kooltronic.com/bess-cooling

Case Study:

Tailoring an enclosure air conditioner for battery energy storage systems.

Project Scope

Advancements in battery energy storage technology are making it possible for companies to provide a reliable source of clean, renewable power for commercial and residential needs. During the summer of 2021, one of these companies -- a leading OEM of turnkey energy storage systems (ESS) -- contacted Kooltronic, Inc. for a cooling solution to fit its unique enclosure requirements.

The customer deploys its portable power systems onsite, within varying climates, to enable a near-instant supply of backup power for long-duration outages. Effective thermal management is critical in helping maximize battery storage capacities and system reliability within this application.

After an initial consultation, it was determined that two NEMA 4 Guardian Series DP60 closed-loop air conditioners would supply enough cool, humidity-stable air to maintain the required temperature range of 75°F - 85°F (23°C - 29°C). However, a number of product modifications would be required to meet the customer's requirements, including:

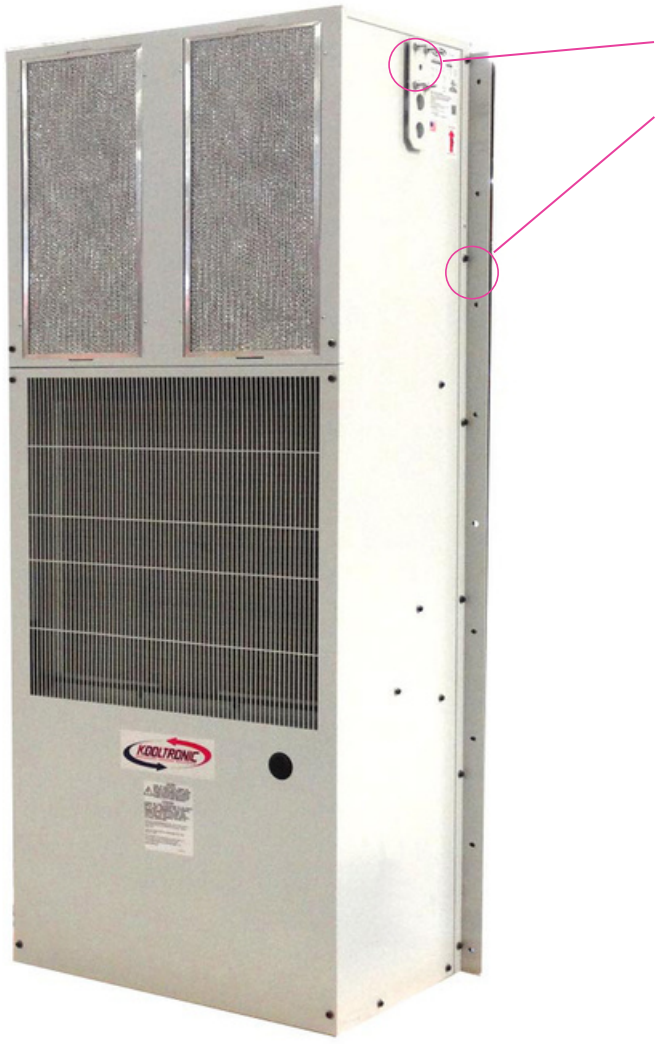
- Mounting configuration - the AC units would need to be easily mounted onto the sides of the ESS enclosure.
- Electrical connections - alterations were to be made to the locations of the power and control conduits.
- Installation - the AC unit weight would require accommodation for crane lifting during ESS assembly.

Product Specs

- **26,000 BTU Cooling Capacity.**
- **230 Volts AC / 60 Hertz.**
- **60" H x 24" W x 13" D.**
- **UL/CUL Listed.**

A Cooling Solution Tailored to Customer Needs

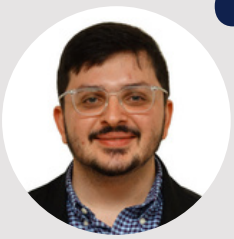
Shortly after being presented with specifications from the ESS manufacturer, Kooltronic's Engineering team recommended a number of modifications to the standard Guardian Series DP 60 air conditioning unit. The proposed product upgrades, which were perfectly suited for the application, resulted from a collaborative, problem-solving approach from both companies. Ultimately, this approach led to a custom-tailored cooling solution designed to maintain the temperature within range and avoid damaging condensation while keeping the battery compartment clean, dry, and isolated from the outside air.



- Removable lifting eyes (x2) for hoisting and installation.
- Customized mounting configuration utilizing side rails.
- Modified electrical conduit locations for power/control.
- SCADA compatible by the use of Modbus protocol.
- Fully integrated 1,200 watt finned strip heater.
- Compressor short-cycle protector.
- Condenser fan cycling control.
- Custom paint.

Achieving Results Together

Through numerous discussions and sharing of design improvements, the project teams of both companies were able to build a great relationship. The battery energy storage systems being developed through this collaborative project will provide renewable energy and significant utility cost savings to the end-users. The future looks bright!



“Working in collaboration with the customer's Engineering team taught us many valuable lessons with regard to the controls aspects of the air conditioner. Being able to play a role in the Energy Storage industry is very satisfying.”

— Sepehr Sabeti, Project Engineer at Kooltronic, Inc.

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