

Rapid Beverage Cooler

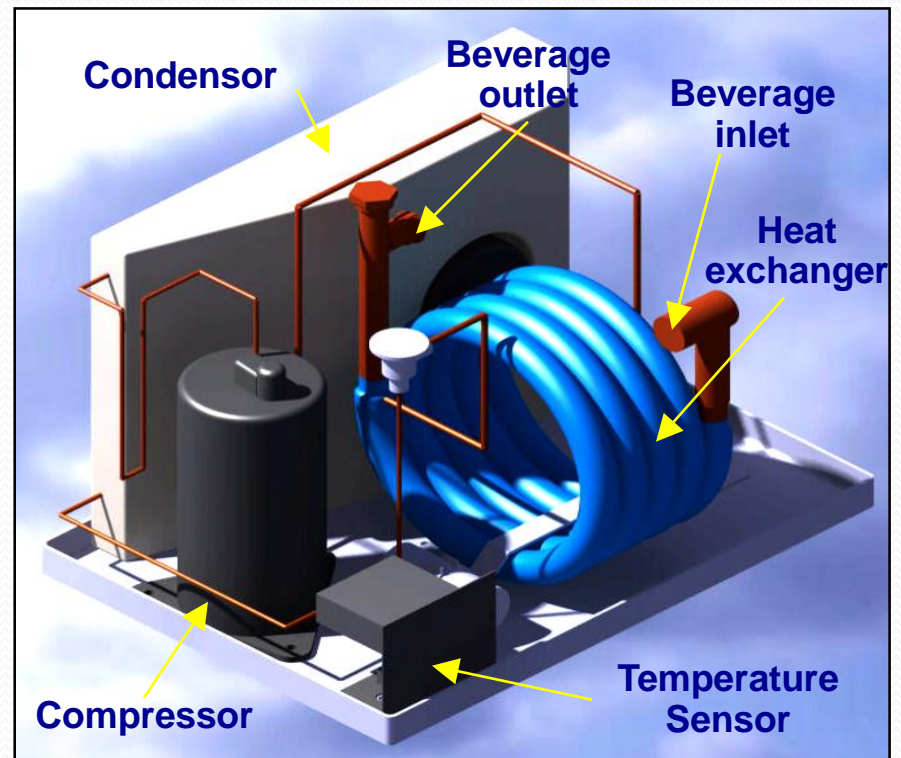
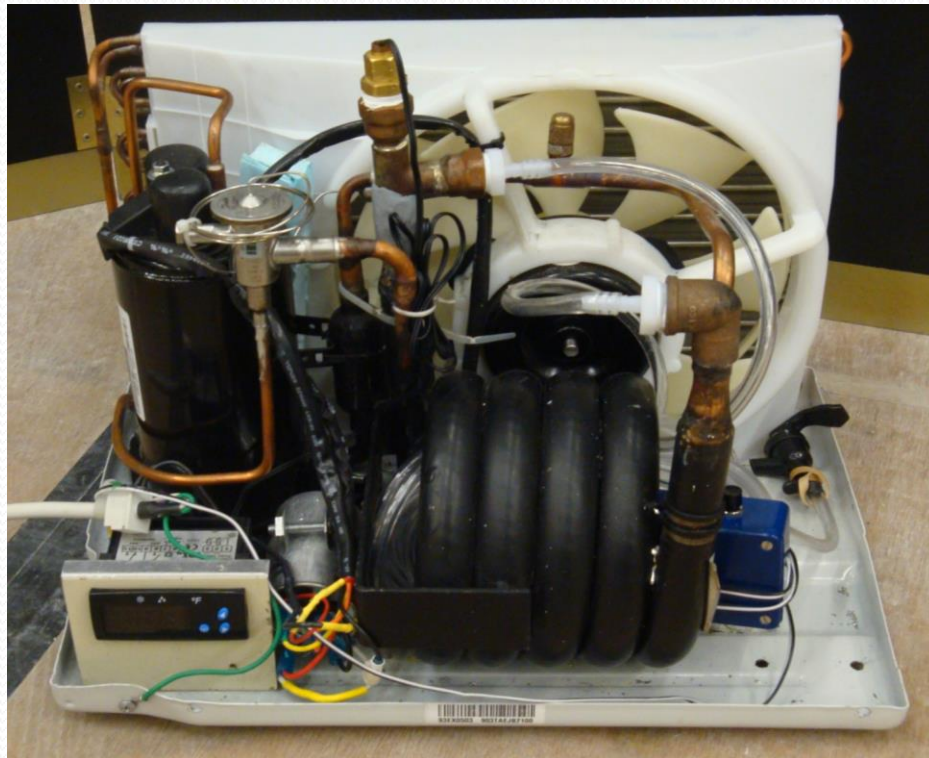
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Objectives:

- To design a continuous beverage cooler that not only can be used near any outlet in a home, but can also be brought up to a tailgating field.
- The design will also require no more than an electrical supply and no assembly will be required.
- The design must also operate with a pressurized container.

Requirements:

- To be used in both the home and tailgating.
- Allow continuous cooling with the option of power outside the home.
- Able to maintain an acceptable drinking temperature of 40°F (4.5°C) or lower.
- Ability to pour a pint of liquid at the acceptable temperature in 30 seconds.
- Should be compact and mobile.



How it Works

- Warm beverage enters inner tube of tube-in-tube heat exchanger.
- Outer tube acts as evaporator to cool the beverage.
- A temperature sensor controls the system during idle periods.
- The handle has a bypass switch to provide continuous cooling while pouring to adapt to the incoming beverage.

Design Attributes:

- Reaches cooling equilibrium in 3-5 minutes, much quicker than commercial refrigeration systems.
- Allows for continuous cooling of beverage without having to cool entire container.
- Can maintain beverage temperature indefinitely.
- Bypass switch allows system to adapt to incoming beverage by providing additional cooling, unlike conventional refrigeration systems.
- Internal CO₂ tank pressurizes beverage vessel.
- Through trials, maximum cooling from 90°F down to 40°F achieved in 26 sec/pint.
- At around 10-15 Psi, system was able to maintain an acceptable drinking temperature indefinitely.

