

Heratherm refrigerated incubators

Introduction

Thermo Fisher Scientific is committed to designing our products with the environment in mind—it's part of how we enable our customers to make the world healthier, cleaner, and safer. This fact sheet provides an in-depth review of the supporting data on reduced energy usage of Thermo Scientific™ Heratherm™ refrigerated incubators.



Green benefits

- Energy-efficient—uses 70–84% less energy than traditional compressor units
- Additional energy saved as a result of reduced heat output during operation

Product description

Heratherm refrigerated incubators (Figure 1) are designed with energy efficiency in mind. For incubation temperatures close to ambient (e.g., for microbiological, fungal, and yeast studies, or shelf-life testing), these units consume less energy than conventional, compressor-based units. Likewise, the heat output to the room is lower, which reduces the heating, ventilation, and air conditioning (HVAC) burden compared to that of conventional technology.

The Heratherm refrigerated incubators operate on Peltier technology which, in addition to saving energy, also allows precise temperature set points—all without harmful chlorofluorocarbon or hydrofluorocarbon refrigerants. The Peltier module cools and heats thermoelectrically via an automatic control, which ensures optimal adaptations based on set temperatures. Unlike in compressor-based incubators, the Peltier module always stays above 0°C in cooling mode, preventing ice accumulation and the necessity to defrost regularly. Finally, the absence of significant vibrations in the units, compared to previous models, helps to maintain sample integrity. With these efficient features, the Heratherm refrigerated incubators use up to 84% less energy than traditional compressor-based models.



Figure 1. Heratherm refrigerated incubators, available as floor-standing and benchtop models, are used for a variety of applications, including microbiological, fungal, and yeast studies, cell culture, shelf-life testing, wastewater sample testing, storage of vaccines, reagents, and antibodies, and crystallization.

* Based on measurements of two compressor units at 37° and 20°C. Details on next page.

Green features

Energy-efficient

Heratherm refrigerated incubators use 70–84% less energy to operate (at 20°C and 37°C) than the Thermo Scientific™ BK 6160 and Precision™ Low Temperature BOD refrigerated incubators (Table 1). Power consumption was measured using a Christ multimeter (model CLM1000) and a Yokogawa 2533E AC digital power meter with the incubators equilibrated to either 20°C or 37°C. Power consumption (kW) was measured for a 24 hr span

to determine energy consumption (kWh/day) after the set temperature was reached. Measurements were conducted at ambient temperature (22 ± 3°C) and humidity, similar to typical laboratory conditions. Choosing a Heratherm incubator over a traditional compressor model could save over 2,800 kWh of energy over the course of a year. Additional savings are realized because of the lower heat output of the Heratherm incubator (Table 2), which saves on HVAC energy consumption. This represents not only energy cost

savings but also an annual reduction of 2 tons of CO₂ equivalents of energy, or the greenhouse gas emission equivalent of driving more than 4,700 miles in an average passenger car [1]. Besides energy savings, the built-in Peltier technology has the added advantages of having a quiet electric operation and the absence of cooling fluids or gases that may be harmful to the environment. This represents a win for us, our customers, and the planet.

Table 1. Energy usage during operation. In heating/cooling modes, Heratherm refrigerated incubators use 70–84% less energy than compressor models.

Incubator model	Chamber volume	Temperature setting (°C)	Power usage (kW)	Run time (hr)	Energy usage (kWh/day)	Energy use reduction (%)
Heratherm IMP180	178 L	20	0.089	24	2.14	82
BK 6160	166 L	20	0.491	24	11.78	
Heratherm IMP180	178 L	20	0.089	24	2.14	70
Precision Low Temperature BOD	173 L	20	0.296	24	7.10	
Heratherm IMP180	178 L	37	0.093	24	2.23	84
BK 6160	166 L	37	0.590	24	14.16	
Heratherm IMP180	178 L	37	0.093	24	2.23	77
Precision Low Temperature BOD	173 L	37	0.404	24	9.70	

Table 2. Heat output during operation. Heratherm refrigerated incubators with a Peltier module provide lower heat output at temperature settings near ambient temperature (e.g., 20°C or 30°C) than compressor-based models.

Incubator model	Temperature setting (°C)	Heat output to surroundings (BTU/hr)	Reduction in heat output (%)
Heratherm IMP180	20	341.5	84
BK 6160	20	2,117.4	
Heratherm IMP180	37	204.9	90
BK 6160	37	2,390.6	

Reference

1. U.S. EPA Greenhouse Gas Equivalencies Calculator, www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. Accessed 29 Nov 2016

Find out more at
thermofisher.com/refrigeratedincubators

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