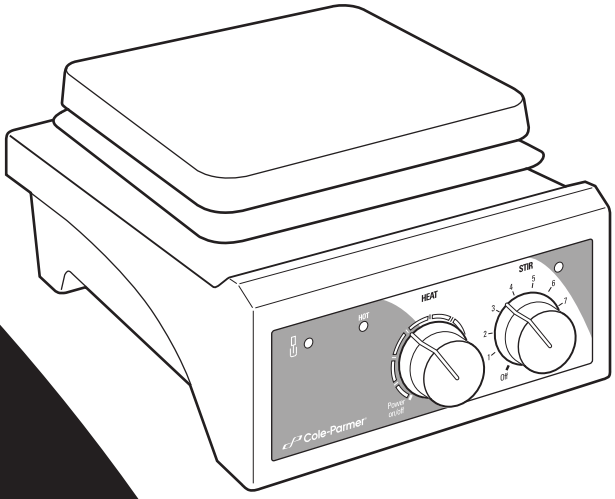
Range of Hot Plates & Stirrers



User Guide

Cole-Parmer®

Version 1.3

Figure 1 - Front view

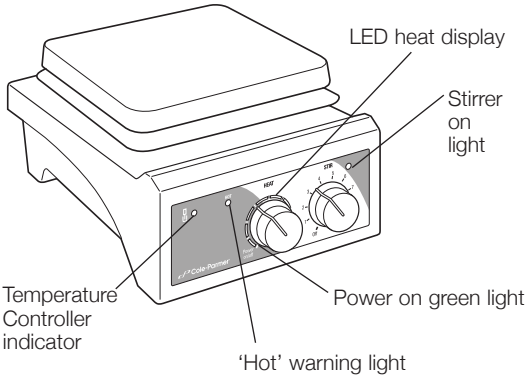


Figure 2 - Rear view

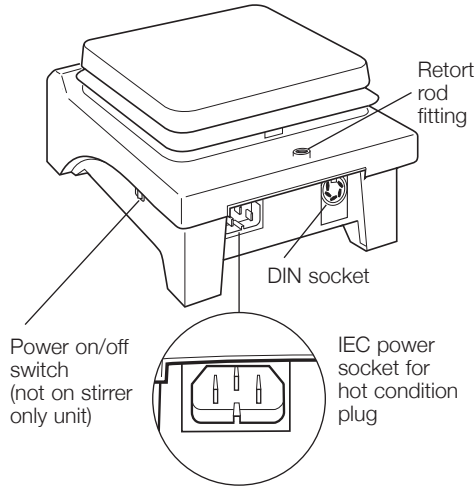


Figure 3 - Front panel (analog versions)

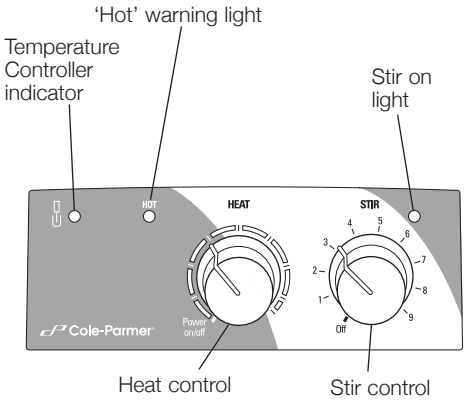
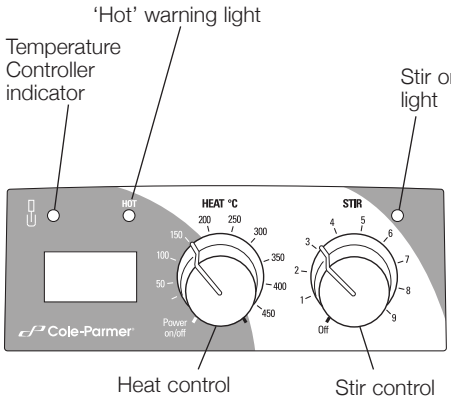


Figure 4 - Front panel (digital versions)



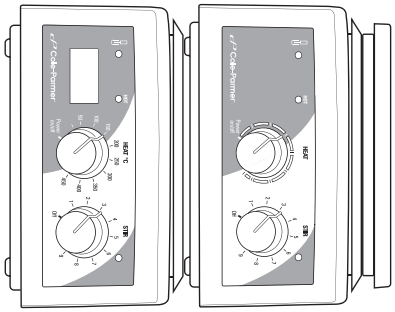


Figure 5 - Stacked on side view (as viewed from above)

Hot Plates & Stirrers

Introduction

Thank you for purchasing this Cole-Parmer product. To get the best performance from the equipment, and for your own safety, please read these instructions carefully before use. Before discarding the packaging check that all parts are present and correct.

This equipment is designed to operate under the following conditions:

- For indoor use only
- Use in a well ventilated area
- Ambient temperature range +5°C to +40°C (+41°F to 104°F)
- Altitude to 2000 m, (6500 ft)
- Relative humidity not exceeding 80%
- Power supply fluctuations not exceeding 10% of nominal
- Overvoltage category II IEC60364-4-443
- Pollution degree 2 IEC664
- Use with a minimum distance all round of 200 mm, (8 in.) from walls or other items

If the equipment is not used in the manner described in this manual and with accessories other than those recommended by the manufacturer, the protection provided may be impaired.

Electrical Installation

THIS EQUIPMENT MUST BE GROUNDED

Before connection please ensure that the line supply corresponds to that shown on the rating plate located on the base of the unit.

Power requirements:

120 V Models		**230 V Models**	
04801-20	500 W	04801-22	500 W
04801-24	700 W	04801-26	700 W
04801-50	50 W	04801-52	50 W
04801-54	50 W	04801-56	50 W
04801-60	550 W	04801-62	550 W
04801-65	750 W	04801-67	750 W
04801-64	550 W	04801-66	550 W
04801-68	750 W	04801-70	750 W

There is an IEC hot condition power socket (C16) for a hot condition IEC plug (C15).

The 120 V unit is provided with a power/mains lead fitted with an IEC hot condition (C15) plug and with a NEMA 5-15 plug for connection to the power supply.

The 230 V unit is provided with a power/mains lead fitted with an IEC hot condition (C15) plug and with either a UK 3-pin plug and a “Schuko” 2-pin plug for connection to the power supply.

Should the cable not be suitable for connecting to the power supply, replace the plug with a suitable alternative.

THIS OPERATION SHOULD ONLY BE UNDERTAKEN BY A QUALIFIED ELECTRICIAN.

NOTE: Refer to the equipment rating plate to ensure that the plug and fusing are suitable for the voltage and wattage stated.

The wires in the power cable (120 V) are colored as follows:

BLACK - HOT/LIVE
WHITE - NEUTRAL
GREEN - EARTH

The wires in the power cable (230 V) are colored as follows:

BROWN - HOT/LIVE
BLUE - NEUTRAL
GREEN/YELLOW - EARTH

Should the power cable need replacing, a cable of 1 mm^2 of harmonized code H05RR-F or H05RN-F connected to an IEC hot condition plug should be used.

IF IN DOUBT CONSULT A QUALIFIED ELECTRICIAN

The appropriate power cable should be connected BEFORE connection to the power supply.

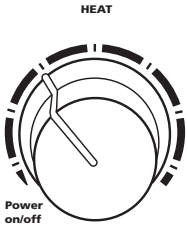
Safety Advice

- HIGH TEMPERATURES ARE DANGEROUS as they can cause serious burns to operators and ignite combustible material. Users should be aware of the following safety advice:
- USE CARE AND WEAR PROTECTIVE GLOVES TO PROTECT HANDS.
- DO NOT use combustible substances near hot objects.
- NEVER lift or carry the instrument until it has been switched off and allowed to cool for at least 30 minutes. The hot warning light will give guidance.
- The unit should be carried using both hands with the fingers under the side edges.
- NEVER move or carry the unit with containers on the top plate or while still connected to the power supply.
- There is a danger of liquid spillage if containers are over-filled and stirred at high speed. Always build stirrer speed slowly and never stir more rapidly than necessary.
- NEVER place a cold glass vessel onto a hot plate which is already hot.
- NEVER use a retort rod longer than 600 mm (23.6 in.).
- When a retort rod is installed with apparatus attached, or when swivelling support rods, take care that there is sufficient weight on the plate to prevent the whole unit tipping over.
- When using a retort stand, in order to provide the unit with adequate ventilation the base of the retort stand must NOT exceed 19.5 mm (0.75 in.) in height and 125 mm (5 in.) in width.

Operation

Analog Hot Plate Models

Switch the unit on using the power on/off switch (see Figure 2).



The control dial labelled “HEAT” on the front panel controls the heat output and hence the plate temperature. The approximate temperature is indicated visually by LED back-lighting that increases from Green to Red. The temperature range for your model can be referenced in the technical specifications section.

Turn the control dial clockwise to the desired plate temperature. As the plate heats up the LED temperature segments around the dial will light up in turn and their light intensity increase until the surface temperature is reached. The LED temperature segments refers to the temperature of the top plate and not to the temperature of the contents of the vessel being heated. Conversely if the unit is cooling, the LED temperature segments will go out as the plate approaches the set temperature.

Digital Hot Plate Models

Switch the unit on using the power on/off switch (see Figure 2). When the control dial labelled “HEAT” is pointing to the Power on/off position, the LED display will show the word “OFF”. Turn the control dial to the required temperature which will be shown on the LED display. The temperature will increase in 5°C (41°F) steps. A few seconds after setting the temperature, the display will revert to showing the actual temperature of the hot plate.

If the unit is switched off using the power on/off switch while the control dial is in a set position, the next time the unit is switched on, the LED display will show the word “On” followed briefly by the previously set temperature. The display will then revert to the actual top plate temperature and the unit will then begin to heat to the set temperature.

WARNING: When the surface becomes too **HOT** to touch the red "**HOT**" warning light on the front panel will begin to flash (see Figure 1). This will continue to flash while the plate temperature is above 50°C (122°F) for a maximum of 30 minutes, even if the unit is disconnected from the electricity supply.

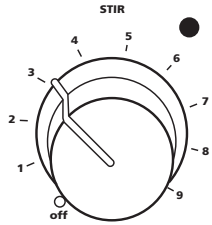
WARNING: The plate may still be **HOT** beyond 30 minutes when large masses are left on the plate, even though the **"HOT"** warning light has gone out.

WARNING: The top surface of the instrument may be **HOT,** especially in free air when a surface temperature of 450°C (842°F) can be achieved on the ceramic top models and 325°C, (617°F) on the metal top models. Do not leave heaters switched on when not in use.

Stirring Models

Your unit is provided with two 25 mm (1 in.) PTFE stirrer bars. These should be placed in the liquid to be stirred. They are suitable for liquid volumes up to 500mL (16 fl oz).

Turn ON by turning the dial clockwise from the OFF position.



The control dial labelled “STIR” on the front panel controls the stirrer speed. When switched on, a green light illuminates (see Figure 1). The dial is graduated with an arbitrary 1-9 scale. Turning the dial to a higher number increases the stirrer speed.

Using the Optional Temperature Controller Accessory

The temperature controller allows accurate temperature control of aqueous and oil based samples in the laboratory and can be used in two different modes, as a precise temperature controller from 20°C to 200°C (20°F to 392°F) or as a digital thermometer from -4 to 325°C (25°F to 617°F).

Connection of the temperature controller probe is via the DIN probe socket located at the rear of the hot plate (see Figure 2).

In control mode, the heat control of the hot plate is disabled, allowing precise control of sample temperature via the temperature controller. The illuminated contact thermometer indicator LED indicates communication between the temperature controller and hot plate (see Figure 3).

When used in monitor mode, the controller operates as a digital thermometer and the hot plate temperature is controlled by the “HEAT” control dial as described above. In this mode the LED temperature segments adjacent to the “HEAT” control dial (analog models) or the LED temperature display (digital models) refer to the surface temperature of the hot plate not the sample.

For full instructions on use please refer to the temperature controller user guide.

Cleaning and Care

Before Attempting Cleaning:
Ensure that the top is cool, disconnect from the power supply.

Metal Casework:
The metal casing should be cleaned using a damp cloth and a mild detergent solution.

Ceramic Top Units:
A damp cloth will normally remove most types of contamination. For more difficult stains a domestic cream cleanser is recommended.

Cleaning is made easier if spillages are attended to promptly. In any case, spillages of alkali, phosphoric acid and hydrofluoric acid MUST be removed immediately as these chemicals can attack and damage the glass ceramic. Ensure that the appropriate safety precautions are observed.

During cleaning and general operation take care not to scratch the surface of the top plate as this could result in subsequent thermal breakage.

WARNING: A ceramic top which is scratched, chipped, chemically etched or damaged must not be used.

Metal Top Units:
The metal top plate should be cleaned using a damp cloth and a mild detergent solution.

Cleaning is made easier if spillages are attended to promptly. In any case, spillages of acids and alkalis MUST be removed immediately as these chemicals can attack and damage the surface of the coated aluminum alloy. Ensure that the appropriate safety precautions are observed.

Preparation of Media
Take particular care when heating liquids having a high viscosity. Viscous liquids can act as thermal insulators and can cause thermal breakage of the glassware. This is very important with media solutions as the viscosity will usually increase as the temperature rises.

- ❖ Check that the stirring action is sufficient to agitate the whole of the liquid. Unstirred areas in the liquid can result in uneven heat transfer and “hot spots” in the glassware. This can induce thermal stress and so cause failure.
- ❖ Check the stirring action regularly to ensure that it remains adequate as the viscosity of the solution increases.
- ❖ Always use the largest magnetic stirrer bar possible and, if necessary, use a mechanical overhead stirrer.
- ❖ Do not use glass vessels with thick walls, e.g. Pyrex Heavy Duty Ware or standard beakers and flasks having capacities of 5 liters (170 fl oz) or greater.
- ❖ NEVER heat glass bottles on a hot plate.
- ❖ Ensure that the heat is built up slowly to avoid localized overheating.
- ❖ Ensure the glassware is completely free from scratches or other defects.
- ❖ Place the hot plate in a tray large enough to contain the liquid in the event of glassware failure.
- ❖ Wear the appropriate safety clothing, e.g. gloves, goggles, protective apron etc.

Storage
The unit is designed so that the top plate fits into the base plate of the next unit for easy and compact storage when placed on their side (see Figure 5).

Accessories

Retort Rod
The optional Retort rod is available to support apparatus used with the instrument. The instrument is equipped with a fitting on the rear to accept the support rod accessory available from Cole-Parmer (see Figure 2). To fit the rod to your instrument, first isolate unit from the power supply and allow to cool. Screw the threaded end of the support rod into the fitting on the rear of the instrument. The shape of the base also allows a rectangular shaped retort rod stand, whose dimensions must not exceed 19.5 mm (0.75 in.) high and 125 mm (5 in.) wide, to be placed directly underneath the unit. The Retort Rod accessory is 12 mm (0.47 in.) wide x 600 mm (23.6 in.) high.

Temperature Controller
For more information on the optional temperature controller and its usage, please see page 6.

Heating Blocks
A complete range of modular heating blocks for heating round bottom flasks is available for use with the metal top hot plate.

Please visit the Cole-Parmer website www.coleparmer.com for further information.

Troubleshooting

Error Codes
The following error codes are displayed if the instrument detects an error condition. On the digital models the errors are shown as Er1, Er2 etc. on the LED display. On the analog models, the Er1 condition is shown by flashing the first LED on the temperature scale, Er2 would be shown by flashing the second LED and so on.

- **Er1** – Probe Range Error – If temperature controller reports probe temperature of > 325°C (617°F) or < -99°C (-146°F).
- **Er2** – Communication Lost Error – Communications with the temperature controller have been lost.
- **Er3** – Hot Plate Temperature Error – If the hot plate measures its temperature > 585°C (1085°F) or < -9.9°C (-14°F).
- **Er4** – Hot Plate Ambient Error – If the temperature sensed inside the hot plate (not the plate temperature) is 85°C (185°F).
- **Er5** – Character Error – An unknown character was received from the temperature controller accessory.
- **Er6** – Probe Out Error – The instrument detects that the temperature controller probe has been removed from the solution being heated.
- **Er7** – Timeout Error – The temperature controller did not respond to a request in the required time.

Servicing and Repair

This product range does not require any routine servicing.

Note: There are no internal user replaceable parts.

In the event of product failure it is recommended that any repair is only undertaken by suitably qualified personnel. For advice, please contact Cole-Parmer quoting the model and serial number.

Only spare parts supplied by the manufacturer or its agent should be used. Fitting of non-approved parts may affect the performance of the safety features of the instrument.

Note: The magnetic stirrer drive utilizes strong magnets.

If in doubt, please contact Cole-Parmer.

Warranty

Cole-Parmer warrants this equipment to be free from defects in material and workmanship, when used under normal laboratory conditions, for a period of **three (3)** years. In the event of a justified claim, Cole-Parmer will replace any defective component or replace the unit free of charge.

This warranty does NOT apply if:

- ❖ A ceramic top has broken due to mechanical impact, scratching, chipping or chemical etching.
- ❖ Any repair has been made or attempted other than by the manufacturer or its agent.
- ❖ Any minor coating chips or scratches occur during normal use (i.e., wear and tear).
- ❖ Damage is caused by fire, accident, misuse, neglect, incorrect adjustment or repair, damage caused by installation, adaptation, modification or fitting of non-approved parts.

Technical Specification

Stirring Hot Plates	**120 V: 04801-65** **230 V: 04801-67**	**120 V: 04801-60** **230 V: 04801-62**	**120 V: 04801-68** **230 V: 04801-70**	**120 V: 04801-64** **230 V: 04801-60**
Plate material	Coated aluminum/silicon	Glass ceramic	Coated aluminum/silicon	Glass ceramic
Plate dimensions	150 x 150 mm / (6 x 6 in.) all models			
Heated area	150 x 150 mm (6 x 6 in.)	120 x 120 mm (4.75 x 4.75 in.)	150 x 150 mm (6 x 6 in.)	120 x 120 mm (4.75 x 4.75 in.)
Heater control	Analog	Analog	Digital	Digital
Heater power	700 W	500 W	700 W	500 W
Max. plate temp	325°C / (617°F)	450°C / (842°F)	325°C / (617°F)	450°C / (842°F)
Min. set temp	-	-	25°C / (77°F)	25°C / (77°F)
Stirrer speed, rpm	100-2000	100-2000	100-2000	100-2000
Max. stirring capacity*	15 L / (4 gal.) all models			
Supports Temperature Controller	Yes	Yes	Yes	Yes
Accuracy with Controller	±1°C / (±2°F)	±1°C / (±2°F)	±1°C / (±2°F)	±1°C / (±2°F)
Dimensions (w x d x h)	172 x 248 x 120 mm (6.75 x 9.75 x 4.7 in.)	172 x 248 x 122 mm (6.75 x 9.75 x 4.8 in.)	172 x 248 x 120 mm (6.75 x 9.75 x 4.7 in.)	172 x 248 x 122 mm (6.75 x 9.75 x 4.8 in.)
Net weight all models	2.9 kg / (6.4 lbs)			
Power	750 W	550 W	750 W	550 W
Electrical supply	120 V, 60 Hz or 230 V, 50 Hz	120 V, 60 Hz or 230 V, 50 Hz	120 V, 60 Hz or 230 V, 50 Hz	120 V, 60 Hz or 230 V, 50 Hz

Hot Plates	**120 V: 04801-24** **230 V: 04801-26**	**120 V: 04801-20** **230 V: 04801-22**
Plate material	Coated aluminum/silicon	Glass ceramic
Plate dimensions	150 x 150 mm / (6 x 6 in.)	150 x 150 mm / (6 x 6 in.)
Heated area	150 x 150 mm / (6 x 6 in.)	120 x 120 mm / (4.75 x 4.75 in.)
Heater control	Analog	Analog
Heater power	700 W	500 W
Max. plate temp	325°C / 615°F	450°C / 842°F
Supports Temperature Controller	Yes	Yes
Accuracy with Controller	±1 C / (±2°F)	±1 C / (±2°F)
Dimensions (w x d x h)	172 x 248 x 120 mm (6.75 x 9.75 x 4.7 in.)	172 x 248 x 122 mm (6.75 x 9.75 x 4.8 in.)
Net weight	2.2kg / (4.8 lbs)	2.2kg / (4.8 lbs)
Power	700 W	500 W
Electrical supply	120 V, 60 Hz or 230 V, 50 Hz	120 V, 60 Hz or 230 V, 50 Hz

Stirrers	**230v: 04801-56** **120v: 04801-54**	**230v: 04801-52** **120v: 04801-50**
Plate material	Stainless steel	Glass ceramic
Plate dimensions	150 x 150 mm / (6 x 6 in.)	150 x 150 mm / (6 x 6 in.)
Speed control	Analog	Analog
Stirrer speed, rpm	100-2000	100-2000
Max. stirring capacity	15 L / (4 gal.)	15 L / (4 gal.)
Supports Temperature Controller	No	No
Dimensions (w x d x h)	172 x 248 x 109 mm (6.75 x 9.75 x 4.3 in.)	172 x 248 x 107 mm (6.75 x 9.75 x 4.2 in.)
Net weight	2.0 kg / (4.4 lbs)	2.0 kg / (4.4 lbs)
Power	50 W	50 W
Electrical supply	120 V, 60 Hz or 230 V, 50 Hz	120 V, 60 Hz or 230V , 50 Hz

**Based on water contained in a 20 liter (5.2 gal.) glass bottom flask.*

CE These products meet the relevant EC harmonized standards for radio frequency interference and may be expected not to interfere with, or be affected by, other equipment with similar qualifications. We cannot be sure that other equipment used in their vicinity will meet these standards and we cannot guarantee that interference will not occur in practice. Where there is a possibility that injury, damage or loss might occur if equipment malfunctions due to radio frequency interference, or for general advice before use, please contact the manufacturer.

Declaration of Conformity

Catalog Number:	Description:
04801-20	ADVANCED ANALOG HOT PLATE, CERAMIC, 120 V
04801-22	ADVANCED ANALOG HOT PLATE, CERAMIC, 230 V
04801-50	ADVANCED ANALOG STIRRER, CERAMIC, 120 V
04801-52	ADVANCED ANALOG STIRRER, CERAMIC, 230 V
04801-60	ADVANCED STIRRING HOT PLATE, CERAMIC, 120 V
04801-62	ADVANCED STIRRING HOT PLATE, CERAMIC, 230 V
04801-64	ADVANCED DIGITAL STIRRING HOT PLATE, CERAMIC, 120 V
04801-66	ADVANCED DIGITAL STIRRING HOT PLATE, CERAMIC, 230 V
04801-24	ADVANCED ANALOG HOT PLATE, ALUMINUM, 120 V
04801-26	ADVANCED ANALOG HOT PLATE, ALUMINUM, 230 V
04801-54	ADVANCED ANALOG STIRRER, STAINLESS, 120 V
04801-56	ADVANCED ANALOG STIRRER, STAINLESS, 230 V
04801-65	ADVANCED STIRRING HOT PLATE, ALUMINUM, 120 V
04801-67	ADVANCED STIRRING HOT PLATE, ALUMINUM, 230 V
04801-68	ADVANCED DIGITAL STIRRING HOT PLATE, ALUMINUM, 120 V
04801-70	ADVANCED DIGITAL STIRRING HOT PLATE, ALUMINUM, 230 V

These products comply with the requirements of the EU Directives listed below:

2004/108/EC	**EMC Directive**
2006/95/EC	**Low Voltage Directive (LVD)**
2011/65/EC	**RoHs Directive**

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