J-TB-037AL
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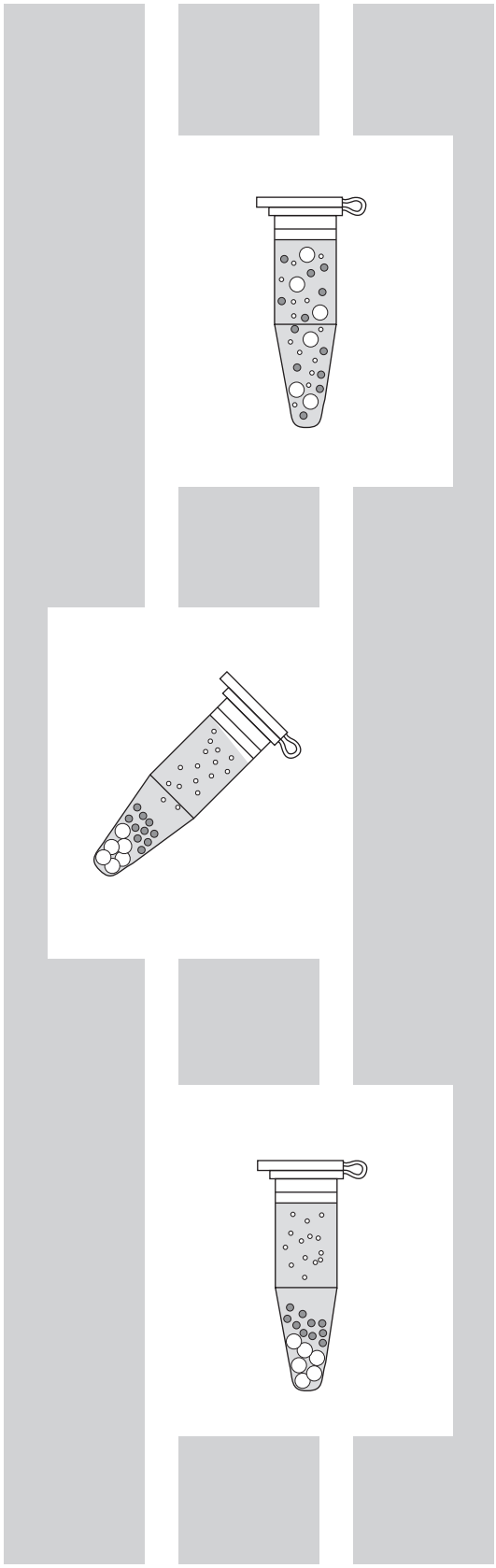


JA-18.1 Fixed Angle Rotor

Used in Beckman Coulter J2, J6, and Avanti J Series Centrifuges

Trademarks

SAFETY NOTICE

This safety notice summarizes information basic to the safe use of the rotor described in this manual. The international symbol displayed above 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 throughout this publication, pay special attention to the specific safety information presented. Observance of safety precautions will also help to avoid actions that could damage or adversely affect the performance of the rotor.

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. 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.

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.

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.

Although rotor components and accessories made by other manufacturers may fit in the JA-18.1 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in the JA-18.1 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.

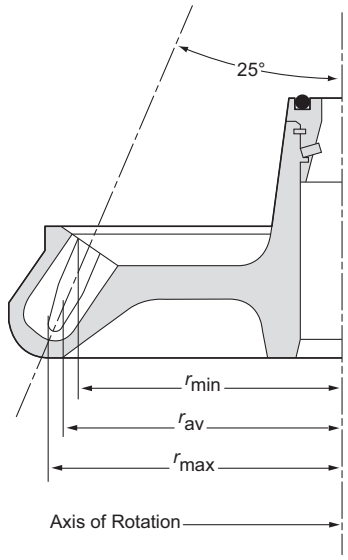
Make sure that filled containers are loaded symmetrically into the rotor and that opposing tubes are filled to the same level with liquid of the same density.

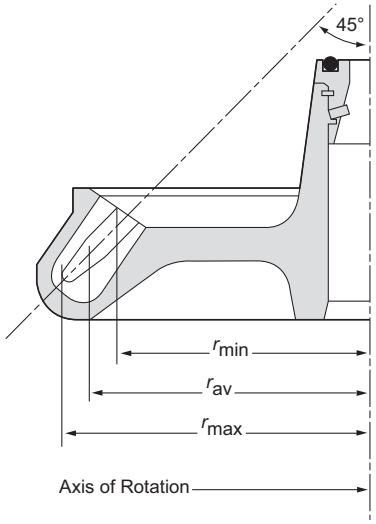
If disassembly reveals evidence of leakage, you should assume that some fluid escaped the rotor. Apply all appropriate safety and decontamination procedures to the centrifuge and accessories.

Never exceed the maximum rated speed of the rotor and labware in use. Refer to the section on RUN SPEEDS.

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.

JA-18.1 FIXED ANGLE ROTOR





SPECIFICATIONS

Maximum speed	18 000 rpm
Critical speed range*	600 to 800 rpm
Density rating at maximum speed	1.4 g/mL
Maximum allowable imbalance of opposing loads	3 grams
Relative Centrifugal Field†	
at maximum speed (18 000 rpm) at 45-degree angle:	
At r_{max} (116 mm)	42 100 × *g*
At r_{av} (105 mm)	38 100 × *g*
At r_{min} (95 mm)	34 500 × *g*
k factor at maximum speed at 45-degree angle	156
Relative Centrifugal Field†	
at maximum speed (17 000 rpm) at 25-degree angle:	
At r_{max} (112 mm)	36 300 × *g*
At r_{av} (106 mm)	34 300 × *g*
At r_{min} (101 mm)	32 700 × *g*
k factor at maximum speed at 25-degree angle	91
Conditions requiring speed reductions	see RUN SPEEDS
Number of tube cavities	24
Available tubes	see Table 4
Nominal tube capacity (largest tube)	1.8 mL
Nominal rotor capacity	43.2 mL
Approximate acceleration time to maximum speed (rotor fully loaded)	1 1/2 min
Approximate deceleration time from maximum speed (rotor fully loaded)	1 1/2 min
Approximate acceleration time to 12 000 × *g*‡ (9627 rpm at 45-degree angle; 9798 rpm at 25-degree angle)	40 seconds
Approximate deceleration time from 12 000 × *g*‡ (max. brake, rotor fully loaded)	40 seconds
Weight of fully loaded rotor	3.6 kg (8 lb)
Rotor material	aluminum
Rotor entry code for J2 and J6 series microprocessor-controlled centrifuges	18.1

* 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.

† 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:

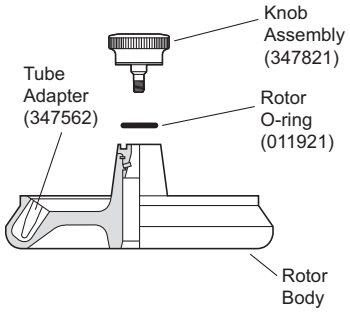
$$RCF = \frac{r\omega^2}{g}$$

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:

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

‡ Typical microcentrifuge *g* force.

DESCRIPTION



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

The JA-18.1, rated for 18 000 rpm, is a fixed angle rotor that holds up to twenty-four 1.8-mL tubes at either a 45- or 25-degree angle to the axis of rotation, in a reversible tube adapter (347562). Used in Beckman Coulter J2, J6, and Avanti® J series centrifuges, the rotor develops centrifugal forces that can efficiently pellet subcellular particles to obtain cells and subcellular organelles such as mitochondria or chloroplasts.

The rotor body is made of aluminum and anodized for corrosion resistance. An O-ring made of Buna N rubber fits around the top of the rotor hub and makes a tight seal with the Teflon[1] washer located at the bottom of the knob assembly. The tube adapter is made of polypropylene. Two pins in the rotor drive hole mate with grooves in the centrifuge drive hub (in older model centrifuges), or with drive hub teeth (new model centrifuges), to prevent the rotor from slipping during acceleration and deceleration.

The JA-18.1 rotor is warranted for 7 years (see the Warranty).

PREPARATION AND USE

Specific information about the JA-18.1 rotor is given here. Use J Series Rotors and Tubes *(publication JR-IM) along with this rotor manual for complete rotor and accessory operation.*

NOTE

Although rotor components and accessories made by other manufacturers may fit in the JA-18.1 rotor, their safety in this rotor cannot be ascertained by Beckman Coulter. Use of other manufacturers' components or accessories in this 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.

[1] Teflon is a registered trademark of E.I. Du Pont de Nemours and Company.

PRERUN SAFETY CHECKS

Read the Safety Notice page at the front of this manual before using the rotor.

1. Make sure that the rotor is clean and shows no signs of corrosion or cracking.
2. Check the chemical compatibilities of all materials used. Refer to Appendix A of *Rotors and Tubes* for chemical compatibilities.
3. Verify that the tubes being used are listed in Table 4.

ROTOR PREPARATION

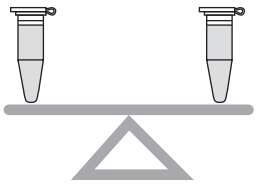
For runs at other than room temperature, refrigerate or warm the rotor beforehand for fast temperature equilibration.

Be sure that metal threads in the rotor are clean and lightly but evenly lubricated with Spinkote lubricant (306812). Also ensure that the O-ring is lightly but evenly coated with silicone vacuum grease (335148).

Using the Adapter

The tube adapter (347562) accommodates tubes at either a 25- or 45-degree angle. Using tubes at different angles will produce pellets at different positions to facilitate removing the supernatant with a pipette, or decanting by inverting the tube. Since the *g* forces generated during centrifugation are different depending on the angle of the tube, running the same sample at different angles will produce different results. Unless you require different results, insert the adapters so that all tubes rest at the same angle. To change from one angle to another, reverse the adapter in the rotor cavity.

Symmetric and Balanced Loading



If you mix different tubes, tube angles, and/or sample densities in the same run, make sure that the load is balanced. Adapters inserted at the same angle, tubes of the same type, and samples of the same density must be placed symmetrically around the center of rotation. Figure 1 shows some possible symmetrical combinations.

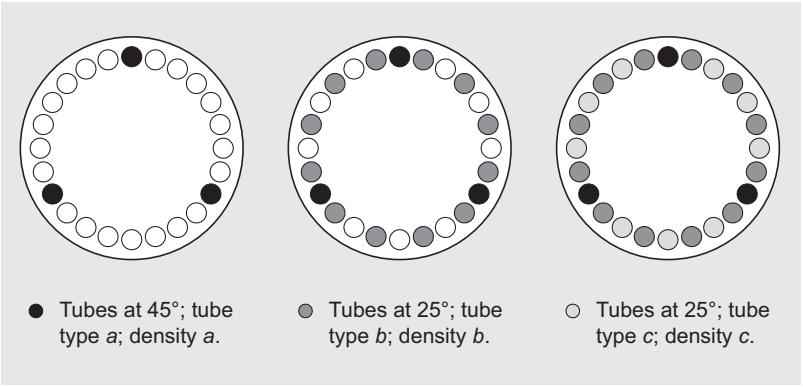


Figure 1. Symmetric and Balanced Loading. Place tubes of the same type, containing samples of the same density, in adapters that are inserted at the same angle symmetrically around the center of rotation.

NOTE

Running the rotor with unfilled cavities will cause a loud whistling noise. To reduce the noise, place an adapter in each cavity and place an empty tube in each adapter not containing a sample-filled tube.

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.
- If fluid containment is required, *use capped tubes.* It is strongly recommended that all containers carrying physiological fluids be capped to prevent leakage.
- If you are using an Avanti J series centrifuge, select the JA-18.1 rotor. If you are using a microprocessor-controlled J2 or J6 series centrifuge, enter rotor code **18.1**. Refer to your centrifuge instruction manual for additional information.

INSTALLING THE ROTOR

Lubricate J2 and J6 series centrifuge drive hubs with a thin, even coat of Spinkote to prevent the rotor from sticking. Avanti J series centrifuges have Delrin[2] rings on the hubs to prevent rotor sticking, and do not require lubrication.

Two metal pins inside the rotor drive hole engage with teeth on the centrifuge drive hub to prevent the rotor from slipping during acceleration and deceleration (see Figure 2). When the rotor is properly installed, the pins sit either in the drive hub grooves or on top of the hub surface (see Figure 3).

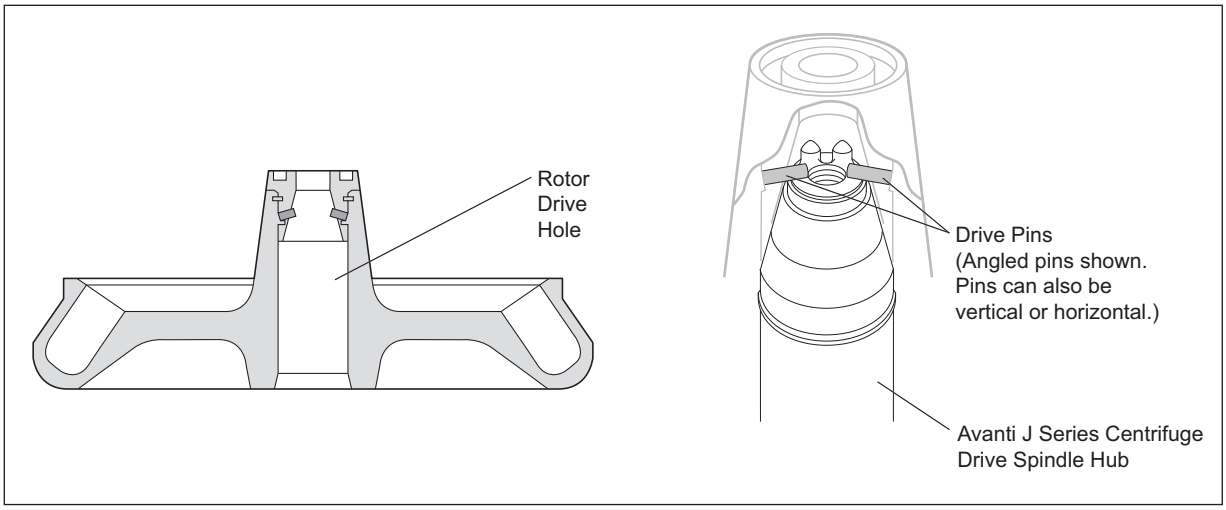


Figure 2. Rotor Drive Pin Location and Orientation

1. Carefully lower the rotor straight down onto the centrifuge drive spindle hub (see Figure 4). *Do not drop the rotor onto the hub*.
2. Slowly turn the rotor, making sure that it is properly seated on the spindle hub (see Figure 2).
3. To secure the rotor to the drive spindle, screw the rotor knob down tight.

[2] Delrin is a registered trademark of E. I. Du Pont de Nemours & Company.

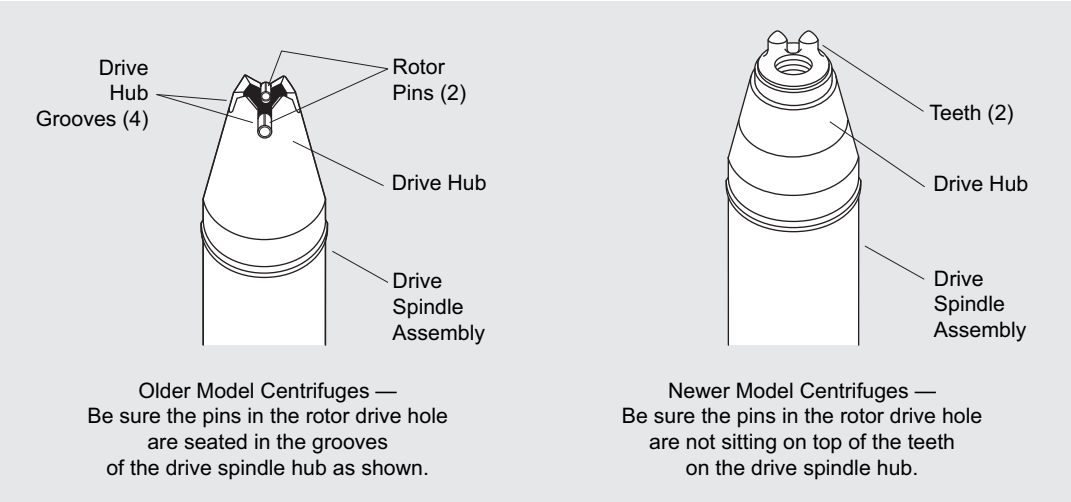


Figure 3. Centrifuge Drive Hub Configurations

REMOVAL AND SAMPLE RECOVERY

CAUTION

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

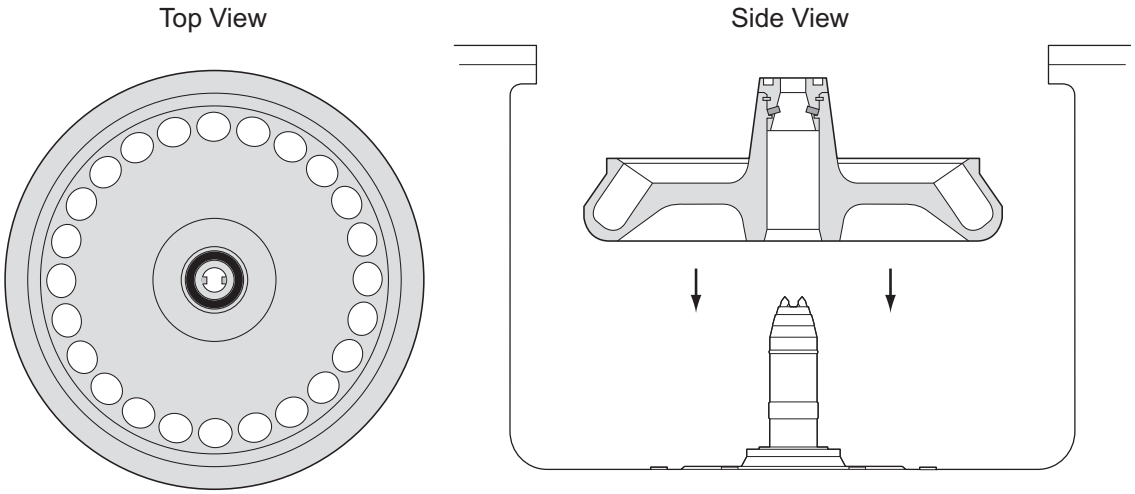
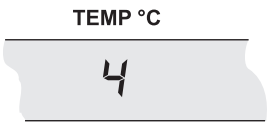


Figure 4. Installing the Rotor

1. Unscrew the rotor knob to release the rotor from the spindle hub.
2. Lift the rotor straight up and off the drive spindle.

TEMPERATURE



To ensure that the JA-18.1 rotor reaches the required temperature during the run, follow the appropriate instructions below for the centrifuge being used.

Avanti J Series Centrifuges

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

Microprocessor-Controlled J2 and J6 Series Centrifuges (Models J2-MI, J6-MI, J2-MC, and J6-MC)

Enter rotor code **18.1**, 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 1 or 2 that corresponds with the set temperature and run speed. The compensation values listed in Table 1 are approximates for all microprocessor-controlled 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 1/2 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.

Table 1. J2 Series Centrifuge Temperature Compensation Settings

Rotor Speed (rpm)	Required Sample Temperature (°C)						
	–20	–10	2	5	10	20	40
18 000	N	N	N	N	–8	–5	0
17 000	N	N	N	N	–6	–5	0
15 000	N	N	–9	–5	–4	–3	0
10 000	–7	–7	–3	–3	–2	0	+2
8 000	–6	–5	–3	–3	–1	0	+2

An "N" indicates that the rotor cannot achieve the desired temperature at this speed.

Table 2. J6 Series Microprocessor-Controlled Centrifuge Temperature Compensation Settings

Rotor Speed (rpm)	Required Sample Temperature (°C)				
	2	5	10	20	40
6 000	–7	–5	–4	–2	–2
4 000	–6	–5	–3	–2	0
2 000	–5	–5	–3	0	N

An "N" indicates that the rotor cannot achieve the desired temperature at this speed.

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 desired compensation value. Press the [**±** .]key to enter a minus sign; pressing it again will remove the minus sign.

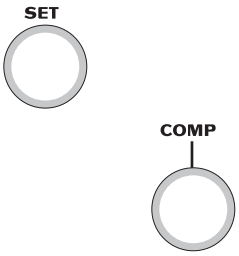
5. Check the temperature display. (If the entry is incorrect, press [**CE**] and reenter the digits.)

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

NOTE

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

Analog J2 Series Centrifuges



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

1. Turn the SET knob to the required sample temperature.
2. Find the compensation value (Table 1 or 3) that corresponds to the required temperature and run speed. Set the COMP dial to that setting. (Interpolate if intermediate values are required.)

Table 3. J2-HC Centrifuge Temperature Compensation Settings

Rotor Speed (rpm)	Required Sample Temperature (°C)						
	–20	–10	2	5	10	20	40
16 000*	N	N	–8	–5	–4	–3	0
15 000	N	N	–2	–2	–2	–2	0
10 000	–4	–3	–3	–3	–3	–2	N
8 000	–1	–2	–4	–3	–2	–1	N

An "N" indicates that the rotor cannot achieve the desired temperature at this speed.

* When the JA-18.1 rotor is used in the model J2-HC, the rotor must be derated as follows: when the adapters are used at a 25-degree angle, do not run the rotor above 16 000 rpm; when the adapters are used at a 45-degree angle, do not run the rotor above 15 000 rpm.

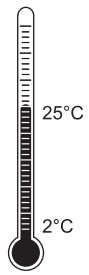
TUBES

The JA-18.1 rotor uses the microfuge tubes listed in Table 4. Use only those items listed, and observe the maximum speed limits and fill volumes shown. (Maximum fill volume is the maximum amount that can be centrifuged in the container listed.) Refer to Appendix A in *Rotors and Tubes* for chemical compatibilities of tube and accessory materials.

Table 4. Available Tubes for the JA-18.1 Fixed Angle Rotor.
Use only the items here and observe fill volumes and maximum run speeds.
All tubes listed in this table use polypropylene tube adapter 347562.

Dimensions and Volume	Tube Description	Part Number	Max Fill Vol (mL)		Max Speed*		Max RCF × *g*/*k* Factor	
			45°	25°	45°	25°	45°	25°
11 × 39 mm 1.8 mL	natural polyethylene	340196	1.5	1.4	18 000	17 000	42 100/ 156	36 300/ 91
11 × 39 mm 1.5 mL	natural polypropylene snap-on cap	357448	1.4	1.2	18 000	17 000	42 100/ 156	36 300/ 91
11 × 39 mm 1.5 mL	orange polypropylene, snap-on cap	356094	1.4	1.2	18 000	17 000	42 100/ 156	36 300/ 91
11 × 39 mm 1.5 mL	yellow polypropylene, snap-on cap	356093	1.4	1.2	18 000	17 000	42 100/ 156	36 300/ 91
11 × 39 mm 1.5 mL	green polypropylene, snap-on cap	356092	1.4	1.2	18 000	17 000	42 100/ 156	36 300/ 91
11 × 39 mm 1.5 mL	blue polypropylene, snap-on cap	356091	1.4	1.2	18 000	17 000	42 100/ 156	36 300/ 91
11 × 39 mm 1.5 mL	natural polypropylene, snap-on cap	356090	1.4	1.2	18 000	17 000	42 100/ 156	36 300/ 91
11 × 39 mm 1.5 mL	polypropylene open-top tube	343169	1.4	1.0	18 000	10 000	42 100/ 156	12 500/ 262

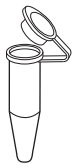
* In the J2-HC centrifuge, maximum speed must be reduced to 16 000 rpm when tubes are run at 25° and to 15 000 rpm when tubes are run at 45°.



Temperature Limits

- Plastic containers 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.

Microfuge® Tubes



Microfuge tubes can be run partially filled, but opposing tubes for a run must be filled to the same level with liquid of the same density. Do not overfill capped or capless microfuge tubes; be sure to note the fill volumes and run speeds shown in Table 4, and note that these are different based on whether you are running the tubes at 25 or 45 degrees.

RUN TIMES

The *k* factor of the rotor is a measure of the rotor's pelleting efficiency. Beckman Coulter has calculated the *k* factors for all of its rotors, at maximum speed with full tubes, using the following formula:

$$k = \frac{\ln(r_{max}/r_{min})}{\omega^2} \times \frac{10^{13}}{3600} \quad (1)$$

where ω is the angular velocity of the rotor in radians per second ($\omega = 0.105 \times \text{rpm}$), r_{max} is the maximum radius, and r_{min} is the minimum radius.

After substitution:

$$k = \frac{(2.533 \times 10^{11})\ln(r_{max}/r_{min})}{\text{rpm}^2} \quad (2)$$

Run times (t, in hours) for pelleting in the JA-18.1 rotor can be estimated if the sedimentation coefficients (s) of the particles of interest are known. Use the following equations. At maximum speed, the *k* factor of the rotor[3] is either 156 when tubes are run at a 45-degree angle or 91 when tubes are run at a 25-degree angle, and s is in Svedberg units (S).

$$t = \frac{k}{s} \quad (3)$$

[3] Based on sedimentation in water at 20°C.

Since listed *k* factors are calculated for the rotor's maximum speed, *k* must be adjusted if the rotor is to be run at less than maximum speed as follows:

$$k = 156\left(\frac{18\ 000\ \text{rpm}}{\text{actual run speed}}\right)^2 \quad [\text{at } 45°]$$

or (4)

$$k = 91\left(\frac{17\ 000\ \text{rpm}}{\text{actual run speed}}\right)^2 \quad [\text{at } 25°]$$

For example, when running tubes at 18 000 rpm at a 45-degree angle in this rotor, some viruses (s = 700 *S*) can be pelleted in

$$t = \frac{156(1)}{700}^2 = 14 \text{ minutes.} \quad (5)$$

For more information on *k* factors, see *Use of* k *Factor for Estimating Run Times from Previously Established Run Conditions (*publication DS-719).

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 a number of rotor speeds is provided in Table 5.

In the JA-18.1 rotor, different maximum speeds apply depending on which adapter angle is used. Maximum speed for tubes run at a 45-degree angle is 18 000 rpm and for tubes run at a 25-degree angle, 17 000 rpm. Depending on the type of tube used, maximum speed may be even lower. Refer to Table 4 for actual maximum speeds.

When the JA-18.1 rotor is used in the J2-HC centrifuge, the maximum speed when running tubes at 25 degrees is 16 000 rpm and the maximum speed when running tubes at 45 degrees is 15 000 rpm.

Table 5. Relative Centrifugal Fields for the JA-18.1 Rotor. Entries in this table are calculated from the formula $RCF = 1.12\ r\ (RPM/1000)^2$ and then rounded to three significant digits.

Rotor Speed (rpm)	Relative Centrifugal Field (× *g*) (Tube Angle 45°)			Relative Centrifugal Field (× *g*) (Tube Angle 25°)		
	At r_{max} (116 mm)	At r_{av} (105 mm)	At r_{min} (95 mm)	At r_{max} (112 mm)	At r_{av} (106 mm)	At r_{min} (101 mm)
18 000	42 100	38 100	34 500			
17 000	37 500	34 000	30 700	36 300	34 300	32 700
16 000	33 300	30 100	27 200	32 100	30 400	29 000
15 000	29 200	26 500	23 900	28 200	26 700	25 500
14 000	25 500	23 000	20 900	24 600	23 300	22 200
13 000	22 000	19 900	18 000	21 200	20 100	19 100
12 000	18 700	16 900	15 300	18 100	17 100	16 300
11 000	15 700	14 200	12 900	15 200	14 400	13 700
10 000	13 000	11 800	10 600	12 500	11 900	11 300
9 000	10 500	9 530	8 620	10 200	9 620	9 160
8 000	8 310	7 530	6 810	8 030	7 600	7 240
7 000	6 370	5 760	5 210	6 150	5 820	5 540
6 000	4 680	4 230	3 830	4 520	4 270	4 070
5 000	3 250	2 940	2 660	3 140	2 970	2 830
4 000	2 080	1 880	1 700	2 010	1 900	1 810
3 000	1 170	1 060	957	1 130	1 070	1 020
2 000	519	470	425	501	474	452
1 000	129	117	106	125	118	113
500	32	29	26	31	29	28

CAUTION

If different kinds of tubes or adapters of different angles are used during the same run, do not exceed the lowest speed listed in Table 4 for the tubes used at the angles chosen.

When solutions more dense than 1.4 g/mL are centrifuged in this rotor, use one of the following equations to calculate the reduced maximum allowable rotor speed:

$$\text{reduced maximum speed} = (18\,000 \text{ rpm}) \sqrt{\frac{1.4 \text{ g/mL}}{\rho}}$$

or (6)

$$\text{reduced maximum speed} = (17\,000 \text{ rpm}) \sqrt{\frac{1.4 \text{ g/mL}}{\rho}}$$

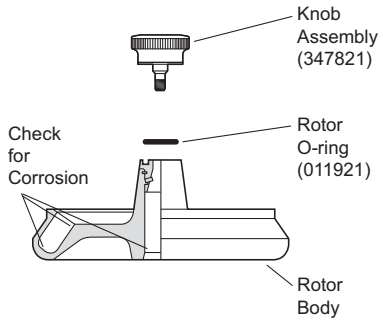
where ρ is the density of the tube contents.

CARE AND MAINTENANCE

MAINTENANCE

NOTE

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.



- Periodically (at least monthly) inspect the rotor, especially inside cavities, for rough spots or pitting, white powder deposits (frequently aluminum oxide), or heavy discoloration. If any of these signs are evident, do not run the rotor. Contact your Beckman Coulter representative for information about the Field Rotor Inspection Program and the rotor repair center.
- Before using the rotor, inspect the rotor drive pins to ensure that they are not damaged. Damaged drive pins can prevent the rotor from seating properly on the centrifuge drive hub (Avanti J series centrifuges only). To inspect the drive pins, turn the rotor upside down and look into the drive hole in the center of the rotor. If the drive pins appear damaged, contact Beckman Coulter Field Service.
- Regularly lubricate the metal threads in the rotor with a thin, even coat of Spinkote lubricant (306812). Failure to keep these threads lubricated can result in damaged threads.
- Regularly apply silicone vacuum grease to the O-ring (011921) around the rotor hub. Replace the O-ring about twice a year or whenever worn or damaged.

- Regularly apply Spinkote lubricant to the centrifuge drive spindle hub to prevent the rotor from sticking (not required with Avanti J series centrifuges).

Refer to Appendix A in *Rotors and Tubes* for chemical compatibilities of rotor and accessory materials. Your Beckman Coulter representative provides contact with the Field Rotor Inspection Program and the rotor repair center.

CLEANING

Wash the rotor and rotor components immediately if salts or other corrosive materials are used or if spillage has occurred. Do not allow corrosive materials to dry on the rotor.

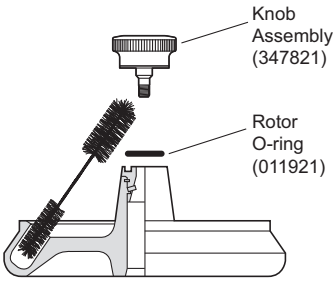
Under normal use, wash the rotor frequently (at least weekly) to prevent buildup of residues.

1. Remove the O-ring before washing.
2. Wash the rotor in a mild detergent, such as Beckman Coulter Solution 555, that won't damage the rotor. The Rotor Cleaning Kit (339558) contains two special 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.

3. Thoroughly rinse the cleaned rotor and components with distilled water.
4. Air-dry the rotor upside down. *Do not use acetone to dry the rotor.*



5. Apply a thin, even coat of silicone vacuum grease to the O-ring before replacing it in the groove around the rotor hub.

Clean metal threads every 6 months, or as necessary. Use a brush and concentrated Solution 555. Rinse and dry thoroughly, then lubricate lightly but evenly with Spinkote to coat all threads.

Periodically remove the O-ring and wipe clean as necessary. Clean the O-ring groove with a cotton-tipped swab. Reapply a light film of silicone vacuum grease.

DECONTAMINATION

If the rotor (and/or accessories) becomes contaminated with radioactive material, it should be decontaminated 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),[4] and Radiacwash.[5]

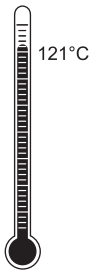
NOTE

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 and all rotor components can be autoclaved at 121°C for up to an hour. Remove the lid from the rotor and place the rotor and lid in the autoclave upside down.
- Ethanol (70%)[6] may be used on all rotor components, including those made of plastic. Bleach (sodium hypochlorite) may be used, but may cause discoloration of anodized surfaces. Use the minimum immersion time for each solution, per laboratory standards.

[4] 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).
[5] In U.S., contact Biodex Medical Systems (Shirley, New York); internationally, contact the U.S. office to find the dealer closest to you.
[6] Flammability hazard. Do not use in or near operating centrifuges.

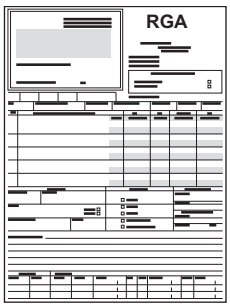
While Beckman Coulter has tested these methods and found that they do not damage the rotor or components, no guarantee of sterility or disinfection is expressed or implied. When sterilization or disinfection is a concern, consult your laboratory safety officer regarding proper methods to use.

Refer to publication IN-192, included in each box of tubes, for tube sterilization and disinfection procedures.

STORAGE

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

RETURNING A ROTOR



Before returning a rotor or accessory for any reason, prior permission (a Returned Goods Authorization form) must be obtained from Beckman Coulter, Inc. This RGA form may be obtained from your local Beckman Coulter sales office, and should contain the following information:

- 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 phone number of the person to be notified upon receipt of the rotor or accessory at the factory, and,
- name and phone number 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 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 by calling Beckman Coulter at 1-800-742-2345 in the United States, or by contacting your local Beckman Coulter office.

Contact Beckman Coulter Sales (1-800-742-2345 in the United States) or your local Beckman Coulter office, or see the *High Performance, High Speed, High Capacity Rotors, Tubes & Accessories* catalog (BR-8102) for detailed information on ordering parts and supplies. For your convenience, a partial list is given below.

REPLACEMENT ROTOR PARTS

JA-18.1 rotor assembly	347824
Rotor O-ring	011921
Tie-down kit	364918
Knob assembly	347821
Tube adapter	347562

OTHER

Tubes	see Table 4
Spinkote lubricant (2 oz)	306812
Silicone vacuum grease (1 oz)	335148
Rotor Cleaning Kit	339558
Beckman Solution 555 (1 qt)	339555
Rotor cleaning brush	339379

J SERIES 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, Inc. 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, Inc., 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, Inc. will pay all transportation charges.

A defective rotor will be replaced by Beckman Coulter, Inc. 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 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, Inc. 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.

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.

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