

# Environmental Control Unit ECU-1800

Compact air conditioners for transit case/electronics enclosures

The ECU Series are ruggedized air conditioning systems for cooling electronics in austere and mobile applications. They maintain 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. These systems have been fully ruggedized for military use to MIL-STD-810.

ECU Series will continuously maintain a temperature of  $\leq 125^{\circ}\text{F}$  ( $51.6^{\circ}\text{C}$ ) inside an electronics enclosure in a  $125^{\circ}\text{F}$  ambient environment removing 1,800 Watts of heat. The electronics remain sealed against all environmental contamination, improving reliability.

## Application Example: WIN-T Program



The original ECU-550 was developed for US DOD (Warfighter Information Network-Tactical ) WIN-T communications program. Since that time, more than 3,000 ECU's have served with great success in Afghanistan and Iraqi operations logging millions of hours of operation. With ten years of successful deployments supporting C4ISR systems, Aspen has been asked to develop a larger similar ECU based on our miniature vapor compression cooling technology.

In response to these ongoing requests, Aspen launched the ECU-1800. Leveraging many of the same components as the ECU-550, the new system boasts - 1800 Watt cooling capacity, improved airflow distribution and increased SWAP efficiency.



## System Highlights

- » Enables COTS electronics
- » Ruggedized for use in-theater
- » Below ambient cooling
- » **4-6 X** the efficiency of thermoelectrics
- » Ultra compact
- » Extremely lightweight
- » MIL-qualified/SWaP-C effective
- » >90,000 hour MTBF



World's Smallest Rotary Compressor

# Environmental Control ECU-1800

for high performance cooling/heating and humidity management

## Specifications<sup>1</sup>

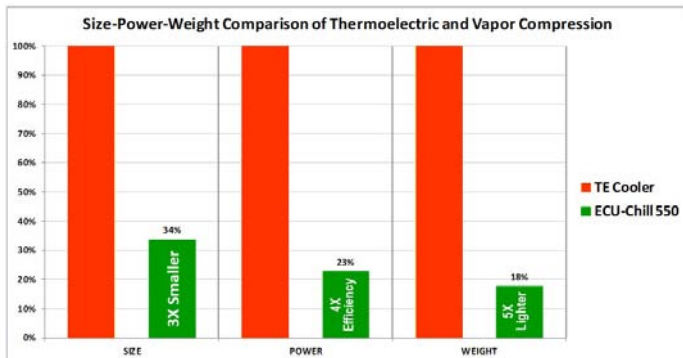
Parameter	Specification	Notes
Cooling Capacity	1800 Watts	at rated operating conditions (see graph)
Heating Capacity	300 Watts (optional)	Resistive heating
Operating Ambient Temperature Range	-40 to 140°F	(-40 to 60°C)
Storage Temperature	-40 to 160°F	(-40 to 71°C)
Maximum Power Draw	900 Watts @ 28 VDC	Actual power draw varies with operating condition
Voltage	28 VDC	22-32 VDC
Maximum Current	32 A @ 28 VDC	
Altitude	15,000 ft. (4.6 km)	
Humidity Control	70% RH	
Orientation	± 15°	On any axis from vertical
Military Standard	MIL-STD-810	Environmental
	MIL-STD-461	EMI protection
	MIL-STD-1275	Power Supply
Weight	36.2 lbs.	(16.5 kg)
Dimensions	15.5" x 18.5" x 11.5"	39.4cm x 47cm x 29cm

<sup>1</sup> Preliminary data

In cooling applications, the vapor compression based ECU Series provides the highest efficiency and capacity, smaller size, low weight, minimal maintenance and low cost when compared to thermoelectric coolers (TEC).

### ECU Advantages

- » 3 times smaller
- » 4 times more efficient
- » 5 times lighter
- » >90,000 hour MTBF

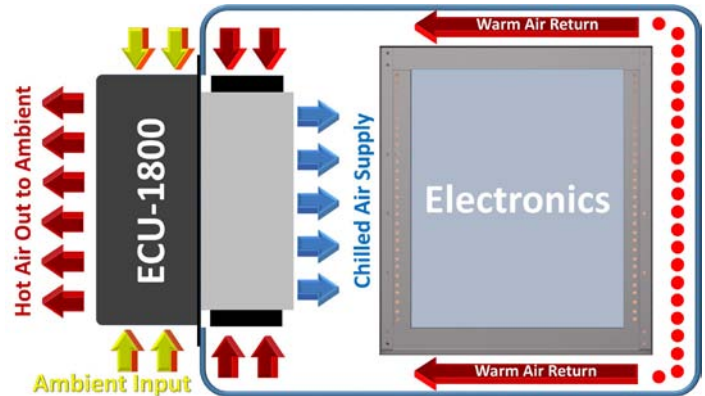


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### Airflow Schematic - Top View

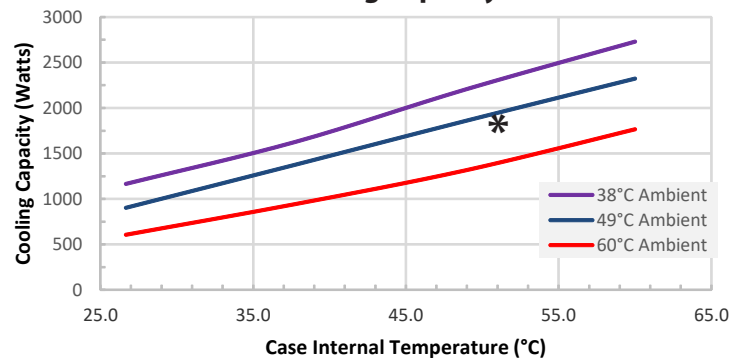


### ECU-1800 Mounted in an Electronics Enclosure

- Sealed enclosure protects electronics
- ECU-1800 does not allow mixing of inside and outside air

## Cooling Capacity Graph

### ECU-1800 Cooling Capacity Performance<sup>1</sup>



<sup>1</sup> Preliminary data

\* Rated Operating Condition:  
52°C Ambient, 52°C Case, 1800W Capacity

### Aspen Background

Aspen Systems is the world leader in miniature refrigeration systems. We have created refrigeration systems to meet specifications for dozens of customers with thousands of installations in personal cooling, manufacturing, mobile electronics, airborne electronics, lasers, military, and medical.

