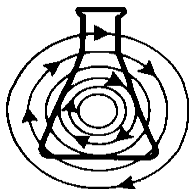




Guide to Operations

C-1 Classic Platform Shaker

MANUAL NO: M1258-0050
Revision F
November 2, 2004



NEW BRUNSWICK SCIENTIFIC CO., INC.

BOX 4005 • 44 TALMADGE ROAD • EDISON, NJ 08818-4005

Telephone: 1-732-287-1200 • 1-800-631-5417

Fax: 732-287-4222 • Telex: 4753012 NBSCO

Internet: <http://www.nbsc.com> • E-mail: bioinfo@nbsc.com

INTERNATIONAL OFFICES:

BELGIUM

New Brunswick Scientific NV-SA
Stationsstraat 180/4
3110 Rotselaar
België/Belgique
Tel: 32 (0)16 56 28 31
Fax: 32 (0)16 57 27 53
E-mail: sales@nbsnv-sa.be

CHINA

New Brunswick Scientific Co., Inc.
Room 1501, Xiangjiang Building, No. 18
Lane 1265, Zhongshan Road (W)
Shanghai 200051, P.R. China
Tel: 86 21 3223 0203
Fax: 86 21 6278 7182
E-mail: nbschc@online.sh.cn

FRANCE

New Brunswick Scientific SARL
3, rue des Deux-Boules
75001 Paris
France
Tel: 33 (0)1 4026 2246
Fax: 33 (0)1 4026 5423
E-mail: sales@nbssarl.fr

GERMANY

New Brunswick Scientific GmbH
In Der Au 14
D-72622 Nürtingen
Deutschland
Tel: 49 (0)7022 932490
Fax: 49 (0)7022 32486
E-mail: sales@nbsgmbh.de

THE NETHERLANDS

New Brunswick Scientific BV
Kerkenbos 1101, 6546 BC Nijmegen
P.O Box 6826, 6503 GH Nijmegen
Nederland
Tel: 31 (0)24 3717 600
Fax: 31 (0)24 3717 640
E-mail: sales@nbsbv.nl

UNITED KINGDOM

New Brunswick Scientific (UK) Ltd.
17 Alban Park
St. Albans, Herts. AL4 0JJ
United Kingdom
Tel: 44 (0)1727 853855 or 0800 581331
Fax: 44 (0)1727 835666
E-mail: bioinfo@nbsuk.co.uk
Web: www.nbsuk.co.uk

THIS PAGE IS INTENTIONALLY BLANK

**CAUTION!**

This equipment *must* be operated as described in this manual. If operational guidelines are not followed, equipment damage and personal injury *can* occur. Please read the entire User's Guide before attempting to use this unit.

Do not use this equipment in a hazardous atmosphere or with hazardous materials for which the equipment was not designed.

New Brunswick Scientific Co., Inc. (NBS) is not responsible for any damage to this equipment that may result from the use of an accessory not manufactured by NBS.

THIS PAGE IS INTENTIONALLY BLANK

Copyright Notice

New Brunswick Scientific Company, Inc.
Box 4005 44 Talmadge Road
Edison, New Jersey 08818-4005

© Copyright 2004 New Brunswick Scientific Co., Inc.

All Rights Reserved.

Reproduction, adaptation, or translation without prior written permission from New Brunswick Scientific is prohibited.

Disclaimer Notice

New Brunswick Scientific Co., Inc. reserves the right to change information in this document without notice. Updates to information in this document reflect our commitment to continuing product development and improvement.

Manual Conventions



Notes contain essential information that deserves special attention.



CAUTION!

Caution messages appear before procedures which, if caution is not observed, could result in damage to the equipment.



WARNING!

Warning messages alert you to specific procedures or practices which, if not followed correctly, could result in serious personal injury.

Bold

Text in bold face type emphasizes key words or phrases.

THIS PAGE IS INTENTIONALLY BLANK



THIS PAGE IS INTENTIONALLY BLANK

TABLE OF CONTENTS

1	OVERVIEW	13
1.1	SPECIFICATIONS	13
2	INSPECTION, UNPACKING & VERIFICATION OF EQUIPMENT	15
2.1	INSPECTION OF BOXES	15
2.2	UNPACKING	15
2.3	VERIFICATION.....	15
3	PREPARING THE LOCATION	17
3.1	PHYSICAL LOCATION	17
3.2	ENVIRONMENT	17
4	GETTING STARTED	19
4.1	PLATFORM INSTALLATION	19
4.2	CLAMP INSTALLATION	20
4.3	ELECTRICAL CONNECTIONS	20
5	OPERATION	23
5.1	STARTING THE C-1	23
5.2	STOPPING THE C-1	24
5.3	POWER FAILURE	24
6	PREVENTIVE MAINTENANCE	25
6.1	CLEANING EXTERNAL SURFACES.....	25
6.2	FUSE REPLACEMENT	25
6.3	BELT REPLACEMENT.....	26
7	TROUBLESHOOTING	31
8	REPLACEMENT PARTS & ACCESSORIES	33
8.1	REPLACEMENT PARTS	33
8.2	ACCESSORIES	33
8.2.1	<i>Dedicated Platforms</i>	33
8.2.2	<i>Universal Platform Flask Capacity</i>	33
8.2.3	<i>Carriers & Test Tube Capacities</i>	34
8.2.4	<i>Accessory Flask Clamps</i>	34
9	DRAWINGS	35
9.1	LIST OF DRAWINGS	37
9.2	LIST OF TABLES	37
10	INDEX	39

THIS PAGE IS INTENTIONALLY BLANK

1 OVERVIEW

The C-1 Classic Platform Shaker is a portable benchtop shaker utilizing a triple eccentric counter balanced drive to provide horizontal plane rotary motion in a ¾-inch (19 mm) circular orbit. The shaker is operated continuously over a range of 50-400 rpm.

The C-1 can be used with a wide variety of NBS 11 x 13-inch (28 cm x 33 cm) platforms which will accept a variety of clamps for flasks, test tubes, etc. Dedicated platforms are available for a variety of flask sizes. Universal platforms, utility trays, utility carriers and test tube racks are available.

1.1 Specifications

C-1 Classic Shaker	
Speed	50-400 rpm
Stroke	¾ inch (1.9 cm)
Ambient Operating Environment	5 - 45°C, 20 to 90% relative humidity, non-condensing
Automatic Restart	Automatic restart after power is restored.
Electrical Requirements	110/120V AC 50/60 Hz, 1320 VA 220/240V AC 50/60 Hz, 1320 VA
Platform	11 inches X 13 inches (28 X 33 cm)
Overall Dimensions	14.5 W X 17.5 D X 7.4 inches H (37 X 44.5X 18.8 cm)
Net Weight	35 lbs (16 kg)
Gross Weight	50 lbs (22.7 kg)

THIS PAGE IS INTENTIONALLY BLANK

2 INSPECTION, UNPACKING & VERIFICATION OF EQUIPMENT

2.1 *Inspection of Boxes*

After you receive your order from New Brunswick Scientific, inspect the boxes carefully for any damage that may have occurred during shipping. Report any damage to the carrier and to your local NBS Sales Order Department.

2.2 *Unpacking*

Save all packing materials and User's Guide. If any part of your order was damaged during shipping, missing pieces, or fails to operate properly, please fill out the *Customer Satisfaction Form 6300* and return it by fax.

2.3 *Verification*

Verify against your NBS packing list and the checklist below that you have received the correct materials:

- C-1 CLASSIC SHAKER**
100/120V 50/60 Hz (M1258-0000)
220/240V 50/60 Hz (M1258-0001)

- POWER KIT (POWER CORD & FUSE)**
100/120V 50/60 Hz (M1244-0600)
220/240V 50/60 Hz (M1244-0601)

THIS PAGE IS INTENTIONALLY BLANK

3 PREPARING THE LOCATION

3.1 *Physical Location*

It is essential that the instrument be situated in a area where there is sufficient space for the shaker and platform to clear walls and obstructions during operation. The surface on which the unit is placed must be smooth, level, and able to support the shaker under full load operating conditions.

3.2 *Environment*

The shaker is designed to operate optimally in the following ambient conditions:

- 5 - 45°C
- 20 to 90% Relative Humidity non-condensing

THIS PAGE IS INTENTIONALLY BLANK

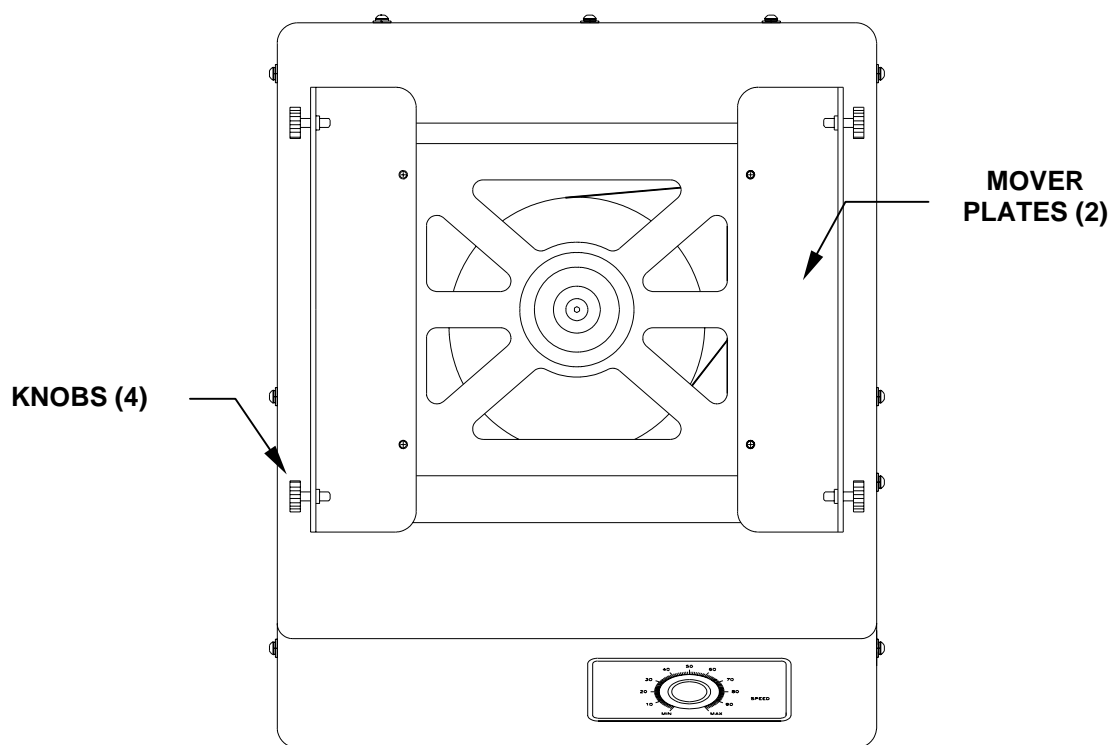
4 GETTING STARTED

4.1 Platform Installation

A platform is required for operation. To install a platform on the unit:

1. Loosen the four knobs on the left and right **MOVER PLATES**.

Figure 1: Platform Installation (top view)



2. Align the four slots in the platform with the four holes in the **MOVER PLATES**, and place the platform on the **MOVER PLATES**.
3. Tighten the knobs to secure the platform.


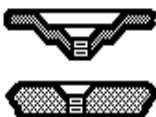
4.2 Clamp Installation

Flask clamps purchased for use with universal platforms require installation. Clamps are installed by securing the base of the clamp to the platform with the correct type and number of screws (*refer to Table 1 below*). All clamps are shipped complete with hardware.

NBS flask clamps are used on a variety of shaker platforms. Flat head screws of different lengths and thread pitch are used to secure the clamp. To identify the proper screw for your shaker application by reference to the head style, consult Table 1 below, find the proper screws and set the others aside:

Table 1: Clamp Hardware Application Chart

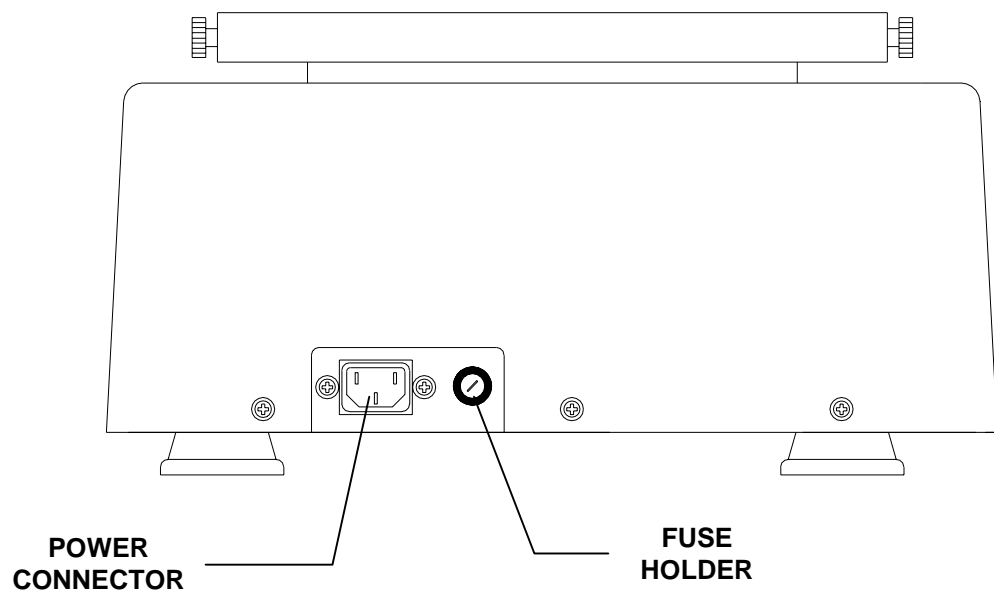
No matter what size the clamp, use these screws to fasten them to your platform:

	Description	Part Number	Qty.	Application
	10-24 x 5/16 (7.9 mm) flat Phillips (+) head screw	S2116-3051	1	5/16" (7.9 mm) thick aluminum, phenolic and stainless steel platforms. 

4.3 Electrical Connections

Before making electrical connections, verify that the power source voltage matches the voltage on the **ELECTRICAL SPECIFICATION PLATE** and the **ON/OFF SWITCH** is on the **OFF** position. The **ELECTRICAL SPECIFICATION PLATE** is located on the side panel of the unit near the **ON/OFF SWITCH**.

Connect the **POWER CORD** to the **POWER CONNECTOR** (*see Figure 2 on the following page*) and the other end to a suitable, grounded receptacle.

Figure 2: Rear Panel

THIS PAGE IS INTENTIONALLY BLANK

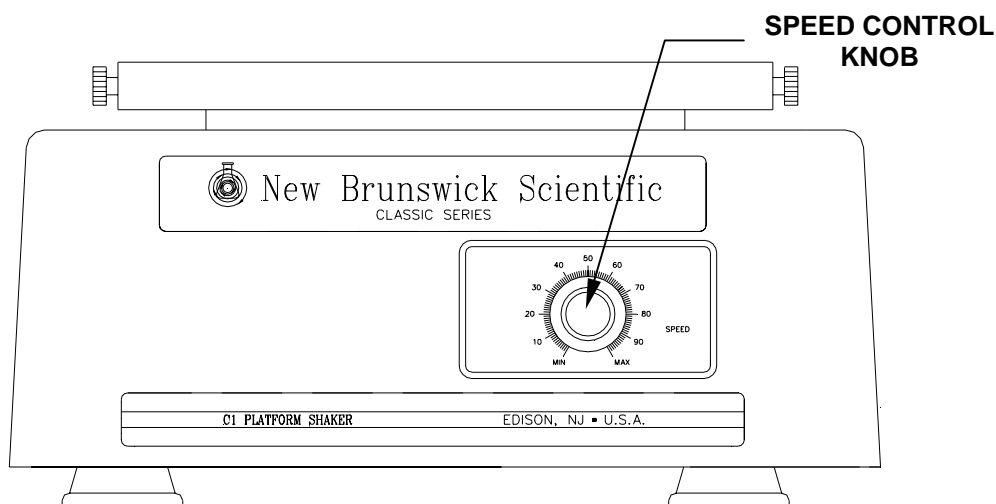
5 OPERATION

5.1 Starting the C-1

To operate the shaker:

1. Verify that the **SPEED CONTROL KNOB** is in the **MIN POSITION**.

Figure 3: Front Panel



NOTE:

The shaker is turned on or off by the **ON/OFF POWER SWITCH** located on the side panel of the unit, not by the **MIN POSITION** of the **SPEED CONTROL KNOB**. The **MIN POSITION** is the minimum speed at which the shaker operates. We recommend starting and stopping the shaker at this speed.

2. Set the **ON/OFF POWER SWITCH** on the side of unit to the **ON** position.. The shaker will start shaking at its minimum speed.
3. Adjust speed as desired.



NOTE:

The graduations around the **SPEED CONTROL KNOB** are for reference only. They do not correspond to specific speeds or any particular % of maximum speed.

5.2 *Stopping the C-1*

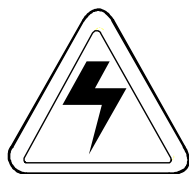
To stop the shaker, perform the following:

1. Turn the **SPEED CONTROL KNOB** to the min position.
2. Set the **ON/OFF** switch on the side of unit to the **OFF** position. The shaker will stop shaking.

5.3 *Power Failure*

In the event of a power failure, the C-1 shaker is equipped with an automatic restart function. If the shaker was in operation at the time of the power interruption, the shaker will begin to operate at its last setpoint.

6 PREVENTIVE MAINTENANCE



WARNING!

Always turn off the shaker and disconnect the power cord from the power supply **BEFORE** performing maintenance on the unit.

6.1 *Cleaning External Surfaces*

The unit may be cleaned using a damp cloth or any standard, household or laboratory cleaner to wipe down its outer surfaces. Do not use abrasive or corrosive compounds to clean this instrument, as they may damage the unit and void the warranty.

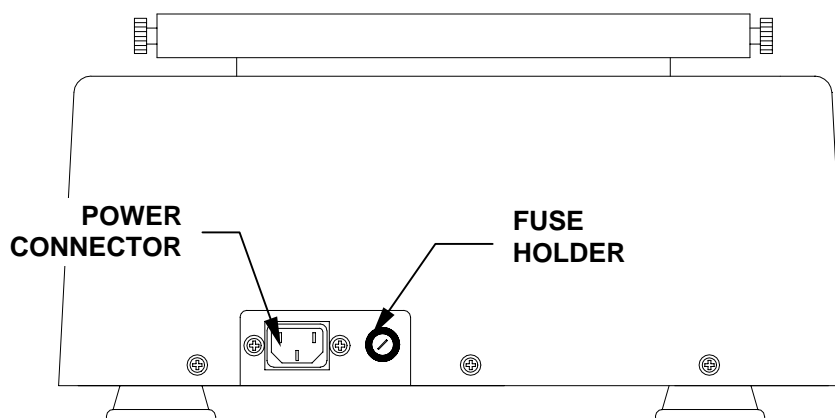
6.2 *Fuse Replacement*

The electrical fuse of the unit is housed in the fuse holder on the rear panel of the unit above the **POWER CORD CONNECTOR**.

To check or replace the fuse:

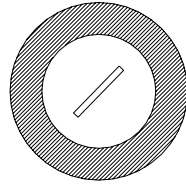
1. If you have not already done so, set the **ON/OFF SWITCH** to **OFF** and disconnect the **POWER CORD** from the power source (*see Figure 2, repeated below*).

Figure 2: Rear Panel



2. Insert a small flat-bladed screwdriver into the fuse holder groove (see *Figure 4 below*) and turn counterclockwise until it disengages and the fuse holder springs free.

Figure 4: Fuse Holder (detail)



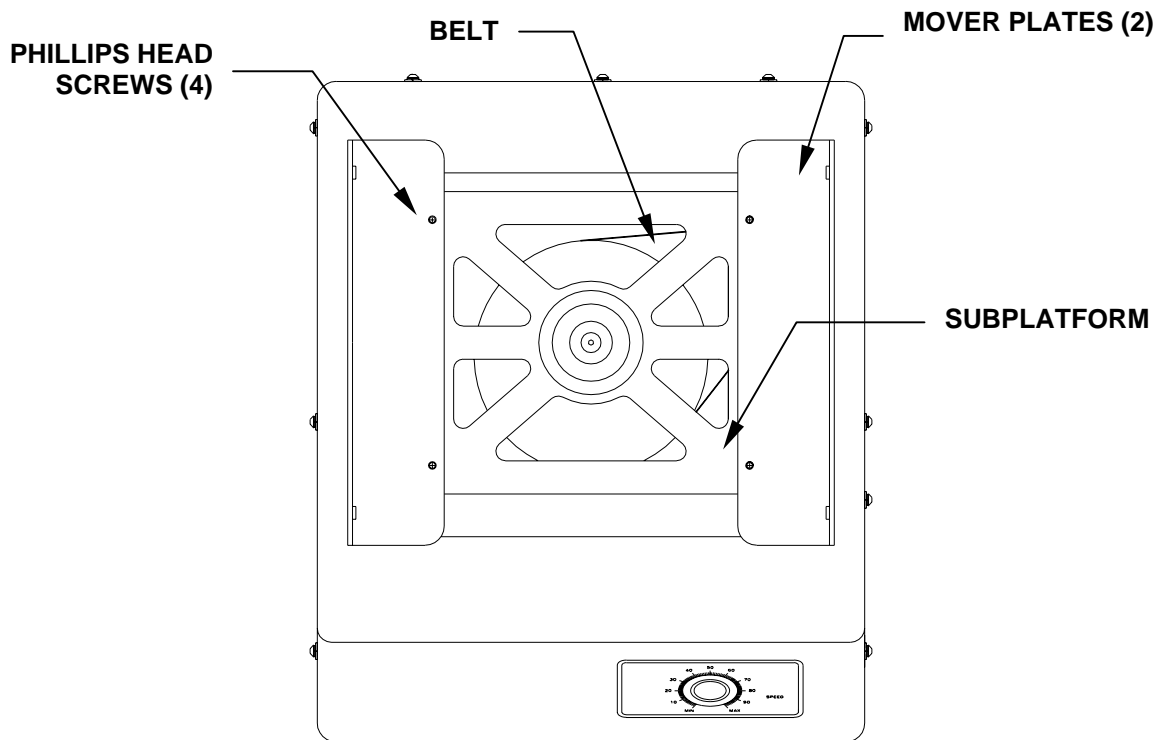
3. Check the fuse. If it has failed, replace the fuse.

6.3 Belt Replacement

To replace the shaker drive belt:

1. Turn off the unit, disconnect the power cord from the power source.
2. Remove the platform if equipped. Set the platform and knobs aside.
3. Remove the Phillips head screws that secure the **MOVER PLATES** to the **SUBPLATFORM**.

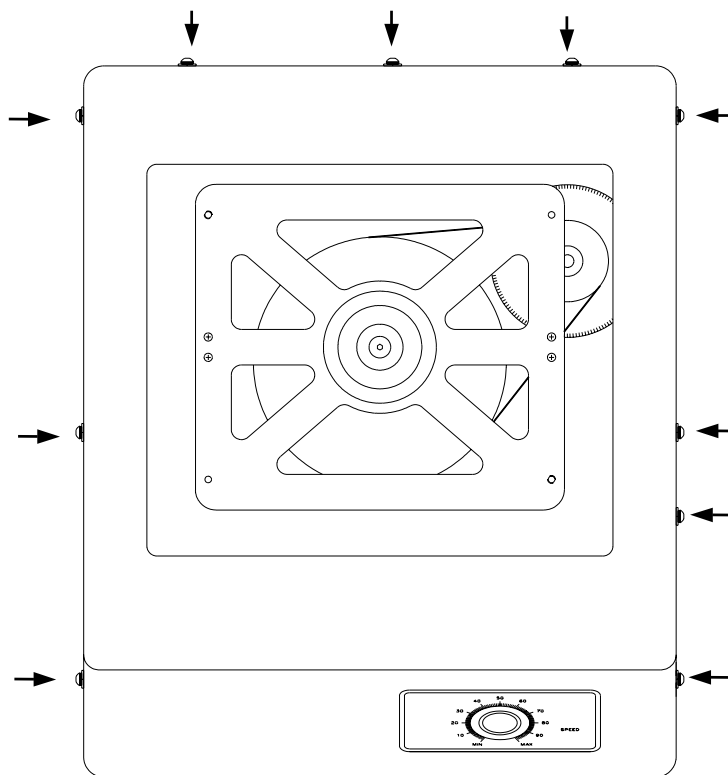
Figure 5: Mover Plate Removal



4. Lift and remove the **MOVER PLATES** from the unit.

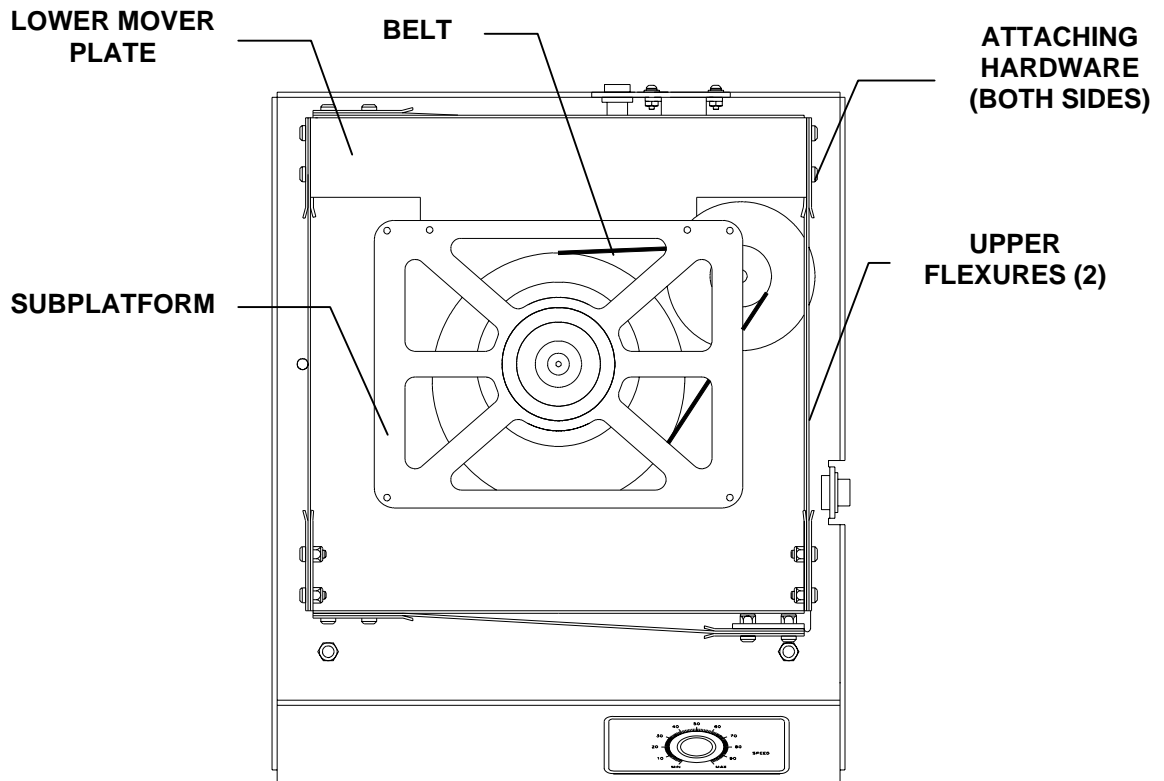
5. Remove the Phillips head screws (shown) that attach the **COVER** to the frame.

Figure 6: Cover Removal



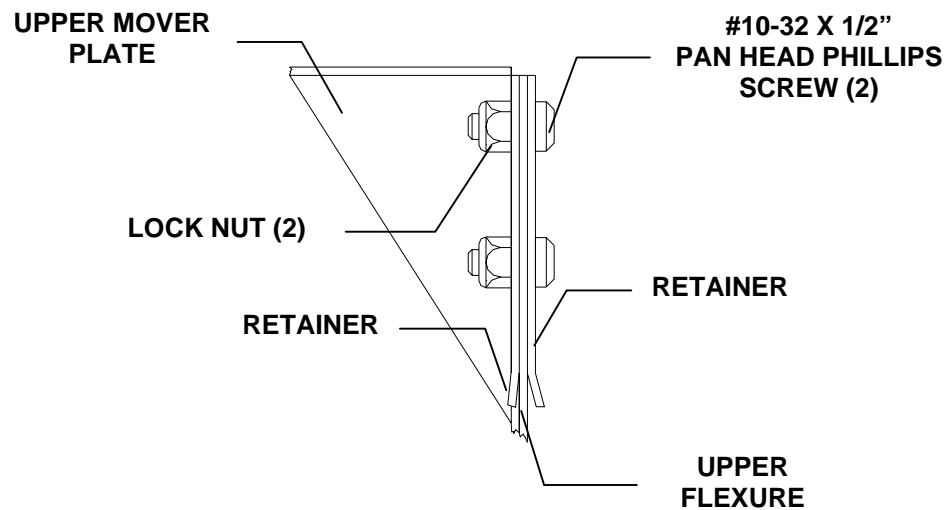
6. Lift and remove the **COVER** from the unit (*see Figure 7 on the following page*).

Figure 7: Top View without Cover



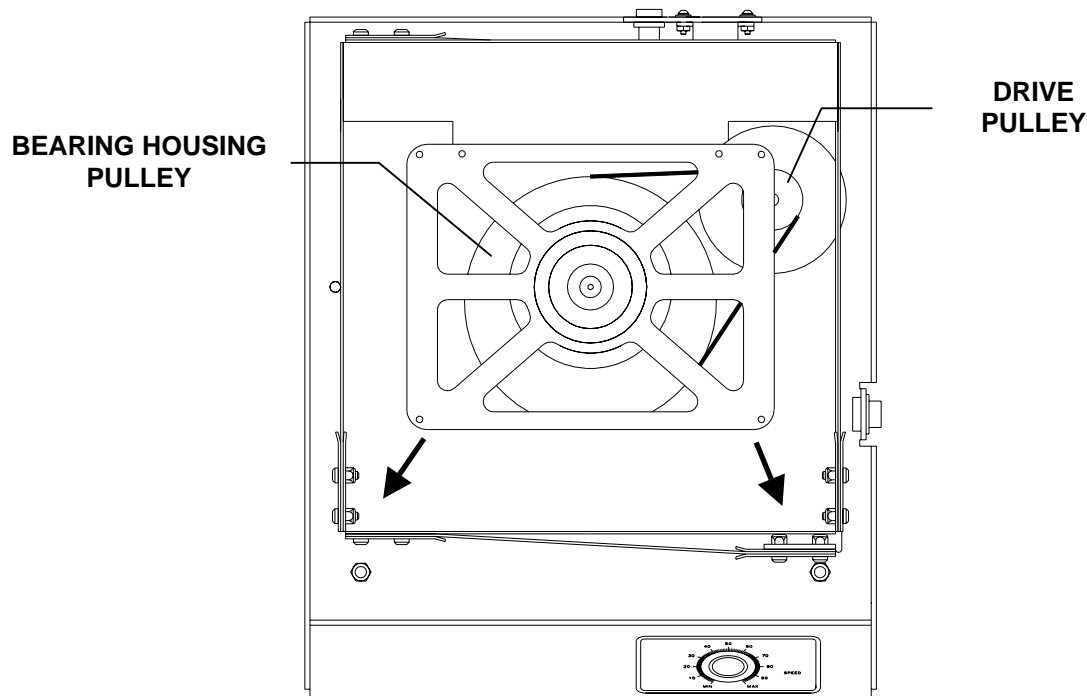
7. Loosen and remove the hardware that attaches the **UPPER FLEXURES** to **LOWER MOVER PLATE**.

Figure 8: Flexure Attaching Hardware (reverse view)



- Using your fingers, reach under the **SUBPLATFORM** and move the belt so that it falls off the drive pulley. Remove the belt from the bearing housing pulley.

Figure 9: Removing the Drive Belt



- Grab the belt from underneath the **SUBPLATFORM**, pull it forward and over one corner of the **SUBPLATFORM**. Repeat for the other corner until the belt clears the **SUBPLATFORM**, but is constrained by the **LOWER MOVER PLATE**.
- Slide the belt to one of the unattached sides of the **LOWER MOVER PLATE** and pull it through the opening.
- Slide the belt to the other side of the **LOWER MOVER PLATE**, pull it through the opening, and remove it from the unit.
- Install the replacement belt in similar fashion.
- Reattach the **UPPER FLEXURES** to the **LOWER MOVER PLATE**.
- Reattach the **COVER** to the frame and secure.
- Reinstall the **MOVER PLATES** and secure.

THIS PAGE IS INTENTIONALLY BLANK

7 TROUBLESHOOTING

If any problems occur with your shaker, do not attempt to perform any service on the unit other than specified in this manual. Unauthorized servicing may void the warranty. Please contact your NBS Sales Order Department

In any correspondence with NBS, please refer to the Model Number and Serial Number of your unit. This information is on the **ELECTRICAL SPECIFICATION PLATE** which is located on the side panel of the unit.

THIS PAGE IS INTENTIONALLY BLANK

8 REPLACEMENT PARTS & ACCESSORIES

When ordering replacement or accessory parts, or requesting service information, please provide the Model Number and Serial Number of your shaker. This information is on the **ELECTRICAL SPECIFICATION PLATE** which is located on the side panel of the unit.

8.1 Replacement Parts

<i>Part Description</i>	<i>NBS Part Number</i>
V-Belt	R-243
Fuse, Slo Blo .2 A, 250 V	P0380-3830

8.2 Accessories

8.2.1 Dedicated Platforms

<i>Platform Description</i>	<i>Flask Capacity</i>	<i>NBS Part Number</i>
10 ml Erlenmeyer Flasks	60	AG2-10
25 ml Erlenmeyer Flasks	32	M1190-9919
50 ml Erlenmeyer Flasks	20	M1190-9915
125 ml Erlenmeyer Flasks	12	M1190-9916
250 ml Erlenmeyer Flasks	8	M1190-9917
500 ml Erlenmeyer Flasks	6	M1190-9918

8.2.2 Universal Platform Flask Capacity

The Universal Platform (NBS number M1001-0240) is capable of holding the following quantities of flasks:

<i>Flask Type</i>	<i>Capacity</i>
10 ml Erlenmeyer Flasks	60
25 ml Erlenmeyer Flasks	20
50 ml Erlenmeyer Flasks	15
125 ml Erlenmeyer Flasks	11
250 ml Erlenmeyer Flasks	6
500 ml Erlenmeyer Flasks	4

8.2.3 Carriers & Test Tube Capacities

<i>Accessory Description</i>	<i>NBS Part Number</i>
Utility Carrier with rubber mat and 2 bars for captivating glassware	AG2-UT
Utility tray with rubber mat for shaking 96-well plates, petri dishes and other labware at low speeds	AG2-00
Adjustable angle Test Tube Rack for 17 mm-25 mm Test Tubes	AG2-TA25

8.2.4 Accessory Flask Clamps

<i>Clamp Type</i>	<i>NBS Part Number</i>
10 ml Erlenmeyer Clamp, stainless steel	ACE-10S
25 ml Erlenmeyer Clamp, stainless steel	M1190-9004
50 ml Erlenmeyer Clamp, stainless steel	M1190-9000
125 ml Erlenmeyer Clamp, stainless steel	M1190-9001
250 ml Erlenmeyer Clamp, stainless steel	M1190-9002
500 ml Erlenmeyer Clamp, stainless steel	M1190-9003

9 DRAWINGS

Figure 10: Control Schematic (100-130 VAC, 50/60 Hz)

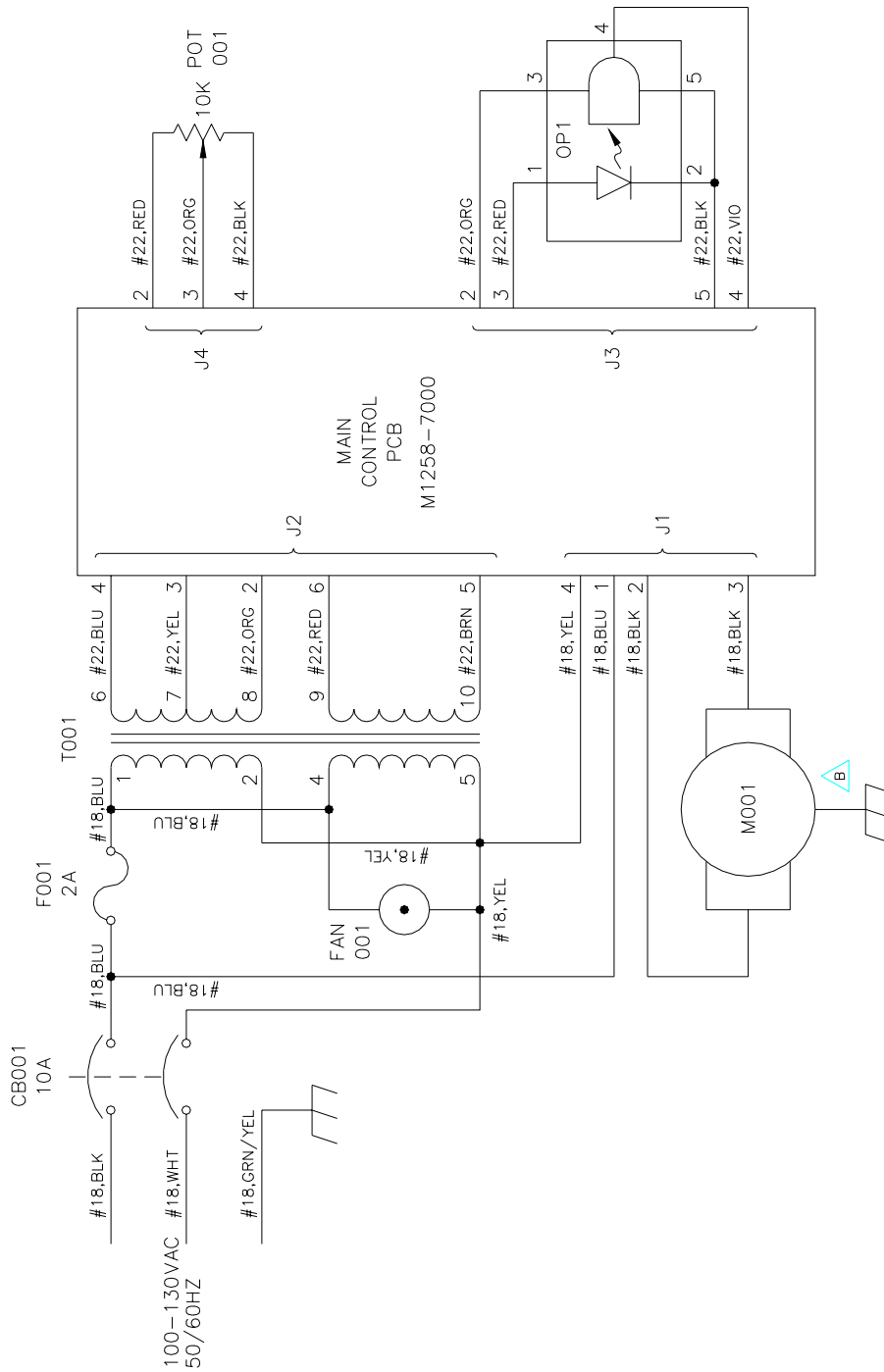
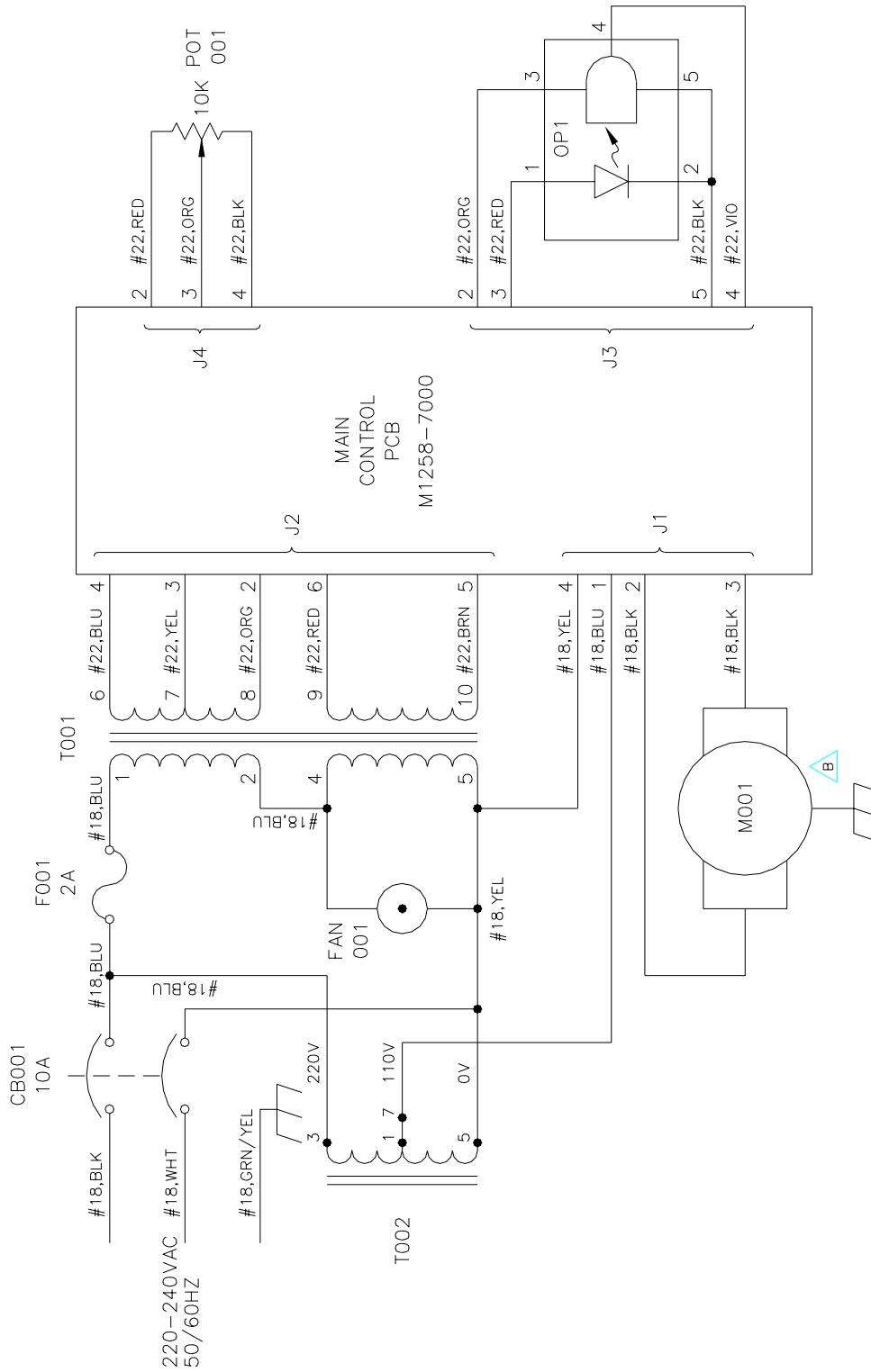


Figure 11: Control Schematic (220-240 VAC, 50/60 Hz)



9.1 List of Drawings

Figure	Description	Page
1	Platform Installation (top view)	19
2	Rear Panel	21, 25
3	Front Panel (detail)	23
4	Fuse Holder (detail)	26
5	Mover Plate Removal	26
6	Cover Removal	27
7	Top View without Cover	28
8	Flexure Attaching Hardware (reverse view)	28
9	Removing the Drive Belt	29
10	Control Schematic (100-130 VAC, 50/60 Hz)	35
11	Control Schematic (220-240 VAC, 50/60 Hz)	36

9.2 List of Tables

Table	Description	Page
1	Clamp Hardware Application Chart	20

THIS PAGE IS INTENTIONALLY BLANK

10 INDEX

A

Accessories · 33

B

Belt

- Removing the · 29
- Replacement of · 26

C

Carriers · 34

CAUTION

- Symbol for · 7

Clamp Hardware · 20

Clamps

- Installation of · 20

Cleaning · 25

Control Schematics · 35, 36

Copyright Notice · 7

Cover Removal · 27

D

Dedicated Platforms · 33

Disclaimer Notice · 7

Drawing Index · 37

E

Electrical Connections · 20

Equipment

- Unpacking of · 15

F

Flask Capacity

- of Platforms · 33

Flask Clamps · 34

Flexures · 28

Front Panel · 23

Fuse Holder · 21

Fuse Holder · 26

Fuse Replacement · 25

I

Inspection · 15

Installing a Platform · 19

Installing Platform Clamps · 20

International Offices

- List of · 3

L

List of Drawings · 37

List of Tables · 37

M

Maintenance · 25

Manual Conventions · 7

Mover Plate

- Removal of · 26

N

NOTE

- Symbol for · 7

O

Operating Environment · 17

Operation · 23

Overview · 13

P

Physical Location · 17

Platform Flask Capacity · 33

Platform Installation · 19

Power Connector · 21

Power Failure · 24

R

Rear Panel · 21

Removing the Belt · 29

Replacement Parts · 33

Replacing the Belt · 26

Replacing the Fuse · 25

S

Service · 31

Specifications · 13

Speed Control Knob · 23

Starting the Unit · 23

Stopping the Shaker · 24

T

Table Index · 37
Table of Contents · 11
Test Tube Capacities · 34
Test Tube Rack · 34
Troubleshooting · 31

U

Universal Platform · 33
Unpacking Equipment · 15

Utility Tray · 34

V

Verifying Material Received · 15

W

WARNING
Symbol for · 7
Warranty · 9