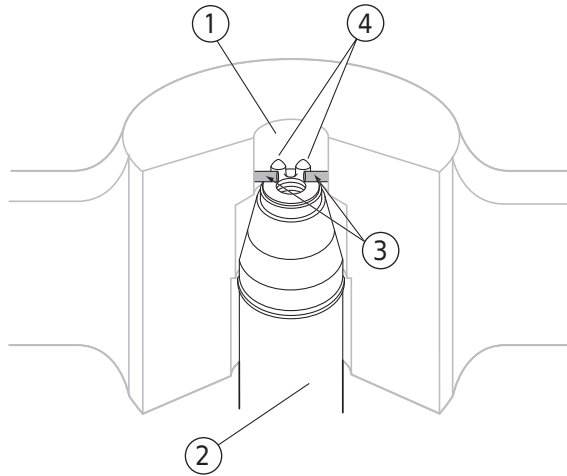
- 1 Hold the rotor with both hands and carefully lower the rotor yoke straight down onto the centrifuge drive spindle hub.
  - a. Slowly rotate the yoke back and forth to make sure that it is properly seated.



**Never drop the rotor yoke onto the drive spindle hub. The drive spindle can be bent if the yoke is dropped onto it.**

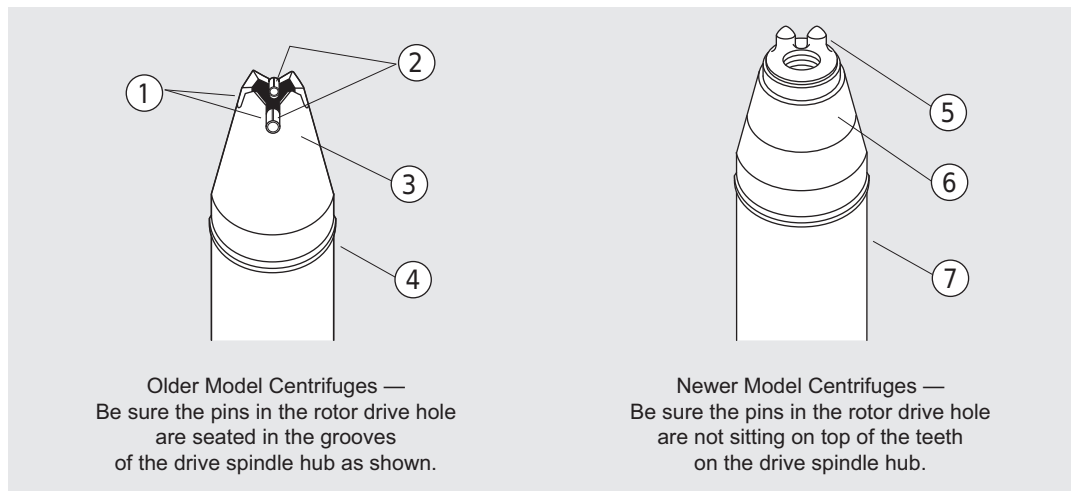


**Figure 1** Rotor Drive Pin Location and Orientation



- |                         |                    |
|-------------------------|--------------------|
| 1. Rotor Drive Hole     | 3. Drive Pins      |
| 2. Centrifuge Drive Hub | 4. Drive Hub Teeth |

**Figure 2** Centrifuge Drive Spindle Hub Configuration

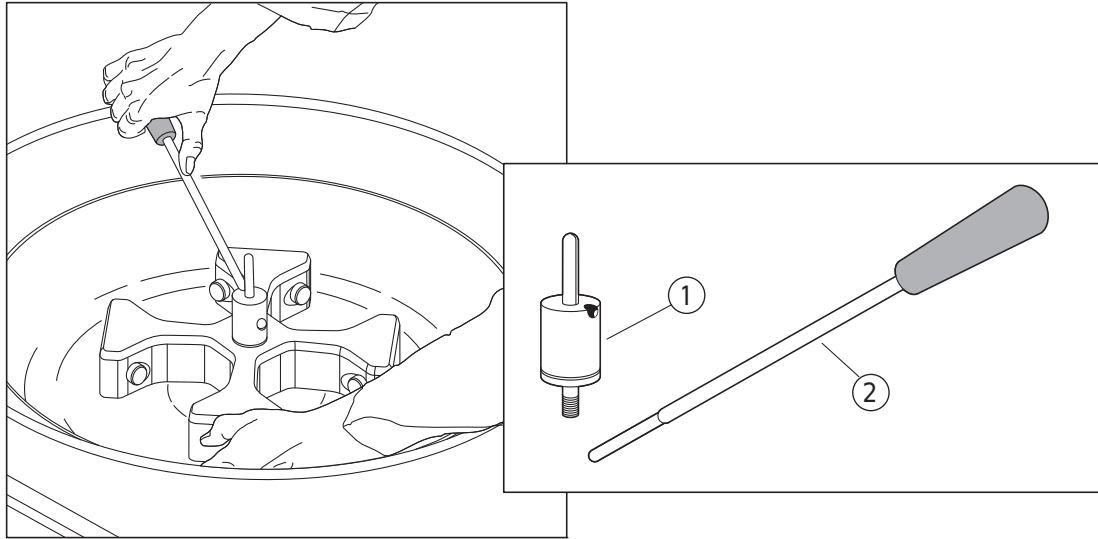


- |                           |                           |
|---------------------------|---------------------------|
| 1. Drive Hub Grooves (4)  | 5. Teeth (2)              |
| 2. Rotor Pins (2)         | 6. Drive Hub              |
| 3. Drive Hub              | 7. Drive Spindle Assembly |
| 4. Drive Spindle Assembly |                           |

- 2 After the rotor is properly seated, secure it to the drive hub with the tie-down bolt (368518).
  - a. Tighten the bolt with the tie-down tool (368521), then remove the tool.
    - This system is shown in [Figure 3](#).
    - Older rotors may have a tie-down screw (339031) which is tightened with a torque bar (878439), as shown in [Figure 4](#).

- 3** *JS-4.2 and JS-4.2SM rotors only:* Place the lid onto the rotor, carefully seating it on the windshield.
- Make sure that the tie-down bolt pin protrudes into the hole in the lid knob.
  - If you keep the rotor in the centrifuge, re-tighten the tie-down bolt before each run.*

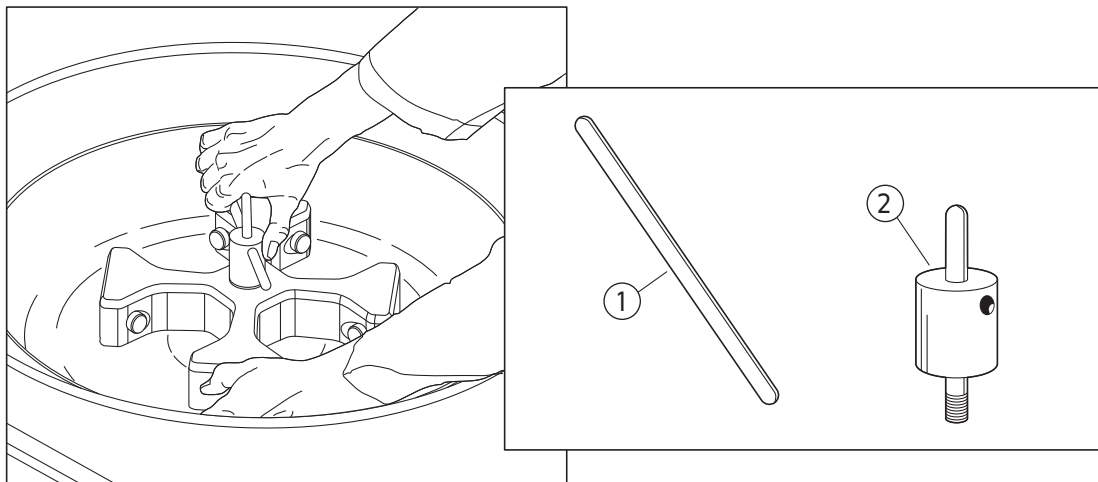
**Figure 3** Using the Tie-Down Bolt and Tie-Down Tool to Tighten the Rotor onto the Drive Hub



1. Rotor Tie-Down Bolt (368518)

2. Tie-Down Tool (368521)

**Figure 4** Using the Tie-Down Screw and Torque Bar to Tighten the Rotor onto the Drive Hub (Older Rotors)



1. Torque Bar (878439)

2. Rotor Tie-Down Screw (339031)

## Installing the Buckets or Microplate Carriers

- 1 Lubricate the contact area between the buckets or carriers and the pivot pins on the rotor yoke as described under [Maintenance](#).
- 2 Place buckets or carriers over the pivot pins on the rotor yoke.
  - a. Fill all six positions with a bucket or carrier.
- 3 Make sure that the buckets or carriers are properly seated by gently swinging them on the pivot pins.

### CAUTION

All six positions on the rotor yoke must contain either a bucket or a microplate carrier (loaded or unloaded) during a run. Never run the rotor without all six positions being filled.

Microplate carriers cannot be used in the Avanti J-HC centrifuge.

## Loading the Buckets and Carriers

### WARNING

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 rotor 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.

When working with potentially hazardous materials, always fill or open containers in an appropriate hood or biological safety cabinet. Capped tubes or bottles are designed to provide fluid containment. We strongly recommend that all containers carrying physiological fluids be capped to prevent leakage.



**Load adapters, cups, buckets, or microplate carriers first before placing them into the installed rotor to avoid damaging the centrifuge.**

## Symmetric and Balanced Loading

To ensure optimal performance and stability, load the rotors symmetrically (see [Figure 5](#)). Two factors affect symmetric loading:

- the rotor must be loaded symmetrically with respect to its center of rotation.
- the buckets or microplate carriers must be loaded symmetrically with respect to their pivotal axes.

This means that for best results you should load opposing buckets or carriers with the same type of labware containing the same amount of fluid of equal density.

- *Rotors run in J6 series centrifuges:* two, three, four, or six sample loads can be run (see [Figure 6](#)). Opposing buckets or carriers and their contents must weigh within 10 grams of each other. If three loads are run, all three must weigh within 10 grams of each other.
- *JS-4.2 rotor run in the Avanti J-HC centrifuge:* three, four, or six sample loads can be run (see [Figure 7](#)). Opposing buckets and their contents must weigh within 5 grams of each other. *Do not run only two loads.*

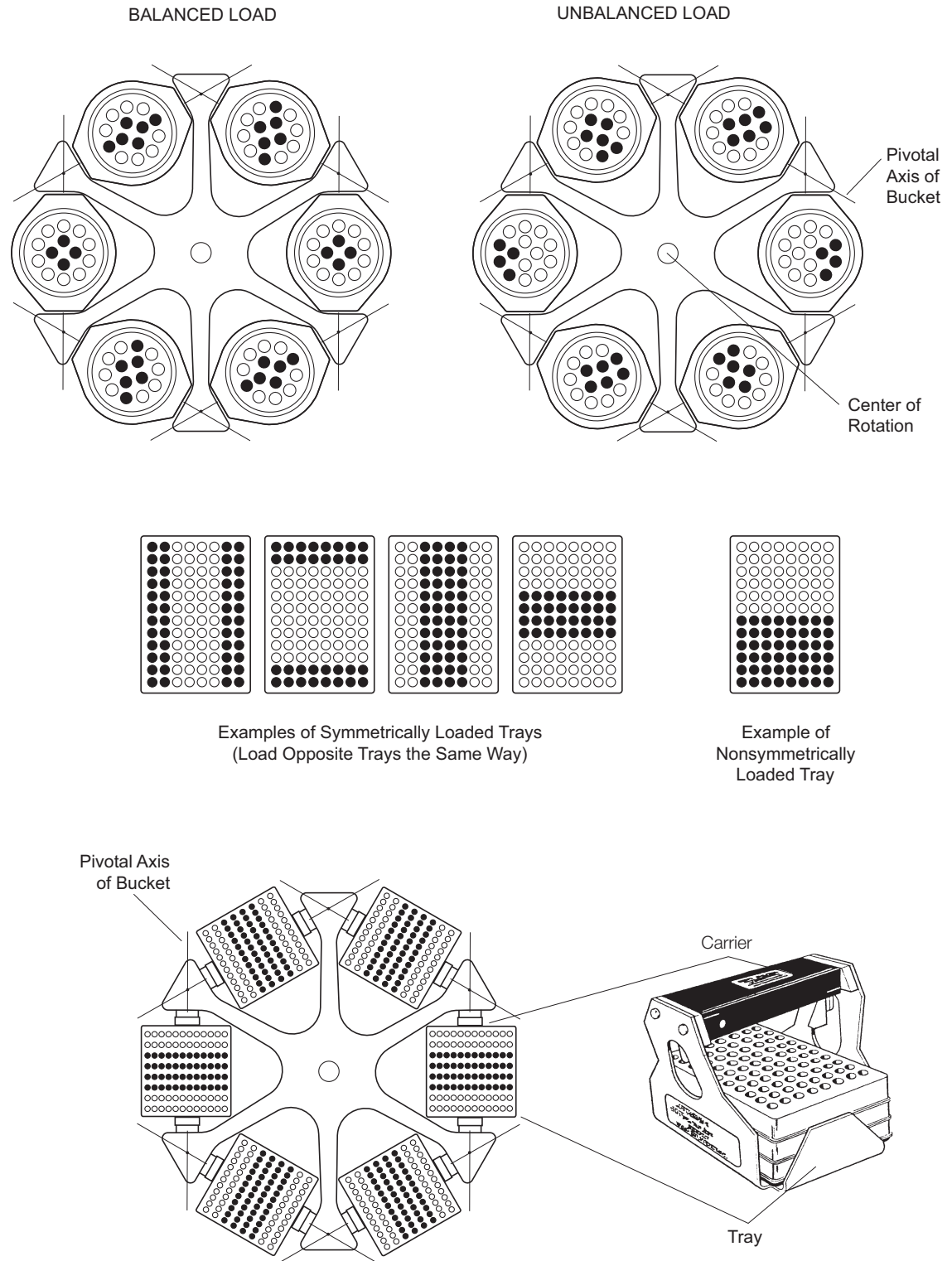
During a run, buckets (or carriers) swing 90 degrees from their at-rest position. The pivotal axis of a bucket can be imagined as a line extending across the bucket from one pivot pin to the other. If a bucket is loaded so that its weight is unequally distributed on either side of its pivotal axis, it will not hang vertically at rest and, more importantly, may not swing to a horizontal position during a run (see [Figure 8](#)). As a result, extra stress will be placed on the bucket and labware during the run, increasing the possibility of breakage or rotor imbalance.

## Loading Buckets

Load buckets before or after they are installed on the rotor yoke. In either case, we recommend filling the labware first and then loading the labware into the buckets. This is especially important when using blood bags—you can trip the imbalance detector in the centrifuge by pushing blood bag cups into buckets installed in the rotor.

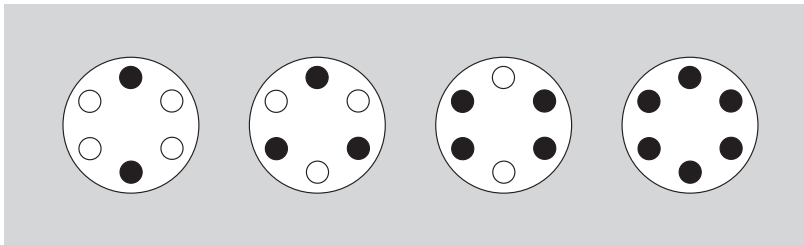
Refer to [Table 1](#) through [Table 5](#) to determine the appropriate labware for your application. Whether you are running tubes, bottles, or blood bags, you must load the buckets symmetrically around the center of rotation and each bucket must be loaded symmetrically with respect to its pivotal axis (see [Symmetric and Balanced Loading](#), above).

**Figure 5** Examples of Correctly and Incorrectly Loaded Buckets and Carriers\*



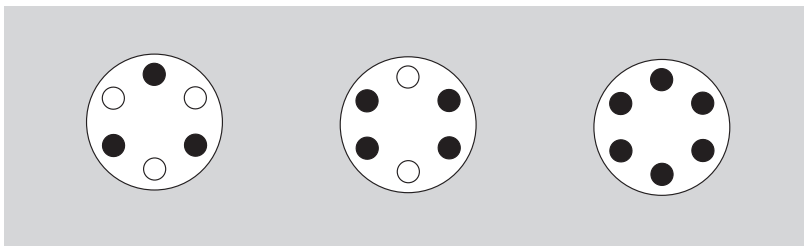
\* Contents of opposing buckets or carriers must be the same and each bucket or carrier must be balanced on its pivotal axis.

**Figure 6** Arranging Loads in the Rotor in a J6 Series Centrifuge



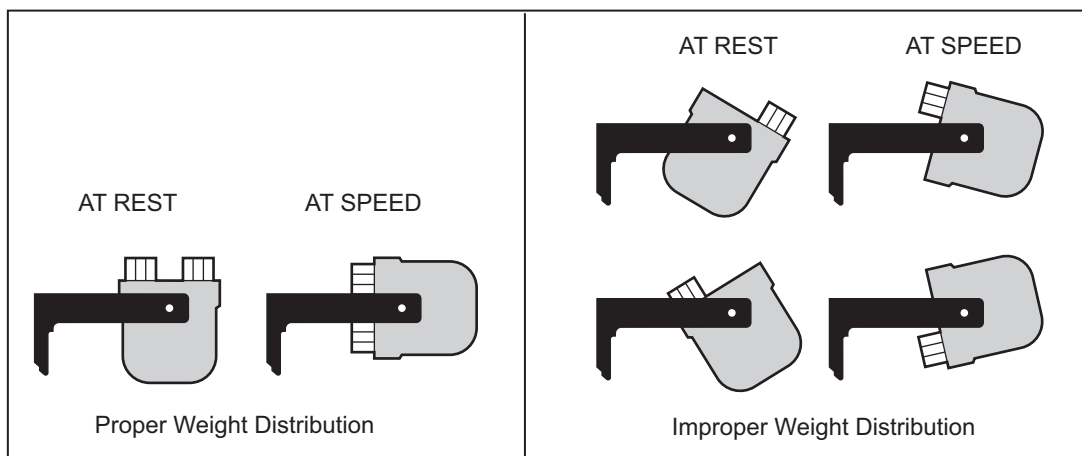
**NOTE** Two, three, four, or six loads can be run, if they are arranged symmetrically in the rotor, as shown.

**Figure 7** Arranging Loads in the JS-4.2 Rotor in the Avanti J-HC Centrifuge



**NOTE** Three, four, or six loads can be centrifuged per run, if they are arranged in the rotor as shown. Do NOT run only two loads.

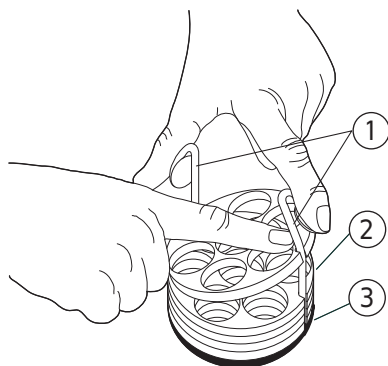
**Figure 8** Examples of the Effects on the Horizontal Swing of Buckets Caused by Proper and Improper Weight Distribution



## Assembling Multi-Disc Adapters

- 1 Slide the U-shaped bracket into the grooved, black rubber adapter base (see [Figure 9](#)).
  - Modified bracket 343369 is required if you are using Aerosal Covers.

**Figure 9** Assembling a Multi-Disc Adapter

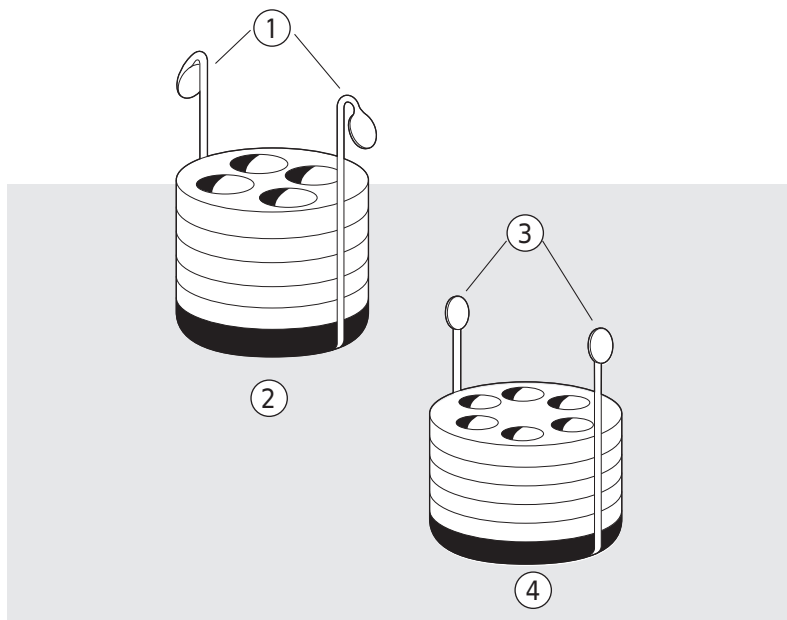


1. Brackets      2. Discs      3. Base

- 2 Place the base and bracket on a lab bench (not in the rotor).
- 3 Position one of the discs so that its grooves are aligned with the bracket.
  - a. Push the disc down until the bracket snaps into the grooves.
- 4 Add more discs until the height of the assembly is nearly as tall as the tubes you will be using.
  - a. Remove or add discs to the bracket to accommodate shorter or longer tubes.
  - b. If the tubes fit too snugly in the adapter's rubber base, apply a light film of powder, such as talcum powder, to prevent the tubes from sticking.
  - c. To disassemble the adapters, pry back the bracket arms by hand and remove the discs.
    - As a safety precaution, the discs have been designed so that they cannot slide up off the bracket.

**NOTE** Do not intermix Beckman Coulter GH-3.8 rotor style Multi-Disc adapters with adapters for the JS-4.2 and JS-3.0 rotors. The adapters are similar in appearance (see [Figure 10](#)), but they have very different weights. Mixing them during a run can cause imbalance.

**Figure 10** Brackets (Vertical Supports) for the JS-4.2-Style Multi-Disc Adapters and the GH-3.8-Style Modular Disk Adapters



- |             |                  |
|-------------|------------------|
| 1. Brackets | 3. Brackets      |
| 2. JS-4.2   | 4. GH-3.8/JS-4.3 |

## Loading Adapters

- 1 First, test to make sure that the tubes or bottles in the adapters will not contact the rotor yoke during centrifugation.
  - a. Place empty tubes or bottles in an adapter and then place the adapter in a bucket on the rotor yoke.
  - b. Manually swing the bucket to horizontal position and make sure that all tubes clear the yoke.
- 2 Place filled tubes or bottles in the assembled adapters.
  - a. If all positions in an adapter are not filled, load the adapter symmetrically with respect to its pivotal axis (see [Symmetric and Balanced Loading](#), above).
- 3 Place the adapters into the buckets so that the brackets line up with the rotor pivot pins.
  - a. If two or four loaded adapters are run, place them in opposite buckets and place empty buckets in the other positions on the yoke.
  - b. If three loaded adapters are run, leave a space between each filled bucket on the rotor yoke and place three empty buckets in the open positions.



## Loading Blood Bag Cups

To load blood bag cups, follow the recommended loading procedure provided by the blood bag manufacturer. With any blood bag, ensure the following conditions.

- When loaded into the cups and buckets, the blood bags must be as vertical as possible with no folds at the top or corners.
- The superstructure of the blood bag protruding from the cup must not inhibit the bucket from swinging out to horizontal position.
  - Test each bucket by swinging it gently to make sure that it reaches horizontal position.
  - If it does not, remove the cup from the rotor and reposition the blood bag so that it seats further into the cup.
  - Allowing a blood bag to contact the rotor yoke during centrifugation can cause the bucket to come off the pivot pins and can seriously damage the rotor and the centrifuge.
- If two or four blood bags are run, place them in cups in opposing buckets.
  - If three blood bags are run, alternate them around the yoke.
  - Place empty buckets in the other positions.
  - Do not run the rotor with fewer than six buckets installed, whether loaded or empty.

## Loading Microplate Carriers

- 1 To prevent plate breakage during centrifugation, place a rubber pad (341830) on the bottom of each carrier.
- 2 Fill the wells not more than three-quarters full, filling wells symmetrically in the plate, and then place a 96-well cap strip (267002) over the loaded plate to prevent leakage.
  - If using more than one plate per carrier, place a 96-well cap strip (267002) between the plates to prevent breakage during centrifugation.
- 3 Tilt the carrier and insert the multiwell plate, being careful not to spill the contents.
  - If you are running more than one plate per carrier, carefully load each plate one at a time into the carrier.

**NOTE** Do not intermix microplate carriers for the Beckman Coulter JS-5.2 and JS-4.0 rotors with those used in the JS-4.2 and JS-3.0 rotors. The carriers look similar, but have different weights and maximum speeds. Each carrier is marked with its maximum speed and the rotors it can be used in; before each run, check that you are using the correct carriers for your rotor. Mixing carriers during a run can cause imbalance. See publication J6-TB-009, shipped with the carriers, for more information.

## Run Speeds

The centrifugal force at a given radius in a rotor is a function of the rotor speed. Comparisons of forces between different rotors are made by comparing the rotors' relative centrifugal fields (RCF). When rotational speed is selected so that identical samples are subjected to the same RCF in two different rotors, the samples are subjected to the same force (see [Table 6](#), [Table 7](#), and [Table 8](#)).

**Table 6** Relative Centrifugal Fields (JS-4.2 and JS-3.0 Rotors with Buckets)<sup>a</sup>

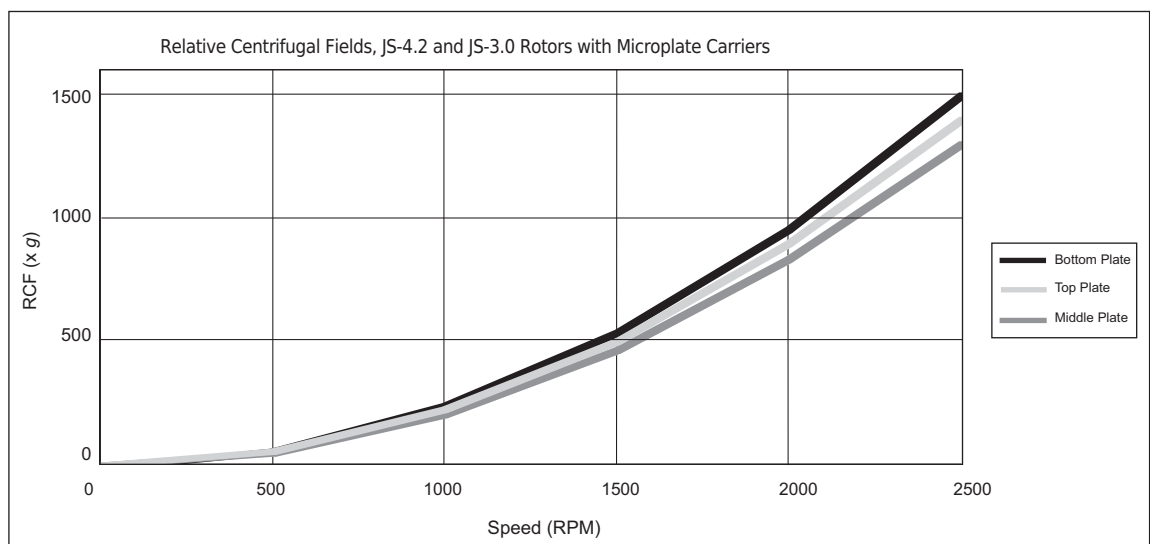
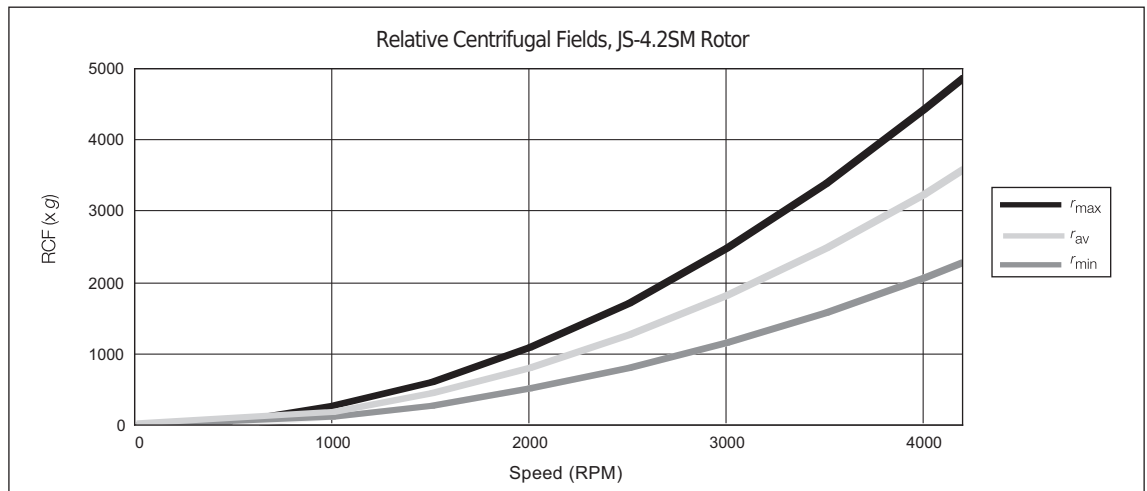
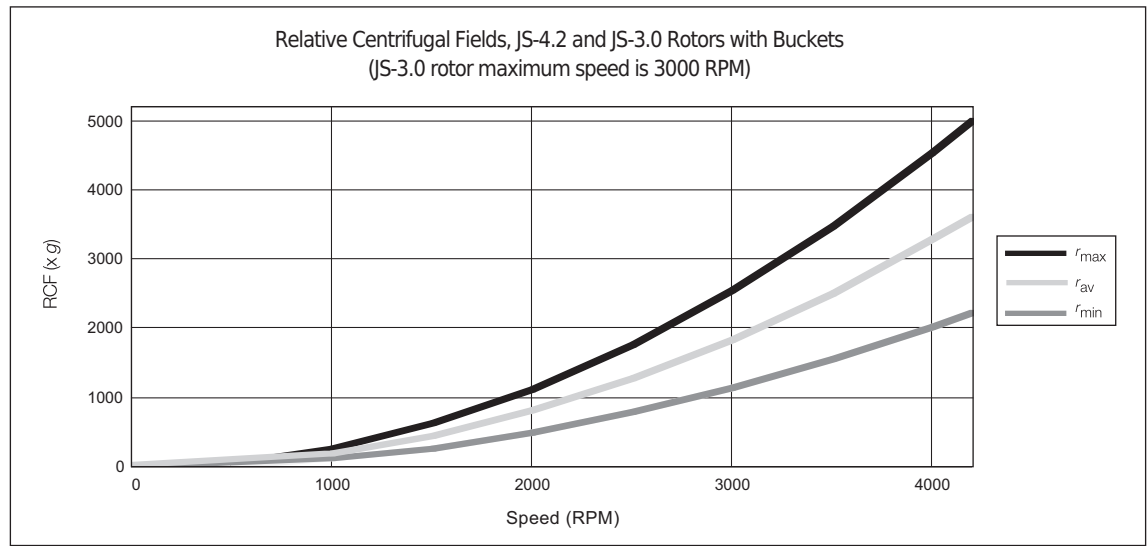
Rotor Speed (RPM)	Relative Centrifugal Field ( $\times g$ ) JS-4.2 and JS-3.0 Rotors and Buckets (JS-3.0 rotor max. speed is 3000 RPM)		
	At $r_{\max}$ (254 mm)	At $r_{\text{av}}$ (184 mm)	At $r_{\min}$ (114 mm)
4200	5020	3640	2250
4000	4550	3300	2040
3500	3480	2520	1560
3000	2560	1850	1150
2500	1780	1290	798
2000	1140	824	510
1500	640	463	287
1000	284	206	127

a. Entries in this table are calculated from the formula  $\text{RCF} = 1.12 r (\text{RPM}/1000)^2$  and then rounded to three significant digits.

**Table 7** Relative Centrifugal Fields (JS-4.2SM Rotor with Buckets)<sup>a</sup>

Rotor Speed (RPM)	Relative Centrifugal Field ( $\times g$ ) JS-4.2SM Rotors and Buckets		
	At $r_{\max}$ (248 mm)	At $r_{\text{av}}$ (182 mm)	At $r_{\min}$ (116 mm)
4200	4900	3600	2250
4000	4440	3260	2040
3500	3400	2500	1560
3000	2500	1830	1150
2500	1880	1380	798
2000	1110	815	510
1500	624	458	287
1000	277	203	127

a. Entries in this table are calculated from the formula  $\text{RCF} = 1.12 r (\text{RPM}/1000)^2$  and then rounded to three significant digits.



**Table 8** Relative Centrifugal Fields for the JS-4.2 and JS-3.0 Rotors When Microplate Carriers are Used<sup>ab</sup>

Rotor Speed (RPM)	Bottom Plate (214 mm)	Middle Plate (186 mm)	Top Plate (186 mm)	MiniTube Rack (214 mm)
2500	1500	1400	1300	1500
2000	958	896	833	958
1500	539	504	468	539
1000	239	224	208	239

- a. Entries in this table are calculated from the formula  $RCF = 1.12 r (RPM/1000)^2$  and then rounded to three significant digits.
- b. Radial distances shown were measured from the center of the rotor to the center of the plate or rack when horizontal.

The rotors can process solutions at the maximum rated speeds only if the solution density is 1.2 g/mL or less. Rotor speeds must be reduced from the rated maximum under any of the following circumstances:

- If the rotor is run without a lid, limit the speed to 3000 RPM. The additional windage created by not using the lid will overload the centrifuge drive and refrigeration systems above this speed.
- Maximum speed when microplate carriers are used is 2500 RPM in all rotors.
- When centrifuging solutions of densities greater than 1.2 g/mL, compute the maximum allowable speed from the following formula:

$$RPM = (\text{maximum rated speed}) \sqrt{\frac{2500 \text{ grams}}{\rho}}$$

where  $\rho$  = the weight in grams of the bucket and its contents.

## Run Temperature

To ensure that the rotor reaches the required temperature during the run, follow the appropriate instructions below for the centrifuge model being used.

### Avanti J-HC Centrifuge

Enter the run temperature according to the instructions in your centrifuge instruction manual. No additional input is required.

### Microprocessor-Controlled J6 Series Centrifuges (Models J6-MI and J6-MC)

Enter rotor code **4.2** (for the JS-4.2 and JS-4.2SM) or rotor code **3.0** (for the JS-3.0) and then follow the steps below.

- 1 Press the **TEMP** key on the centrifuge control panel and then use the keypad to enter the sample temperature.

- 2 Find the compensation value in Table 9 that corresponds with the set temperature and run speed.
  - The compensation values listed in Table 9 are approximates for all J6 series centrifuge models.

**Table 9** J6 Series Centrifuge Temperature Compensation Settings<sup>a</sup>

Rotor Speed (RPM)	Required Sample Temperature						
	2°C	4°C	8°C	10°C	15°C	20°C	30°C
4200	-3	0	5	7	13	19	30
3000	0	2	7	9	14	20	30
2000 and below	2	4	8	10	15	20	30

a. (settings are approximates for all centrifuge models)

If precise temperature control is required, determine the compensation settings empirically as follows:

- a. Fill the rotor with water-filled tubes or bottles.
  - Precool the rotor and water to the required temperature.
- b. Place the filled, precooled rotor in the centrifuge and run the system for at least one-half hour.
- c. Measure the water temperature.
  - If it is lower than the required run temperature, enter positive compensation units during run setup following steps 3 and 4 below.
  - If it is higher than the required run temperature, enter negative compensation units during run setup, also using steps 3 and 4, below.
- d. Discard the water.
  - Fill tubes with sample, load tubes into the rotor, and precool the system to the required temperature before starting the run.

- 3 Press **COMP ADJ.** The word **COMP** flashes below the **TEMPERATURE** display and the display flashes.

- 4 Use the keypad to enter the compensation value.
  - a. Press the  $\pm$ . key to enter a minus sign; pressing it again will remove the minus sign.

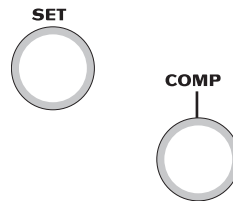
- 5 Check the temperature display.
  - a. (If the entry is incorrect, press **CE** and reenter the digits.)

- 6 When the entry is correct, press **ENTER/RECALL**.

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

### Model J6-HC Analog Centrifuge

Enter the required run temperature and the appropriate temperature compensation setting on the centrifuge control panel as follows.



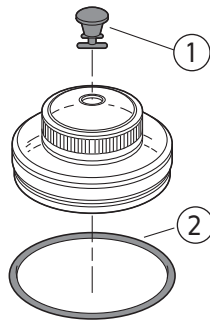
- 1 Find the compensation setting in [Table 9](#) that corresponds with the set temperature and run speed.
  - [Table 9](#) lists approximate compensation settings for all J6 series centrifuge models.
  - If precise temperature control is required, follow the steps in [Microprocessor-Controlled J6 Series Centrifuges \(Models J6-MI and J6-MC\)](#), above.
- 2 Turn the **SET** knob until the green bar on the temperature meter is at the predetermined setting (from [Table 9](#)).

## Care and Maintenance

### Inspection

- 1 Periodically (at least monthly) inspect the rotor yoke and buckets for rough spots or pitting, white powder deposits (frequently aluminum oxide), or heavy discoloration.
  - a. If any of these signs are evident, do not run the rotor.
  - b. Contact your Beckman Coulter representative for information about the Field Rotor Inspection Program and the rotor repair center.
- 2 Regularly check the condition of the tie-down bolt; if it is worn or damaged, replace it.

- 3** Before each use, inspect Aeroseal cover sealing surfaces, especially the O-ring groove.
- It must be smooth and free of scratches.
  - a. Also ensure that the top 2.54 cm (1 in.) of the bucket is clean and smooth; buckets with scratches or gouges in this surface will not seal properly.
  - b. Inspect the O-ring and plug for nicks, abrasions, and other damage.
  - c. Replace damaged components with Beckman Coulter parts only; *do not use a substitute for the O-ring—it has been specifically selected for this application.*

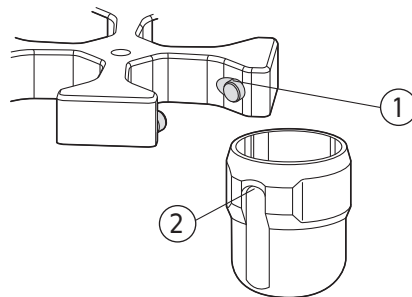


1. Plug  
2. O-ring

## Maintenance

*The rotor yoke, buckets, and microplate carriers are made of anodized aluminum. Do not use sharp tools on them, as scratches in the anodized surface may lead to corrosion.*

- 1** After cleaning and before reinstalling the rotor body in the centrifuge, apply a light, even film of Spinkote lubricant (306812) to the centrifuge drive hub to prevent the rotor from sticking.
- 2** Approximately once a week and after cleaning and/or autoclaving, wipe the rotor pins and pin sockets with a paper towel, then coat with Paint On Graphite Lubricant (977212).
- a. Allow the lubricant to dry for at least 5 minutes before installing the rotor in the centrifuge.



1. Lubrication Points (all pins)  
2. Lubrication Area (both pin sockets)

- 3 Lubricate the O-ring and plug of Aeroseal bucket covers with silicone vacuum grease (335148).
  - a. Also, lightly grease the inside top 1.2 cm (0.5 in.) of the bucket.
- 4 Refer to Appendix A in *Rotors and Tubes* for the chemical resistances of rotor and accessory materials.
  - Your Beckman Coulter representative provides contact with the Field Rotor Inspection Program and the rotor repair center.

## Cleaning

Under normal conditions, remove the rotor from the centrifuge at least once a week for cleaning and lubrication.

Clean the rotor body using a sponge or cloth dampened with the detergent solution, then wipe away the detergent using distilled water. Do NOT immerse or spray the rotor body with water because the liquid can become trapped in the hinge area, which can lead to corrosion.

Allow the rotor body to air-dry upside down. Do not use acetone to dry the rotor. When the rotor is dry, lubricate the bucket sockets and pins as described under [Maintenance](#). Before reinstalling the rotor, lightly lubricate the centrifuge drive hub with Spinkote to prevent the rotor from sticking.

## Rotor Components

- 1 If spillage has occurred, or if salt solutions or other corrosive materials are used, clean the rotor and components immediately.
  - a. Do not allow corrosive materials to dry on rotor components.
- 2 Approximately once a week (or every 80 runs), clean the pins and bucket pin sockets, then lubricate as described under [Maintenance](#).



- 3 Most laboratory detergents are too harsh for use on aluminum rotors because they can damage the anodized surface.
  - a. Use a mild detergent such as Beckman Solution 555 (339555), diluted 10 to 1 with water, and a soft brush to clean the rotor yoke and tie-down bolt.
  - The Rotor Cleaning Kit (339558) contains two quarts of Solution 555 and brushes that will not scratch the rotor.



## Buckets

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- 1 Clean the buckets with a mild detergent such as Solution 555 (339555), diluted 10 to 1 with water.
    - Buckets can be immersed or cleaned with a sponge.
  - 2 Rinse buckets thoroughly with distilled water and allow them to air-dry completely.
  - 3 After cleaning, lubricate bucket pin sockets as described under [Maintenance](#).
- 

## Microplate Carriers (Including Pad) and Blood Bag Cups

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- 1 Wash with a mild detergent such as Solution 555 (339555), diluted 10 to 1 with water, and a soft brush.
  - 2 Thoroughly rinse and air-dry them upside down.
- 

## Multi-Disc Adapters

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- 1 Adapters, carriers, and cups may be cleaned with a weak, lukewarm solution of mild soap or detergent, such as Solution 555, diluted 10 to 1 with water.
    - Rinse well and dry.
    - Multi-disc adapters can be separated slightly within their brackets to allow full surface contact of the washing solution.
    - They do not need to be disassembled unless a tube has broken.
      - If this happens, separate parts and *carefully* remove the glass; make sure that no glass is embedded in the polypropylene or in the rubber base.
      - If necessary, apply a light film of silicone vacuum grease (335148) to the grooves on the rubber adapter bottom to make reassembling easier.
    - Keep matched sets of adapters together; do not intermix sets.
-

## Decontamination



If the rotor yoke, buckets, and/or microplate carriers become contaminated with radioactive material, decontaminate them using a solution that will not damage their anodized surfaces. Beckman Coulter has tested a number of solutions and found several that do not harm anodized aluminum: RadCon Surface Spray or IsoClean Solution for soaking)\* and Radiacwash.†

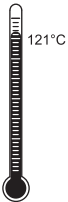
**NOTE** IsoClean can cause fading of colored anodized surfaces. Use it only when necessary and remove it promptly from surfaces.

While Beckman Coulter has tested these methods and found that they do not damage components, no guarantee of decontamination is expressed or implied. Consult your laboratory safety officer regarding the proper decontamination methods to use.



If the rotor or other components are contaminated with toxic or pathogenic materials, follow appropriate decontamination procedures as outlined by your laboratory safety officer.

## Sterilization and Disinfection



- The rotor yoke, buckets, microplate carriers, and tube adapters can be autoclaved at 121°C for up to an hour. *Do not autoclave blood bag cups.* Ethanol (70%)‡ may be used on all rotor components, including those made of plastic and rubber. See Appendix A in *Rotors and Tubes* for more information regarding chemical resistance of tubes, bottles, and accessories.

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

Refer to publication IN-192 (included with each box of tubes) for tube sterilization and disinfection procedures.

## Returning a Rotor

Before returning a rotor or accessory for any reason, prior permission must be obtained from Beckman Coulter, Inc. This form may be obtained from your local Beckman Coulter sales office. The form, entitled *Returned Material Authorization* (RMA) for United States returns or *Returned Goods Authorization* (RGA) for international returns, should contain the following information:

- rotor type and serial number,
- history of use (approximate frequency of use),
- reason for the return,
- original purchase order number, billing number, and shipping number, if possible,

\* In the United States, contact Nuclear Associates (New York); in Eastern Europe and Commonwealth States, contact Victoreen GmbH (Munich); in South Pacific, contact Gammasonics Pty. Ltd. (Australia); in Japan, contact Toyo Medic Co. Ltd. (Tokyo).

† In the United States, contact Biodex Medical Systems (Shirley, NY); internationally, contact the U.S. office to find the dealer nearest you.

‡ Flammability hazard. Do not use in or near operating ultracentrifuges.

- name and email address of the person to be notified upon receipt of the rotor or accessory at the factory,
- name and email address of the person to be notified about repair costs, etc.

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. Smaller items (such as tubes, bottles, etc.) should be enclosed in a sealed plastic bag.

*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.***

Use the address label printed on the RMA/RGA form when mailing the rotor and/or accessories.

Customers located outside the United States should contact their local Beckman Coulter office.

## Supply List

**NOTE** Publications referenced in this manual can be obtained at [www.beckmancoulter.com](http://www.beckmancoulter.com), by calling Beckman Coulter at 1-800-742-2345 in the United States, or by contacting your local Beckman Coulter office.

See the *Beckman Coulter High Performance, High Speed, High Capacity Rotors, Tubes, & Accessories* catalog (BR-8102, available at [www.beckmancoulter.com](http://www.beckmancoulter.com)) or contact Beckman Coulter Sales (1-800-742-2345 in the United States) for detailed information on ordering parts and supplies. For your convenience, a partial list is given below.

## Replacement Rotor Parts

Description	Part Number
<b>JS-4.2 and JS-3.0</b>	
Rotor assembly, JS-4.2 Contains one rotor body with attached windshield, one rotor cover assembly (348392), round buckets, set of 6 (368575)	339080
Rotor assembly, JS-3.0 Contains one rotor body (no windshield), round buckets, set of 6 (368575)	339081
Rotor buckets (round, blue anodized, set of 6)	368575
Aeroseal cover for round buckets (1)	343686

Description	Part Number
<b>JS-4.2SM</b>	
Rotor assembly, JS-4.2SM Contains one rotor body with attached windshield, one rotor cover assembly (348392), oval buckets, set of 6 (348393), blood bag cups, gray, set of 6 (3 sets of 363651, pkg/2 each)	348394

## Other

**NOTE** For MSDS information, go to the Beckman Coulter website at [www.beckmancoulter.com](http://www.beckmancoulter.com).

Description	Part Number
Blood bag cups	see <a href="#">Table 3</a> and <a href="#">Table 4</a>
Cover assembly (for JS-4.2 and JS-4.2SM only)	348392
Microplate carriers (includes rubber pads), set of 2	358682
Microplate carrier labware	See <a href="#">Table 5</a>
Rubber pad for use in microplate carriers (1)	341830
96-well cap strip, nonsterile (pkg/12)	267002
Multi-disc adapters (polypropylene)	See <a href="#">Table 2</a>
Tubes and bottles	see <a href="#">Table 1</a>
Rotor Cleaning Kit	339558
Rotor tie-down kit Contains tie-down bolt (368518) and tie-down tool (368521)	367045
Silicone vacuum grease (1 oz)	335148
Solution 555 (1 qt)	339555
Spinkote lubricant (2 oz)	306812
Paint On Graphite Lubricant	977212

# Beckman Coulter, Inc.

## J-Series Swinging-Bucket Rotor Warranty

Subject to the conditions specified below and the warranty clause of the Beckman Coulter, Inc., terms and conditions of sale in effect at the time of sale, Beckman Coulter, Inc. agrees to correct either by repair, or, at its election, by replacement, any defects of material or workmanship which develop within seven (7) years after delivery of a J series rotor to the original buyer by Beckman Coulter, Inc. or by an authorized representative, provided that investigation and factory inspection by Beckman Coulter discloses that such defect developed under normal and proper use. Should a Beckman Coulter centrifuge be damaged due to a failure of a rotor covered by this warranty, Beckman Coulter will supply free of charge all centrifuge parts required for repair.

### 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.

A defective rotor will be replaced by Beckman Coulter at its then current list price less a credit based upon the age of the rotor (years since date of purchase). The Buyer shall not receive credit until the claimed defective rotor is returned to Beckman Coulter's Indianapolis, Indiana, facility or delivered to a Beckman Coulter Field Service representative.

The replacement price (cost to Buyer) for the respective rotor shall be calculated as follows:

$$\text{Replacement price} = \text{Current rotor list price} \times \frac{\text{years}}{7}$$

### Conditions

1. Except as otherwise specifically provided herein, this warranty covers the rotor only and Beckman Coulter shall not be liable for damage to accessories or ancillary supplies including but not limited to (i) tubes, (ii) tube caps, (iii) tube adapters, or (iv) tube contents.
2. This warranty is void if the rotor has been subjected to customer misuse such as operation or maintenance contrary to the instructions in the Beckman Coulter rotor or centrifuge manual.
3. This warranty is void if the rotor is operated with a rotor drive unit or in a centrifuge unmatched to the rotor characteristics, or is operated in a Beckman Coulter centrifuge that has been improperly disassembled, repaired, or modified.
4. Each bucket, whether purchased with a rotor assembly or purchased separately, is covered by this warranty for seven (7) years from the date of purchase, and will be replaced or repaired during such period according to the terms and conditions of this warranty.
5. Buckets should not be used after the expiration date, which is seven (7) years beyond the date of purchase. Use of a bucket after such expiration date voids Beckman Coulter's warranty obligations with respect to any rotor and/or centrifuge in which such a bucket is used.

### 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.





## Related Documents

### **Rotors and Tubes for Beckman Coulter J2, J6, Avanti J Series Centrifuges (JR-IM-10)**

- Rotors
- Tubes, Bottles, and Accessories
- Using Tubes, Bottles, and Accessories
- Using Fixed-Angle Rotors
- Using Swinging-Bucket Rotors
- Using Vertical-Tube and Near-Vertical Tube Rotors
- Care and Maintenance
- Chemical Resistances for Beckman Coulter Centrifugation Products
- Temperature Compensation Tables
- Gradient Materials
- Blood Component Separation
- References
- Glossary

Available in hard copy or electronic pdf by request.

### **Rotors and Tubes CD (369668)**

- Rotors and Tubes for Tabletop Preparative Ultracentrifuges
- Rotors and Tubes for J2, J6, Avanti J Series Centrifuges
- Rotors and Tubes for Preparative Ultracentrifuges
- Rotor Safety Bulletin
- Chemical Resistances for Beckman Coulter Centrifugation Products

Included with shipment of instrument.

### **Additional References**

- Chemical Resistances for Beckman Coulter Centrifugation Products (IN-175)
- Beckman Coulter High-Performance and High-Capacity Centrifuges catalog (BR-8102)
- Use and Care of Centrifuge Tubes and Bottles (IN-192)

Available at [www.beckmancoulter.com](http://www.beckmancoulter.com)

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