Instructions For Use

JA-10.100 Fixed-Angle Rotor

For Use in the Beckman Coulter
Avanti J-15 and J-15R Centrifuges

B80290AB
December 2018

Beckman Coulter, Inc.
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BECKMAN COULTER

JA-10.100 Fixed-Angle Rotor For Use in the Beckman Coulter Avanti J-15 and J-15R Centrifuges
B80290AB (December 2018)

Contact Us
If you have any questions, contact our Customer Support Center.

- Worldwide, find us via our website at www.beckman.com/support/technical.
- In the USA and Canada, call us at 1-800-369-0333.
- Outside of the USA and Canada, contact your local Beckman Coulter Representative.

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

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Glossary of Symbols is available at beckman.com/techdocs (PN C24689).

Original Instructions

Revision Status

This document applies to the latest and higher versions. When a subsequent version affects the information in this document, a new issue will be released to the Beckman Coulter website. For labeling updates, go to www.beckman.com/techdocs and download the latest version of the manual or system help for your instrument.

Initial Issue B80290AA, 05/2017

Issue AB, 12/2018
Changes were made to: *Related Documents*, removed unavailable manual; Removed Symbols Glossary, see beckman.com/techdocs (PN C24689).

Note: *Changes that are part of the most recent revision are indicated in text by a bar in the margin of the amended page.*

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 us.

Beckman Coulter, Inc. urges its customers and employees to comply with all national health and safety standards such as the use of barrier protection. This may include, but is not limited to, protective eyewear, gloves, and suitable laboratory attire when operating or maintaining this or any other automated laboratory instrumentation.

⚠ WARNING

If the equipment is used in a manner not specified by Beckman Coulter, Inc., the protection provided by the equipment may be impaired.

⚠ CAUTION

If you purchased this product from anyone other than Beckman Coulter or an authorized Beckman Coulter distributor, and, if it is not presently under a Beckman Coulter Service Maintenance Agreement, Beckman Coulter cannot guarantee that the product is fitted with the most current mandatory engineering revisions or that you will receive the most current information bulletins concerning the product. If you purchased this product from a third party and would like further information concerning this topic, contact us.

Alerts for Warning, Caution, Important and Note

All Warnings and Cautions in this document include an exclamation point, framed within a triangle.

The exclamation point symbol is an international symbol which serves as a reminder that all safety instructions should be read and understood before installation, use, maintenance, and servicing are attempted.

⚠ 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.

IMPORTANT IMPORTANT is used for comments that add value to the step or procedure being performed. Following the advice in the IMPORTANT adds benefit to the performance of a piece of equipment or to a process.

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

JA-10.100 Rotor Safety Precautions

IMPORTANT This rotor was developed, manufactured, and tested for safety and reliability as part of a Beckman Coulter centrifuge/rotor system. Its safety or reliability cannot be assured if used in a centrifuge not of Beckman Coulter's manufacture or in a Beckman Coulter centrifuge that has been modified without Beckman Coulter's approval.

NOTE Although rotor components and accessories made by other manufacturers may fit in the JA-10.100 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the JA-10.100 rotor may void the rotor warranty and should be prohibited by your laboratory safety officer. Only the components and accessories listed in this publication should be used in this rotor.

Safety During Installation and/or Maintenance

⚠ WARNING

Risk of injury or equipment damage. Vapors from flammable reagents or combustible fluids could enter the centrifuge air system and be ignited by the motor. Do not use the centrifuge in the vicinity of flammable liquids or vapors, and do not run such materials in the instrument.

Perform only the maintenance described in the appropriate User's Manual for the Avanti J-15 Series Centrifuges. Maintenance other than that specified in the User's Manual should be performed only by a Beckman Coulter Representative.

IMPORTANT It is your responsibility to decontaminate components of the instrument before requesting service by a Beckman Coulter Representative or returning parts to Beckman Coulter for repair. Beckman Coulter will NOT accept any items which have not been decontaminated where it is appropriate to do so. If any parts are returned, they must be enclosed in a sealed plastic bag stating that the contents are safe to handle and are not contaminated.

Any servicing of this equipment that requires removal of any covers can expose parts that involve the risk of electric shock or personal injury. Make sure that the power switch is off and the

centrifuge is disconnected from the main power source by removing the Mains (power) plug from the outlet receptacle, and refer such servicing to qualified personnel.

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

Radiation Safety

Use universal precautions when working with radioactive materials. Means must be available to decontaminate the instrument and dispose of radioactive waste.

Chemical and Biological Safety

Use universal precautions when working with pathogenic materials. Means must be available to decontaminate the instrument and to dispose of biohazardous waste.

NOTE Observe all warnings and cautions listed for any external devices attached or used during operation of the instrument. Refer to applicable external device user's manuals for operating procedures of that device.

NOTE For Safety Data Sheets (SDS/MSDS) information, go to the Beckman Coulter website at **https://www.beckman.com/techdocs**.

⚠ WARNING

Risk of chemical injury from bleach. To avoid contact with the bleach, use barrier protection, including protective eyewear, gloves, and suitable laboratory attire. Refer to the Safety Data Sheet for details about chemical exposure before using the chemical.

⚠ WARNING

Risk of personal injury or equipment damage. Ethanol is a flammability hazard. Do not use it in or near operating centrifuges.

⚠ WARNING

Risk of personal injury or property damage. The rotor 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. Always observe appropriate cautionary procedures as defined by your safety officer when using flammable solvents.

⚠ WARNING

Risk of personal injury or contamination. Before running with chemical or biological samples, test new labware types to determine if normal operation of the rotor may involve the use of materials that are toxic, flammable, or otherwise biologically harmful. When using such materials, observe the following precautions:

- **Handle infectious samples according to good laboratory procedures and methods to prevent the spread of disease.**
- **Observe all cautionary information printed on the original solutions' containers prior to their use.**
- **Dispose of all waste solutions according to your facility's waste disposal procedures.**
- **Operate the instrument in accordance with the instructions outlined in this manual and take all the necessary precautions when using pathological, toxic, or radioactive materials.**
- **Splashing of liquids may occur; therefore, take appropriate safety precautions, such as using safety glasses and wearing protective clothing, when working with potentially hazardous liquids.**
- **Use an appropriately-contained environment when using hazardous materials.**
- **Observe the appropriate cautionary procedures as defined by your safety officer when using flammable solvents in or near a powered-up instrument.**
- **Always observe appropriate cautionary procedures as defined by your safety officer when using flammable solvents or toxic, pathological, or radioactive materials.**

⚠ WARNING

Risk of contamination. 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 procedures and methods to prevent spread of disease. Because spills may generate aerosols, observe proper safety precautions for aerosol containment.

⚠ WARNING

Risk of personal injury or contamination. 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.

⚠ CAUTION

Risk of contamination. If disassembly reveals evidence of leakage, you should assume that some fluid escaped the rotor. Apply appropriate decontamination procedures to the centrifuge and accessories as determined by your laboratory safety officer.

Mechanical Safety

⚠ WARNING

Risk of personal injury. To avoid injury due to moving parts, observe the following:

- **Never attempt to exchange labware or reagents while the instrument is operating.**
- **Never attempt to physically restrict any of the moving components of the instrument.**
- **NEVER attempt to slow or stop a rotor by hand.**
- **Keep the instrument work area clear to prevent obstruction of the movement.**

Rotors are designed for use at the speeds indicated; however, speed reductions may be required because of weight considerations of tubes, adapters, and/or the density of the solution being centrifuged. Be sure to observe the instructions in this rotor manual.

The strength of containers can vary between lots, and will depend on handling and usage. We highly recommend that you pretest them in the rotor (using buffer or gradient of equivalent density to the

intended sample solution) to determine optimal operating conditions. Scratches (even microscopic ones) significantly weaken glass and polycarbonate containers.

To help prevent premature failures or hazards by detecting stress corrosion, metal fatigue, wear or damage to anodized coatings, and to instruct laboratory personnel in the proper care of rotors, Beckman Coulter offers the Field Rotor Inspection Program (FRIP). This program involves a visit to your laboratory by a specially trained Beckman Coulter representative, who will inspect all of your rotors for corrosion or damage. The representative will recommend repair or replacement of at risk rotors to prevent potential rotor failures. Contact us to request this service.

California Prop 65 Warning

This product may contain a chemical known to the State of California to cause cancer, or birth defects or other reproductive harm.

Cleaning

Observe the cleaning procedures for the rotor outlined in *Cleaning*. Prior to cleaning equipment that has been exposed to hazardous material:

- Contact the appropriate Chemical and Biological Safety personnel.
- Review the Chemical and Biological Safety information in the user's manual.

Maintenance

Perform only the maintenance described in this manual. Maintenance other than that specified in this manual should be performed only by your Beckman Coulter Representative.

IMPORTANT It is your responsibility to decontaminate components of the rotor before requesting service by a Beckman Coulter Representative or returning parts to Beckman Coulter. Beckman Coulter will NOT accept any items which have not been decontaminated where it is appropriate to do so. If any parts are returned, they must be enclosed in a sealed plastic bag stating that the contents are safe to handle and are not contaminated.

Disposal

Clean and decontaminate the rotor per the *Care and Maintenance* section of this manual before disposal. Users are encouraged to check with local waste disposal authorities for specific disposal requirements.

JA-10.100 Fixed Angle Rotor Safety Messages

⚠ CAUTION

Risk of equipment damage or contamination. Rotors operated with improperly balanced loads can cause breakage or contamination. Make sure that filled containers are loaded symmetrically into the rotor and that opposing bottles or tubes are filled to the same level with liquid of the same density.

⚠ WARNING

Risk of personal injury or contamination. 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.

⚠ CAUTION

Risk of equipment damage. The drive shaft can be damaged if the rotor is forced sideways or dropped onto it. Never force or drop the rotor yoke onto the centrifuge drive shaft.

⚠ CAUTION

Risk of equipment damage. Operating the centrifuge at speeds above those recommended for the rotor and labware can cause breakage. Never exceed the maximum rated speed of the rotor and labware in use.

⚠ CAUTION

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

⚠ CAUTION

Risk of equipment damage. Salts and other corrosive materials can damage the rotor and rotor components. Wash the rotor and rotor components immediately if salts or other corrosive materials are used or if spillage has occurred, according to your laboratory safety procedures.

⚠ CAUTION

Risk of contamination or equipment damage. Tubes can break during centrifugation. Clean the rotor and adapters thoroughly immediately following a tube breakage, according to your laboratory safety procedures.

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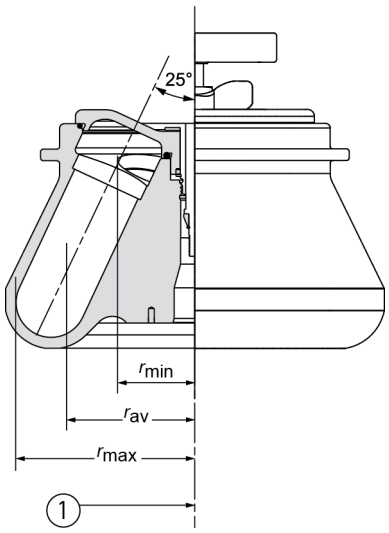
JA-10.100 Fixed-Angle Rotor

Specifications



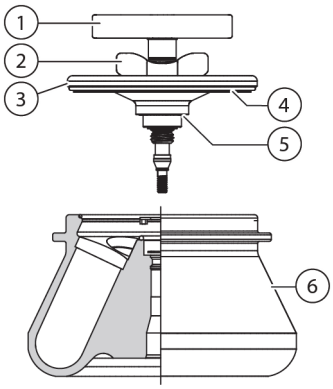
1. Axis of Rotation

Maximum speed	10,200 RPM
Density rating at maximum speed	1.2 g/mL
Critical speed range[a]	1450 to 1650 RPM
Relative Centrifugal Field[b] at maximum speed	
at r_{max} (98.0 mm)	11,420 × *g*
at r_{av} (66.5 mm)	7,750 × *g*
at r_{min} (35.0 mm)	4,080 × *g*
k factor at maximum speed	2507
Conditions requiring speed reductions	see *Run Speeds*
Number of tube cavities	6
Nominal tube dimensions (largest bottle)	38 × 102 mm
Nominal tube capacity (largest bottle)	100 mL
Nominal rotor capacity	600 mL
Maximum allowable imbalance of opposing loads	6 grams
Approximate acceleration time to maximum speed (fully loaded)	45 seconds
Approximate deceleration time from maximum speed (fully loaded)	40 seconds
Weight of fully loaded rotor	6.5 kg (14.3 lb)
Rotor and lid material	anodized aluminum

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 or running at 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, ω is the angular velocity in radians per second (2π RPM /60), and *g* is the standard acceleration of gravity (9807 mm/s^2). After substitution: RCF = 1.12*r* (RPM/1000)^2

Description



1. Tie-down T-Bar
2. “Daisy” Knob
3. Lid
4. Large O-ring
5. Small O-ring
6. Rotor Body

This rotor is intended for indoor use only.

This Beckman Coulter rotor has been manufactured in an ISO 9001 or 13485 facility for use with the specified Beckman Coulter centrifuges.

The JA-10.100 is a fixed-angle rotor designed to centrifuge up to six 100 mL tubes at a 25° angle to the axis of rotation. Applications for this rotor include density gradient separations of erythrocytes, cell lysate fractions, granules, as well as differential separation of DNA, proteins, and viruses. Up to 600 mL of sample volume can be centrifuged per run.

The rotor and lid are made of aluminum and are anodized for corrosion resistance. The rotor is black and the lid is green. A lubricated O-ring in the rotor maintains atmospheric pressure in the rotor during centrifugation. A tie-down T-bar is used to secure the rotor to the centrifuge drive hub.

The rotor was tested (see *Bio-Safety*) to demonstrate containment of microbiological aerosols under normal operating conditions of the associated Beckman Coulter centrifuge, when used and maintained as instructed.

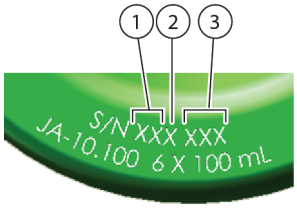
Refer to the *Beckman Coulter, Inc. JA-10.100 Warranty* at the back of this manual for warranty information.

Bio-Safety

Validation of microbiological containment for the rotor was done at an independent third-party testing facility: Public Health England, Porton Down, UK. Improper use or maintenance may affect seal integrity and thus containment.

Serial Number

Figure 1 JA-10.100 Serial Number



1. Year
2. Manufacturer code
3. Serialized number

The rotor lid and rotor body have the same serial number. The centrifuge identifies the rotor type during the run by means of a magnetic sensor system in the rotor chamber and magnets imbedded in the rotor. The overspeed system ensures that the rotor does not exceed its permitted speed.

Preparation and Use

Specific information about the JA-10.100 rotor is given here. Information about the centrifuge is contained in the centrifuge manual, which should be used together with this manual for complete centrifuge, rotor, and accessory operation.

Pre-run Safety Checks

IMPORTANT Read the *Safety Notice* section at the front of this manual before using the rotor.

1 Make sure that the rotor, lid, and all tubes or bottles and accessories are clean and show no signs of corrosion or cracking.

2 If fluid containment is required, *use capped bottles or tubes.*

- All containers carrying physiological fluids should be capped, and not overfilled, to prevent leakage.

3 Check the chemical compatibilities of all materials used (refer to *Chemical Resistances,* publication IN-175).

Rotor Preparation

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 required temperature.

NOTE Temperatures may vary slightly between centrifuges. If sample temperature is crucial, test temperature settings on your instrument using water samples.

1 Be sure that the metal threads in the rotor are clean and lightly but evenly coated with Spinkote lubricant (306812).

⚠ WARNING

Risk of contamination. 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 procedures and methods to prevent spread of disease. Because spills may generate aerosols, observe proper safety precautions for aerosol containment.

⚠ CAUTION

Risk of equipment damage or contamination. Rotors operated with improperly balanced loads can cause breakage or contamination. Make sure that filled containers are loaded symmetrically into the rotor and that opposing bottles or tubes are filled to the same level with liquid of the same density.

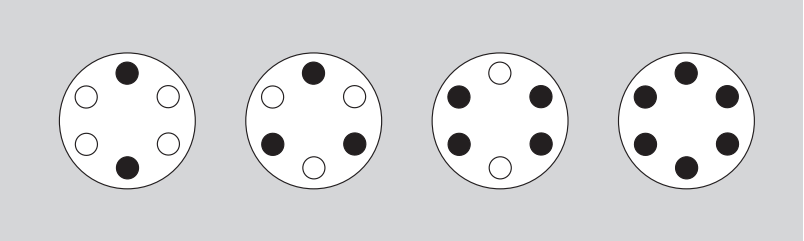
⚠ WARNING

Risk of personal injury or contamination. 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.

2 Load the filled containers symmetrically into the rotor (see *Tubes and Bottles* for tube and bottle information).

- If fewer than six tubes are being run, they must be arranged symmetrically in the rotor (see Figure 2).
- *Opposing tubes must be filled to the same level with liquid of the same density*—maximum imbalance is 6 grams.

Figure 2 Typical Examples of Arranging Tubes or Bottles in the Rotor



NOTE Two, three, four, or six containers can be centrifuged per run, if they are arranged in the rotor as shown in Figure 2.

Operation

Refer to the applicable centrifuge instruction manual for detailed operating information.

1 Be sure the lid O-rings are lightly but evenly coated with silicone vacuum grease (335148).

2 Put the lid in place and use the "daisy" knob to tighten it by hand as firmly as possible.

⚠ CAUTION

Risk of equipment damage. The drive shaft can be damaged if the rotor is forced sideways or dropped onto it. Never force or drop the rotor yoke onto the centrifuge drive shaft.

3 Install the rotor into the centrifuge by centering it over the drive shaft and carefully lowering it straight down.

4 Turn the tie-down T-bar to the right (clockwise) to secure the rotor to the drive shaft.

5 Refer to the instrument instruction manual for centrifuge operation.

Removal and Sample Recovery

⚠ CAUTION

Risk of contamination. If disassembly reveals evidence of leakage, you should assume that some fluid escaped the rotor. Apply appropriate decontamination procedures to the centrifuge and accessories as determined by your laboratory safety officer.

1 If removing the rotor, turn the tie-down T-bar to the left (counterclockwise) to release it, and lift it straight up and off the drive shaft.

2 Turn the "daisy" knob counterclockwise to remove the rotor lid and unload the containers.

Tubes and Bottles

Tubes and bottles 38 mm in diameter and up to 108 mm long can be run in the JA-10.100 rotor without adapters. Smaller tubes and bottles can be used with adapters listed in Table 1, Bottle and Tube Adapters for the JA-10.100 Rotor. Available Beckman Coulter tubes and bottles are listed in Table 2, Available Beckman Coulter Bottles and Tubes for the JA-10.100 Rotor.

Fill tubes and bottles at least half full. Speed reduction may be required if containers are less than 75 percent full.

To minimize the possibility of leakage from capped tubes or bottles, load the containers with sample, secure the caps, and precool the loaded labware to run temperature before beginning the run.

Refer to *Chemical Resistances* (publication IN-175) for information on the chemical compatibilities of labware materials.

Table 1 Bottle and Tube Adapters for the JA-10.100 Rotor[a]

Adapter Part Number (set of 6)	Tube or Bottle Type[b]	Tube Dimensions (mm)	Nominal Tube Volume (mL)	R_{max} (mm)	RCF_{max}
392830	round-bottom tube or bottle	29 × 108	50	93.6	10,907
392268	conical tube	30 × 115	50	91.9	10,709
392823	bottle	18 × 107	15	87.7	10,219
392270	conical tube	17 × 120	15	88.7	10,336
392824	round-bottom bottle	16 × 82	10	86.9	10,126
344497[c]	microfuge tube	11 x 39	1.5	92.3	10,755

a. Unless otherwise indicated, adapters are polypropylene.

b. Observe manufacturer's recommendations for RCF and temperature limitations.

c. 344497 fits in 392830.

Table 2 Available Beckman Coulter Bottles and Tubes for the JA-10.100 Rotor

Dimensions and Volume	Tube Description	Part Number	Max. Fill Volume[a] (mL)	Required Accessory		R_{max}	Max Speed[b]/ RCF/ k Factor
				Description	Part Number		
38 × 102 mm 100 mL	polypropylene bottle with screw cap	355624 (pkg/6)	93.0	none	—	98	10,200 RPM 11,419 x g 2000
38 × 102 mm 94 mL	polypropylene thickwall tube	355643 (pkg/25)	50.7	none	—	98	10,200 RPM 11,419 x g 1020
38 × 102 mm 94 mL	polycarbonate thickwall tube	355628 (pkg/25)	50.7	none	—	98	10,200 RPM 11,419 x g 1020
38 × 104 mm 85 mL	polycarbonate bottle with cap assembly	363081 (pkg/6)	74.5	none	—	98	10,200 RPM 11,419 x g 1358
38 × 104 mm 80 mL	polypropylene bottle with screw cap	363082 (pkg/6)	67.4	none	—	98	10,200 RPM 11,419 x g 1300
38 × 102 mm 70 mL	polycarbonate bottle with cap assembly	355620 (pkg/6)	66.2	none	—	98	10,200 RPM 11,419 x g 1277

Table 2 Available Beckman Coulter Bottles and Tubes for the JA-10.100 Rotor *(Continued)*

Dimensions and Volume	Tube Description	Part Number	Max. Fill Volume[a] (mL)	Required Accessory		R_{max}	Max Speed[b]/ RCF/ k Factor
				Description	Part Number		
29 × 104 mm 50 mL	polycarbonate bottle with screw cap	357002 (pkg/25)	38.5	polypropylene adapter	392830 (pkg/6)	93.6	10,200 RPM 10,907 x g 1470
29 × 104 mm 50 mL	polypropylene bottle with screw cap	357003 (pkg/25)	38.5	polypropylene adapter	392830 (pkg/6)	93.6	10,200 RPM 10,907 x g 1470
29 × 104 mm 50 mL	polycarbonate tube	363647 (pkg/25)	36.5	polypropylene adapter	392830 (pkg/6)	93.6	10,200 RPM 10,907 x g 1470
29 × 104 mm 50 mL	polypropylene tube	357007 (pkg/25)	36.5	polypropylene adapter	392830 (pkg/6)	93.6	10,200 RPM 10,907 x g 1470
29 × 104 mm 50 mL	polycarbonate tube	363075 (pkg/8)	38.5	polypropylene adapter	392830 (pkg/6)	93.6	10,200 RPM 10,907 x g 1470
18 × 98 mm 15 mL	polypropylene tube	342082 (pkg/100)	8.5	polypropylene adapter	392823 (pkg/6)	87.7	10200 RPM 10,219 x g 1,411
18 × 98 mm 15 mL	polyethylene tube	342081 (pkg/100)	8.5	polypropylene adapter	392823 (pkg/6)	87.7	10,200 RPM 10,219 x g 1411
18 × 98 mm 15 mL	polycarbonate tube	342080 (pkg/100)	8.5	polypropylene adapter	392823 (pkg/6)	87.7	10,200 RPM 10,219 x g 1411
16 × 76 mm 10 mL	polycarbonate tube	355630 (pkg/25)	8.5	polypropylene adapter	392824 (pkg/6)	86.9	10,200 RPM 10,126 x g 1136
16 × 76 mm 10 mL	polypropylene tube	355640 (pkg/25)	8.5	polypropylene adapter	392824 (pkg/6)	86.9	10,200 RPM 10,126 x g 1136
11 x 45 mm 1.8 mL	Polyethylene tube with snap-on cap	340196[c] (pkg/500)	1.4	344497 fits in 392830	392830 (pkg/6)	92.3	10,200 RPM 10,755 x g 489

Table 2 Available Beckman Coulter Bottles and Tubes for the JA-10.100 Rotor *(Continued)*

Dimensions and Volume	Tube Description	Part Number	Max. Fill Volume[a] (mL)	Required Accessory		R_{max}	Max Speed[b]/ RCF/ k Factor
				Description	Part Number		
11 x 38 mm 1.5 mL	Polypropylene tube with snap-on attached cap	357448[c] (pkg/500)	1.4	344497 fits in 392830	392830 (pkg/6)	92.3	10,200 RPM 10,755 x g 489
11 x 40 mm 1.5 mL	Polypropylene tube with separate cap	343169[c] (pkg/500)	1.4	344497 fits in 392830	392830 (pkg/6)	92.3	10,200 RPM 10,755 x g 489

a. Fill bottles and tubes at least half full. Containers may be filled less than or equal to the maximum fill volumes provided here.

b. Maximum speeds listed 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.

c. RCF and k Factor values reflect the tube in its maximum position. Minimum position values are: RCF = 6409 x g k-Factor 775

Temperature Limits

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

Thickwall Tubes

Thickwall polypropylene and polycarbonate tubes can be run partially filled (at least half 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 can be run partially filled (not less than half full). Again, all opposing containers for a run must be filled to the same level with liquid of the same density.

Run Speeds

The centrifugal force at a given radius in a rotor is a function of speed. Comparisons of forces between different rotors are made by comparing the rotors' relative centrifugal fields (RCF). When rotational speed is adjusted so that identical samples are subjected to the same RCF in two different rotors, the samples are subjected to the same force. The RCF at each speed is automatically

calculated by the centrifuge software; if the RCF is entered, the centrifuge calculates the equivalent revolutions per minute (RPM).

⚠ CAUTION

Risk of equipment damage. Operating the centrifuge at speeds above those recommended for the rotor and labware can cause breakage. Never exceed the maximum rated speed of the rotor and labware in use.

The maximum run speed listed in the rotor specifications is for operation when all conditions are within the standard specifications. Speeds must be reduced under the following circumstances:

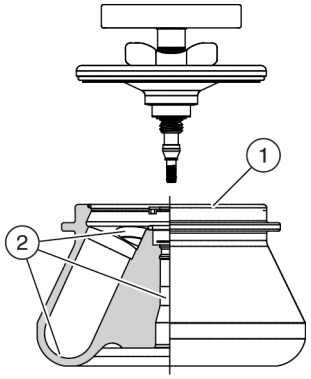
- When certain glass or plastic tubes are used, reduce rotor speed to prevent tube breakage. Follow the manufacturers' recommendations regarding maximum speed capacity for the tubes. Because the strength of tubes can vary between lots, and depend on handling and usage, Beckman Coulter highly recommends that you pretest these tubes in this rotor (using water instead of valuable sample) to determine optimal operating conditions.
- If non-precipitating solutions more dense than 1.2 g/mL are centrifuged, the maximum allowable run speed must be reduced according to the following equation:

$$\text{reduced maximum speed} = (10\,200\ \text{RPM}) \sqrt{\frac{1.2\ \text{g/mL}}{\rho}}$$

  where ρ is the density of the tube contents. This speed reduction will protect the rotor from excessive stresses due to the added tube load.

- *Further speed limits must be imposed* when self-forming-gradient salts are centrifuged, as the equation does not predict concentration limits/speeds that are required to avoid precipitation of salt crystals.

Care and Maintenance



1. Rotor Body
2. Check for Corrosion

NOTE If a glass tubes breaks, remove the glass very carefully from the adapter or cavity. Imbedded glass particles that remain in cavities or adapters can cause tube failure during subsequent runs.

Maintenance

⚠ CAUTION

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

Do not use sharp tools on a rotor, as the surface can get scratched. Corrosion begins in scratches and may open fissures in the rotor with continued use. The corrosion process accelerates with speed induced stresses. The potential for damage from corrosion is greatest in aluminum rotors and components.

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1 Periodically (at least monthly) inspect the rotor, especially inside cavities, for rough spots, cracks, pitting, white powder deposits (frequently aluminum oxide), or heavy discoloration.

- If any of these signs are evident, do not run the rotor.
- Contact us for information about the Field Rotor Inspection Program and the Rotor Repair Program.

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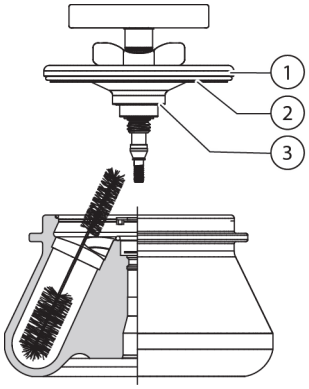
2 Regularly check the condition of O-rings or gaskets and replace any that are worn or damaged.

3 Regularly apply a thin, even coat of Spinkote lubricant (306812) to the rotor drive hole to prevent rotor sticking.

Refer to *Chemical Resistances* (Publication IN-175) for the chemical compatibilities of rotor and accessory materials. Contact us for information about the Field Rotor Inspection Program and the rotor repair center.

Cleaning



1. Lid
2. Large O-Ring
3. Small O-Ring

⚠ CAUTION

Risk of equipment damage. Salts and other corrosive materials can damage the rotor and rotor components. Wash the rotor and rotor components immediately if salts or other corrosive materials are used or if spillage has occurred, according to your laboratory safety procedures.

Under normal use, wash the rotor frequently (at least weekly) to prevent buildup of residues. If the rotor is left in the centrifuge for long periods of time, remove it at least once a month for cleaning and lubrication.

1 Remove the O-rings and wash the rotor, lid, and O-rings in a mild detergent, such as Beckman Solution 555 (339555), that won't damage the rotor.

- The Rotor Cleaning Kit (339558) contains two plastic-coated brushes and two quarts of Solution 555 for use with rotors and accessories.
  - — Dilute the detergent 10 to 1 with water.

NOTE Do not wash rotor components in a dishwasher. Do not soak in detergent solution for long periods, such as overnight.

2 Rinse the cleaned rotor and components with distilled water.

3 Air-dry the rotor and lid upside down.

- *Do not use acetone to dry the rotor.*

4 Lightly but evenly lubricate the rotor drive-hole threads with Spinkote (306812).

5 Apply a thin, even coat of silicone vacuum grease (335148) to the O-rings. Replace them in the lid.

6 Clean metal threads every 6 months, or as necessary.

- Use a non-metal brush and concentrated Solution 555.
- Rinse and dry thoroughly.
- Lubricate lightly but evenly with Spinkote to coat all threads.

Decontamination

Rotors contaminated with radioactive or pathogenic materials must be decontaminated, following appropriate laboratory safety guidelines and/or other regulations.

NOTE Strong bases and/or high-pH solutions can damage aluminum rotors and components.

If the rotor (and/or accessories) becomes contaminated with radioactive material, decontaminate it using a solution that will not damage the anodized surfaces. Beckman Coulter has tested a number of solutions and found two 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 do not soak rotor components longer than the minimum time specified in the IsoClean usage instructions. Then remove it promptly from surfaces.

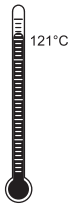
* In U.S., contact Nuclear Associates (New York); in Eastern Europe and Commonwealth States, contact Victoreen GmbH (Munich); in South Pacific, contact Gammasonics Pty. Ltd. (Australia); in Japan, contact Toyo Medic Co. Ltd. (Tokyo).

† In U.S., contact Biodex Medical Systems (Shirley, New York); internationally, contact the U.S. office to find the dealer closest to you.

While Beckman Coulter has tested these methods and found that they do not damage the rotor or 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 accessories are contaminated with toxic or pathogenic solutions, follow appropriate decontamination procedures as outlined by appropriate laboratory safety guidelines and/or other regulations. Consult *Chemical Resistances* (publication IN-175) to be sure the decontamination method will not damage any part of the rotor.

Sterilization and Disinfection



The rotor and all rotor components can be autoclaved at 121°C for up to one hour. Remove the lid from the rotor and place the rotor, lid, and O-ring in the autoclave upside down.

⚠ WARNING

Risk of chemical injury from bleach. To avoid contact with the bleach, use barrier protection, including protective eyewear, gloves, and suitable laboratory attire. Refer to the Safety Data Sheet for details about chemical exposure before using the chemical.

⚠ WARNING

Risk of personal injury or property damage. The rotor 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. Always observe appropriate cautionary procedures as defined by your safety officer when using flammable solvents.

⚠ WARNING

Risk of personal injury or equipment damage. Ethanol is a flammability hazard. Do not use it in or near operating centrifuges.

If a hazardous substance such as blood is spilled onto the instrument, clean up the spill by using 70% alcohol, a 10% bleach solution, or use your laboratory decontamination solution. Then follow your laboratory procedure for disposal of hazardous materials. If the instrument or accessories need to be decontaminated, contact us.

Ethanol (70%) or hydrogen peroxide (6%) may be used on all rotor components, including those made of plastic. High-quality, fragrance-free, gel-free bleach (5 to 6% solution of sodium hypochlorite - available chlorine) may be used, but may cause discoloration of anodized surfaces. Use the minimum immersion time for each solution, per laboratory standards.

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 regarding proper methods to use.

Refer to *Use and Care of Tubes and Bottles* (publication IN-192), included in each box of tubes or bottles, for tube sterilization and disinfection procedures.

Tube Breakage

⚠ CAUTION

Risk of contamination or equipment damage. Tubes can break during centrifugation. Clean the rotor and adapters thoroughly immediately following a tube breakage, according to your laboratory safety procedures.

If a glass bottle or tube breaks, remove the glass very carefully from the rotor. Imbedded glass particles that remain in the rotor cavities or adapters can cause tube failure during subsequent runs. Clean the rotor thoroughly *immediately* following a bottle or tube breakage.

Disposal Information

Clean and decontaminate the rotor per the *Care and Maintenance* section of this manual before disposal. Users are encouraged to check with local waste disposal authorities for specific disposal requirements.

Storage

When the rotor is not in use, store it in a dry environment with the rotor lid removed to allow air circulation so moisture will not collect in the tube cavities. Do not store the rotor in the centrifuge.

Troubleshooting

Refer to the *Avanti J-15 Series Centrifuges For IVD Use Instructions For Use* (PN B80286), or the *Avanti J-15 Series Centrifuges Instructions For Use* (PN B80287) for Troubleshooting information.

Returning a Rotor

Before returning a rotor or accessory for any reason, prior permission must be obtained from Beckman Coulter, Inc. Contact us to obtain the required form, entitled *Returned Material Authorization* (RMA) for United States returns or *Returned Goods Authorization* (RGA) for international returns. The form 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

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

NOTE 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 RGA/RMA form when mailing the rotor and/or accessories.

Supply List

NOTE Publications referenced in this manual can be obtained at www.beckman.com or contact us.

Contact us for detailed information on ordering parts and supplies. For your convenience, a partial list is given below.

Replacement Rotor Parts

JA-10.100 rotor assembly	B77584
Rotor Lid assembly	B77586
Large O-ring	870612
Small O-ring	010179

Other

NOTE For SDS (MSDS) information, go to the Beckman Coulter website at www.beckman.com.

Spinkote lubricant (2 oz)	306812
Silicone vacuum grease (1 oz)	335148
Rotor Cleaning Kit	339558
Beckman Solution 555 (1 qt)	339555

Glossary

Avanti J-15 — Avanti 3 Liter non-refrigerated centrifuge

Avanti J-15R — Avanti 3 Liter refrigerated centrifuge

Angular Velocity, ω — Rate of rotation, measured in radians per second.

$$\omega = \frac{2\pi\,\mathrm{rpm}}{60}$$

or

$\omega = 0.10472$ rpm

Anodized coating — A thin, hard layer of aluminum oxide formed electrochemically on aluminum rotor and/or accessory surfaces as a protective coating for corrosion resistance.

Autoclaving — Sterilization by heat (dry or steam).

Centrifugal Force — In a centrifugal field, the force which causes a particle to move away from the center of rotation.

Density — Mass per unit volume.

Erythrocytes — See RBC (red blood cells).

Fixed-angle rotor — A rotor in which the tubes are held at an angle (usually 20 to 45 degrees) from the axis of rotation.

IFU — Instructions For Use

IVD — *In Vitro* Diagnostic

***k* factor —** (clearing factor) Relative pelleting efficiency of the rotor at maximum rotation speed. As the *k* factor decreases, rotor efficiency increases.

$$k = \frac{2.53 \times 10^5 \times \ln(r_{max}/r_{min})}{(\mathrm{RPM}/1000)^2}$$

RCF — Relative centrifugal field; the ratio of the centrifugal acceleration at a specified radius and speed (rω2) to the standard acceleration of gravity (g) according to the following equation:

$$\mathrm{RCF} = \frac{\mathrm{r}\omega^2}{\mathrm{g}}$$

where *r* is the radius in millimeters, ω is the angular velocity in radians per second (2π RPM/60), and *g* is the standard acceleration of gravity (9807 mm/s^2). Thus the relationship between RCF and RPM is:

$$\mathrm{RCF} = 1.12\mathrm{r}\left(\frac{\mathrm{RPM}}{1000}\right)^2$$

r_{av} — (Average radius) the position of the liquid in the tube at the average distance from the axis of rotation when the rotor is at speed.

r_{max} — (Maximum radius) the position of the liquid in the tube at the maximum distance from the axis of rotation when the rotor is at speed.

r_{min} — (Minimum radius) the position of the liquid in the tube at the minimum distance from the axis of rotation when the rotor is at speed.

RBC — Red blood cells, or erythrocytes, carry oxygen to the tissues and carbon dioxide to the lungs for exhalation.

Solution 555 — Beckman Coulter concentrated rotor cleaning solution; recommended because it is a mild solution that has been tested and found effective and safe for Beckman Coulter rotors and accessories.

UI — User Interface

Beckman Coulter, Inc.
JA-10.100 Warranty

Subject to the conditions specified below and the warranty clause of the Beckman Coulter, Inc., terms and conditions in effect at the time of sale, Beckman Coulter 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 benchtop centrifuge rotor 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. 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.

Conditions

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.

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.

This warranty is void if the rotor is operated with a rotor drive unit or in a centrifuge unmatched to the rotor characteristics or operated in a Beckman Coulter centrifuge that has been improperly disassembled, repaired, or modified.

Thermoplastic rotors or components used in some benchtop centrifuges are warranted for one (1) year from date of purchase.

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

Pre-installation Instructions for the Avanti J-15 Series Centrifuges
PN B80285

Avanti J-15 Series Centrifuges for In Vitro Diagnostic Use Instructions for Use
PN B80286

Avanti J-15 Series Centrifuges Instructions for Use
PN B80287

Avanti J-15 Series Centrifuges Safety Manual
PN B80288

JS-4.750 Swinging-Bucket Rotor Instructions for Use
PN B80289

Instructions for Using the Anti-Rotation Anchoring Kit to Secure the Avanti J-15 Series Benchtop Centrifuges
PN B80291

JS-4.750 Swinging-Bucket Rotor and JA-10.100 Fixed Angle Rotor Safety Manual
PN C01058

Avanti J-15 Series Centrifuge Quick Start Guide
PN C01864

Chemical Resistances for Beckman Coulter Centrifugation Products
PN IN-175

Available in hard copy or electronic pdf by request.

Available at www.beckman.com

www.beckman.com

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