# Instruction Manual
# Round Top Hotplate-Stirrers

Advanced Unit

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## Package Contents

Round Top Hotplate-Stirrer
92" (234cm) detachable power cord
Spin bar
Instruction manual

## Warranty

Manufacturer warrants this product to be free from defects in material and workmanship when used under normal conditions for two (2) years. Register your equipment or instrument online at: www.vwrsp.com/warranty for US residents or www.vwrcanlab.com/warranty for Canadian residents. For your reference, make a note of the serial number, date of purchase and supplier here.

Serial No.:_____ Date of Purchase:_____
Supplier:_____

## Installation

Upon receiving the VWR Round Top Hotplate-Stirrer, check to ensure that no damage has occurred in shipping. It is important that any damage that occurred in shipping is detected at the time of unpacking. If you do find such damage the carrier must be notified immediately.

After unpacking, place the Round Top Hotplate-Stirrer 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 (15.2cm) from vertical surfaces. Always place the unit on a sturdy work surface.

The Round Top Hotplate-Stirrer 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

The Round Top Hotplate-Stirrer is built for long, trouble-free, dependable service. It needs no user maintenance beyond keeping the surfaces clean. The unit should be given the care normally required for any electrical appliance. Avoid wetting or unnecessary exposure to fumes. Spills should be removed promptly after the unit has cooled down. Do not use a cleaning agent or solvent on the front panel or top plate 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.

**CLEANING STAINLESS STEEL TOPS:**

For simple dust and dirt, clean the stainless steel top by using a damp cloth with soap and water. For more stubborn deposits, try using a flat edge wooden spatula to scrape off as much as possible. For more stubborn stains, try using a couple of tablespoons of white vinegar to two pints of water and mix well. Dip a clean cloth into the mixture and gently rub the exterior of the stainless steel surface. Generally, it is not a good idea to use abrasive pads or cleaners on stainless steel, as the metal will scratch easily. If you must use some type of abrasive, try applying baking soda to the surface and then rubbing with a moist cloth. This will work as well as most scouring pads and is less likely to create deep scratches in the surface. Be careful not to use steel wool or scouring pads as they can leave the stainless steel riddled with little scratches that make it harder to clean in the future. If you feel you must use steel wool, use the finest grade you can find and use as sparingly as possible with as little pressure as possible, making circular motions starting at the center and working towards the edge.

## Intended Use

The VWR Round Top Hotplate-Stirrers are intended for general laboratory use.

## Environmental Conditions

**Operating Conditions:** Indoor use only.

| | |
|---|---|
| Temperature: | 5 to 40°C (41 to 104°F) |
| Humidity: | 20% to 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: | 20% to 80% relative humidity, non-condensing |

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

## Safety Instructions

Please read the entire instruction manual before operating the Round Top Hotplate-Stirrer.

**WARNING! DO NOT** use the Round Top Hotplate-Stirrer 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 unit by the top plate.

**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 after the unit has cooled down. **DO NOT** immerse the unit for cleaning. Alkalis spills, hydrofluoric acid or phosphoric acid spills may damage the unit and lead to thermal failure.

**CAUTION!** The top plate can reach 400°C, **DO NOT** touch the heated surface. Use caution at all times. Keep the unit away from explosive vapors and clear of papers, drapery and other flammable materials. Keep the power cord away from the heater plate.

**DO NOT** operate the unit at high temperatures without a vessel/sample on the top plate.

**WARNING!** Units are **NOT** explosion proof. Use caution when heating volatile materials.

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



Earth Ground - Protective Conductor Terminal

Alternating Current

## Standards & Regulations

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

**Safety standards:**

| | |
|---|---|
| IEC 61010-1 | Safety requirements for electrical equipment for measurement, control and laboratory use. Part: General Requirements. |
| IEC 61010-2-010 | Part II: Particular requirements for laboratory equipment for the heating of materials. |
| IEC 61010-2-051 | Part II: Particular requirements for laboratory equipment for mixing and stirring. |

UL Std. No. 61010-1

**EMC standards:**

| | |
|---|---|
| EN61326-1 Class A | EN61000-3-3/3-2 |
| EN6100-4-5 | EN61000-4-4 |
| EN55022-B | EN61000-4-3 |
| EN61000-4-11 | EN61000-4-6 |

**Associated EU guidelines:**

EMC directive 2004/108/EC
LVD directive 2006/95/EC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class A digital apparatus complies with Canadian ICES-003.

## Consignes de sécurité

Veuillez lire la totalité du manuel d'instruction avant d'utiliser le dispositif Agitateur/ Agitateur à plaque chauffante.

**AVERTISSEMENT! N'UTILISEZ PAS** le dispositif Plaque chauffante/Agitateur/ Agitateur à plaque chauffante dans une atmosphère dangereuse ou avec des matériaux dangereux pour lesquels l'emploi du dispositif n'a pas été conçu. L'utilisateur doit en outre toujours être conscient du fait que la protection fournie par le fabricant peut être désactivée si le dispositif est utilisé avec des accessoires non fournis ni recommandés par le fabricant ou s'il est utilisé de manière non stipuléepar le fabricant.

Utilisez toujours le dispositif sur une surface à niveau pour optimiser non seulement la performance mais la sécurité.

**NE SOULEVEZ PAS** le dispositif en saisissant la plaque supérieure.

**ATTENTION!** Pour éviter tout choc électrique, coupez le courant vers le dispositif en débranchant le cordon d'alimentation du dispositif ou de la prise murale. Débranchez le dispositif de l'alimentation avant d'effectuer toute opération de maintenance ou de réparation.

Les liquides renversés doivent être nettoyés tout de suite après le refroidissement du dispositif. **N'IMMERGEZ PAS** le dispositif pour le nettoyer. Les produits déversés comme les alcalis et les acides hydrofluorique et phosphorique peuvent entraîner un choc thermique.

**ATTENTION!** La plaque supérieure peut atteindre 400°C, **NE TOUCHEZ PAS** la surface chauffée. Faites preuve de prudence à tout moment. Tenir le dispositif loin des vapeurs explosives et des papiers, rideaux et autres substances inflammables. Tenir le cordon d'alimentation loin de la plaque chauffante.

**N'UTILISER PAS** le dispositif à des températures élevées si un récipient/échantillon n'est pas sur la plaque supérieure.

**AVERTISSEMENT!** Les dispositifs **NE SONT PAS** antidéflagrants. Faites preuve de prudence lors du chauffage de substances volatiles.

Remplacez la plaque céramique immédiatement si celle-ci est endommagée. Une plaque endommagée peut se fendre si elle est utilisée.

**N'UTILISEZ PAS** le dispositif s'il y a des signes de dommages électriques ou mécaniques.

Mise à la terre - Borne du conducteur de protection

Courant alternatif

## Normes et réglementations

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

**Normes de sécurité:**

| | |
|---|---|
| CEI 61010-1 | Conditions de sécurité des composants électriques pour la mesure, le contrôle et l'utilisation en laboratoire. Partie: Conditions générales. |
| CEI 61010-2-010 | Partie II: Conditions spécifiques à l'équipement en laboratoire pour le chauffage de matériaux. |
| CEI 61010-2-051 | Partie II: Conditions spécifiques à l'équipement en laboratoire pour le mélange et l'agitation. |

Norme UL No. 61010-1

**Normes EMC:**

| | |
|---|---|
| EN61326-1 Catégorie A | EN61000-3-3/3-2 |
| EN6100-4-5 | EN61000-4-4 |
| EN55022-B | EN61000-4-3 |
| EN61000-4-11 | EN61000-4-6 |

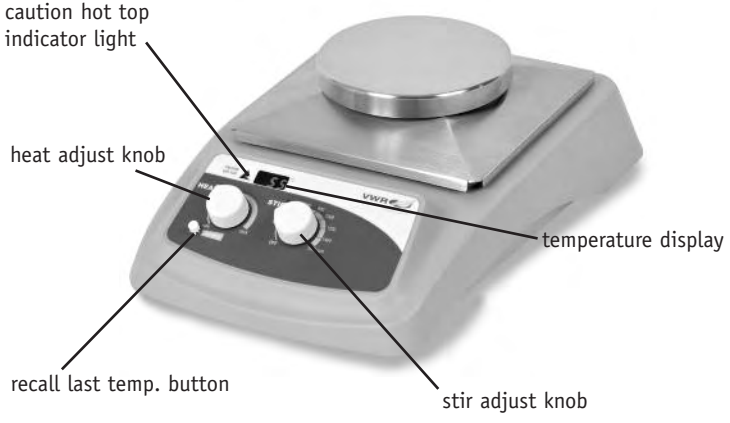
**Directives UE associées:**
Directive CEM 2004/108/EEC
Directive LVD 2006/95/EEC

## Round Top Hotplate-Stirrer Specifications

| | | |
|---|---|---|
| **Dimensions (L x W x H):** | | 14.77 x 9.85 x 4.00" (37.5 x 25 x 10.2cm) |
| **Top plate dimensions:** | | 5.3" (135mm) Diameter |
| **Electrical (50/60 Hz):** | **120V** | 8.3 amps/500 watts |
| | **230V** | 4.6 amps/500 watts |
| **Fuses:** | | 5mm x 20mm, 10 amp slow blow |
| **Temperature range:** | | ambient +5°C to 400°C |
| **Temperature stability*:** | | +/-3% |
| **Speed range:** | | 60 to 1600rpm |
| **Speed stability:** | | +/-2% |
| **Capacity:** | | 1500mL, gross weight should not exceed 40lbs |
| **Controls:** | | see diagram |
| **Ship weight:** | | 9.4lbs (4.3kg) |

** Below 100°C +/-2°C. Environmental and sample conditions permitting.*

## Advanced Unit



## Heating Operating Instructions

The Round Top Hotplate-Stirrers have a microprocessor controlled heater that is designed to bring samples to temperature quickly and accurately.

1. **Getting ready:**
   a. Turn the heat knob to the off position. Plug power cord into a properly grounded 3-prong outlet.
   b. Place a vessel with solution and the appropriate accessories in the center of the top plate. This is important because the vessel should be over the hottest part of the top plate.

2. **Setting temperature:**
   a. Turn the heat knob clockwise until the display reaches the desired heat setting. The display will flash the set-point temperature until the temperature is reached, at which time the display will stop flashing and beep 5 (five) times. When the heat is turned on, the indicator light above the heat knob is illuminated. Removing or adding more to a sample content could cause the temperature to fluctuate. If this occurs, the display will again start to flash until the set-point value is stabilized.
   b. Temperature adjustments can be made without interrupting heating by turning the heat knob clockwise to increase heat or counter-clockwise to decrease heat.
   c. To stop heating, turn the heat knob to the off position. Your vessel can then be removed.

**Caution hot top indicator:**
The caution hot top indicator light warns that the top plate is too hot to touch. The caution hot top indicator light will illuminate when the heat is turned on and remain on until the top plate cools down.


**Recall last temperature button:**
Round Top Hotplate-Stirrers have a built-in memory that allows users to recall the last set temperature, even after the unit has been turned off. (The temperature in memory is the last temperature that ran for more than 5 minutes.)

**OPERATING TIPS**

The unit may overshoot the temperature up to 10°C before stabilizing at the set-point.

If a glass vessel is used, anticipate overshoot. Start with a setting 5-10°C below the desired temperature. When the temperature stabilizes at this lower setting, turn the heat knob to the final temperature. Overshoot is then reduced to about 1°C.

The temperature display on the Advanced units show the actual temperature of the heater not the top plate or sample. The vessel contents being heated may be at a lower temperature depending on the size and insulating qualities of the vessel. It may be beneficial to monitor the temperature of the vessel contents and adjust the set-point temperature accordingly.

## Typical Time To Boil Water

The chart below is an example of an approximate time to boil for the specified amount of water in a specific vessel.
*These values are only approximate and can vary from unit to unit. Values are based on 23°C water in an ambient environment of 23°C.*

| STAINLESS STEEL TOP | |
|---|---|
| **Volume of Water** | **Time** |
| | |
| 500mL in 600mL beaker | 30 |
| | |
| 1500mL in 2,000mL beaker | 45 |

## Temperature Calibration Procedure (Single Point Calibration)

This method can be used for calibrating the top plate surface of the unit.
To set a Single Point Calibration (SPC) adjustment:

a. Turn the heat knob clockwise until the display reaches the desired heat setting, and let the unit stabilize to the user input temperature. The heater temperature has stabilized when the temperature display is no longer blinking and the unit will beep five times.
b. Wait ten minutes for the surface temperature to stabilize. Measure the center of the top plate with a traceable surface temperature measuring device.
c. Press and hold the Last Temperature button. The display will start to scroll through the available SPC options ("UP", "dn", "SEt" and "dEL") as long as the Last Temperature button is held down. Once you select "UP" or "dn" mode and release the Last Temperature button the unit will beep two times and the display will begin to blink quickly. This lets you know you are programming in SPC mode.

**NOTE:** There is a thirty second time out (Last Temperature button must be pressed at least once in thirty seconds, or unit will exit SPC mode). **Do not touch the heat knob while in SPC mode.** If the heat knob is adjusted during this procedure you will exit SPC mode.

d. Once the desired option is displayed, release the Last Temperature button. Please see the explanation below for each option.
e. Selecting the "SEt" option saves the Single Point Calibration adjustment for that temperature set-point and allows you to exit this SPC mode (see Section c). When the "Set" option is selected "SEt" will be displayed. To save the current SPC point and exit the SPC programming mode, release the Last Temperature button when "SEt" is on the display. The display will now show your set-point temperature with a decimal point for that setting.
f. Select the "UP" option if your externally measured temperature of the top plate is **higher** than the set-point on the display. When the "UP" option is selected the current SPC adjusted temperature is displayed and blinking quickly. **To increase the SPC, press and release the Last Temperature button multiple times (do not touch heat knob)** until the display reads the value you recorded as the measured temperature of the top plate. Changes are not saved until the "SEt" option is selected (and the Last Temperature button is pressed and released), if the temperature is adjusted too high, delete the SPC adjustment and repeat procedure.
g. Select the "dn" option if your externally measured temperature of the top plate is **lower** than the set-point on the display. When the "dn" option is selected the current SPC adjusted temperature will be displayed and blinking quickly. **To decrease the SPC, press and release the Last Temperature button multiple times (do not touch the heat knob)** until the display reads the value you recorded as the measured temperature of the top plate. Changes are not saved until the "SEt" option is selected (and the Last Temperature button is pressed and released), if the temperature is adjusted too low, delete the SPC adjustment and repeat procedure.
h. Selecting the "dEL" option will delete **all** Single Point Calibration points and allow you to exit this SPC mode (see Section c). When the "dEL" option is selected "dEL" will be displayed. To delete **all** SPC points and exit the SPC mode release the Last Temperature button when "dEL" is on the display.
i. For set-point temperatures with a SPC adjustment, there will be a decimal point in the display. Once the SPC adjustment is set, the display will blink while the unit's temperature is settling. When the SPC set-point is reached, the display will stop blinking and the unit will beep five times.
j. This process may be repeated for up to **three separate** set-points. If a fourth SPC set-point is entered, the first set-point will be overwritten. To readjust an existing SPC set-point, you must delete the current settings (all SPC points will be deleted, and the decimal points will no longer be displayed at those temperatures) and repeat the SPC procedure. If SPC adjustments are **not deleted** prior to resetting SPC for a set-point then the temperature adjustment will not be accurate
k. The SPC adjustments are limited to the maximum and minimum temperatures and limits allowed by the particular unit.

## Stirring Operating Instructions

The microprocessor controlled ramping feature slowly increases speed until the set-point is reached. This feature helps to avoid splashing, improves magnetic coupling and provides excellent low end control. The microprocessor also monitors and regulates the stirring speed, sensing your requirements whether you're stirring an aqueous, viscous or semi-solid solution.

Initial stirring speed may exceed set speed if the following conditions exist:
1. The stirrer is set at a low speed and the stirrer has not been operated for an extended period of time.
2. The stirrer is set at a low speed and it is the stirrer's initial use.

1. **Getting ready:**
   a. Turn stir knob to the off position. Plug power cord into a properly grounded outlet.
   b. Place a vessel with solution and the appropriate spin bar in the center of the top plate.

2. **Setting speed:**
   a. Turn the stir knob clockwise until the pointer reaches the desired speed setting. The stir indicator light above the stir knob will illuminate to indicate the stirring feature is in use. The stir indicator light will blink while reaching the set-point. Once the set-point is reached the light will remain lit.
   b. Speed adjustments can be made without interrupting stirring by turning the stir knob clockwise to increase speed, or counter-clockwise to decrease speed.
   c. To stop stirring, turn the stir knob to the off position. Your vessel can then be removed.

## Operating Tips

**Stir protection:**
If stirrer motor stops or fails, the unit will automatically shut down the heater.

The stirrer increases speed at a steady rate until the set-point is reached, if the stir bar is too large or the liquid is too viscous, the stirrer may not reach its set-point. The set-point speed needs to be reduced. The stir bars magnetic strength can reduce over time and may need to be replaced.

**Stirring vessels in oil baths:**

When heating and stirring a reaction vessel within an oil bath or similar set-up, the stirring function will stir up to approximately one (1) inch (2.54cm) from the top plate. The stirring speed will vary according to liquid viscosity, stir bar length and distance from the top plate. Adjust one or all of these to achieve the desired stirring speed.

**EXAMPLE:** The closer the reaction vessel is to the top plate the stronger the magnetic connection.

## Technical Service

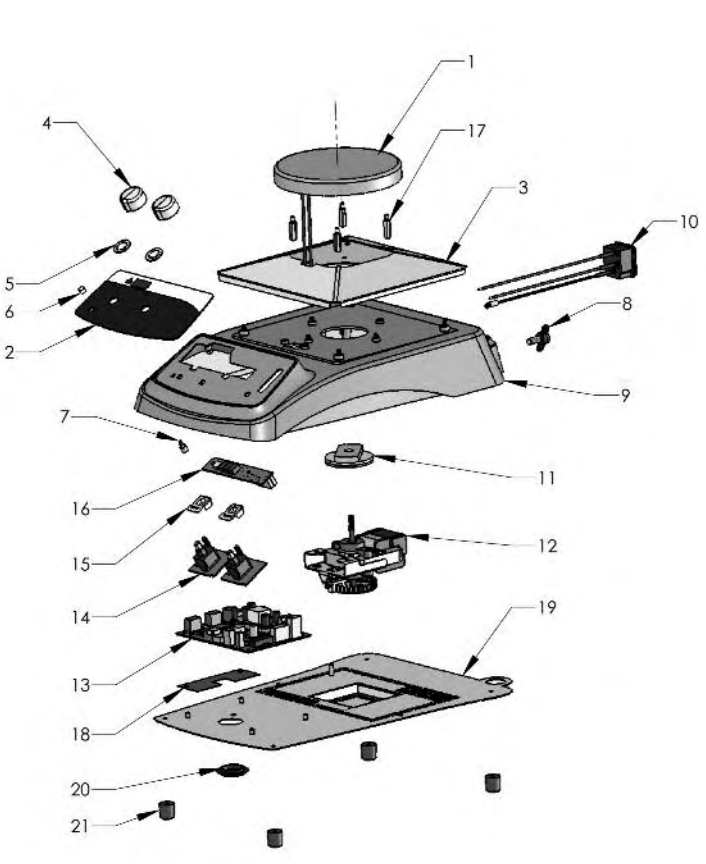
For information or technical assistance contact your local VWR representative or visit vwr.com.

## Troubleshooting

If the unit gives an error code, immediately switch the unit off. See error table below for proper corrective action. If the error cannot be cleared, please contact your VWR representative for repairs.

| Error | Cause of Error | How to Fix |
|---|---|---|
| **E1** | An “E1” error means the heater sensor is open or malfunctioned. | This error cannot be fixed by the end user. Please contact your VWR representative for repair. |
| **E2** | An “E2” error means the heater sensor shorted or malfunctioned. | This error cannot be fixed by the end user. Please contact your VWR representative for repair. |
| **E3** | An “E3” error means there is either no motion on the motor or the motor is not working properly. | Reset the unit by rotating the knobs for speed and heat to the off positions until they click then turn them back on. If it still doesn’t work, please contact your VWR representative for repair. |
| **E6** | An “E6” error means there is an internal electronics system error. | This error cannot be fixed by the end user. Please contact your VWR representative for repair. |
| **E8** | An "E8" error means the unit had a catastrophic over temperature condition or temperature runaway condition (temperature greater than 600°C) and therefore automatically shut down to prevent damage. | This error cannot be fixed by the end user. Please contact your VWR representative for repair. |
| **E9** | An “E9” error means the heater failed. This might occur if heater temperature fails to rise when asked to, or there is a sudden drop in heater temperature for no apparent reason. | This error cannot be fixed by the end user. Please contact your VWR representative for repair. |

## Replacement Parts




| Description | | Part Number |
|---|---|---|
| 1. Top Plate Assembly: | Stainless steel, 120V | 886330-00 |
| | Stainless steel, 230V | 886331-00 |
| 2. Front Panel Overlay | | 386266-00 |
| 3. Formed Top | | 286704-00 |
| 4. Control Knob | | 286116-00 |
| 5. Internal Lock Washer | | 130015-00 |
| 6. Last Temperature Cap | | 386101-00 |
| 7. Last Temperature Switch | | 386104-00 |
| 8. Thumb Knob, Support Stand | | 186208-00 |
| 9. Housing | | 286614-00 |
| 10. IEC Module: | 120V | 386679-00 |
| | 230V | 386681-00 |
| | Fuse, 10 amp | 386005-00 |
| 11. Magnetic Flywheel | | 286616-00 |
| 12. Motor Assembly: | 120V | 286623-00 |
| | 230V | 286627-00 |
| 13. Main PCB | | 386693-00 |
| 14. Pot Module | | 386661-00 |
| 15. Pot Plate | | 286630-00 |
| 16. Single Display Module | | 386663-00 |
| 17. Hex Standoff | | 186150-00 |
| 18. PCB Insulator | | 386863-00 |
| 19. Bottom Plate | | 286611-00 |
| 20. Cap | | 186201-00 |
| 21. Foot | | 186200-00 |
| Detachable 92" (234cm) power cord: | 120V | 330100-00 |
| | 230V Euro | 330101-00 |

## UNI-BLOCKS

| TEST TUBES | | | | |
|---|---|---|---|---|
| **Sample Type** | **No. of Wells** | **Well Dia.** | **Well Depth** | **Cat No.** |
| 12mm Tube | 40 | 12.7mm | 45.7mm | 89171-904 |
| 16mm Tube | 32 | 17.5mm | 45.7mm | 89171-906 |
| 20mm Tube | 32 | 20.5mm | 45.7mm | 89171-908 |
| 25mm Tube | 24 | 25.4mm | 41.9mm | 89171-910 |

| VIALS | | | | |
|---|---|---|---|---|
| **Sample Type** | **No. of Wells** | **Well Dia.** | **Well Depth** | **Cat No.** |
| 12mm Vial (2mL) | 40 | 12.7mm | 16.8mm | 89171-894 |
| 15mm Vial (1 dram) | 40 | 15.5mm | 16.8mm | 89171-896 |
| 17mm Vial (2 dram) | 32 | 17.8mm | 16.8mm | 89171-898 |
| 21mm Vial (4 dram) | 24 | 21.5mm | 16.8mm | 89171-900 |
| 28mm Vial | 16 | 28.8mm | 16.8mm | 89171-902 |

## SECTIONAL BLOCKS

| TEST TUBES | | | | |
|---|---|---|---|---|
| **Sample Type** | **No. of Wells** | **Well Dia.** | **Well Depth** | **Cat No.** |
| 12mm Tube | 9 | 12.7mm | 45.7mm | 89171-886 |
| 16mm Tube | 8 | 17.5mm | 45.7mm | 89171-888 |
| 20mm Tube | 5 | 20.5mm | 45.7mm | 89171-890 |
| 25mm Tube | 5 | 25.4mm | 41.9mm | 89171-892 |

| VIALS | | | | |
|---|---|---|---|---|
| **Sample Type** | **No. of Wells** | **Well Dia.** | **Well Depth** | **Cat No.** |
| 12mm Vial (2mL) | 9 | 12.7mm | 16.8mm | 89171-876 |
| 15mm Vial (1 dram) | 10 | 15.5mm | 16.8mm | 89171-878 |
| 17mm Vial (2 dram) | 7 | 17.8mm | 16.8mm | 89171-880 |
| 21mm Vial (4 dram) | 5 | 21.5mm | 16.8mm | 89171-882 |
| 28mm Vial | 3 | 28.8mm | 16.8mm | 89171-884 |

| ACCESSORIES | |
|---|---|
| **Description** | **Cat No.** |
| Base plate for 153mm diameter plates | 89171-872 |
| Safety Handles (2) | 89171-874 |

Manufactured by:

**HENRY TROEMNER LLC**

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