

ECU-550

Environmental Control Unit



Vapor Compression Cooling for Electronics Enclosures

Application

ECU-550 is an extremely small, lightweight, ruggedized air conditioning system for cooling electronics. ECU-550 maintains air temperatures at or below ambient temperatures, enabling Commercial-Off-The-Shelf (COTS) electronics to be safely used in extreme environments. The system has been fully ruggedized for military use to MIL-STD-810, MIL-STD-1275, and MIL-STD-461.

Weighing less than 20 pounds, the ECU-550 will continuously maintain a temperature of $\leq 125^{\circ}\text{F}$ (51.6°C) within the enclosure in a 125°F ambient environment while absorbing 550 Watts of heat. The electronics remain sealed against all environmental contamination, improving reliability.

Description

The ECU-550 is an efficient vapor compression refrigeration system using Aspen's miniature rotary compressor. The ECU-550 circulates the enclosure air, heating or cooling as required to maintain setpoint temperatures. The ECU-550 manages the temperature in electronics transit cases, for legacy systems, or designed into new custom enclosures. The major transit case manufacturers have a cooling collar mount for the ECU-550.

Features and Benefits

ECU- 550 Environmental Control Units use vapor compression air conditioning technology to cool electronics below ambient temperature.

- 550 Watts of cooling at rated conditions
- 300 Watts of heating
- Dehumidifies enclosure
- MIL – Qualified*
- Sealed case keeps electronics clean and dry
- Field Proven – Qualified and Shipping
 - Used on ground vehicles
 - Used on operational transit cases
- SWAP effective vs. thermoelectric systems
 - 3 times smaller
 - 4 times more efficient
 - 5 times lighter
- NSN# 4120-01-590-1647 Environmental Control



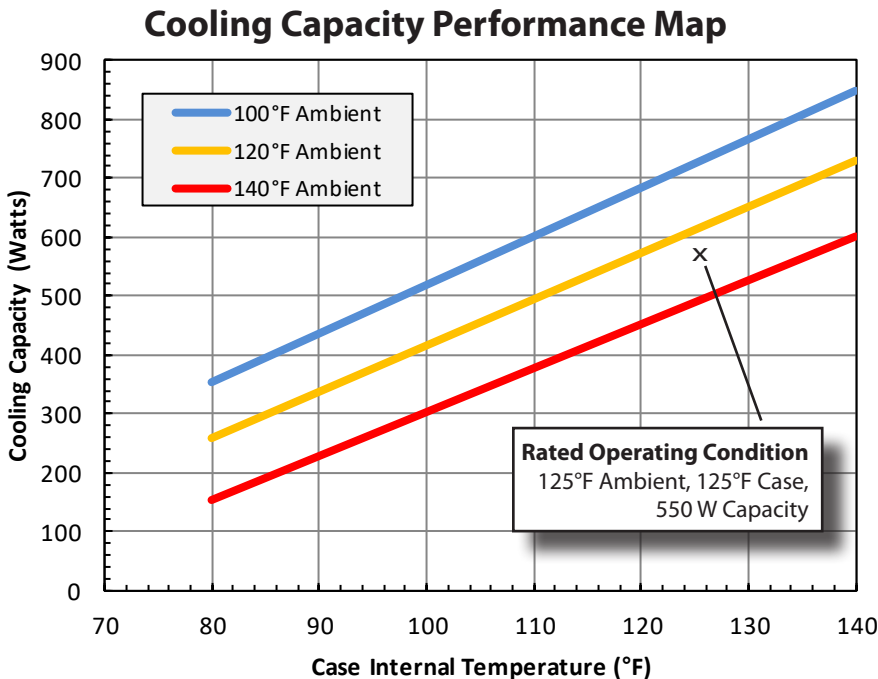
World's Smallest Rotary Compressor

Technical Data (FP00027)

Cooling Capacity	550 Watts	At rated operating conditions**
Heating Capacity	300 Watts (Resistive)	At 40°F (4.4°C) or below
Operating Ambient Temperature Range	-40°F to 140°F (-40°C to 60°C)	At T _{ambient} < 125°F (51.6°C), capacity is > 550 Watts
Storage	-40°F to 160°F (-40°C to 71°C)	
Maximum Power Draw	525 Watts (at 32 VDC) 420 Watts (at 28 VDC)	Actual power draw varies with operating condition
Voltage	22 - 32 VDC	
Maximum Current	16.4 Amps (at 32 VDC) 15.0 Amps (at 28 VDC)	
Altitude	15,000 ft. (4.6 km)	
Humidity Control	70% RH between 50°F and 140°F	See manual for condensate drain instructions
Orientation	± 15°	On any axis from vertical
Military Standards	MIL-STD 810* MIL-STD-461 MIL-STD-1275	Environmental EMI Protection Power Supply
Weight	20 lb (9.1 kg)	
Dimensions	H x W x D 9.0 x 18.5 x 6.7 in. 22.8 x 47.0 x 17.0 cm	

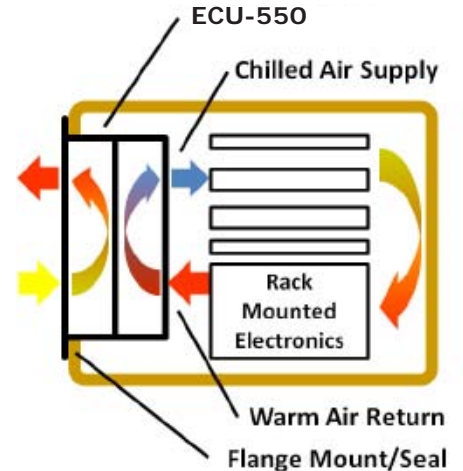
*When installed in a qualified military transit case

**Rated Conditions: 125°F ambient, 125°F return air within enclosure



Airflow Schematic

ECU-550 Mounted in an Electronics Enclosure



- Sealed enclosure protects electronics within the case
- ECU-550 does not allow mixing of inside and outside air

Expected Performance

ECU-550 is a ruggedized air conditioning system for cooling electronics in sealed electronics enclosures and mobile applications. The ECU has been rigorously tested and qualified to military standards including 810, 461, and 1275 when installed in a qualified enclosure. 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.

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