


# Solaris 4000R Incubated and Refrigerated Benchtop Shaker



**Greener by design™**

 **More energy efficient:**  
uses 58% less energy than prior model

 **Less hazardous:**  
uses refrigerant-free cooling system

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## Introduction

Thermo Fisher Scientific is committed to designing our products with the environment in mind. This fact sheet provides the rationale behind the environmental claim that the Thermo Scientific™ Solaris™ 4000R Incubated and Refrigerated Benchtop Shaker is more energy efficient and uses 58% less energy compared to a prior model. This fact sheet also establishes that the Solaris 4000R Refrigerated Shaker is less hazardous than the prior model since it uses a refrigerant-free cooling system.

## Product description

The Solaris 4000R Incubated and Refrigerated Benchtop Shaker sets a new standard for reliability and technical innovation. Ruggedly built for demanding use, it offers a new ergonomic design with key feature enhancements that help save you time, protect your process and drive your science forward.

Our triple eccentric drive mechanism is built upon proven technology to easily support heavy loads. The belt is maintenance-free and engineered to last the life of the shaker. The shaker mechanism itself comes with a 10-year warranty. Other useful 4000R features include:

- Exceptional reliability with heavy-duty drive mechanism
- User programmability for easy set up and reproducibility
- Compact footprint designed to fit on your benchtop
- Connectivity for easy monitoring
- Industry-leading warranty for peace of mind

## Green features

### More energy efficient

The Solaris 4000R shaker uses 58% less energy than the prior model Thermo Scientific™ MaxQ™ 4000 Benchtop Orbital Shaker (Table 1). Choosing the Solaris 4000R shaker over the prior model MaxQ™ 4000 shaker would save 1,715 kWh of energy over the course of one year of typical use. This savings represents 1.2 metric tons of CO<sub>2</sub> equivalents, the same greenhouse gas emissions from driving 3,000 miles in an average passenger car [1]. It also translates into an energy cost savings of \$181 annually [2], based on commercial sector electricity rates.

### Less hazardous

In addition to using less energy, Solaris 4000R has a refrigerant-free cooling system. In contrast, the prior model MaxQ 4000 shaker uses R-134a refrigerant. The United States Environmental Protection Agency [3] and European Commission [4] have identified hydrofluorocarbon (HFC) refrigerants like R-134a to be powerful greenhouse gases with significant global warming potential. We are phasing out the use of these coolants in favor of more environmentally friendly alternatives.

The Solaris 4000R's refrigerant-free cooling system is more efficient than traditional refrigerant compressor-based heating and cooling systems, which use more energy as they switch on heating or cooling at full power to continually adjust temperature. The updated refrigerant-free cooling system instead uses solid-state Peltier elements, which can be set to either heating or cooling. By applying the correct current for the value selected, the Peltier elements generate precise temperatures for consistent results. The refrigerant-free cooling system also eliminates the noisy moving parts typically found in refrigerant compressors.

Designing the Thermo Scientific™ Solaris 4000R Incubated and Refrigerated Benchtop Shaker to be more energy efficient and less hazardous is a win for our company, our customers, and the planet.

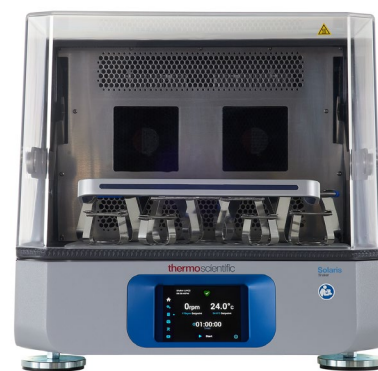
**Table 1. Comparison of energy usage between Solaris and prior model refrigerated shakers.**

Instrument	Average energy consumption (kWh/day)*	Energy use reduction with Solaris model	Cat. No.
Solaris 4000R	4.7	58.2%	SKR4002
MaxQ 4000	11.3	NA	SHKE4000-7 SHKE4000-8CE

\* Represents average of energy consumption at 5, 15, 37 and 60°C with a 24-hour run time at ambient laboratory temperature of 22°C +/-1K. Run conditions: Chamber with 18 x 18 inch platform and 5 x 250 mL flasks, each containing 50 mL of water, placed in corners and center of platform.



MaxQ 4000 Shaker



Solaris 4000R Shaker

## References

1. US EPA Greenhouse Gas Equivalencies Calculator. (2022, March 11). <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>
2. Based on an energy rate of \$0.1059 as reported as the national average Commercial rate by US Energy Information Administration. (2022, March 11). [https://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.cfm?t=epmt\\_5\\_6\\_a](https://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a)
3. US EPA. (2022, March 11). <https://www.epa.gov/snap>
4. European Commission. (2022, March 11). [https://ec.europa.eu/clima/policies/ff-gas\\_en](https://ec.europa.eu/clima/policies/ff-gas_en)

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