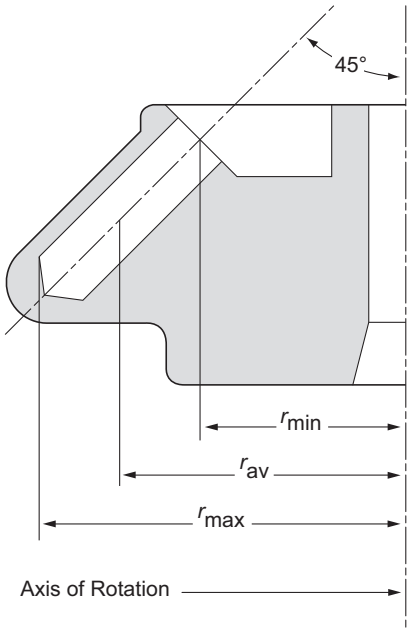
INSTRUCTIONS FOR USING THE F1202 FIXED ANGLE ROTOR
In Beckman Coulter Allegra 64R and Avanti 30 Series Centrifuges



SPECIFICATIONS

Maximum speed	30 000 rpm*
Density rating at maximum speed	1.2 g/mL
Relative Centrifugal Field† at maximum speed	
At r_{max} (64.0 mm)	$64\,400 \times g$
At r_{av} (47.5 mm)	$47\,880 \times g$
At r_{min} (31.0 mm)	$31\,250 \times g$
k factor	204
Conditions requiring speed reductions	see RUN SPEEDS
Maximum allowable imbalance	6 grams
Number of tube cavities	12
Nominal tube dimensions (largest tube)	11×45 mm
Nominal tube capacity (largest tube)	2 mL
Nominal rotor capacity	24 mL
Approximate acceleration time to maximum speed (fully loaded, accel curve 9)	30 sec
Approximate deceleration time from maximum speed (fully loaded, decel curve 9)	57 sec
Weight of fully loaded rotor	1.9 kg (4.1 lb)
Rotor material	aluminum

* Allegra 64R or Avanti 30 @ 4°C . . . . . 28 500 rpm ($58\,283 \times g$)

† 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:

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

DESCRIPTION

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

The F1202, rated for 30 000 rpm, is a fixed-angle rotor with a tube angle of 45 degrees from the axis of rotation. The rotor can centrifuge up to twelve 1.5- to 2.0-mL reaction-vials, as well as 250- to 750-µL vials, and is used in Beckman Coulter Allegra 64R and Avanti 30 centrifuges. This rotor develops centrifugal forces that can efficiently pellet sub-cellular organelles, viruses, bacteria, mitochondria, chloroplasts, or algae. Up to 24 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 body is black and the lid is blue. A lubricated O-ring in the rotor lid maintains atmospheric pressure in the rotor during centrifugation. A tie-down screw is used to secure the rotor to the drive shaft during centrifugation.

The centrifuge identifies rotor speed during the run by means of a magnetic speed 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.

See the Warranty at the back of this manual for warranty information.

PREPARATION AND USE

Specific information about the F1202 fixed angle rotor is given here. Use this manual together with the centrifuge instruction manual for complete rotor, centrifuge, and accessory operation information.

WARNING

Normal operation may involve the use of solutions and test samples that are pathogenic, toxic, or radioactive. Operator error or tube failure may generate aerosols. Do not run toxic, pathogenic, or other hazardous materials in this rotor unless you take all appropriate safety precautions. Ask your laboratory safety officer to advise you about the level of containment required for your application and the proper decontamination or sterilization procedures to follow if fluids escape from containers.

TUBES

The F1202 rotor holds up to twelve 1.5 to 2.0-mL reaction-vials in the adapters listed in Table 1. The rotor also holds 250, 400, 500, or 750-µL vials in adapters. Tubes should be pretested under anticipated run conditions (using water or gradient solution instead of valuable samples) if operating below 4°C or above room temperature. Refer to *Chemical Resistances (*publication IN-175) for information on the chemical compatibilities of tube materials.

Table 1. Available Beckman Coulter Tubes for the F1202 Rotor

Description	Dimensions	Volume	Part Number	Adapter	Max Speed
polyethylene tube, attached cap	11 × 45 mm	1.8 mL	340196 (pkg/500)	364701 (pkg/12)	10 000 rpm
polypropylene tube with cap	11 × 40 mm	1.5 mL	343169 (pkg/500)	364701 (pkg/12)	30 000 rpm
polypropylene tube with cap (natural)	11 × 40 mm	1.5 mL	357448 (pkg/500)	364701 (pkg/12)	30 000 rpm
polypropylene tube with cap	7 × 40 mm	400 µL	342867 (pkg/1000)	361247 (pkg/24)	11 500 rpm
polypropylene tube with cap	7 × 40 mm	400 µL	342867 (pkg/1000)	361247 (pkg/24)	11 500 rpm
polyethylene tube, plain	7 × 40 mm	400 µL	314326 (pkg/1000)	361247 (pkg/24)	11 500 rpm
polyethylene tube, Heparin-Lithium Fluoride coated	7 × 40 mm	400 µL	652824 (pkg/2000)	361247 (pkg/24)	11 500 rpm
polyethylene tube, Heparin-Lithium coated	7 × 40 mm	400 µL	652825 (pkg/1000)	361247 (pkg/24)	11 500 rpm
polypropylene tube with cap	7 × 30 mm	250 µL	342865 (pkg/1000)	361247 (pkg/24)	11 500 rpm
polyethylene tube, Heparin-Lithium Fluoride coated	5 × 45 mm	250 µL	65281 (pkg/1000)	361247 (pkg/24)	11 500 rpm
polyethylene tube, Heparin-Lithium coated	5 × 45 mm	250 µL	652822 (pkg/1000)	361247 (pkg/24)	11 500 rpm
polyethylene tube, plain	5 × 45 mm	250 µL	652823 (pkg/1000)	361247 (pkg/24)	11 500 rpm

ROTOR PREPARATION

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

1. Inspect the rotor for any signs of corrosion or damage; if any evidence of damage is present, do not centrifuge the rotor.
2. Load the filled tubes symmetrically into the rotor. If fewer than 12 tubes are being run, they must be arranged symmetrically in the rotor (see Figure 1). Opposing tubes must be filled to the same level with liquid of the same density. Maximum allowable imbalance is 6 grams.

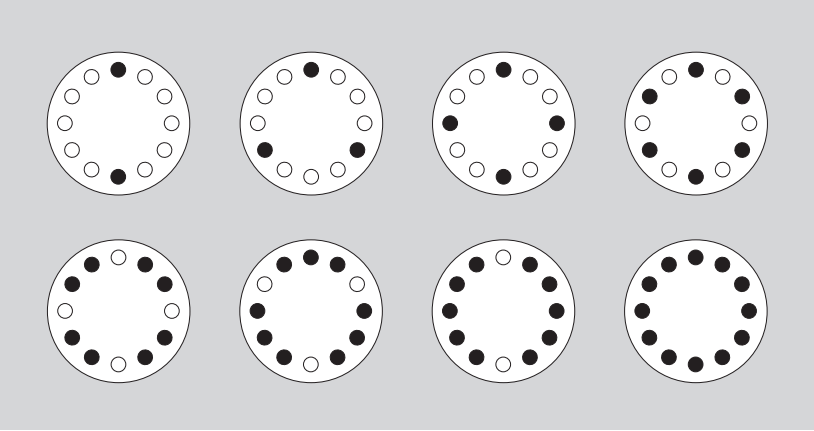


Figure 1. Typical Examples of Loading Fewer Than 12 Tubes

OPERATION

1. Ensure that the rotor tie-down screw (361367) is in good condition and the threads are free of foreign matter.

CAUTION

Never drop the rotor onto the centrifuge drive shaft. The shaft can be bent if the rotor is dropped onto it or forced sideways.

2. Carefully lower the rotor straight down onto the drive shaft (see Figure 2). Be sure the rotor is properly seated on the shaft.

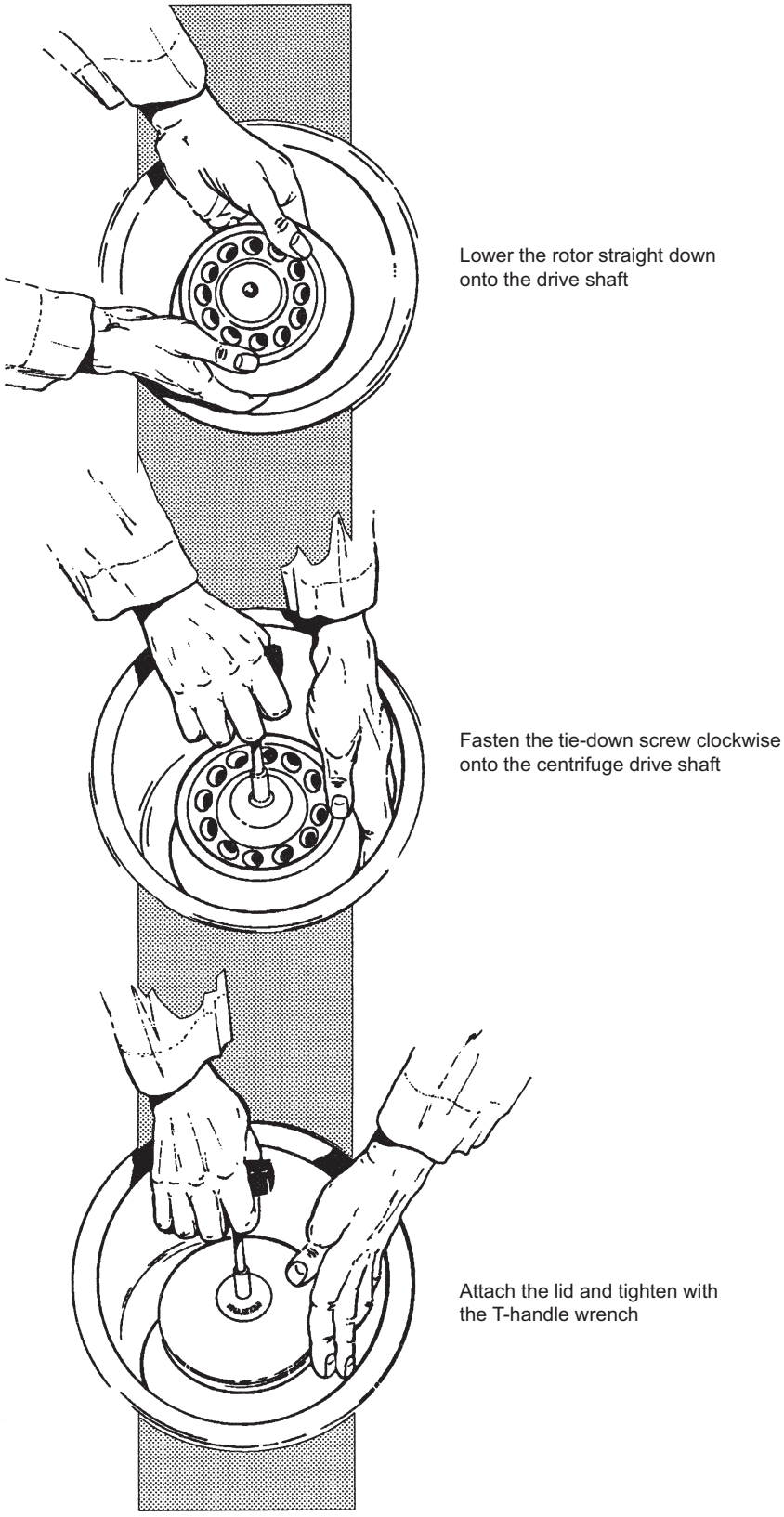


Figure 2. Installing the Rotor on the Centrifuge Drive Shaft

3. Place the tie-down screw onto the centrifuge drive shaft. Use the T-handle rotor wrench (361371) to turn the screw to the right (clockwise) until it is fastened firmly on the shaft.

4. Attach the lid. Tighten the lid with the rotor wrench.

5. Refer to the instrument instruction manual for centrifuge operation.

NOTE

Temperatures may vary slightly between centrifuges. If sample temperature is crucial, test temperature settings on your instrument using water samples. For runs at other than room temperature, refrigerate or warm the rotor beforehand for fast equilibration.

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.

1. Using the T-handle wrench, turn the tie-down screw to the left (counterclockwise) to release the lid. Remove the lid.

2. Use the T-handle wrench to turn the tie-down screw to the left (counterclockwise) to release the rotor.

3. Remove the rotor by lifting it straight up and off the drive shaft.

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). *Do not select rotational speeds that exceed the limits listed in Table 1.*

The rotor can process solutions at the maximum rated speed if the solution density is 1.2 g/mL or less. When centrifuging solutions of densities greater than 1.2 g/mL, the maximum run speeds must be reduced according to the following equation to protect the rotor from excessive stresses due to the added tube load:

$$\text{reduced maximum speed} = (30\,000 \text{ rpm}) \sqrt{\frac{1.2 \text{ g/mL}}{\text{density of tube contents}}}$$

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

MAINTENANCE

Do not use sharp tools on the rotor, as they can scratch the anodized 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, cracks, 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 tie-down screw, check it for damage such as stripped threads. Replace it if it is damaged.
- Regularly apply Spinkote lubricant (306812) to the threads in the rotor drive cavity to prevent the rotor from sticking.
- Store the rotor in a dry environment (not in the instrument).

Refer to *Chemical Resistances* for the chemical compatibilities of rotor and accessory materials.

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 conditions, wash the rotor at least weekly to prevent buildup of residues.

NOTE

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

1. Remove the O-ring from the rotor lid before washing.
2. Wash the rotor, lid, and O-ring using a mild detergent, such as Beckman Solution 555, that won't damage the rotor. The Rotor Cleaning Kit (339558) contains two brushes and two quarts of Solution 555 (339555) for use with rotors and accessories. Dilute the detergent 10 to 1 with water.
3. Rinse with distilled water.
4. Air-dry the rotor and lid upside down. *Do not use acetone to dry the rotor.*
5. Lightly but evenly lubricate the rotor drive-hole threads with Spinkote (306812).
6. Apply a thin, even coat of silicone vacuum grease (335148) to the lid O-ring, then replace it in the groove in the outer rim of the lid.

DECONTAMINATION

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),[1] and Radiacwash.[2]

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 components are contaminated with toxic or pathogenic materials, follow appropriate decontamination procedures as outlined by your laboratory safety officer. Check *Chemical Resistances* to be sure the decontamination method will not damage any part of the rotor.

[1] 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).

[2] In the United States., contact Biodex Medical Systems (Shirley, New York); internationally, contact the U.S. office to find the dealer closest to you.

STERILIZATION AND DISINFECTION

- The rotor and all rotor components can be autoclaved at 121°C for up to an hour. Place the rotor in the autoclave upside down.
- Ethanol (70%)[3] may be used on all rotor components, including those made of plastic.

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.

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 office. It 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 the 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.

[3] Flammability hazard. Do not use in or near operating centrifuges.

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; worldwide offices are listed on the back cover of this manual) for detailed information on ordering parts and supplies. For your convenience, a partial list is given below.

REPLACEMENT ROTOR PARTS

F1202 rotor assembly	364630
Rotor lid	369357
Rotor lid O-ring (OD, 80 × 3.5 mm)	961931
Tie-down screw	361367
T-handle rotor wrench	361371

OTHER

Tubes and adapters	see Table 1
Adapter for 750-µL vials (pkg 12)	364690
Spinkote lubricant (2 oz)	306812
Silicone vacuum grease (1 oz)	335148
Rotor Cleaning Kit	339558
Rotor cleaning brush	339379
Beckman Solution 555 (1 qt)	339555

BENCHTOP ROTOR 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

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 operated in a Beckman Coulter centrifuge that has been improperly disassembled, repaired, or modified.
4. 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.

TRADEMARKS

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