



Airscrew Specialist Cooling Systems

Specialist Cooling Systems Information

AMETEK Airscrew has an established expertise in the design, development and manufacture of specialist systems for cooling sensitive electronic equipment and maintaining environmental control within occupied crew spaces.

These systems are designed specifically to satisfy the technical requirements of each individual application that generally encompass the extremes of climatic conditions together with the highest levels of electromagnetic compatibility.

A wide range of passive cooling and active vapor cycle air and liquid conditioning systems have been produced for a variety of ground based, airborne and naval defense applications. These include cooling for air defense systems, command shelter temperature control, radar conditioning equipment, decompression chamber environmental control and other specialist equipment cooling solutions.

AMETEK Airscrew specialist cooling systems are in service with armed forces throughout the world.

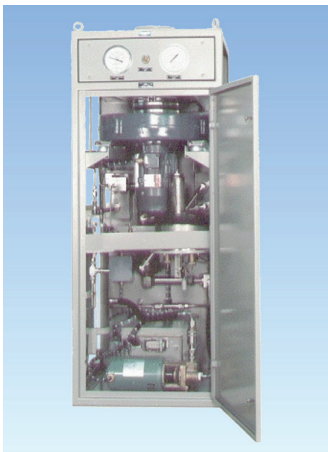
Passive Cooling Systems

AMETEK Airscrew passive cooling systems typically employ a fluid circuit to transfer heat away from equipment to a location where it can be dissipated to an appropriate heat sink. This may be ambient air or, in the case of naval vessels, the installed chilled water system.

The Missile Canister Climate Control System maintains a controlled environment for missiles whilst contained within deck-mounted canisters. A chiller/heater unit interfaces with the ships chilled water system in a below decks location and produces a supply of temperature controlled ethylene glycol/water fluid that is distributed to air handling units housed within the missile canisters.



Missile Canister Climate Control System ►



◀ Ship-borne Radar Cooling Unit

The Ship-borne Radar Cooling Unit is a further example of a passive cooling system that utilizes the ships chilled water. In this instance, the unit delivers independent supplies of chilled air and demineralized water to cool various elements of the radar equipment.

In addition to a pump and reservoir, the secondary water circuit includes a demineralization filter, rotary flow meter and temperature alarms.

Specifications subject to change without notice



Active Cooling Systems

AMETEK Airscrew active cooling systems employ the latest vapor cycle refrigeration technology to maximize cooling performance whilst minimizing space envelope. Direct expansion air conditioning is commonly employed for equipment cooling in both airborne and land based applications.

The Sea King Radar Cooling Unit, for example, provides closed loop air-cooling for radar equipment and also incorporates a second evaporator for spot cooling of two crewmembers.



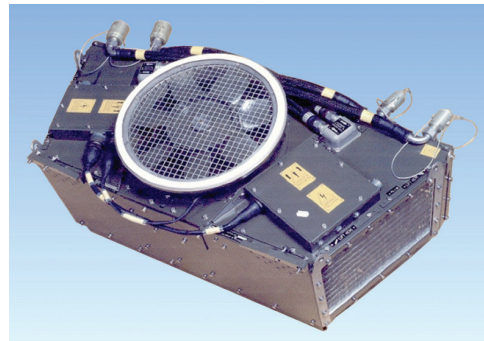
Sea King Radar Cooling Unit ▶



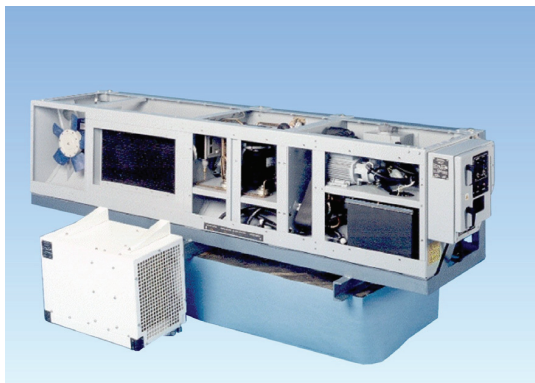
▲300W Equipment Cooling Unit

Active cooling system performances range from the 300W Equipment Cooling Unit to multi-cylinder compressor units in excess of 20kW. The full range of AC electrical power supplies spanning 50, 60 and 400Hz can be accommodated and the lower performance units can be configured to operate from low voltage DC supplies.

The versatility of vapor cycle cooling systems can be enhanced by the addition of a secondary fluid circuit, enabling chilled liquid to be delivered effectively and conveniently to the heat generating equipment. Incorporation of a reversionary mode capability allows the vapor cycle circuit to be switched off during low temperature operating conditions, with ambient air then being used to cool the secondary fluid. The Active Cooling Module developed for an air defense missile application is a good example of a system incorporating these features.



▲Active Cooling Module



◀Decompression Chamber Environmental Control System

Secondary fluid circuits for both cooling and heating modes are also employed in the Decompression Chamber Environmental Control System, to enable the vapor cycle circuit to be safely located externally to the chamber. This arrangement also allows rapid dehumidification by operating both cooling and heating modes simultaneously. The internally mounted air-handling unit incorporates control features to slow the fan as pressure increases, thus maintaining a constant mass flow of air.

Specifications subject to change without notice