



Instruction Manual  
Standard Orbital Shaker  
Advanced Orbital Shaker



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### PACKAGE CONTENTS

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Orbital or Reciprocating 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.vwr.com/warranty](http://www.vwr.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 Orbital or Reciprocating 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.

After unpacking, place the shaker on a level bench or table, 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 Orbital or Reciprocating 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 Orbital or Reciprocating 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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These Shakers are intended for general laboratory use.

**Operating Conditions:** Indoor use only.

## ENVIRONMENTAL CONDITIONS - STANDARD

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

Temperature: 0 to 40°C (32 to 104°F)

Humidity: maximum 80% relative humidity, non-condensing

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

### 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.

## ENVIRONMENTAL CONDITIONS - ADVANCED & RECIPROCATING

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**Operating Conditions:** Indoor use only.

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

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

Temperature: -10 to 40°C (14 to 104°F) (Model 1000 Advanced)

Humidity: maximum 80% relative humidity, non-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 Orbital Shaker.



**WARNING! DO NOT** use the Orbital 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 unplugging 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.



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:

EN 61010

EN 61010-2-051

CAN/CSA C22.2 No. 61010-1-04

UL 61010-1

### EMC standards:

CISPR 11 IEC 61000-4-3

IEC 61326 IEC 61000-4-4

IEC 6100-3-2 IEC 61000-4-5

IEC 6100-3-3 IEC 61000-4-6

IEC 61000-4-2 IEC 61000-4-11

### Associated EU guidelines:

EMC directive 2004/108/EC

LVD directive 2006/95/EC

ROHS directive 2011/65/EU

## CONSIGNES DE SÉCURITÉ

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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.



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

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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:

EN 61010

EN 61010-2-051

CAN/CSA C22.2 No. 61010-1-04

UL 61010-1

### Normes CEM:

CISPR 11 IEC 61000-4-3

IEC 61326 IEC 61000-4-4

IEC 6100-3-2 IEC 61000-4-5

IEC 6100-3-3 IEC 61000-4-6

IEC 61000-4-2 IEC 61000-4-11

### de l'UE directives:

Directive EMC 2004/108/EC

Directive LVD 2006/95/EC

ROHS directive 2011/65/EU

## SPECIFICATIONS

### MODEL 1000

<b>Overall dimensions LxWxH</b>		11 x 17 x 4" (27.9 x 43.2 x 10.2cm)
<b>Tray dimensions LxW</b>		8.75 x 11.75" (22.2 x 29.8)
<b>Electrical</b>	120 volts:	5 amps, 25 watts
	230 volts:	2.5 amps, 25 watts
<b>Fuses</b>		5mm x 20mm, 5 amp quick acting
<b>Speed Range</b>		40 to 300 rpm
<b>Speed Accuracy</b>	Advanced:	
Above 100rpm		±2% of set speed
Below 100rpm		±2rpm
<b>Orbit</b>		0.6" (15 mm)
<b>Capacity</b>		8 lbs (3.6kg)
<b>Controls</b>	Standard:	See page 6
	Advanced:	See page 8
<b>Ship Weight</b>		25 lbs (11.3kg)

### MODEL 3500

<b>Overall dimensions LxWxH</b>		16.25 x 14 x 5.75" (41.3 x 35.6 x 14.6 cm)
<b>Tray dimensions LxW</b>		13 x 11" (33 x 22.2cm)
<b>Electrical</b>	120 volts:	5 amps, 75 watts
	230 volts:	2.5 amps, 75 watts
<b>Fuses</b>		5mm x 20mm, 5 amp quick acting
<b>Speed Range</b>	Advanced:	15 to 500 rpm
	Standard:	25 to 500 rpm
<b>Speed Accuracy</b>	Advanced:	
Above 100rpm		±1% of set speed
Below 100rpm		±1rpm
<b>Orbit</b>		0.75" (19mm)
<b>Capacity</b>		~35 lbs (16kg) @ 75 rpm ~5 lbs (2.3kg) @ 500 rpm
<b>Timer</b>	Advanced:	1 second to 160 hours
	Standard:	1 to 120 minutes
<b>Controls</b>	Advanced:	See page 8
	Standard:	See page 6
<b>Ship Weight</b>		49 lbs (22.2 kg)

### MODEL 3750

<b>Overall dimensions LxWxH</b>		16.25 x 14 x 5.75" (41.3 x 35.6 x 14.6 cm)
<b>Tray dimensions LxW</b>		13 x 11" (33 x 22.2cm)
<b>Electrical</b>	120 volts:	5 amps, 40 watts
	230 volts:	2.5 amps, 40 watts
<b>Fuses</b>		5mm x 20mm, 5 amp quick acting
<b>Speed Range</b>		20 to 300 rpm
<b>Speed Accuracy</b>		
Above 100rpm		±1% of set speed
Below 100rpm		±1rpm
<b>Orbit</b>		0.75" (19mm) Total Travel
<b>Capacity</b>		~15 lbs @ 300 rpm
<b>Timer</b>		1 second to 160 hours
<b>Controls</b>		See page 8
<b>Ship Weight</b>		49 lbs (22.2 kg)

### MODEL 5000

<b>Overall dimensions LxWxH</b>		23.6 x 26.7 x 6.0" (59.9 x 67.8 x 15.2 cm)
<b>Tray dimensions LxW</b>		18 x 24" (45.7 x 70 cm)
<b>Electrical</b>	120 volts:	5 amps, 75 watts
	230 volts:	2.5 amps, 75 watts
<b>Fuses</b>		5mm x 20mm, 5 amp quick acting
<b>Speed Range</b>	Advanced:	20 to 500 rpm
	Standard:	25 to 500 rpm
<b>Speed Accuracy</b>	Advanced:	
Above 100rpm		±1% of set speed
Below 100rpm		±1rpm
<b>Orbit</b>		1" (25.4 mm)
<b>Capacity</b>		~50 lbs @ 125 rpm ~10 lbs @ 500 rpm
<b>Timer</b>	Advanced:	1 second to 160 hours
	Standard:	1 to 120 minutes
<b>Controls</b>	Advanced:	See page 8
	Standard:	See page 6
<b>Ship Weight</b>		109 lbs

## SPECIFICATIONS CONT'D

### MODEL 10000

Overall dimensions LxWxH	28.25 x 26.7 x 7.0" (71.8 x 67.8 x 17.8 cm)
Tray dimensions LxW	24 x 24" (70 x 70cm)
Electrical	120 volts: 5 amps, 80 watts 230 volts: 2.5 amps, 80 watts
Fuses	5mm x 20mm, 5 amp quick acting
Speed Range	10000-1 = 15 to 500 rpm 10000-2 = 15 to 300 rpm
Speed Accuracy	±1% of set speed
Above 100rpm	±1rpm
Below 100rpm	
Orbit	10000-1 = 1" 10000-2 = 2"
Capacity	~100 lbs @ 100 rpm * ~40 lbs @ 300 rpm
Timer	1 second to 160 hours
Controls	See page 8
Ship Weight	200 lbs

### MODEL 15000

Overall dimensions LxWxH	28.25 x 26.7 x 7.0" (71.8 x 67.8 x 17.8 cm)
Tray dimensions LxW	24 x 36" (70 x 91.4cm)
Electrical	120 volts: 5 amps, 80 watts 230 volts: 2.5 amps, 80 watts
Fuses	5mm x 20mm, 5 amp quick acting
Speed Range	15000-1 = 15 to 500 rpm 15000-2 = 15 to 300 rpm
Speed Accuracy	±1% of set speed
Above 100rpm	±1rpm
Below 100rpm	
Orbit	15000-1 = 1" 15000-2 = 2"
Capacity	~150 lbs @ 100 rpm * ~40 lbs @ 300 rpm
Timer	1 second to 160 hours
Controls	See page 8
Ship Weight	230 lbs

## STANDARD ORBITAL SHAKER

\*With optional platform and flask clamp





## STANDARD ORBITAL SHAKER OPERATING INSTRUCTIONS

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The Standard Orbital Shaker is used for general laboratory shaking needs.

### MODEL 1000

#### 1. Getting ready:

- a. The speed knob should be at their extreme counter-clockwise position or at the #1 on the dial.
- b. Make sure the rocker switch is in the off position.
- c. Plug the cord into a properly grounded outlet.

#### 2. Setting speed:

- a. To run push rocker to the on or position. Set speed knob to desired setting and adjust if necessary. Unit will run until you move the rocker switch to the off position. The microprocessor speed control slowly ramps to set speed to avoid splashing.

#### 3. Turning unit off:

- a. To stop shaking function, turn the speed knob to the extreme counter-clockwise position and push the rocker switch to the standby position. The shaker should be kept in the standby position 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.

The shaker will automatically restart after a power interruption.

### MODEL 3500 AND 5000

#### 1. Getting ready:

- a. The speed and time knobs have a built in on-off switch at their extreme counter-clockwise position. Turn both knobs to the off position.
- b. Make sure the rocker switch is in the standby position.
- c. Plug the cord into a properly grounded outlet.

#### 2. Setting speed:

- a. To run in continuous mode, push rocker to the run position. Set speed knob to desired setting and adjust if necessary. Unit will run until you move the rocker switch to the standby position. The microprocessor speed control slowly ramps to set speed to avoid splashing.

#### 3. Setting time:

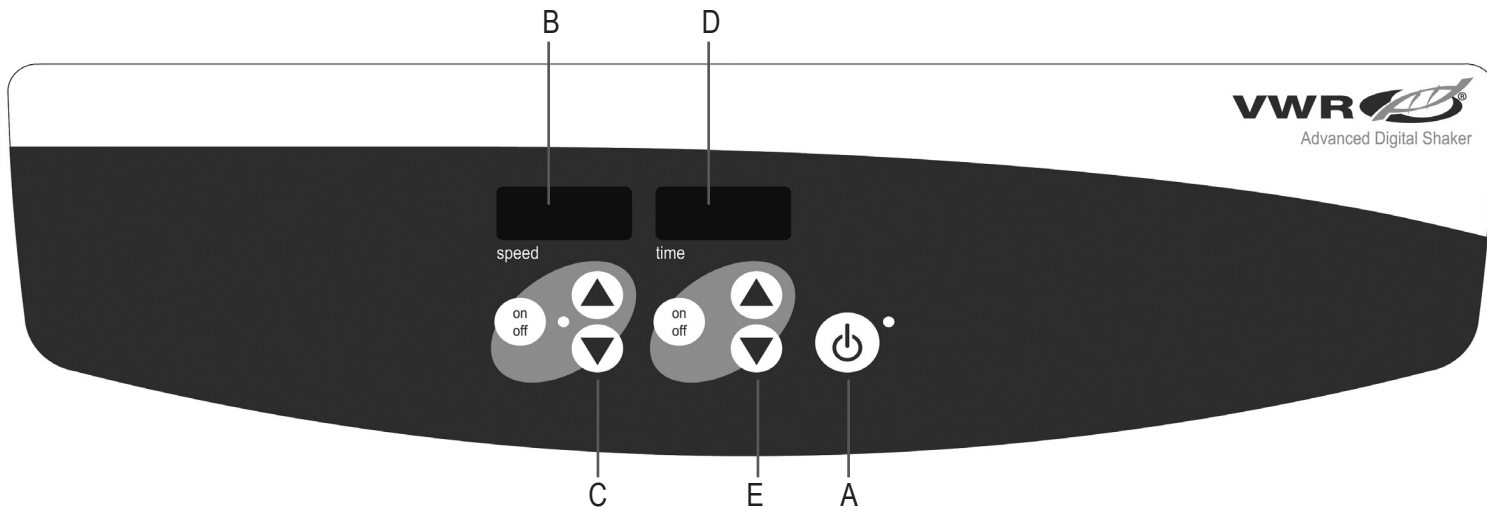
- a. To run in timed mode, set timer and the speed knob to the desired settings. Press the rocker switch to the time position and release. The shaker will now run for the set time. b. To exit the timed mode turn the time knob to the extreme counter-clockwise position.

#### 4. Turning unit off:

- a. To stop shaking function, turn the speed knob to the extreme counter clockwise position and push the rocker switch to the standby position. The shaker should be kept in the standby position 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. To reset the unit, press the rocker switch to standby and then press the rocker switch to the on position. The shaker will automatically restart after a power interruption. Built-in memory maintains the last used speed and time settings during a power interruption.



## CONTROL PANEL - ADVANCED ORBITAL SHAKER

The front panel of the Advanced Orbital 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.

## ADVANCED ORBITAL SHAKER OPERATING INSTRUCTIONS

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The Advanced Orbital 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. Plug the cord into a properly grounded outlet. The standby indicator light will illuminate, verifying power to the shaker.
- b. 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 setpoint 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.

### 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 Orbital 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.

### LOAD SENSING FUNCTION (Advanced Orbital Shakers Model 3500 and up)

The Advanced Orbital Shaker is equipped with a load sensing function that can be activated by the user. This function provides protection against improper positioning of load and maximum load being exceeded. When activated, the unit will automatically sense improper load conditions and slow to a safe running speed, then display that speed followed by E04 on the speed display. The unit will also beep three (3) times every 60 seconds until the error is reset by pressing the speed on/off button. To activate the load sensing function use the following steps:

1. Place the unit in standby mode.
2. Press and hold the speed on/off button and press the standby button. The unit will beep two (2) times, confirming the function is enabled.
3. To restore normal operation, remove AC power to the unit for ten (10) seconds and then restore. If the E04 error occurs be sure the load is within the maximum specification and properly balanced (centered on tray) and/or reduce sample size/speed before restarting the unit. If the E04 occurs due to acceptable sample vibration or another vibration source, the vibration sensing function can be disabled as described above.

### ADDITIONAL LOAD SENSING FEATURE

The Advanced Orbital Shaker Models 3750 and up, are equipped with an additional overload protection feature that lets the user know when the unit's set speed is higher than the achievable speed of the unit. The unit speed display will show an E7. The unit will also beep three (3) times every 60 seconds until the error is reset by pressing the speed on/off button.

To disable this feature perform the following steps:

1. Place the unit in standby mode by pressing the standby button.
2. Press and hold the speed up button and press on/off button. The unit will beep two (2) times, confirming the function is disabled.
3. To restore unit to normal operation, remove AC power to unit (unplug power cord from wall outlet) for ten (10) seconds and restart.

### 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 (Advanced Orbital Shakers Model 3500 and up)

This procedure is used to self calibrate the Advanced Orbital 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 (Advanced Orbital Shakers Model 3500 and up)

RS-232 serial port provides two-way communications for data logging and unit control. If you need additional details, please contact **Troemner** for technical support at: [tech\\_support@troemner.com](mailto:tech_support@troemner.com).

## TROUBLESHOOTING - ADVANCED ORBITAL SHAKER

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Unit will not run	Mechanical obstruction Motor obstruction	Add or replace fuse as necessary. If problem persists, please contact your VWR representative for repair.
Unit is excessively noisy	Sensor fan misaligned Motor misaligned	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 10. If problem persists, please contact your VWR representative for repair.
E3	Mechanical obstruction Drive system failure Ceased bearing Drive belt broken	Remove mechanical obstruction. If problem persists, the reason may be the drive system and should not be addressed by the end user. Contact your VWR representative for repair.
E4	Improper positioning of load Maximum load exceeded	Ensure the load is evenly distributed and does not exceed the maximum load capacity for the unit. See "Load Sensing Function" on page 10. If problem persists, please contact your VWR representative for repair.
E7	Unable to reach set speed	Reduce the speed setting or weight. This function can be disabled by following the instructions listed under "Additional Load Sensing Feature" on page 10. (NOTE: This function is only available on models 3750 and up and is not available on Model 3500 shakers.)
E8	Electronics error	This error cannot be fixed by the end user. Please contact your VWR representative for repair.

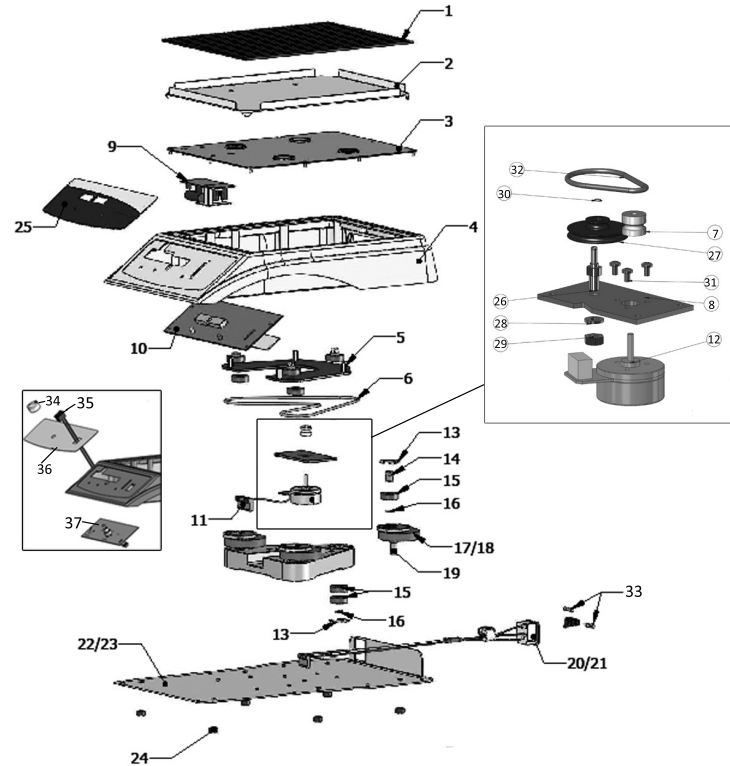
# REPLACEMENT PARTS - STANDARD 1000

## DESCRIPTION

1. Rubber Mat
2. Tray (STD)  
Tray (ADV)
3. Top Plate
4. Housing
5. Shaker Plate
6. Belt
7. Motor Pulley
8. Motor Plate
9. Power Supply
10. PC Board
11. Motor Connection Cable
12. Motor 380763-00
13. Snap ring internal
14. Idler Stud
15. Bearing
16. Snap ring external
17. Eccentric counter weight
18. Eccentric pulley
19. Eccentric shaft
20. Wire assembly, 120V
21. Wire assembly, 230V
22. Base plate, 120V
23. Base plate, 230V
24. Foot
25. Front Panel Membrane Switch
26. Idler Shaft
27. Pulley Speed Reduction
28. Washer, .25" Split Lock
29. 1/4-20 Hex Nut
30. Snap Ring, External .156 Dia
31. Screw 180037-00
32. Belt Speed reduction
33. Fuse
34. Knob
35. Switch Assembly
36. Overlay
37. PC Board

## PART NUMBER

- 480016-00
- 280760-00
- 580050-00
- 280758-00
- 280302-00
- 280759-00
- 280757-00
- 280756-00
- 280720-00
- 380762-00
- 380806-00
- 380765-00
- 180040-00
- 280752-00
- 180059-00
- 180039-00
- 280754-00
- 280755-00
- 280753-00
- 380760-00
- 380767-00
- 280328-00
- 280329-00
- 530052-00
- 380704-00
- 280721-00
- 280723-00
- 180080-00
- 172007-00
- 180081-00
- 280722-00
- 380238-00
- 287010-00
- 380769-00
- 380764-00
- 380766-00



## REPLACEMENT PARTS - STANDARD 3500

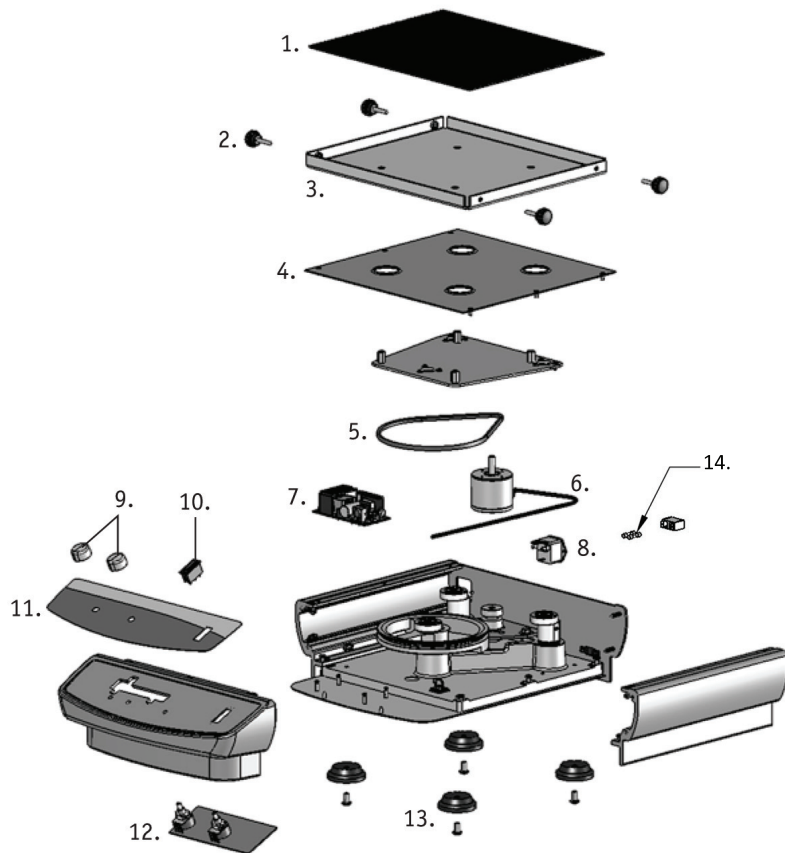
### DESCRIPTION

### PART NUMBER

1.	Rubber mat	480004-00
2.	Thumbscrew	580001-00
3.	Tray	280700-00
4.	Top plate	280703-00
5.	V-belt	580000-00
6.	Motor	280633-00
7.	Power supply	380623-00
8.	IEC power inlet, 120V	380506-00
	IEC power inlet, 230V	380237-00
9.	Knob	287010-00
10.	Rocker switch	349025-00
11.	Front panel	380807-00
12.	Control circuit board	380810-00
13.	Feet	580002-00
14.	Fuse	380238-00

Detachable 92" (234cm) power cord:

120V	330100-00
EURO	330101-00
UK	330102-00
SWISS	330103-00

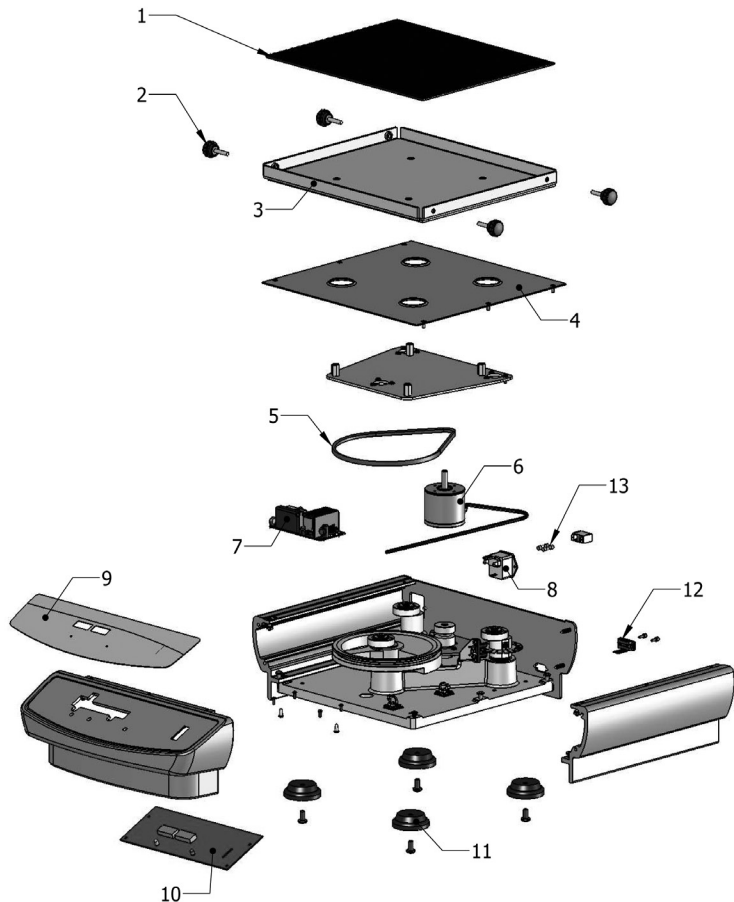


## REPLACEMENT PARTS - ADVANCED 3500

### DESCRIPTION

DESCRIPTION	PART NUMBER
1. Rubber mat	480004-00
2. Thumbscrew	580001-00
3. Tray	280700-00
4. Top plate	280703-00
5. V-belt	580000-00
6. Motor	280633-00
7. Power supply	380623-00
8. IEC power inlet, 120V	380506-00
IEC power inlet, 230V	380237-00
9. Front panel	380803-00
10. Control circuit board	380806-00
11. Feet	580002-00
12. Cable, RS 232, 25"	345152-00
13. Fuse	380238-00

Detachable 92" (234cm) power cord:	120V	330100-00
	EURO	330101-00
	UK	330102-00
	SWISS	330103-00





## REPLACEMENT PARTS - ADVANCED 3750

### DESCRIPTION

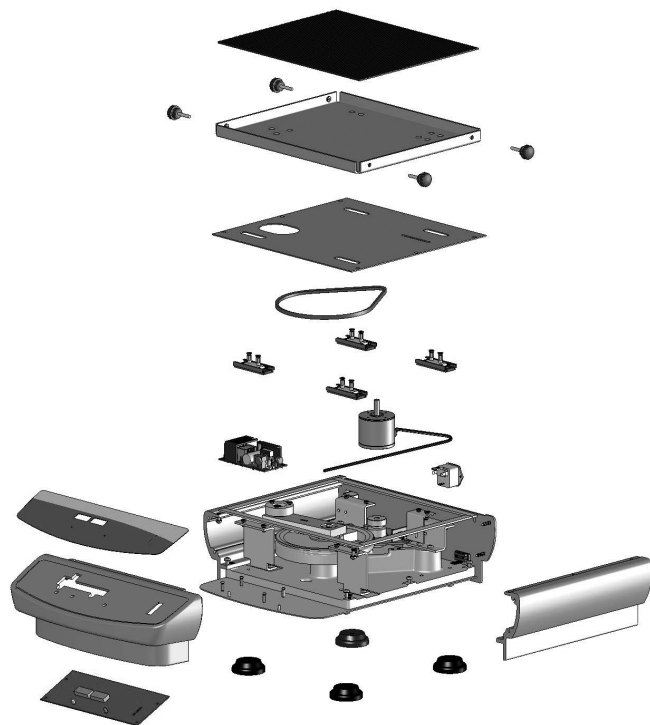
1. Rubber mat
2. Thumbscrew
3. Tray
4. Top plate
5. V-belt
6. Motor
7. Power supply
8. IEC power inlet, 120V  
IEC power inlet, 230V
9. Front panel
10. Control circuit board
11. Feet
12. Slides
13. Fuse
14. Cable, RS 232, 25"

### PART NUMBER

- 480004-00  
580001-00  
280533-00  
280531-00  
580000-00  
280633-00  
380623-00  
380506-00  
380237-00  
380803-00  
380813-00  
580002-00  
180068-00  
380238-00  
345152-00

Detachable 92" (234cm) power cord:

- |       |           |
|-------|-----------|
| 120V  | 330100-00 |
| EURO  | 330101-00 |
| UK    | 330102-00 |
| SWISS | 330103-00 |



## REPLACEMENT PARTS - STANDARD & ADVANCED 5000

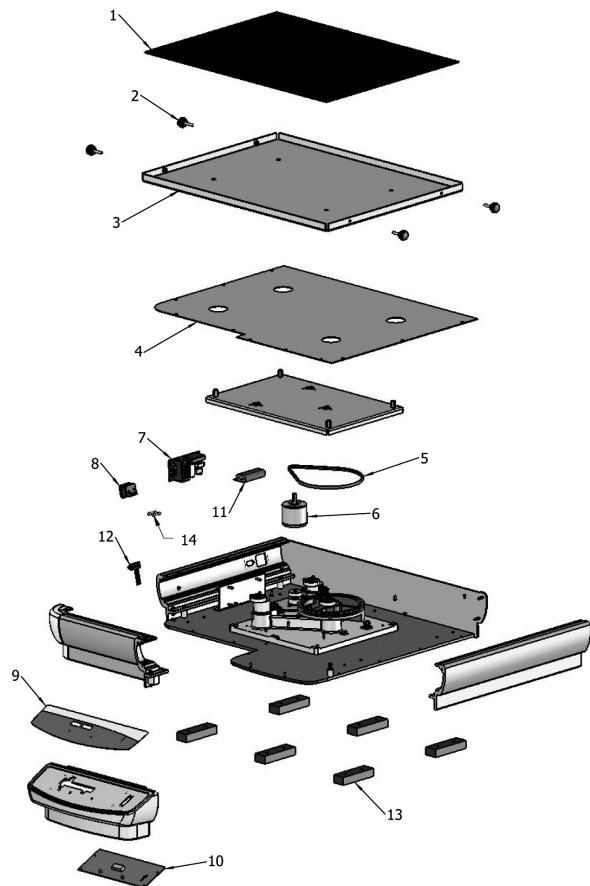
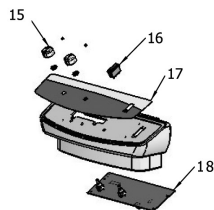
### DESCRIPTION

### PART NUMBER

1. Rubber mat	280809-00
2. Thumbscrew	580001-00
3. Tray	280804-00
4. Top plate	280806-00
5. V-belt	580000-00
6. Motor	280633-00
7. Power supply, 24V	380623-00
8. Power entry module	386122-00
9. Advanced digital membrane switch	380803-00
10. Display circuit board	380813-00
11. Line filter	387022-00
12. Cable, RS-232, 33"	345153-00
13. Feet	580017-00
14. Fuse	380238-00

### STANDARD ONLY

15. Knob	287010-00
16. Rocker switch	349025-00
17. Front panel	380807-00
18. Control circuit board	380812-00

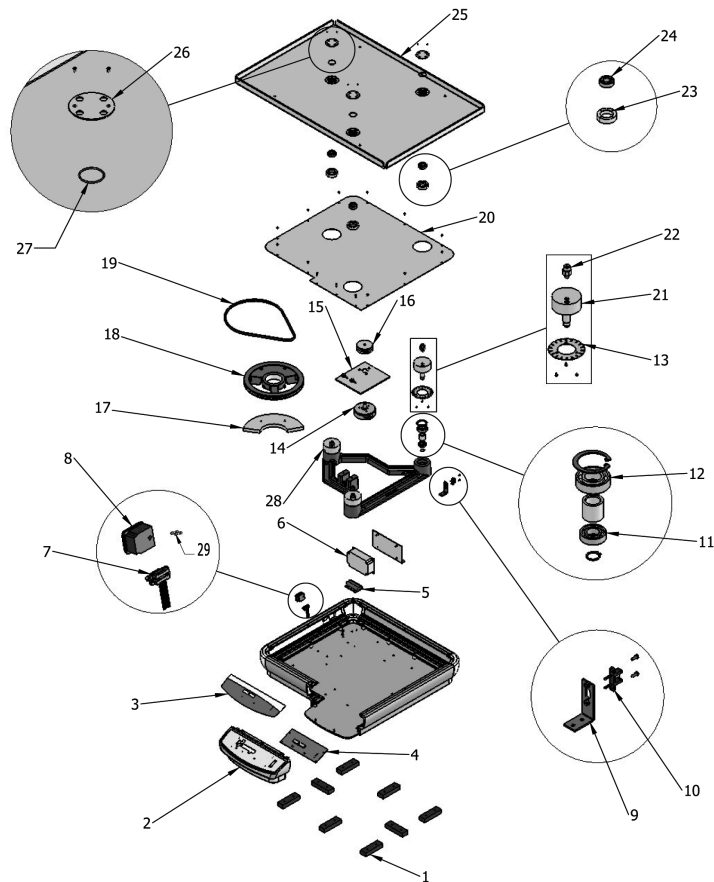


## REPLACEMENT PARTS - ADVANCED 10000 - 150000

### DESCRIPTION

### PART NUMBER

1. Feet	580017-00
2. Front bezel	280501-00
3. Advanced digital membrane switch	380803-00
4. Display circuit board	380813-00
5. Line filter	387022-00
6. Power supply,	386331-00
7. Cable, RS-232, 33"	345153-00
8. Power entry module	386122-00
9. Photosensor mounting bracket	280820-00
10. Photosensor	380636-00
11. Bearing 6000-ZZ, large	130111-00
12. Bearing, ball 6004-ZZ	130108-00
13. Encoder disk	280818-00
14. Motor	386332-00
15. Motor mounting plate	280817-00
16. Pulley 3.75:1	280819-00
17. Counter weight	280094-00
18. Counter pulley	280083-00
19. V-belt	580021-00
20. Top plate	280816-00
21. Drive/idler shaft	280815-00
22. Eccentric shaft insert	480013-00
23. Bearing holder	445026-00
24. Bearing, 1623DS	145027-00
25. Tray - Model 15K	280813-00
Mat - Model 15K	480015-00
Tray - Model 10K	280812-00
Mat - Model 10K	480014-00
26. Bearing cap	280087-00
27. O-ring	180006-00
28. Drive/idler shaft	280814-00
29. Fuse	380238-00



## PLATFORM USAGE CHART

Platform Size	Platform Type	Used on Shaker Model Number	Part Number
11 x 13"	Universal	Model 3500, Model 3750	89027-702
13 x 13"	Universal	Model 3500, Model 3750	97003-586
18 x 18"	Universal	Model 3500, Model 3750**	97003-588
18 x 24**	Universal	Model 3500, Model 3750, Model 5000**	97003-590
18 x 30**	Universal	Model 5000	97003-594
24 x 24"	Universal	Model 10000	97003-592
24 x 36"	Universal	Model 15000	97003-596
13 x 13" (125mL)	16 x 125mL	Model 3500, Model 3750	97003-616
13 x 13 (250mL)	12 x 250mL	Model 3500, Model 3750	97003-618
13 x 13 (500mL)	8 x 500mL	Model 3500, Model 3750	97003-620
13 x 13 (1L)	4 x 1L	Model 3500, Model 3750	97003-622
18 x 18" (125mL)*	27 x 125mL	Model 3500, Model 3750**	97003-624
18 x 18" (250mL)*	20 x 250mL	Model 3500, Model 3750**	97003-626
18 x 18" (500mL)*	13 x 500mL	Model 3500, Model 3750**	97003-628
18 x 18" (1L)*	9 x 1L	Model 3500, Model 3750**	97003-630
Two-Tier Braces			97003-646
18 x 18**	Culture Platform	Model 3500, Model 3750**	97003-598
18 x 24**	Culture Platform	Model 3500, Model 3750**, Model 5000**	97003-600
18 x 18"	Adjustable Platform	Model 3500	97003-602
18 x 24"	Adjustable Platform	Model 5000	97003-604
30 x 18"	Large Vessel Carrier	Model 5000	97003-606
24 x 24"	Large Vessel Carrier	Model 10000	97003-608
24 x 36"	Large Vessel Carrier	Model 15000	97003-610
18 x 18"	Serparatory Funnel Platform	Model 3500, Model 3750	97003-632

## 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	3L 10789-250	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	N/A
13 x 13	97003-586	60	30	15	12	12	8	4	3	3	1	1	1
18 x 18	97003-588	113	64	32	20	20	13	8	5	5	2	4	2
18 x 24	97003-590	158	88	44	28	28	20	12	6	6	3	4	3
18 x 30	97003-594	203	112	56	36	36	26	15	8	8	3	6	4
24 x 24	97003-592	221	121	61	41	42	25	16	9	9	5	5	5
24 x 36	97003-596	336	160	94	61	64	40	24	14	14	7	9	7

### PVC Erlenmeyer Flask Clamps

Platform Size	Part Number	125mL 97003-576	250mL 97003-578	500mL 97003-580	1L 97003-582	2L 97003-584
11 x 13	89027-702	10	8	5	2	N/A
13 x 13	97003-586	12	10	6	4	3
18 x 18	97003-588	20	18	12	8	4
18 x 24	97003-590	28	25	16	10	6
18 x 30	97003-594	36	33	20	14	8
24 x 24	97003-592	41	35	24	13	9
24 x 36	97003-596	61	55	38	22	13

### Stainless Steel Media Bottle Clamps

Platform Size	Part Number	500mL 14215-236	1L 14215-238
11 x 13	89027-702	5	2
13 x 13	97003-586	6	5
18 x 18	97003-588	16	10
18 x 24	97003-590	20	13
18 x 30	97003-594	28	18
24 x 24	97003-592	25	18
24 x 36	97003-596	40	30

### Microplate Clamp

Platform Size	Part Number	Microplate Clamp 980458
11 x 13	89027-702	4
13 x 13	97003-586	6
18 x 18	97003-588	12
18 x 24	97003-590	18
18 x 30	97003-594	21
24 x 24	97003-592	24
24 x 36	97003-596	36

## 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
18 x 30	97003-594	8	8	8	8	8	8	8
24 x 24	97003-592	8	8	8	8	8	8	8
24 x 36	97003-596	7	7	7	7	7	7	7

### 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
18 x 30	97003-594	6	6	6	6
24 x 24	97003-592	7	7	7	7
24 x 36	97003-596	5	5	5	5

**TEST TUBE RACK PLATFORM CAPACITY CONT'D**

<b>Platform Size</b>	<b>Part Number</b>	<b>13mm Test Tube Rack capacity = 90 97003-636</b>	<b>16mm Test Tube Rack capacity = 60 97003-638</b>	<b>20mm Test Tube Rack capacity = 40 97003-640</b>	<b>25mm Test Tube Rack capacity = 24 97003-642</b>	<b>30mm Test Tube Rack capacity = 21 97003-644</b>
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
18 x 30	97003-594	4	4	4	4	4
24 x 24	97003-592	4	4	4	4	4
24 x 36	97003-596	6	6	6	6	6

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