

Application

ECU-CHILL™ is a ruggedized air conditioning system for cooling electronics in mobile applications. *ECU-CHILL™* maintains sealed electronics enclosures at or below ambient temperatures, enabling Commercial-Off-The-Shelf (COTS) electronics to be safely and effectively used for computing and communications in extremely hot or cold environments. The system has been fully ruggedized for military use to MIL-STD 810.

ECU-CHILL™ will continuously maintain a temperature of $\leq 125^{\circ}\text{F}$ (51.6°C) inside an electronics enclosure in a 125°F ambient environment while dissipating 550 Watts of waste heat. The electronics remain sealed against all environmental contamination, improving reliability.

Description

ECU-CHILL™ is a vapor compression refrigeration system that consists of Aspen's miniature rotary compressor, condenser, evaporator, fans, control system, expansion valve, and refrigeration lines. A temperature sensor provides feedback to the control system, which varies compressor speed to maintain desired enclosure temperatures. To assure an even temperature distribution inside the transit case, the internal fans run whenever the ECU is operating.

The system ships ready for mounting to the wall of an electronics enclosure or the cover of a transit case. A power cord is provided to accept 28 VDC power.

Controls

Visual and audible alarms indicate ECU operational status. A toggle switch for disabling the alarm and LED is provided.

Operation

ECU-CHILL™ is a complete environmental control unit that provides cooling or heating as determined by the internal temperature of the enclosure. At temperatures below 40°F (4.4°C) the systems provides 300 Watts of heat. Between 40°F and 80°F (26.6°C) there is no cooling or heating. At temperatures above 80°F the compressor and condenser fans operate and cooling is provided. *ECU-CHILL™* will maintain an internal temperature no higher than 125°F at ambient temperatures up to 125°F . This temperature specification was also met during the MIL-STD 810 blowing sand and dust testing.



ECU-CHILL™ System

“Compact-Light-Rugged:
Cooling Systems for Extreme
Applications”

Technical Data

Cooling Capacity	550 Watts	At 125°F (51.6°C) ambient while maintaining 125°F maximum case temperature
Heating Capacity	300 Watts	Heater operates at internal case temperatures below 40°F (4.4°C)
Operating Ambient Temperature Range	-40°F to 125°F (-40°C) to (51.6°C)	At T(ambient) < 125°F, capacity is > 550 Watts (Please Inquire for complete performance map)
Max Power Draw	420 Watts	
Voltage	22-32 VDC	Meets MIL-STD 1275D requirements
Maximum Current	15 Amps	
Environment	MIL-STD 810G	Unit has been qualified with a full suite of environmental tests for operation on moving military ground vehicles (Please Inquire for complete list of specifications)
Storage Temp.	-40°F to 160°F -40°C to 71°C	
Orientation	30° ± 2°	On any axis from normal vertical
Electrical	MIL-STD 461E	Please inquire for complete list of specifications
Noise	<75dBA	At one meter
Weight	20 lb	
Dimensions	9" high x 18.5" wide x 6.7" deep	22.8 cm high x 47cm wide x 17cm deep

Expected Performance

ECU-CHILL™ is a ruggedized air conditioning system for cooling electronics in mobile applications. The ECU has been rigorously tested and qualified to Military standards including 810G and 461E. The effectiveness of this system, however, is dependent upon other factors. These factors include adequate clearance for ambient air supply on the outside of the system, and sufficient airflow inside the enclosure passing over the heat generating electronics.

Contact

Jim Burnett
Director-Government
Business Development
Aspen Systems Inc.
(508) 481-5058 (119)
jburnett@aspensystems.com