



# GUARDIAN™

## Hotplates & Stirrers Comparison Guide











The Guardian Hotplates & Stirrers Comparison Guide gives you an in-depth look into the differences between the 4 levels of the Guardian series. Use both the chart and frequently asked questions to find which Guardian works best for your lab.

***Ingeniously Practical***

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# GUARDIAN™ Comparison Chart

|                      |              |                 |          |      |
|----------------------|---|--|---|---|
| Features             | <b>GUARDIAN 7000</b>  | <b>GUARDIAN 5000</b>   | <b>GUARDIAN 3000</b>  | <b>GUARDIAN 2000</b>  |
| Functions            | Hotplate-Stirrer  | Hotplate-Stirrer<br>Hotplate<br>Stirrer  | Hotplate-Stirrer  | Hotplate-Stirrer<br>Hotplate<br>Stirrer   |
| Top Plate Dimensions | 7x7 inch (17.8 x 17.8 cm)<br>10x10 inch (25.4 x 25.4 cm)<br>Round 5.3 inch diameter (13.5 cm) |  | 4x4 inch (10.2 x 10.2 cm)<br>7x7 inch (17.8 x 17.8 cm)<br>Round 5.3 inch diameter (13.5 cm) |   |
| Top Plate Material   | Ceramic = 7x7 and 10x10<br>Aluminum = Round   | Ceramic = 7x7 and 10x10<br>Resin = 7x7 Stirrer<br>Aluminum = Round                               | Ceramic = 4x4 and 7x7<br>Ceramic Coated Steel =<br>Round                                    | Ceramic = 4x4 and 7x7<br>Resin = 4x4 and 7x7 Stirrer<br>Ceramic Coated Steel =<br>Round |
| Housing              | SmartHousing™   |  | Painted Aluminum  |   |
| Control              | Digital/Microprocessor  |  |   | Analog  |
| Hot Top Indicator    | Triangle and Progress Bar   | Triangle Only  |   |   |
| SmartLink™           | Yes   | – <a href="#">Distributed by:<br/>Safety Emporium</a>  |   |   |
| SmartPresence™       | Yes   | – <a href="#">PO Box 1003<br/>Blackwood, NJ 08012<br/>Ph: (866) 326-5412 toll-free</a>           |   |   |
| SmartRate™           | Yes - Temperature and Speed   | – <a href="#">Fax: (856) 553-6154<br/>esupport@safetyemporium.com<br/>www.safetyemporium.com</a> |   |   |
| SmartHeat™           | Yes   | –  |   |   |
| SafetyHeat™          | Yes   |  |   | –   |
| Programmability      | Yes   | –  |   |   |
| LCD - Display        | 4.3 x 1.3 in (10.9 x 3.3 cm)  |  | 2.9 x 0.8 in (7.4 x 2.0 cm)   | No Display  |
| LCD - Timer          | Yes   | –  |   |   |
| LCD - Temperature    | Set and Actual  | Toggle to see Set and Actual   |   | No Display  |
| LCD - Speed          | Set and Actual  | Set  |   | No Display  |

|                                 |    |  |                                     |  |
|---------------------------------|---|---|--|---|
| Features                        | <b>GUARDIAN 7000</b>  | <b>GUARDIAN 5000</b>  | <b>GUARDIAN 3000</b>   | <b>GUARDIAN 2000</b>  |
| Front Panel Material            | Glass   | Polycarbonate   | PET  |   |
| Temperature Range               | Ambient +5°C - 500°C (ceramic)<br>Ambient +5°C - 380°C (Aluminum and Ceramic Coated Steel)                                |   |  | 70°C - 500°C (ceramic)<br>50°C - 380°C (Aluminum and Ceramic Coated Steel)          |
| Temperature Stability - plate   | +/- 1% >100°C<br>+/- 1°C < 100°C  | +/- 3% >100°C<br>+/- 2°C < 100°C  |  | -   |
| Temperature Stability - probe   | +/- 0.5% >100°C<br>+/- 1°C < 100°C  | +/- 1% >100°C<br>+/- 1°C < 100°C  | +/- 2% >100°C<br>+/- 2°C < 100°C   | No Probe Connector  |
| Temperature Accuracy - probe    | +/- 0.5°C<br>(@100°C after SPC)   | -   |  | No Probe Connector  |
| Temperature Readability         | 0.1°C   | 1°C   |  | -   |
| Temperature Calibration - plate | 5 points  | 3 points  | 1 point  | -   |
| Temperature Calibration - probe | 5 points  | 3 points  | 1 point  | -   |
| Time to Boil                    | 1 L in 2 L beaker<br>7x7 = 21 min<br>10x10 = 25 min<br>Round = 24 min   |   | 500 mL in 1 L beaker<br>4x4 = 30 min<br>7x7 = 18 min<br>Round = 25 min   |   |
| Stir Capacity                   | 7x7 = 15 L / 10x10 = 18 L / Round = 20 L  |   | All Models = 15 L  |   |
| Speed Range                     | 60 - 1600 rpm   |   | 80 - 1600 rpm  | 200 to 1600 rpm   |
| Speed Stability                 | +/- 2%  |   |  | -   |
| IP Rating                       | IP21  |   |  |   |
| Footprint                       | 7x7 = 12.2 x 8.8 in (30.9 x 22.3 cm)<br>10x10 = 16.3 x 11.3 in (41.5 x 28.6 cm)<br>Round = 10.5 x 6.8 in (26.7 x 17.3 cm) |   | 4x4 = 10.4 x 6.4 in (26.4 x 16.3 cm)<br>7x7 = 12.5 x 8.8 in (31.8 x 22.3 cm)<br>Round = 10.4 x 6.4 in (26.4 x 16.3 cm) |   |
| Power Consumption               | 7x7 = 1080W (120V) / 1242W (230V)<br>10x10 = 12110W (120V) / 1149W (230V)<br>Round = 896W (120V) / 952W(230V)             |   | 4x4 = 550W<br>7x7 = 1050W<br>Round = 550W  | 4x4 = 535W<br>7x7 = 1035W<br>Round = 535W   |

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# GUARDIAN™ *Frequently Asked Questions*

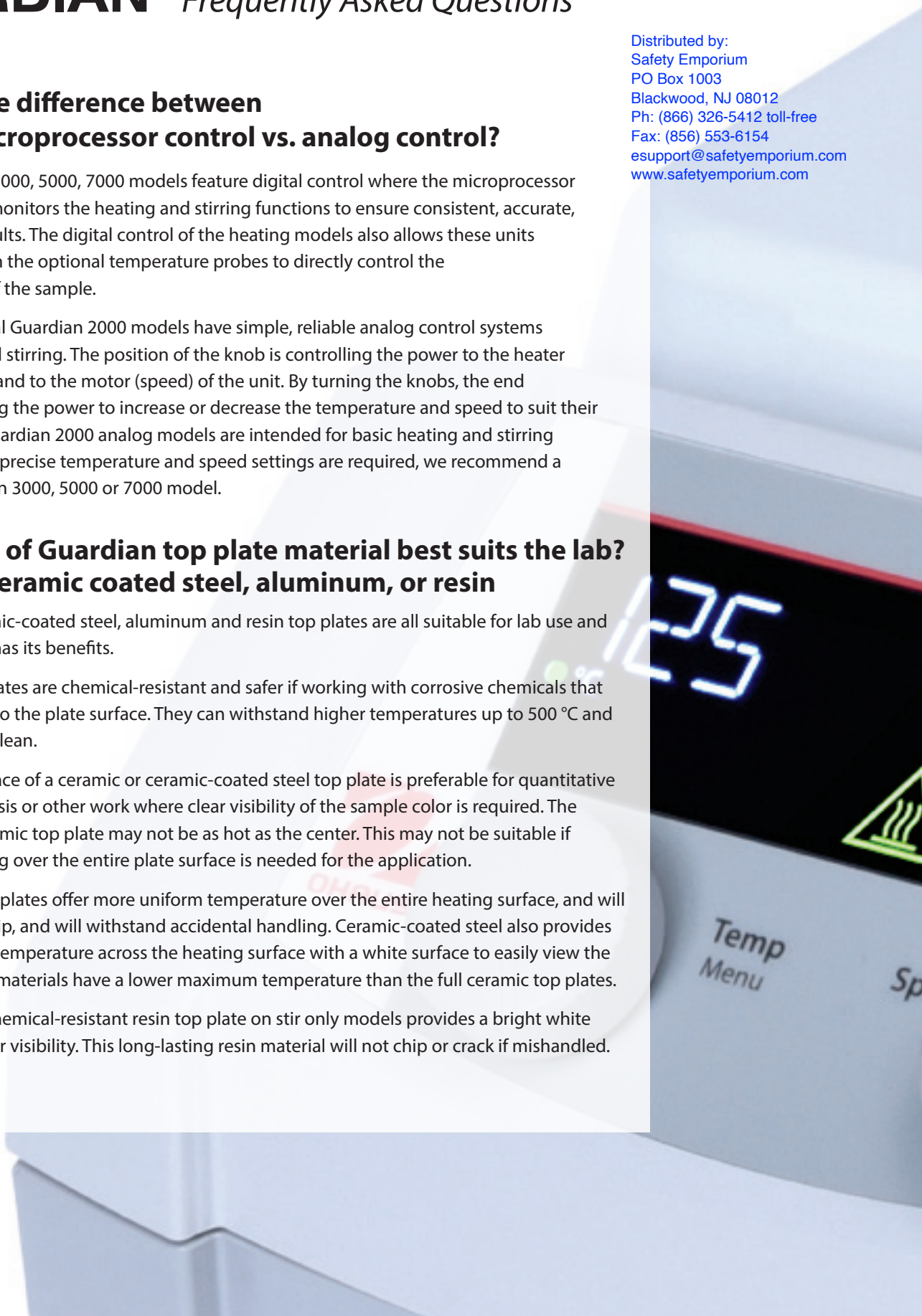
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## What is the difference between digital/microprocessor control vs. analog control?

- The Guardian 3000, 5000, 7000 models feature digital control where the microprocessor continuously monitors the heating and stirring functions to ensure consistent, accurate, repeatable results. The digital control of the heating models also allows these units to be used with the optional temperature probes to directly control the temperature of the sample.
- The economical Guardian 2000 models have simple, reliable analog control systems for heating and stirring. The position of the knob is controlling the power to the heater (temperature) and to the motor (speed) of the unit. By turning the knobs, the end user is adjusting the power to increase or decrease the temperature and speed to suit their application. Guardian 2000 analog models are intended for basic heating and stirring applications. If precise temperature and speed settings are required, we recommend a digital Guardian 3000, 5000 or 7000 model.

## What type of Guardian top plate material best suits the lab? Ceramic, ceramic coated steel, aluminum, or resin

- Ceramic, ceramic-coated steel, aluminum and resin top plates are all suitable for lab use and each material has its benefits.
- Ceramic top plates are chemical-resistant and safer if working with corrosive chemicals that may splash onto the plate surface. They can withstand higher temperatures up to 500 °C and can be wiped clean.
- The white surface of a ceramic or ceramic-coated steel top plate is preferable for quantitative chemical analysis or other work where clear visibility of the sample color is required. The edges of a ceramic top plate may not be as hot as the center. This may not be suitable if uniform heating over the entire plate surface is needed for the application.
- Aluminum top plates offer more uniform temperature over the entire heating surface, and will not crack or chip, and will withstand accidental handling. Ceramic-coated steel also provides more uniform temperature across the heating surface with a white surface to easily view the sample. These materials have a lower maximum temperature than the full ceramic top plates.
- The durable, chemical-resistant resin top plate on stir only models provides a bright white surface for clear visibility. This long-lasting resin material will not chip or crack if mishandled.





## Which safety features are built into the Guardian Series for use in academic settings?

- All Guardian heating models feature a prominent 13 mm Hot Top Indicator Light to alert the end user that the top plate surface is hot and not safe to the touch. This hot top light stays on even when the power switch is turned off. This important feature will help prevent accidents in all settings and especially academic labs where students are using hotplates and hotplate stirrers.
- The Guardian 2000 models feature simple overheat protection where the unit will turn off the heating function if the temperature exceeds the upper limit.
- Guardian 3000, 5000 and 7000 Series heating models feature SafetyHeat™; an industry leading early detection system that uses two independent safety controls to monitor the electronics and stop heating before an overtemperature condition occurs. This important feature protects the sample, the user, and the lab by preventing accidents that occur due to overheating samples.
- The digital control Guardian 3000, 5000 and 7000 models are designed so the user must press the knob to start the heating and stirring function. This knob press is also needed to change a setting. This secondary step provides an additional layer of safety by making the user acknowledge the setting. The analog control Guardian 2000 are simple knob control and easy to use where turning the knob starts the function or adjusts the current setting.
- All Guardian Series models have chemical-resistant housings and feature an easy-to-clean design that channels spills away from internal components and the front panel which protects the unit. The Guardian 5000/7000 Series models are constructed with the SmartHousing™ that remains cool to the touch at all temperature settings. The Guardian 2000/3000 Series feature a rugged metal housing that will withstand harsh conditions in the lab and also remains safe to the touch at all temperatures.

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GUARDIAN 7000



GUARDIAN 5000



GUARDIAN 3000



GUARDIAN 2000

## OHAUS Corporation

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