



# Instruction Manual Advanced Dura-Shaker for Extreme Environments



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### PACKAGE CONTENTS

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Advanced Dura-Shaker  
Non-skid rubber mat,  
92" (234cm) detachable power cord  
Instruction manual

### WARRANTY

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Manufacturer warrants this product to be free from defects in material and workmanship when used under normal conditions for five (5) years. Register your equipment or instrument online at [www.vwrsp.com/warranty](http://www.vwrsp.com/warranty) for US residents or [www.vwrcanlab.com/warranty](http://www.vwrcanlab.com/warranty) for Canadian residents. For your reference, make a note of the serial number, date of purchase and supplier here.

Serial Number: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

Supplier: \_\_\_\_\_

## INSTALLATION

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Upon receiving the VWR Dura-Shaker, check to ensure that no damage has occurred during shipment. It is important that any damage that occurred in transport is detected at the time of unpacking. If you do find such damage the carrier must be notified immediately.

**DO NOT** lift the unit by the controller or power cord. After unpacking, place the shaker on a level bench, table, or surface away from explosive vapors. Ensure that the surface on which the unit is placed will withstand typical heat produced by the unit and place the unit a minimum of six (6) inches from vertical surfaces. Always place the unit on a sturdy work surface.

The Dura-Shaker is supplied with a power cord that is inserted into the IEC connector on the back of the unit first, then it can be plugged into a properly grounded outlet. The 120V unit plugs into a 120 volt, 50/60 Hz source. The 230V unit plugs into a 230 volt, 50/60 Hz source.

## MAINTENANCE & SERVICING

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The Dura-Shaker is built for long, trouble-free, dependable service. No lubrication or other technical user maintenance is required. It needs no user maintenance beyond keeping the surfaces clean. However at least every three (3) months you should:

- Unplug the unit.
- Remove any accumulated dirt from the base and tray.
- Check all accessible items to make sure they are properly tightened.

The unit should be given the care normally required for any electrical appliance. Avoid wetting or unnecessary exposure to fumes. **DO NOT** use a cleaning agent or solvent on the front panel which is abrasive or harmful to plastics, nor one which is flammable. Always ensure the power is disconnected from the unit prior to any cleaning. If the unit ever requires service, contact your VWR representative.

## INTENDED USE

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The VWR Advanced Dura-Shakers are intended for general laboratory use. Safety cannot be guaranteed if used outside of the intended use.

## ENVIRONMENTAL CONDITIONS

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**Operating Conditions:** Indoor use only.

\*For use in CO<sub>2</sub> environments, incubators, or cold rooms.

Temperature (shaker) -10 to 60°C (14 to 140°F)

Temperature (controller) -10 to 50°C (14 to 122°F)

Humidity: up to 100%, condensing

Altitude: 0 to 6,562 ft (2000 M) above sea level

Mains supply voltage: Fluctuations are not to exceed 10 percent of the nominal supply voltage.

**Non-Operating Storage:**

Temperature: -20 to 65°C (-4 to 149°F)

Humidity: maximum 80% relative humidity, non-condensing

Installation Category II and Pollution Degree 2 in accordance with IEC 664.

**\*Avoid cold starts:** Unit is not designed to start after being in a cold room environment. Bring unit into cold room from a room temperature environment, operate and remove unit from cold room as soon as operation is complete.

## EQUIPMENT DISPOSAL

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This equipment must not be disposed of with unsorted waste. It is your responsibility to correctly dispose of the equipment at life-cycle-end by handing it over to an authorized facility for separate collection and recycling. It is also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect the persons involved in the disposal and recycling of the equipment from health hazards.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment. By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

## SAFETY INSTRUCTIONS

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Please read the entire instruction manual before operating the Dura-Shaker.



**WARNING! DO NOT** use the Dura-Shaker in a hazardous atmosphere or with hazardous materials for which the unit was not designed. Also, the user should be aware that the protection provided by the equipment may be impaired if used with accessories not provided or recommended by the manufacturer, or used in a manner not specified by the manufacturer.

Always operate unit on a level surface for best performance and maximum safety.

**DO NOT** lift the unit by the tray.



**CAUTION!** To avoid electrical shock, completely cut off power to the unit by disconnecting the power cord from the unit or unplug from the wall outlet. Disconnect unit from the power supply prior to maintenance and servicing.

Spills should be removed promptly. **DO NOT** immerse the unit for cleaning.

**DO NOT** operate the unit if it shows signs of electrical or mechanical damage.

The main supply power cord provided with this product is rated to safely handle the products electrical load under the stated environmental conditions. **DO NOT** replace the cord with an inadequately rated main supply cord.



Earth Ground - Protective Conductor Terminal



Alternating Current



Pinch Point - Keep fingers clear during operation.

## STANDARDS & REGULATIONS

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VWR hereby declares under its sole responsibility that the construction of this product conforms in accordance with the following standards:

### Safety standards:

CAN/CSA-C22.2 No. 61010-1:2004

CAN/CSA-C22.2 No. 61010-2-051:2004

UL 61010-1:2004

EN 61010-1:2001

EN 61010-2-051:2003

### EMC standards:

CISPR 11

IEC 61000-4-2

IEC 61000-4-4

IEC 61000-4-6

IEC 61326-2013

FCC Part 15 Subpart-B

IEC 61000-3-2/3-3

IEC 61000-4-3

IEC 61000-4-5

IEC 61000-4-11

ICES-003

### Associated EU guidelines:

EMC directive 2004/108/EC

LVD directive 2006/95/EC

ROHS directive 2011/65/EU

## CONSIGNES DE SÉCURITÉ

S'il vous plaît lire l'intégralité du manuel d'instructions avant de faire fonctionner l'agitateur orbital.



**AVERTISSEMENT! N'UTILISEZ PAS** utiliser le secoueur orbital dans un milieu dangereux ou en présence de matières dangereuses non conformes à la conception de l'appareil. L'utilisateur doit également être conscient que la protection assurée par l'équipement peut être amoindrie en cas d'utilisation avec tout accessoire autre que ceux fournis ou recommandés par le fabricant ou en cas d'utilisation contraire aux spécifications du fabricant. Utilisez toujours le dispositif sur une surface à niveau pour optimiser non seulement la performance mais la sécurité.

Toujours utiliser l'appareil sur une surface nivelée pour assurer une performance optimale et un maximum de sécurité.

**NE PAS** soulever l'appareil en le tenant par le plateau.



**MISE EN GARDE!** Pour éviter les électrocutions, couper complètement l'alimentation électrique de l'appareil en débranchant le cordon d'alimentation de l'appareil ou de la prise murale. Déconnecter l'appareil de la source d'alimentation électrique avant de procéder à tout entretien ou réparation.

Essuyer immédiatement tout liquide renversé par accident.

**NE PAS** immerger l'appareil en vue de son nettoyage.

**NE PAS** utiliser l'appareil en présence de tout signe de dommage électrique ou mécanique.

Le principal cordon d'alimentation fourni avec ce produit est évalué à manipuler de façon sécuritaire les produits charge électrique dans les conditions définies. Ne remplacez pas le cordon avec un cordon d'alimentation principal mal classé.



Mise à la terre - Borne du conducteur de protection



Courant alternatif



Point de pincement – garder les doigts à l'écart de l'appareil pendant l'utilisation.

## NORMES ET RÉGLEMENTATIONS

Troemner, LLC déclare par la présente sous sa seule responsabilité que la conception de ce produit répond aux exigences des normes suivantes:

### Normes de sécurité:

CAN/CSA-C22.2 No. 61010-1:2004

CAN/CSA-C22.2 No. 61010-2-051:2004

UL 61010-1:2004

EN 61010-1:2001

EN 61010-2-051:2003

### Normes CEM:

CISPR 11

IEC 61000-3-2/3-3

IEC 61000-4-2

IEC 61000-4-3

IEC 61000-4-4

IEC 61000-4-5

IEC 61000-4-6

IEC 61000-4-11

IEC 61326-2013

ICES-003

FCC Part 15 Subpart-B

### de l'UE directives:

Directive EMC 2004/108/EC

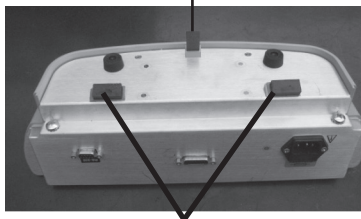
Directive LVD 2006/95/EC

ROHS directive 2011/65/EU

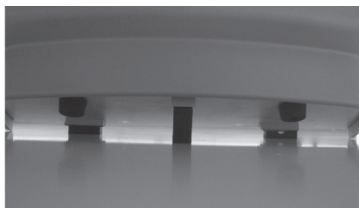
## SPECIFICATIONS



Removable magnet  
included in bag

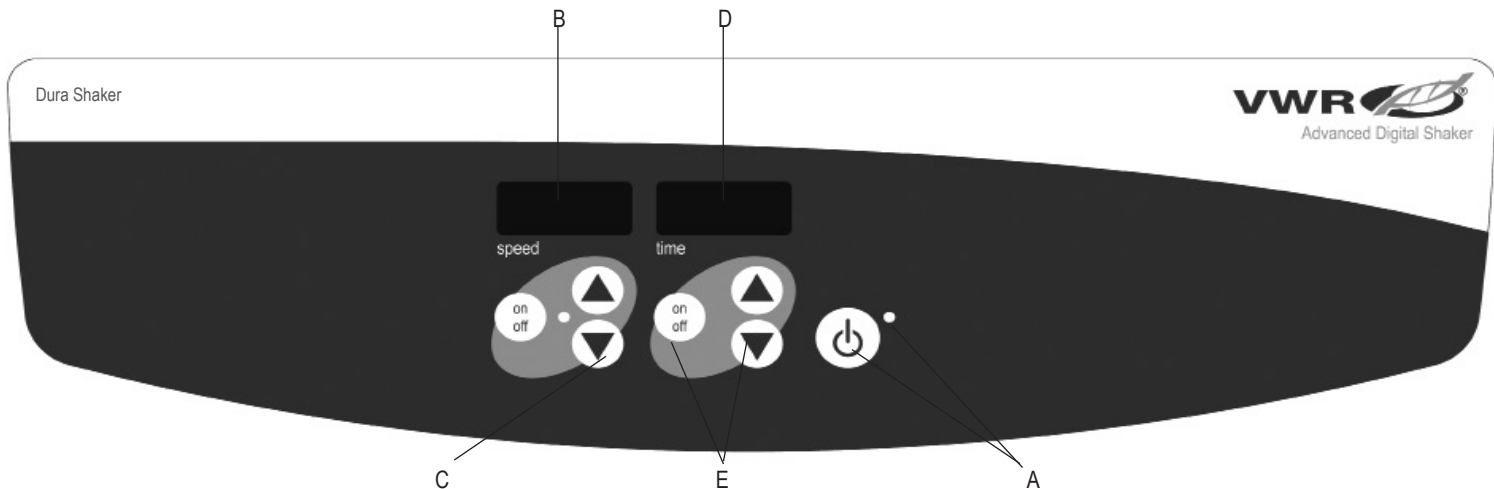


Permanently attached magnets



Proper mounting technique

<b>Overall dimensions (L x W x H):</b>	Shaker:	11.85 x 14 x 6.1" (30.1 x 35.6 x 15.4cm)
	Remote:	5.3 x 14 x 4.6" (13.5 x 35.6 x 11.6cm)
<b>Electrical (50/60 Hz)</b>	120 volts:	0.5 amps, 30 watts
	230 volts:	0.3 amps, 30 watts
<b>Orbit:</b>		19mm (0.75")
<b>Timer:</b>		1 second to 160 hours
<b>Fuse:</b>		5mm x 20mm, 5 amp quick acting, 250V
<b>Speed Range:</b>		15 to 500 rpm
<b>Speed Accuracy:</b>	Above 100 rpm:	± 1% of set speed
	Below 100 rpm:	± 1 rpm
<b>Capacity:</b>		~ 35lbs (16kg) at 75rpm
		~ 5lbs (2.3kg) at 500rpm
<b>Controls:</b>	Removable magnet included in bag	See page 6
	<b>Tray Dimensions:</b>	11 x 13" (27.9 x 33cm)
<b>Ship weight:</b>		49lbs (22.2kg)



## CONTROL PANEL - ADVANCED DURA-SHAKER

The front panel of the Dura-Shaker contains all the controls and displays needed to operate the unit.

**A. Standby button/standby indicator light:** The standby indicator light will illuminate when the unit is plugged in. The unit will be in standby mode. Press the standby button to start the speed and time functions. The standby indicator light will shut off. Press the standby button again and the unit will once again be in standby mode.

**B. Speed display:** Displays the speed of the shaker.

**C. Up/down arrows:** For set-point control. On/off button starts/stops shaking function.

**D. Time display:** Displays accumulated time (continuous mode) or how much time is remaining (timed mode). The display range is from 0 to 9,999 minutes in one (1) second increments. The display will indicate minutes and seconds until the timer reaches 99 minutes and 59 seconds (99:59), then the display will automatically display minutes up to 9,999.

**E. Up/down arrows for setpoint control.** On/off button starts/stops the timer function.

## OPERATING INSTRUCTIONS

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The Dura-Shaker has been designed for the speed and time functions to work independently of one another. The speed can be re-set without re-setting the timer and the timer can be stopped and started without interrupting the shaking function.

### 1. Getting ready:

- a. Place the controller in the desired location. If securing to an incubator door, attach enclosed magnet standoff controller feet, ensuring a strong magnetic attraction over entire magnet surface. Magnetically mount controller to incubator door or other ferrous surface. See photos on page 5 for more details.
- b. Connect the cable from the shaker base to the controller.
- c. Plug the cord into a properly grounded outlet. The standby indicator light will illuminate, verifying power to the shaker.
- d. Press the standby button to move the unit from standby mode. The standby indicator light will turn off and the speed and time displays will illuminate, displaying the previously used settings.

### 2. Setting speed:

- a. Press the up/down arrow below the speed display until you reach the desired speed. When you release the button, the display will blink off and then on indicating the new set speed has been accepted.
- b. Press the on/off button to start the shaking function. The indicator light below the speed display will illuminate and blink until the set-point is reached. Once the set-point is reached the light will stop blinking and remain lit until shaking has ceased. The microprocessor controlled ramping feature slowly increases speed until the set-point is reached which helps to avoid splashing, and provides excellent low end control.
- c. Speed adjustments can be made without interrupting shaking by using the up/down arrows below the speed display. After the change has been made and you release the button, the display will blink off and then on indicating the new set speed has been accepted.
- d. To stop the shaking function press the on/off button below the speed display. The speed indicator light will turn off.

### 3. Setting time to zero (0:00) and continuous mode: Accumulated time.

- a. Press and hold the on/off button below the time display. After three (3) seconds, the display will indicate the previous set time.
- b. Simultaneously press both the up and the down arrows, the display will indicate zero (0:00). The unit time is now set to zero (0:00) minutes. Alternately, you can use the up/down arrows to get to zero (0:00).
- c. Press the on/off button below the time display. The display will indicate accumulated time. The up/down arrows will become inactive. To stop timer, press the on/off button again. **IMPORTANT:** This will **NOT** interrupt the shaking function. Press the on/off button below the speed display to interrupt the shaking function.
- d. To reset, press and hold the on/off button below the time display. After three (3) seconds the display will indicate the previous set time, which was zero (0:00).

### 4. Setting timed mode: Programmed time.

- a. Press the up/down arrows below the time display until you reach the desired time.
- b. Start this function by pressing the on/off button below the time display. The unit will run for the selected time, the up/down arrows will become inactive while the timer is running. The unit will stop shaking when time display reaches zero (0:00). Four (4) audible beeps will indicate the count down function is complete. The time display will default back to the set time. To repeat for the same time, simply depress the on/off button again.
- c. To interrupt an automatic timing cycle before it is completed, press the on/off button below the time display. The display will flash off and on to indicate the time function is on "hold". **IMPORTANT:** This will **NOT** interrupt the shaking function. Press the on/off button below the speed display to interrupt the shaking function. Restart the timer by pressing the on/off button below the time display. Unit will continue counting down to zero (0:00). When the display reaches zero (0:00), you will hear the four (4) audible beeps that indicate the count down function is complete and the shaking function will cease.



## OPERATING INSTRUCTIONS CONT'D

### 5. Turning unit off:

- a. To turn the unit off, press the standby button. The speed and time displays will be blank, the standby indicator light will illuminate. The Dura-Shaker should be kept in standby mode when not in use. To completely cut off power to the unit, disconnect the power cord from the unit or unplug from the wall outlet.

### OPERATING TIPS

Centering your sample and even weight distribution on the tray helps with balance and stability. As a safety feature, a built-in program will shut power off to the motor if the tray is prevented from rotating, or the unit is overloaded beyond its recommended weight capacity. The shaker will automatically restart after a power interruption. Built-in memory maintains the last used speed and time settings during a power interruption.

### BEEPER PREFERENCE

To silence beeper operation (except for error codes), with the unit in standby mode, press and hold the time on/off button and press the standby button. To restore normal beeper operation, remove AC power to unit for ten (10) seconds and then restore.

### CALIBRATION PROCEDURE

This procedure is used to self calibrate the Dura-Shaker. The tray should be free of any samples, vessels, and accessories prior to calibrating.

1. Turn unit on. Speed and time displays will be illuminated.
2. Press and hold the standby button and momentarily press the speed on/off button. The speed display should read "CAL".
3. The unit will run for approximately one (1) minute and automatically calibrate.

### RS-232 SERIAL PORT

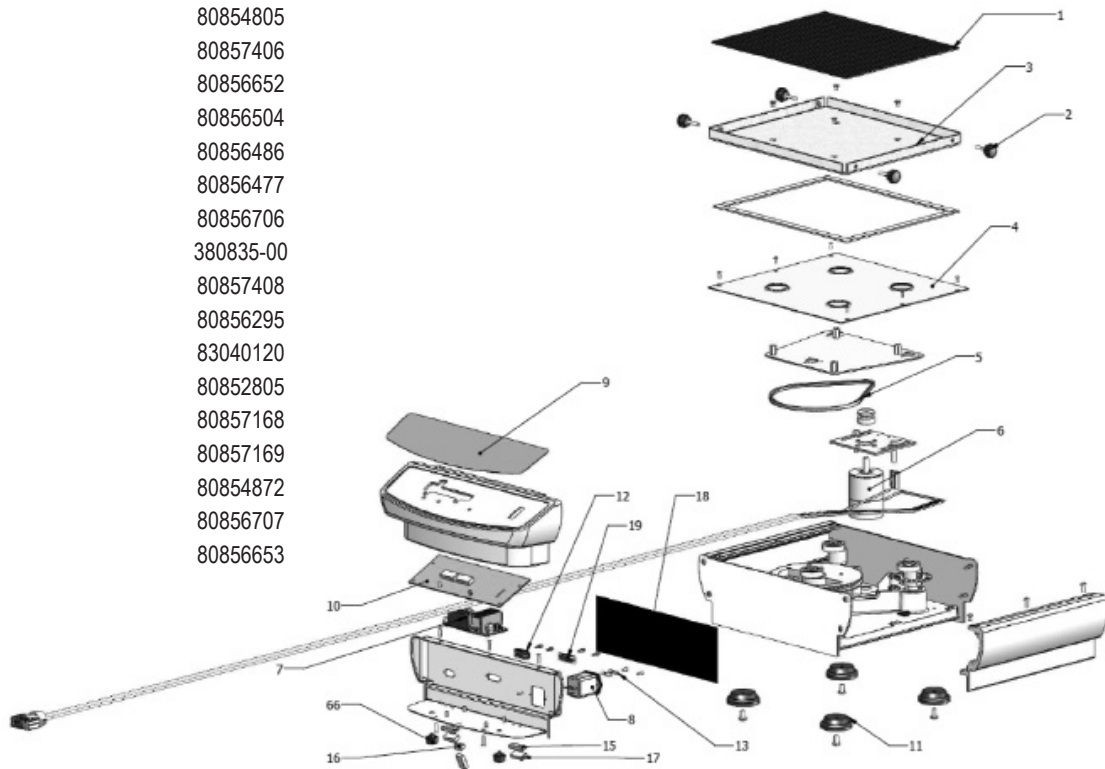
RS-232 serial port provides two-way communications for data logging and unit control. If you need additional details, please contact your local VWR representative or visit [vwr.com](http://vwr.com).

## TROUBLESHOOTING

Problem	Cause	Solution
Unit will not run	<ul style="list-style-type: none"><li>- Mechanical obstruction</li><li>- Motor obstruction</li><li>- Loose thumbscrews on remote cable connector</li></ul>	Add or replace fuse as necessary. Tighten thumbscrews on remote cable connector are tightened with a screw driver. Do not hand-tighten. If problem persists, please contact your VWR representative for repair.
Unit is excessively noisy	<ul style="list-style-type: none"><li>- Sensor fan misaligned</li><li>- Motor misaligned</li></ul>	Ensure that tray is secured tightly. If problem persists, please contact your VWR representative for repair.
Unit not shaking at proper speed		Perform speed calibration test on page 8. If problem persists, please contact your VWR representative for repair.
E3	<ul style="list-style-type: none"><li>- Mechanical obstruction</li><li>- Drive system failure</li><li>- Ceased bearing</li><li>- Drive belt broken</li><li>- Loose thumbscrews on remote cable connector</li></ul>	Remove mechanical obstruction. If problem persists, the reason may be the drive system and should not be addressed by the end user. Tighten thumbscrews on remote cable connector are tightened with a screw driver. Do not hand-tighten. Contact your VWR representative for repair.

## REPLACEMENT PARTS

DESCRIPTION	PART NUMBER
1. Rubber mat	80857155
2. Thumbscrew	80857407
3. Tray	80854802
4. Top plate	80854805
5. V-Belt	80857406
6. Motor & sensor cable assembly	80856652
7. Power supply	80856504
8. IEC power inlet, 120V	80856486
IEC power inlet, 230V	80856477
9. Front panel	80856706
10. Control circuit board	380835-00
11. Shaker foot	80857408
12. RS-232 cable	80856295
13. Fuse	83040120
14. Remote controller foot	80852805
15. Block for permanent magnet	80857168
16. Block for removable magnet	80857169
17. Remote controller mounting magnet	80854872
18. Shaker overlay	80856707
19. Remote controller wire assembly	80856653



## FLASK CLAMP PLATFORM CAPACITY

### Stainless Steel Erlenmeyer Flask Clamps

Platform Size	Part Number	10mL 57018-775	25mL 57018-786	50mL 57018-797	125mL 57018-800	250mL 57018-811	500mL 57018-822	1L 14215-224	2L 14215-226	2.8L 14215-228	4L 14215-230	6L 14215-232
11 x 13	89027-702	60	25	13	10	9	7	4	N/A	N/A	N/A	N/A
13 x 13	97003-586	60	30	15	12	12	8	4	3	3	1	1
18 x 18	97003-588	113	64	32	20	20	13	8	5	5	4	2
18 x 24	97003-590	158	88	44	28	28	20	12	6	6	4	3

### PVC Erlenmeyer Flask Clamps

### Stainless Steel Media Bottle Clamps

### Microplate Clamp

Platform Size	Part Number	125mL 97003-576	250mL 97003-578	500mL 97003-580	1L 97003-582	2L 97003-584	Platform Size	Part Number	500mL 14215-236	1L 14215-238	Platform Size	Part Number	Microplate Clamp 97003-634
11 x 13	89027-702	10	8	5	2	N/A	11 x 13	89027-702	5	2	11 x 13	89027-702	4
13 x 13	97003-586	12	10	6	4	3	13 x 13	97003-586	6	5	13 x 13	97003-586	6
18 x 18	97003-588	20	18	12	8	4	18 x 18	97003-588	16	10	18 x 18	97003-588	12
18 x 24	97003-590	28	25	16	10	6	18 x 24	97003-590	20	13	18 x 24	97003-590	18

## TEST TUBE RACK PLATFORM CAPACITY

### Half Size Stationary

Platform Size	Part Number	1.5 to 2mL Microtube Rack capacity = 70 12620-952	10 to 13mm Test Tube Rack capacity = 63 12620-956	14 to 16mm Test Tube Rack capacity = 48 12620-958	18 to 20mm Test Tube Rack capacity = 35 12620-960	22 to 25mm Test Tube Rack capacity = 24 12620-962	15mL Centrifuge Test Tube Rack capacity = 35 11301-134	50mL Centrifuge Test Tube Rack capacity = 12 11301-136
11 x 13	89027-702	2	2	2	2	2	2	2
13 x 13	97003-586	2	2	2	2	2	2	2
18 x 18	97003-588	4	4	4	4	4	4	4
18 x 24	97003-590	6	6	6	6	6	6	6

## TEST TUBE RACK PLATFORM CAPACITY

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### Full Size Stationary

Platform Size	Part Number	10 to 14mm Test Tube Rack capacity = 48 14215-240	16 to 20mm Test Tube Rack capacity = 33 14215-242	21 to 25mm Test Tube Rack capacity = 21 14215-244	50mL Centrifuge Test Tube Rack capacity = 17 12985-052
11 x 13	89027-702	N/A	N/A	N/A	N/A
13 x 13	97003-586	N/A	N/A	N/A	N/A
18 x 18	97003-588	3	3	3	3
18 x 24	97003-590	5	5	5	5

### Full Size Pivoting

Platform Size	Part Number	13mm Test Tube Rack capacity = 90 97003-636	16mm Test Tube Rack capacity = 60 97003-638	20mm Test Tube Rack capacity = 40 97003-640	25mm Test Tube Rack capacity = 24 97003-642	30mm Test Tube Rack capacity = 21 97003-644
11 x 13	89027-702	1	1	1	1	1
13 x 13	97003-586	2	2	2	2	2
18 x 18	97003-588	2	2	2	2	2
18 x 24	97003-590	3	3	3	3	3

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MANUFACTURED BY:

**TROEMNER LLC**

201 Wolf Drive Thorofare, NJ 08086-0087  
Phone: 856-686-1600 • Fax: 856-686-1601 • E-mail: [troemner@troemner.com](mailto:troemner@troemner.com)  
[www.troemner.com](http://www.troemner.com)

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