Instructions for
CLAY ADAMS® Brand
DYNAC® Centrifuge
Model Nos:
420101
420102

BECTON
DICKINSON
CLAY ADAMS® Brand
DYNAC Centrifuge
Models 420101 and 420102

ELECTRICAL PRECAUTIONS

• Read this manual before operating the CLAY ADAMS Brand DYNAC Centrifuge.
• THIS CENTRIFUGE IS FOR USE ON A.C. (Alternating Current) ONLY.
• Check the data plate on the back of the control panel for the required voltage and frequency.

CAUTION
To avoid electrical shock, connect power cord only to an approved power source such as a 3-wire grounded receptacle. Where a 2-wire receptacle is encountered, have it replaced with a properly grounded 3-wire receptacle in accordance with the National Electrical Code. Do not, under any circumstances, remove the ground prong from the power plug.

Should the power cord and plug become cracked, frayed, broken or otherwise damaged, they should be replaced immediately by a service man.

Unplug the power cord before servicing. The operator should not perform any servicing except as specifically stated in this manual. Refer servicing to trained personnel or return the instrument to the factory for repair.

SPECIMEN PRECAUTIONS

WARNING
BLOOD AND BODY FLUIDS MAY CONTAIN INFECTIOUS ORGANISMS SUCH AS HEPATITIS B VIRUS AND HIV THAT CAN BE TRANSMITTED IF IMPROPERLY HANDLED. ALWAYS WEAR PROTECTIVE LABORATORY GLOVES WHEN COLLECTING, HANDLING AND PROCESSING BLOOD AND BODY FLUIDS.

• Observe good laboratory procedures when handling blood specimens.
• Always use protective laboratory gloves when working with blood.
• If a tube breaks in the shield, carefully remove broken glass with a hemostat or other device, using puncture-resistant utility gloves.
• In addition to wearing gloves, the use of disposable lab coats or gowns and protective glasses or goggles are recommended.

OPERATING INSTRUCTIONS

Attaching Rotor Head
a. Remove knurled head-retaining screw from motor shaft.

b. Place rotor head on shaft so that the pin in the motor shaft engages the slot in the bottom of the head.

c. Push head down until it seats over the shaft pin.

d. Replace knurled screw on motor shaft and tighten snugly.

Balancing Load
For smooth operation and extended life of this centrifuge loads must be balanced as equally as possible. The use of a balance is recommended when loads are unevenly distributed.

Remember that the distribution of material to be centrifuged is as important to balancing as the weight. If the amounts of fluid in opposite tubes cannot be equalized, fill the shield (around the lighter tube) with water until the loads are balanced.

Important: Never balance by adding weights, mercury, or shot to the bottom of a tube or shield.

Use of Controls
BEFORE OPERATING THE CENTRIFUGE, MAKE SURE THAT THE SPEED CONTROL KNOB IS SET AT ZERO (0).

□ Timer
The DYNAC Centrifuge is controlled by a 30-minute timer, with a HOLD position for continuous operation. Operating the timer automatically turns the centrifuge on.

When setting the timer, turn the timer knob only in a clockwise direction.

a. To set the spin time, turn the timer knob clockwise to the setting desired. For INTERVALS OF LESS THAN 5 MINUTES, turn the knob past 5, then set back to the time desired. The centrifuge will operate to the end of the timed cycle, and will then shut itself off.

b. For continuous operation, turn the knob clockwise to the 'HOLD' position. The centrifuge will operate continuously until it is manually shut off. TO SHUT OFF, return the knob counterclockwise to the '0' position until the bell sounds.

c. A bell will signal the end of every centrifugation cycle, whether timer or manual.
\section*{Speed Control}

The Centrifuge incorporates a solid-state speed control, providing the ultimate in smooth control over a wide range of head speeds.

a. Choose the speed setting desired from the speed and force tables in this booklet (see ROTORS AND SPEED tables). USE THE APPLICABLE TABLE. The speed of the centrifuge will vary for any given setting depending on the head and shield used.

\textbf{Note:} An ADAMS Photoelectric Tachometer (Cat. No. 425205) can be used to determine the speed setting desired as well as periodic centrifuge speed monitoring. The Tachometer has four speed ranges, up to 30,000 RPM, for use with virtually all table top and floor model centrifuges.

b. Once the machine has been turned on, move the speed-control knob clockwise from '0' to the setting desired.

c. At the end of the centrifugation cycle, return the speed-control knob to zero.

\section*{Brake Switch}

The Centrifuge is equipped with an electric brake, designed to bring most rotors to a gentle stop in about one-quarter of the normal time. Unless the timer has run out or been turned off, the head will regain speed when the brake switch is released.

\textbf{a. To operate}, press down the brake thumbswitch and hold it down during breaking. The brake will be activated as long as the switch is held down.

\textbf{b. Release} the brake switch as soon as the head comes to a stop. For delicate sedimentations, release the switch just before the head comes to a stop, and let the head coast gently.

\textbf{c. DO NOT HOLD THE BRAKE SWITCH DOWN AFTER THE HEAD STOPS.} If the brake switch is held down too long, the head will immediately reverse and begin accelerating in the opposite direction.

\section*{Panel Light}

Illumination of the red panel light indicates that the Centrifuge is in operation, either timed or continuous.

\section*{Cover and Latch}

The centrifuge cover is closed and locked by means of a lever-type lid latch. To open the cover, press the lid latch DOWN.

\section*{MAINTENANCE}

\subsection*{Lubrication}

Bearings in the motor of the DYNAC Centrifuge are sealed and require no lubrication.

\subsection*{Motor Brushes}

Every six months the motor brushes should be inspected for wear. Brushes should be replaced when they are less than 1/4 of an inch (0.63 cm) long. Use only the replacement brushes specified in the PARTS LIST section.

Referring to the exploded view on page 4, replace the brushes as follows:

\textbf{a. REMOVE THE LINE CORD PLUG FROM THE ELECTRICAL OUTLET.}

\begin{center}
\textbf{CAUTION}
\end{center}

\textbf{TO AVOID ELECTRICAL SHOCK, BE SURE THE LINE CORD IS DISCONNECTED BEFORE ATTEMPTING ANY REPAIRS.}

\textbf{b. Turn the Centrifuge on its side.}

\textbf{c. Remove the screws holding the three rubber feet.}

\textbf{d. Remove the rubber feet and the bottom plate.}

\textbf{e. Using a slotted screwdriver, remove the two brush caps, one on either side of the Centrifuge motor.}

\textbf{f. Remove the spring and brush assembly from the motor.}

\textbf{g. Brush orientation} — If brushes are still usable, orient and replace them \textbf{AS YOU FOUND THEM.}

\textbf{h. To replace,} insert the spring and brush assembly into the motor. IT IS VERY IMPORTANT THAT THE CURVED FRONT SURFACE OF THE BRUSH BE ORIENTED BEFORE INSERTION TO MATCH THE CURVED SURFACE OF THE MOTOR HOUSING. Replace the brush caps and screw down tightly.

\textbf{i. Always run-in new brushes. Proper performance may not occur until after several hours of operation with the rotor head in place.}

\subsection*{Cleaning}

Periodically wipe the interior and exterior of the Centrifuge bowl and plastic cover with a damp cloth. Use a mild detergent to remove stains. DO NOT USE STRONG SOLVENTS OR ALKALIS which can damage these parts.

\textbf{Note:} The transparent plastic cover can also be damaged by carbon tetrachloride, chloroform, and most aromatic hydrocarbons.
ROTORS AND SPEED SETTINGS

120 Volt Combinations

The tables below have been prepared to indicate approximate speeds and forces for complete DYNAC Centrifuge Combinations. The Combinations below consist of a Model 420101 (120 volt) DYNAC Centrifuge equipped with the indicated rotor head and shields. In each case, speed settings have been determined for the specific head and shields supplied. Speed settings are approximate (i.e., ±10%) and will vary with voltage, load, size of tube and age of centrifuge. The tables have been prepared for centrifuge operation at 120 volts, 60 Hz, with the cover closed and the center hole uncovered. Operating the centrifuge with the cover open will reduce its speed considerably.

If the speed setting is critical in a laboratory procedure, use a non-contact tachometer to calibrate speed, such as the ADAMS Photoelectric Tachometer (Cat. No. 425205).

Cat. No. 420087

12-place 15 mL Angle-Head
P/N 420113 with 12 P/N 420901 shields.

<table>
<thead>
<tr>
<th>SPEED SETTING</th>
<th>RPM</th>
<th>RCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>1000</td>
<td>180</td>
</tr>
<tr>
<td>71</td>
<td>2000</td>
<td>725</td>
</tr>
<tr>
<td>100</td>
<td>2515</td>
<td>1145</td>
</tr>
</tbody>
</table>

Cat. No. 420089

24-place 15 mL Angle-Head
P/N 420114 with 24 P/N 420902 shields.

<table>
<thead>
<tr>
<th>SPEED SETTING</th>
<th>RPM</th>
<th>RCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>1000</td>
<td>165</td>
</tr>
<tr>
<td>63</td>
<td>2000</td>
<td>655</td>
</tr>
<tr>
<td>100</td>
<td>2755</td>
<td>1240</td>
</tr>
</tbody>
</table>

Cat. No. 420091

24-place 15 mL Angle-Head
P/N 420114 with 24 P/N 420901 shields.

<table>
<thead>
<tr>
<th>SPEED SETTING</th>
<th>RPM</th>
<th>RCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>1000</td>
<td>180</td>
</tr>
<tr>
<td>73</td>
<td>2000</td>
<td>725</td>
</tr>
<tr>
<td>100</td>
<td>2400</td>
<td>1040</td>
</tr>
</tbody>
</table>

Cat. No. 420093

24-place Angle-Head
P/N 420114 with 24 P/N 420904 shields
for 10 × 75 mm and 12 × 75 mm Tubes.

<table>
<thead>
<tr>
<th>SPEED SETTING</th>
<th>RPM</th>
<th>RCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>1000</td>
<td>140</td>
</tr>
<tr>
<td>50</td>
<td>2000</td>
<td>570</td>
</tr>
<tr>
<td>79</td>
<td>3000</td>
<td>1280</td>
</tr>
<tr>
<td>100</td>
<td>3335</td>
<td>1580</td>
</tr>
</tbody>
</table>

220 Volt/50 Hz Combinations

Combinations using a Model 420102 (220V/50Hz) Centrifuge base will provide different speeds than those in the previous tables using equivalent head and shield configurations. At 50 Hz operation, speeds will increase approximately 400-600 rpm at the maximum setting (100).
PARTS LIST
See exploded view with reference numbers opposite.

120V CENTRIFUGE

1. MOTOR & HARDWARE ASSEMBLY: 42010101
   Nut, Flex Loc. No. 8-32 (3)
   Seal, Motor
   Spring Pin, 3/32 Dia. × 7/16 Lg.
   Head Retainer, (Collar Clamp)
   Set Screw, Socket (Allen) (2)
   Head Screw Assembly
   Wiring Instructions

2. MOTOR BRUSH KIT (for 120 V & 220 V Motors): 42000102
   Brush Assembly (2)
   Outer Caps (2)

3. TIMER WITH KNOB: 42010103
   Knob
   Timer
   Lockwasher, Int. Tooth
   Wiring Instructions

4. KNOB ONLY, TIMER: 42010104

5. SWITCH, BRAKE: 42010105
   Switch & Locknut
   Ring Nut
   Wiring Instructions

6. CORDSET ASSEMBLY: 42054109
   Cord Set
   Wiring Instructions

7. COVER ASSEMBLY: 42010308

8. LATCH ASSEMBLY: 42010309

9. SPEED CONTROLLER ASSEMBLY: 42010108
   Wiring Instructions

10. KNOB ONLY, SPEED CONTROL: 42010109

11. LIGHT ASSEMBLY & CONNECTOR: 42010110
    Light with Spring Fastener
    Push-On Connector
    Wire Black 18 GA. 4" Lg.
    Wiring Instructions
    Connector (2)

12. HEAD SCREW ASSEMBLY & RETAINER: 42010111
    Head Screw Assembly
    Head Retainer (Collar Clamp)
    Set Screw, Socket (Allen)
    No. 6-32 N.C. × 1/4 D.P. (2)

13. RUBBER BUMPER: 42010112
    3 per Package

14. RUBBER FOOT & HARDWARE: 42010113
    Rubber Foot with Washer (4)
    Screw, Phil. Hd.
    No. 10-32 × 5/8 Lg. (4)

15. LID CUSHION: 42010310

16. LATCH PLATE: 42010312

220V CENTRIFUGE

17. MOTOR & HARDWARE ASSEMBLY: 42010201
    Motor
    Nut, Flex Loc. No. 8-32 (3)
    Seal, Motor
    Spring Pin, 3/32 Dia. × 7/16 Lg.
    Scotch Foam, 11" Lg.
    Head Retainer (Collar Clamp)
    Set Screw, Socket (Allen) (2)
    Head Screw Assembly
    Wiring Instructions

18. SPEED CONTROLLER ASSEMBLY: 42010202
    Wiring Instructions

*19a. Screw, Pan, Head No. 8-32 × 3/8 Lg.
*20a. Screw, Flat Head No. 8-32 × 5/16 Lg.
*21a. Nut, Hex No. 8-32 Lockwasher Split No. 8

SPECIFICATIONS (both models)

Height: 10 in. (25.4 cm)
Bowl Diameter: 15 in. (38.1 cm)
Overall Width: 18.5 in. (47 cm)
Net Weight (base only): 27 lbs. (12.25 kg)

*Attaching hardware not included. Purchase locally.
ACCESSORIES FOR CLAY ADAMS BRAND DYNACENTRIFUGE

Rotor Selection

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>For Use with Shields</th>
</tr>
</thead>
<tbody>
<tr>
<td>420107</td>
<td>Horizontal-4 place</td>
<td>420001, 420002, 420004, 420005</td>
</tr>
<tr>
<td>420108</td>
<td>Horizontal-4 place</td>
<td>420000</td>
</tr>
<tr>
<td>420109</td>
<td>Horizontal-4 place</td>
<td>420001, 420002, 420004, 420005</td>
</tr>
<tr>
<td>420110</td>
<td>Horizontal-4 place</td>
<td>420008</td>
</tr>
<tr>
<td>420111</td>
<td>Angle-4 place</td>
<td>420001, 420002, 420004, 420005</td>
</tr>
<tr>
<td>420112</td>
<td>Angle-4 place</td>
<td>420000</td>
</tr>
<tr>
<td>420113</td>
<td>Angle-12 place</td>
<td>420001, 420002, 420004, 420005</td>
</tr>
<tr>
<td>420114</td>
<td>Angle-84 place</td>
<td>420001, 420002, 420004, 420005</td>
</tr>
</tbody>
</table>

Shield Selection

<table>
<thead>
<tr>
<th>Catalog No. &amp; Description</th>
<th>Diameter</th>
<th>Tube Sizes</th>
<th>Adapters/Systems for VACUTAINER Tubes with HEMOGARD Closures</th>
</tr>
</thead>
<tbody>
<tr>
<td>420006 Stainless Steel with cushion &amp; 420043</td>
<td>52 x 31 mm 10.8 x 1.5&quot; 10.8 x 3.0 mm</td>
<td>50 ml, 40 ml</td>
<td>For 13 x 25 mm tube, use 420006 &amp; 420007</td>
</tr>
<tr>
<td>420001 Stainless Steel with cushion &amp; 420043</td>
<td>118 x 16 mm 14.4 x 0.5&quot; 14.4 x 1.0 mm</td>
<td>15 ml, 15 ml</td>
<td>For 13 x 25 mm tube, use 420006 &amp; 420007</td>
</tr>
<tr>
<td>420002 Stainless Steel with cushion &amp; 420043</td>
<td>100 x 18 mm 6.2 x 0.5&quot; 6.2 x 1.0 mm</td>
<td>5 ml, 7 ml, 10 ml</td>
<td>For 13 x 25 mm tube, use 420006 &amp; 420007</td>
</tr>
<tr>
<td>420004 Aluminum, with cushion &amp; 420043</td>
<td>25 x 18 mm 0.6 x 0.7&quot; 0.6 x 1.5 mm</td>
<td>3 ml, 10 x 75 mm, 12 x 75 mm, 14 x 5 ml</td>
<td>For 13 x 25 mm tube, use 420006 &amp; 420006</td>
</tr>
<tr>
<td>420005 Aluminum, with cushion &amp; 420043</td>
<td>20 x 15 mm 0.7 x 0.6&quot; 0.7 x 1.0 mm</td>
<td>2 ml, 5 ml</td>
<td>For 13 x 25 mm tube, use 420006 &amp; 420006</td>
</tr>
<tr>
<td>420008 Stainless Steel, with cushion &amp; 420043</td>
<td>100 x 41.4 mm 2.5 x 1.6&quot; 2.5 x 3.0 mm</td>
<td>100 ml tubes, 50 ml plastic tubes</td>
<td>For 13 x 25 mm and 13 x 100 mm tubes not compatible</td>
</tr>
</tbody>
</table>

Multiple Carrier Selection

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Tube Capacity</th>
<th>Tube Size</th>
<th>Rotor Used With</th>
</tr>
</thead>
<tbody>
<tr>
<td>420006</td>
<td>5</td>
<td>75 x 13 mm HEMOGARD*</td>
<td>420100</td>
</tr>
<tr>
<td>420006</td>
<td>3</td>
<td>75 x 13 mm HEMOGARD*</td>
<td>420100</td>
</tr>
<tr>
<td>420020</td>
<td>5</td>
<td>100 x 13 mm HEMOGARD*</td>
<td>420100</td>
</tr>
<tr>
<td>420000</td>
<td>3</td>
<td>100 x 13 mm HEMOGARD**</td>
<td>420100</td>
</tr>
<tr>
<td>420026</td>
<td>9</td>
<td>15 x 75 mm</td>
<td>420110</td>
</tr>
<tr>
<td>420021</td>
<td>7</td>
<td>12 x 75 mm</td>
<td>420110</td>
</tr>
<tr>
<td>420022</td>
<td>5</td>
<td>13 x 100 mm or 7 ml VACUTAINER</td>
<td>420110</td>
</tr>
<tr>
<td>420023</td>
<td>3</td>
<td>16 x 100 or 10 ml VACUTAINER</td>
<td>420110</td>
</tr>
</tbody>
</table>
ACCESSORIES FOR CLAY ADAMS BRAND DYNAC CENTRIFUGE (Continued)

Shield Cushion Selection

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Where Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>420240</td>
<td>Small Black Cushion</td>
<td>HEMOGARD Adapter 420250 &amp; 420251</td>
</tr>
<tr>
<td>420241</td>
<td>Rubber Cushion and Leather Disc</td>
<td>Shield # 420080</td>
</tr>
<tr>
<td>420242</td>
<td>Rubber Cushion</td>
<td>Shield # 420080</td>
</tr>
<tr>
<td>420243</td>
<td>Rubber Cushion</td>
<td>Shield # 420081 &amp; 420002</td>
</tr>
<tr>
<td>420244</td>
<td>Rubber Adapter</td>
<td>Shield # 420001</td>
</tr>
</tbody>
</table>

Adapters and Spacers

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Where Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>420250</td>
<td>Adapter with cushion for 75 x 15 mm HEMOGARD Closure Tubes</td>
<td>Shields # 420001, 420002</td>
</tr>
<tr>
<td>420251</td>
<td>Adapter with cushion for 90 x 13 mm HEMOGARD Closure Tubes</td>
<td>Shields # 420001, 420002</td>
</tr>
<tr>
<td>420252</td>
<td>Spacer ¾&quot; long for HEMOGARD Closure Tubes</td>
<td>Shield # 420001</td>
</tr>
<tr>
<td>420253</td>
<td>Spacer ¾&quot; long for HEMOGARD Closure Tubes</td>
<td>Shield # 420004</td>
</tr>
<tr>
<td>420254</td>
<td>Reducing adapter from 50 ml to 15 ml</td>
<td>Rotors # 420158, 420112</td>
</tr>
<tr>
<td>420255</td>
<td>Reducing adapter from 100 ml to 50 ml</td>
<td>Rotors # 420158</td>
</tr>
</tbody>
</table>

For assistance in the United States, call the Technical Service Department of Becton Dickinson Primary Care Diagnostics 1-800-631-8064

Becton Dickinson Primary Care Diagnostics
7 Loveton Circle, Sparks, MD 21152-0370 U.S.A.

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