

DATA SHEET

Auxiliary Cooling and Power System

Model 705899



01 Description

Meggitt Defense Systems, Inc. (MDSI) is pleased to present an auxiliary cooling and power solution for land based fighting vehicles. The Auxiliary Cooling and Power System (ACPS) is designed to thrive in modern combat environments. Designed to provide cooling for crew comfort and electronic packages in addition to auxiliary power, the ACPS is a rugged, self-contained system ready for today's modern fighting vehicles. The ACPS consists of three major components, the Auxiliary Cooling and Power Unit (ACPU), the Air Handling Unit (AHU), and an Operator Panel.

The ACPU is a rugged self-contained cooling and power unit that is located on the exterior of the vehicle. On the M1 Abrams, the ACPU is mounted on the turret bustle rack. The unit contains a refrigerant based liquid cooling system and 28 VDC power generation system driven by a heavy-fuel based engine. The engine may be powered by different fuels including diesel and JP-8. The cooling system provides the AHU with cold fluid and may be used to cool electronic chassis boxes. The 28 VDC generating system is self-regulating and can be accessed via standard NATO slave plug on the interface panel on the front of the unit.

The AHU consists of a 28 VDC electrically driven fan and liquid-to-air heat exchanger. The AHU is based on the AHU used on the Thermal Management System (TMS™) for M1A2 SEP Abrams Main Battle Tank. The AHU provides conditioned air to crew as well as electronics inside the vehicle.

The Operator Panel provides a remote start and controls for the ACPS. In addition, the Operator Panel provides basic information to the operator, such as modes and faults. The unit may be started via the Operator Panel which would be located inside the vehicle near the AHU. The AHU fan speed is controlled via speed selector knob.

02 Key features and benefits

- Powered by Diesel and JP8
- Provides cooling and power
- Provides 6 hours of cooling without refueling
- Provides 7 kW+ of cooling and 28 VDC power
- Turret mounted Air Handling Unit (AHU)
- Closed loop R134a refrigerant
- Self sufficient system. Does not require input from vehicle to operate

03 Applications

M1 Abrams
Fighting Vehicles

04 Contact

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The ACPS takes advantage of MDSI's extensive experience in analyzing, designing, and production of environmental control products for modern warfighting vehicles. Components selected for the ACPS are battle tested. The ACPS prototype is currently configured for the M1 tank. The ACPS may be reconfigured to meet the requirements of other fighting vehicles as well.

05 Specifications

Cooling capacity	7.0 kW+ (23,900 BTU/hr+)
Rated ambient air temperature	48.8°C (120°F)
Average air return temperature	34°C (93°F)
Average air delivery temperature	20.5°C (69°F)
Export power available	
When cooling system on	2.8 kW+
When cooling system off	7.0 kW+
Power	28 VDC
ACPU	
Fuel type	JP-8 and Diesel
Maximum fuel consumption	3.52 kg/hr (1.2 gal/hr)
Overall dimensions	24" (61 cm) T x 25.5" (65 cm) W x 44.5" (113 cm) L
Weight	302 kg/665 lbs
Air Handling Unit	
Air flow	400 LPS (842 CFM) maximum
Coolant type	PGW or EGW
Overall dimensions	15.6" (40 cm) T x 17.5" (44.5 cm) W x 15" (38.5cm) L
Weight	16 kg/35 lbs
Operator Panel	
Overall dimensions	7" (17.8cm) T x 11" (28 cm) W x 4.5" (11.5cm) L
Weight	3.6 kg/8 lbs
Standard NATO slave plug	
Provides own power for starter	
Control box provided	

06 Outline details

Based on the M1A2 Main Battle Tank SEP Thermal Management Unit (TMS™) using many of the same refrigeration components. Heavy Fuel engine is a proven military variant of a Commercial Off the Shelf (COTS) engine. Alternator is a military model used in military vehicles. Coolant is used as medium of heat transfer between the ACPU and the AHU (in the turret). This prevents refrigerant from leaking in the vehicle. AHU uses power from ACPU. The system does not draw additional power from the vehicle. System is self-contained and self-sufficient, only requiring fuel and minor routine maintenance.



Auxiliary Cooling and Power Unit