

Highlighting innovative design features
and useful application information for
Thermo Scientific -86°C upright freezers

smart notes

design and innovation ▶ Ultra-Low Temperature Freezers

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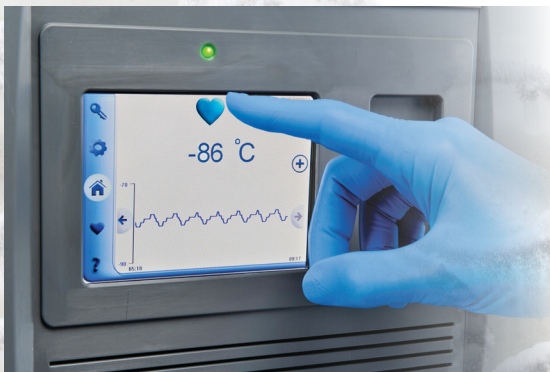


Q A

How can a water-cooled condenser option significantly reduce energy consumption and heat output without compromising sample protection?

The ability to reduce energy consumption without compromising ultra-low temperature freezer performance is a concern in today's laboratory. A water-cooled condenser option in conjunction with a Thermo Scientific™ -86°C freezer can save up to 17% in energy consumption* and reduce heat output into the lab by more than 70%*.

- Freezers with water-cooled condensers must have a constantly flowing water supply when they are running. Air alone is not sufficient to cool the freezer. In the event of insufficient water supply (or airflow for air-cooled freezers), the freezer will attempt to run as long as possible and alarm if the temperature cannot be maintained. This results in a very high stress level on the refrigeration system, but **protecting samples is always the highest priority.**
- Water-cooled freezers allow the use of a chilled or cool water system to remove the majority of the heat rejected from the freezer, significantly reducing the room cooling load.
- Cooling capacity and energy consumption for air-cooled freezers can be significantly impacted by room ambient conditions. With consistent water inlet conditions, freezers with water-cooled condensers have less sensitivity to room ambient conditions.
- Always remember to consider an optional back-up system and alarm system to provide optimal protection for your irreplaceable samples. A wireless monitoring solution is also recommended for peace of mind in the event of a mechanical or power failure.



* Internal test data comparing Thermo Scientific -86°C freezers with and without water-cooled condenser. Data on file. July, 2012

Thermo Scientific -86°C freezers with a factory-installed water-cooled condenser option, significantly reduce energy consumption and heat output.

Energy Savings or High-Performance Mode?

Thermo Scientific -86°C freezers allow you to choose the freezer's performance mode through a touch-screen user interface. For GMP applications requiring the strictest tolerances, high-performance mode provides tight temperature uniformity and peak variation. For most applications, the energy savings mode offers excellent temperature control as well as up to 15% energy savings, compared to high-performance.

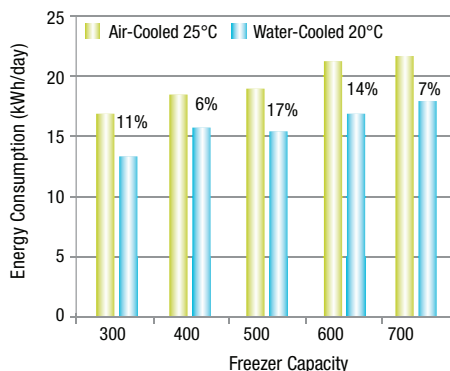
Water-Cooled Condenser Option Requirements

- Water pressure range:**
 Not to exceed 90 PSI (621 kPa)
- Water temperature range:**
 $+12^{\circ}\text{C}$ to $+25^{\circ}\text{C}$ (53.6°F to 77°F)
- Water flow rate:**
 Minimum 1.0 gallons (3.8 liters) per minute
- Water connection:**
 $\frac{1}{2}$ " NPT or $\frac{1}{2}$ " BSPT on inlet and outlet.
 Installation requires a qualified technician

Summary

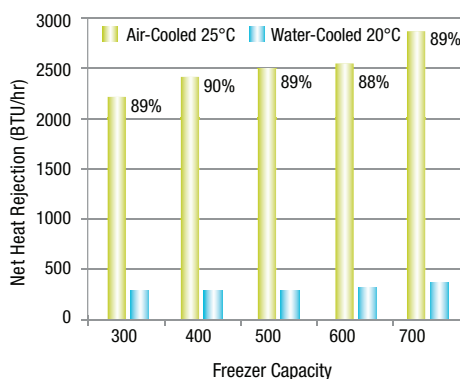
The addition of a factory-installed, water-cooled condenser reduces energy consumption and facility cooling loads in a Thermo Scientific -86°C freezer without compromising freezer performance.

* Internal test data comparing Thermo Scientific -86°C freezers with and without water-cooled condenser. Data on file. July, 2012.



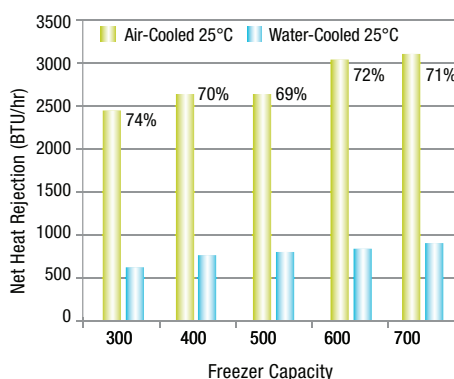
Energy Consumption Data in High Performance Mode

When installed on a Thermo Scientific -86°C freezer operating in high-performance mode, the water-cooled condenser option reduces energy consumption ranging from 7% in the 700 box capacity freezer to 17% in the 500 box capacity freezer when compared to air-cooled.*



Heat Rejection in Energy Savings Mode

When installed on a Thermo Scientific -86°C freezer operating in energy-savings mode, the water-cooled condenser option reduces heat rejection into the lab by 88% in the 600 box capacity freezer to 90% in the 400 box capacity freezer.* This reduces the need for cooling and has a significant impact on HVAC systems.



Heat Rejection in High Performance Mode

When installed on a Thermo Scientific -86°C freezer operating in high-performance mode, the water-cooled condenser option reduces heat rejection into the lab by 69% in the 500 box capacity freezer to 74% in the 300 box capacity freezer.*

Find the freezer that's right for your samples, visit thermoscientific.com/cold

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