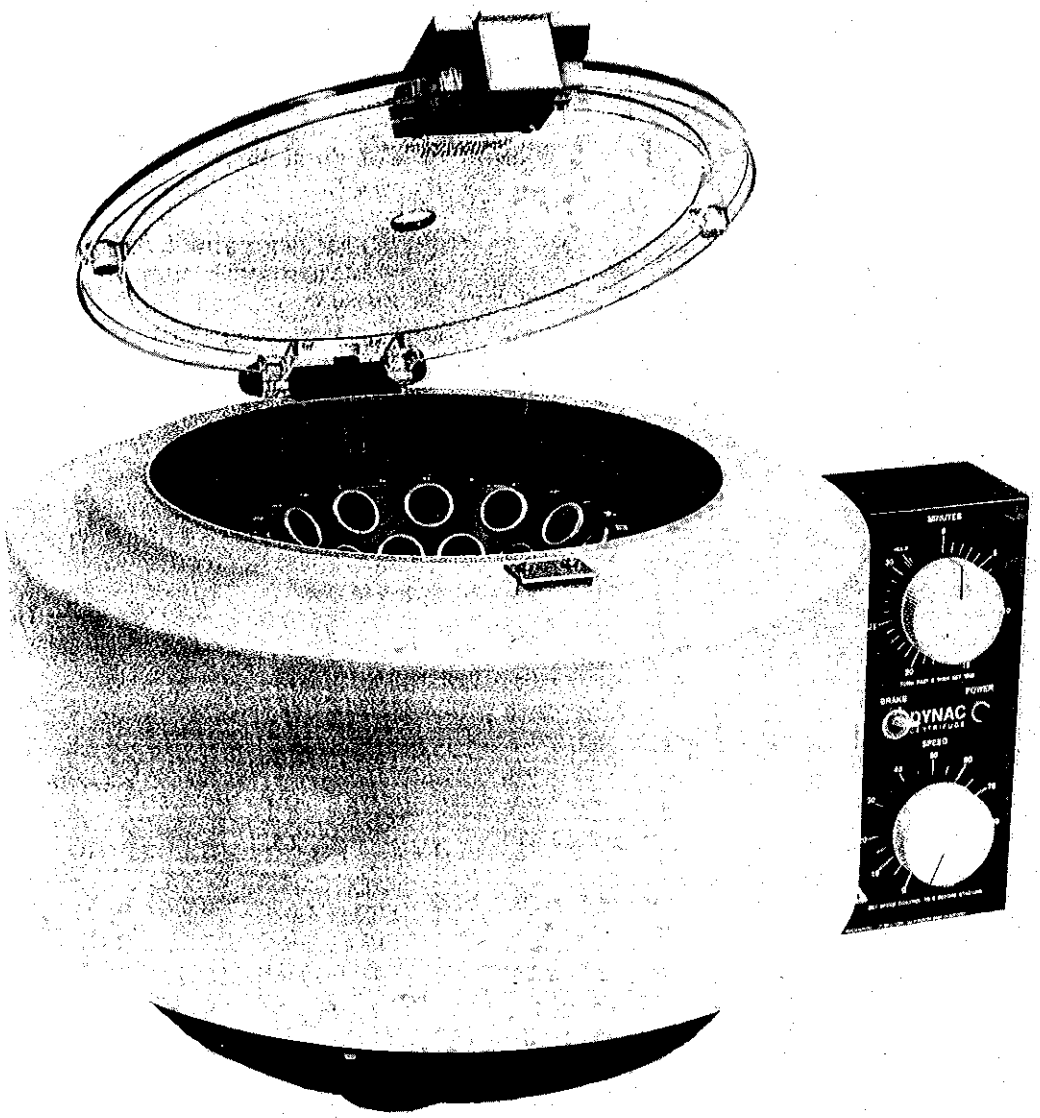
Instructions for
CLAY ADAMS® Brand
DYNAC® Centrifuge
Model Nos:
420101
420102



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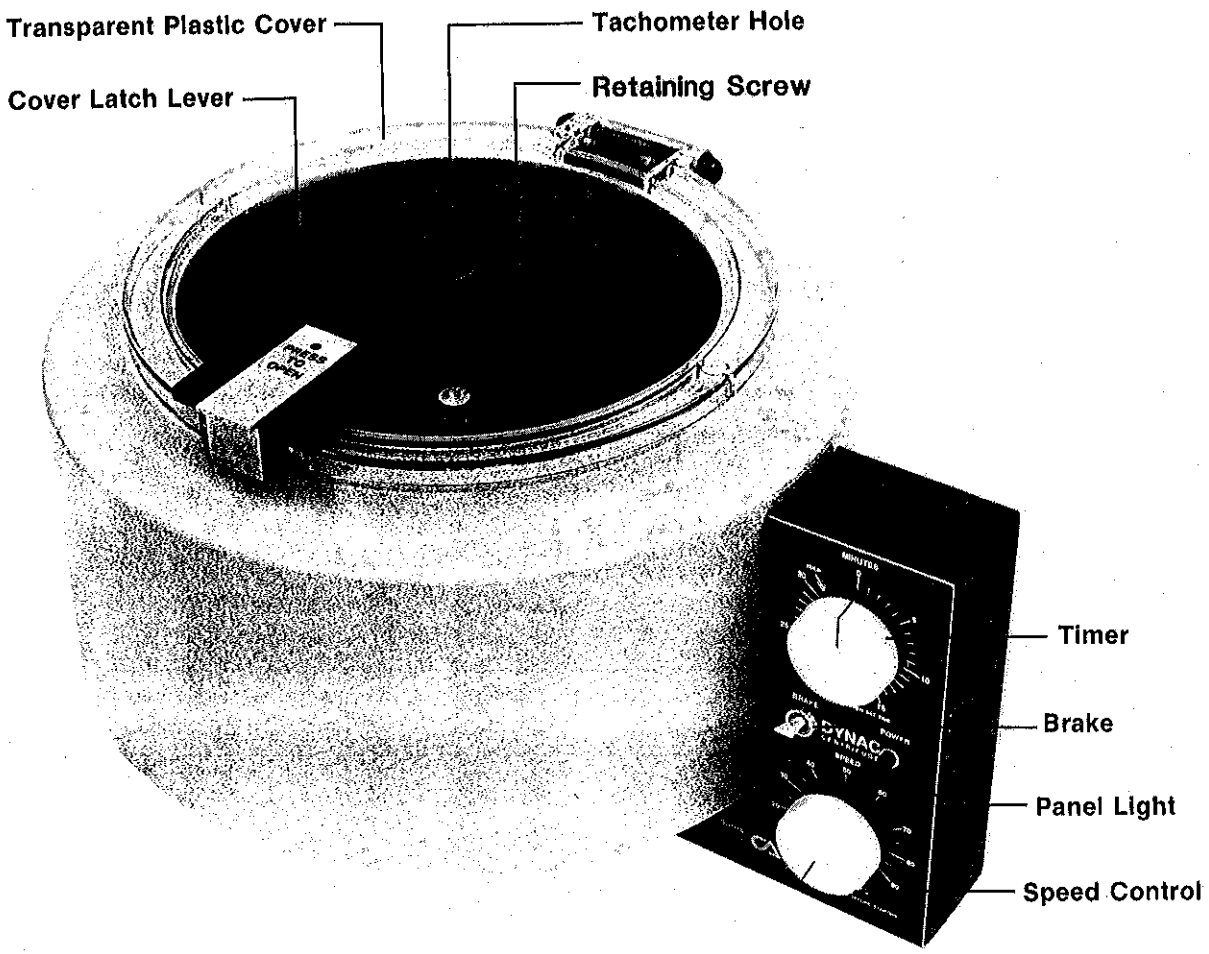

CLAY ADAMS Brand
DYNAC Centrifuge
Models 420101 and 420102

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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 time 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.

☐ 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.

   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.

☐ 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.

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.

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.

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.

☐ Panel Light

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

☐ 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.

MAINTENANCE

Lubrication

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

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:

a. **REMOVE THE LINE CORD PLUG FROM THE ELECTRICAL OUTLET.**

> **CAUTION**
>
> TO AVOID ELECTRICAL SHOCK, BE SURE THE LINE CORD IS DISCONNECTED BEFORE ATTEMPTING ANY REPAIRS.

b. Turn the Centrifuge on its side.

c. Remove the screws holding the three rubber feet.

d. Remove the rubber feet and the bottom plate.

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

f. Remove the spring and brush assembly from the motor.

g. **Brush orientation** — If brushes are still usable, orient and replace them **AS YOU FOUND THEM.**

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.

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

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.

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. 420063

4-place 50 mL Horizontal Head
P/N 420108 with 4 P/N 420900 shields.

SPEED SETTING	RPM	RCF
24	1000	180
63	2000	730
100	2790	1425

Cat. No. 420065

8-place 15 mL Horizontal Head
P/N 420109 with 8 P/N 420901 shields.

SPEED SETTING	RPM	RCF
36	1000	200
78	2000	800
100	2300	1060

Cat. No. 420067

4-place 100 mL Horizontal Head
P/N 420110 with 4 P/N 420908 shields.

SPEED SETTING	RPM	RCF
35	1000	200
75	2000	810
100	2385	1150

Cat. No. 420085

12-place 15 mL Angle-Head
P/N 420113 with 12 P/N 420902 shields.

SPEED SETTING	RPM	RCF
26	1000	160
60	2000	650
100	2890	1360

Cat. No. 420087

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

SPEED SETTING	RPM	RCF
30	1000	180
71	2000	725
100	2515	1145

Cat. No. 420089

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

SPEED SETTING	RPM	RCF
30	1000	165
63	2000	655
100	2755	1240

Cat. No. 420091

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

SPEED SETTING	RPM	RCF
33	1000	180
73	2000	725
100	2400	1040

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.

SPEED SETTING	RPM	RCF
18	1000	140
50	2000	570
79	3000	1280
100	3335	1580

220 Volt/50 Hz Combinations

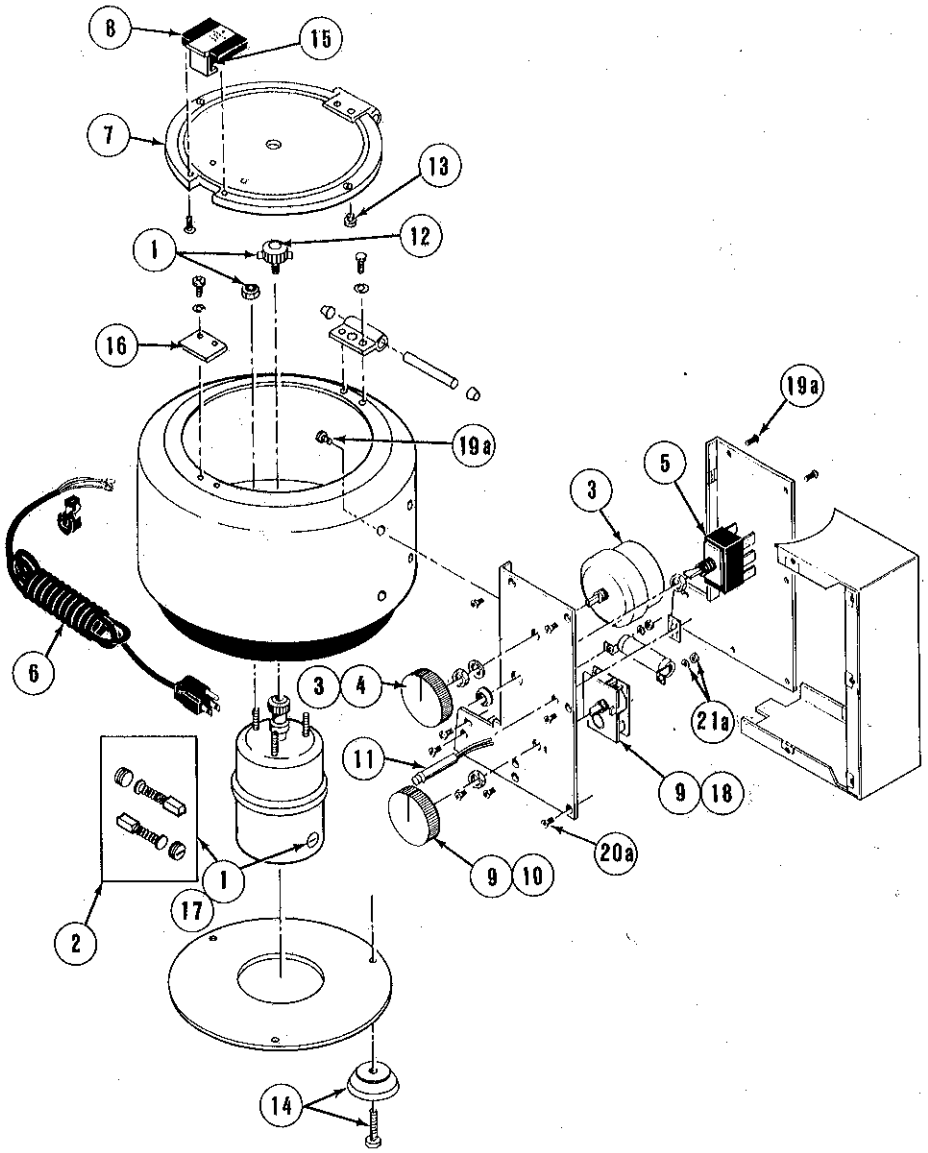
Combinations using a Model 420102 (220V/50Hz) Centrifuge base will provide different speeds than those in the previous tables using equivalent head and shield configurations. At 50 Hz operation, speeds will increase approximately 400-600 rpm at the maximum setting (100).

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**



Exploded View, DYNAC Centrifuge
Models 420101 and 420102

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. 6-32 × 3/8 Lg.

*20a. Screw, Flat Head
No. 6-32 × 5/16 Lg.

*21a. Nut, Hex No. 6-32
Lockwasher Split No. 6

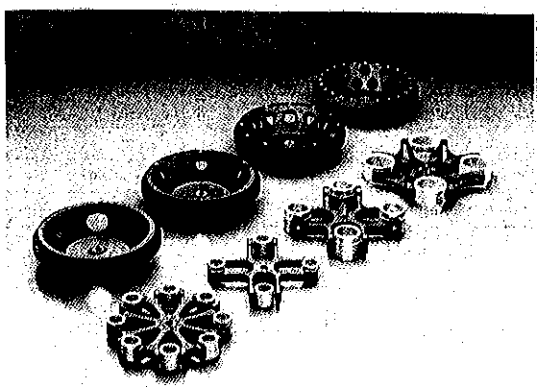
SPECIFICATIONS (both models)

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.

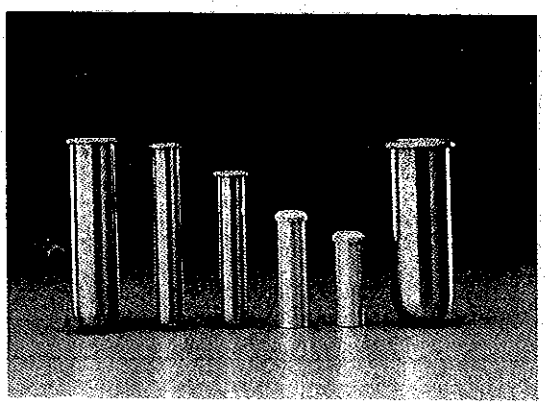
ACCESSORIES FOR CLAY ADAMS BRAND DYNAC CENTRIFUGE

Rotor Selection



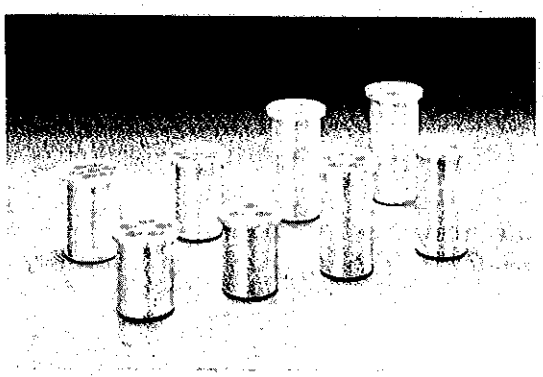
Cat. No.	Description	For Use with Shields
420107	Horizontal-4 place	420901, 420902, 420904, 420905
420108	Horizontal-4 place	420900
420109	Horizontal-8 place	420901, 420902, 420904, 420905
420110	Horizontal-4 place	420908
420111	Angle-6 place	420901, 420902, 420904, 420905
420112	Angle-4 place	420900
420113	Angle-12 place	420901, 420902, 420904, 420905
420114	Angle-24 place	420901, 420902, 420904, 420905

Shield Selection



Catalog No. & Description	Dimensions	Tube Sizes:	Adapters/Spacers for VACUTAINER Tubes with HEMOGARD Closures
420900 Stainless Steel with cushion # 420941	123 x 31 mm (4 15/16 x 1¼") I.D. 30 mm	50 ml 40 ml heavy duty tubes	
420901 Stainless Steel with cushion # 420943	118 x 18 mm (4 11/16 x 1⅛") I.D. 17.6 mm	15 ml, 15 ml VACUTAINER Blood Collecting Tubes	• For 13 x 75 mm tube, use # 420250 and 420252 • For 13 x 100 mm tube, use # 420251 and 420252
420902 Stainless Steel with cushion # 420943	100 x 18 mm (4 x ¾") I.D. 17.6 mm	5 ml, 15 ml, 7 ml, 10 ml VACUTAINER Blood Collecting Tubes	• For 13 x 75 mm tube, use # 420250 • For 13 x 100 mm tube, use # 420251
420904 Aluminum, with cushion	75 x 18 mm (3 x ¾") I.D. 13.8 mm	3 ml, 10 x 75 mm, 12 x 75 mm, 4 and 5 ml VACUTAINER Blood Collecting Tubes	• For 13 x 75 mm tube, use # 420253 spacer • 13 x 100 mm tube not compatible
420905 Aluminum, with cushion	60 x 18 mm (2⅜ x ¾") I.D. 11.5 mm	2 ml, 1 ml and 0.5 ml tubes, 10 x 55 mm, 3 ml VACUTAINER Blood Collecting Tubes	• 13 x 75 mm and 13 x 100 mm tubes not compatible
420908 Stainless Steel, with cushion # 420942, supplied in balanced pairs	101 x 41.4 mm (3 63/64 x 1¾") I.D. 39.3 mm	100 ml tubes, 50 ml plastic tubes with screw caps	

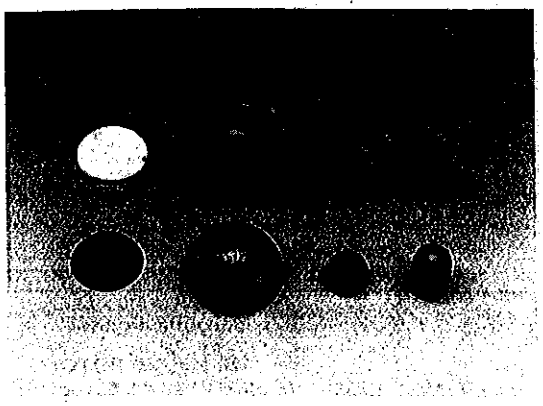
Multiple Carrier Selection



Cat. No.	Tube Capacity	Tube Size/s	Rotor Used With
420255	5	75 x 13 mm HEMOGARD™	420110
420256	3	75 x 13 mm HEMOGARD™	420110
420259	5	100 x 13 mm HEMOGARD™	420110
420260	3	100 x 13 mm HEMOGARD™	420110
420920	9	10 x 75 mm	420110
420921	7	12 x 75 mm	420110
420922	5	13 x 100 mm, or 7 ml VACUTAINER	420110
420923	3	16 x 100 or 10 ml VACUTAINER	420110

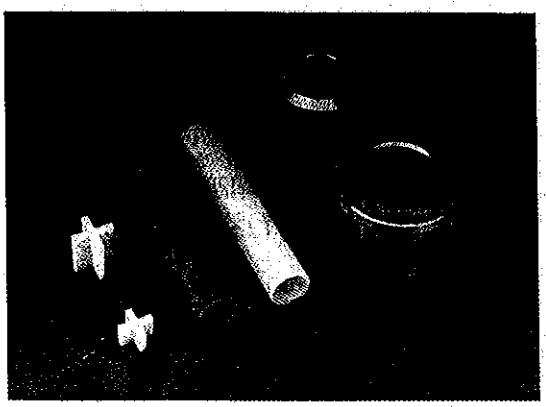
ACCESSORIES FOR CLAY ADAMS BRAND DYNAC CENTRIFUGE (Continued)

Shield Cushion Selection



Cat. No.	Description	Where Used
420249	Small Black Cushion	HEMOGARD Adapter # 420250 & 420251
420241	Rubber Cushion and Leather Disc	Shield # 420900
420242	Rubber Cushion	Shield # 420908
420243	Rubber Cushion	Shield # 420901 & 420902
420244	Rubber Adapter	Shield # 420901

Adapters and Spacers



Cat. No.	Description	Where Used
420250	Adapter with cushion for 75 x 13 mm HEMOGARD Closure Tubes	Shields # 420901, 420902
420251	Adapter with cushion for 100 x 13 mm HEMOGARD Closure Tubes	Shields # 420901, 420902
420252	Spacer ¾" long for HEMOGARD Closure Tubes	Shield # 420901
420253	Spacer ⅜" long for HEMOGARD Closure Tubes	Shield # 420904
420931	Reducing adapter from 50 ml to 15 ml	Rotors # 420108, 420112
420934	Reducing adapter from 100 ml to 50 ml	Rotor # 420110

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

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