Highlighting innovative design features
and useful applications information for
Thermo Scientific Liquid Temperature Control

smart notes

Thermo SCIENTIFIC

selection

CHILLERS AND BATH CIRCULATORS

SIZE vs. COOLING

Q A

I plan on using my bath circulator for external circulation only. Should I get a large reservoir that can absorb the heat for more stability?

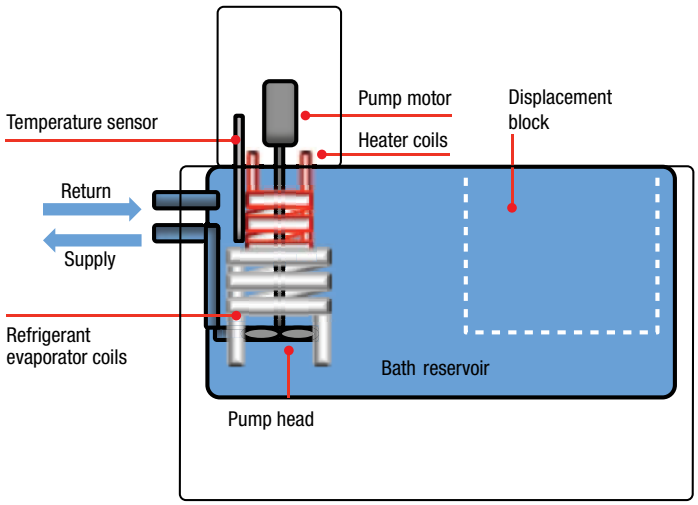
No. A large bath reservoir is not an indication of increased cooling capacity or better temperature stability. Cooling capacity is based on setpoint temperature and compressor size. Temperature stability is affected by two things: the consistency of the heat load from your application, and how precisely the heating and/or cooling is controlled by the bath circulator.

The best selection for you would be a bath circulator with the smallest possible bath reservoir that still meets your setpoint temperature and cooling capacity requirements. This will lower the load when changing from one setpoint to another, improving your time to temperature.

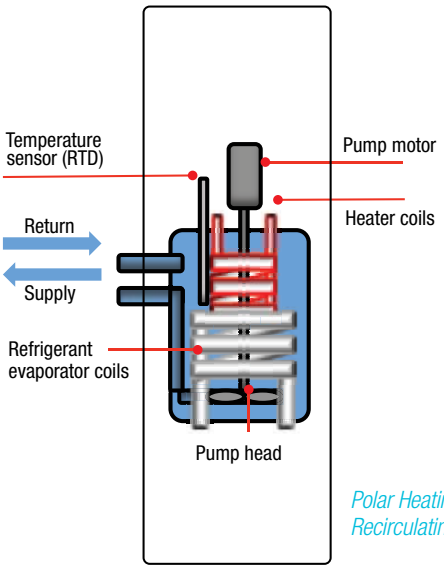
why

The stability specification of the bath is ultimately determined by how well the heater and flow of the refrigerant are controlled.

Temperature stability is not impacted by the size of the reservoir.



SAHARA Heated Bath Circulator



Polar Heating/Cooling Recirculating Chiller

It is a common misconception that a bath with a larger reservoir provides greater stability because the addition of heat energy results in a smaller temperature rise, giving it the appearance of better stability than a smaller reservoir. To achieve temperature stability, heat must be accurately removed at the same rate as it is added.

Bath Circulators

All of the factors important to the temperature stability of your application take place toward the rear of the bath reservoir (heating, cooling, pumping, temperature measurement and control).

When you need (or have) a product that has powerful cooling (up to 800W) and a large reservoir, adding a displacement block will reduce the volume. This will improve time-to-temperature by leaving more of the cooling or heating capacity for your application – where it counts!

Chillers

For applications that require up to 500W of heat removal, the optimal solution would be the “bathless” Thermo Scientific™ Polar laboratory circulators that have fast time-to-temperature, a lower cost and a smaller footprint than traditional bath circulators.

Summary

Bigger is not better. Good control of the heating and cooling is what makes the temperature of the outgoing fluid stable – not the extra volume of fluid that in bath reservoir.

Thermo SCIENTIFIC

Part of Thermo Fisher Scientific