

CM-ATR-25/35/45/SixHex-16HP Series VPX/VME/cPCI Hybrid Cooled Military ATR Chassis

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Performance assured

EXPLORING THE LIMITS OF SEALED AIR-COOLED ATR DESIGN

The SixHex-16HP completes CM Computers fourth generation high performance sealed ATR chassis family, available in traditional 5, 7 and 12 slot sizes for versatility and conformity with VME, VPX & cPCI open COTS architecture.

This dry-air hybrid enclosure incorporates the latest technologies in both conductivity and phase transition to increase thermal transfer through the integration of 16 heat pipes. This provides a 15% increase in system power dissipation with respect to our standard SixHex series. This cost effective performance enhancement benefits long term system operational reliability in military system applications with high power dissipation requirements.

SixHex-16HP ATR enclosures incorporate all features and practical functionalities that are defined in the SixHex series general specifications catalog. All electrical, mechanical and environmental characteristics remain universal, resulting in only a 3% increase in chassis weight. The embedded hybrid heat transfer mechanism improves system payload MTBF by 40%, performing under a reduced thermal profile of 5°C less on average.

ISOLATED INTEGRATION FOR SAFETY

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HEAT OUT

The 16 heat pipes remove heat directly from the internal chassis card-cage, providing an "expressway" to the ambient environment. CM's unique condenser modules optimize heat dissipation through the sidewall heat exchanger's forced air flow. Extreme care has been taken to ensure the heat pipes do not come into direct contact with valuable system electronics. Even in the event of improbable pipe failure, drops of cooling liquid will never reach the card-cage.

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EVAPORATOR

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Minutes

50

Heat enters at the evaporator where it causes the working fluid to vaporize, absorbing thermal heat. The vaporized fluid creates a pressure gradient which forces the vapor toward the condenser.

ADIABATIC

Vapor migrates from the evaporator to the condense along a cavity (adiabatic) to the lower temperature end.

WICK

The wick serves as a pump using capillary pressure to return the fluid from the condenser back to the higher temperature evaporator.

CONDENSER

Heat exits where the vapor condenses back to a fluid which is absorbed by the wick, releasing thermal energy. The working fluid is drawn back into pores of the wick for return to the evaporator.



nd more technical info our military ATR series i





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4th Gen. ATR Catalog 3rd Gen. ATR Catalog 2nd Gen. ATR Catalog



Breaking all the rules

THE 'FOURTH GENERATION PLUS' HAS ARRIVED

At CM Computers we consider the release of a new generation of military ATR chassis when the temperature of its payload has been decreased by approximately 10°C with respect to the previous generation, indicating the system MTBF has doubled. Following this criteria, our latest 16 heat pipe ATRs could be considered a "half generation" series (5°C off). It is interesting to remark that approximately 85% of the total heat transferred is attributed to the six large cross flow heat exchangers (SixHex), whilst the remaining heat is dissipated via the new embedded heat pipes.

Heat pipes become more efficient when internal chassis temperatures rise so that their benefits can be fully realized under extreme climatic operating conditions. The installed heat pipes are fully MIL certified, externally fitted, have no moving parts and offer zero maintenance in service.

CM SixHex-16HP enclosures are maintenance-free and do not require air intake dust filters. This stand alone single pack ATR solution also incorporates the exclusive CM universal "floating" card cage capable of accommodating and freely intermixing all standard conduction-cooled and air-cooled Eurocard formats.

UPGRADE WITH CONFIDENCE

Customers wishing to improve the SixHex series performance should consider 16HP integration as a direct upgrade to systems already in service. Compatibility also extends to the Mounting Tray facilitating immediate replacement in the field. The SixHex-16HP is fast becoming the COTS preferred choice for system integrators who wish to employ the latest high power VPX modules.

Expressly designed to compete against impractical liquid cooled alternatives, this advance in forced air-cooled hybrid dynamics establishes new max. limits for the following ATR enclosures:

- Our smallest 5 slot ½ ATR 9kg (25) chassis is now capable of dissipating up to 700 Watts.
- The popular 7 slot ¾ ATR 13kg (35) chassis is now capable of dissipating up to 1000 Watts.
- The flagship 12 slot 1 ATR 18kg (45) chassis is now capable of dissipating up to 1500 Watts.

The following chart reflects conservative ATR operation to ensure full military performance.



Self-dissipation Military Chassis Figures Total Power vs Board Card-rail Temperature



ERECTOR

UNRIVALED COTS AVAILABILITY

CM customers are able to select the optimum type of CM-ATR-25/35/45 sealed chassis depending on the following key parameters:

- COTS Backplane Bus type
- Number of slots required
- Total payload Power Dissipation*

*Total system power requirement will demand the most suitable CM ATR cooling technique to ensure that reasonable operational temperature limits are maintained for the enclosed electronic modules.

To complete your chassis P/N, use CMs innovative Online Configurator. CM not only offers the widest range of Military ATR chassis in the COTS market but also provides the most competitive delivery because we manufacture our products entirely in our advanced in-house production facilities.

Expand your horizons

THE MOST COMPREHENSIVE MILITARY FEATURES



Contaminant-free enclosure

- Available in ½, ¾ & 1 ATR size
- VPX, VME64 & cPCI ready
- Accepts Conduction & Air-cooled 6Us
- Flexible Top & Bottom I/O wiring
- Six internal Heat Exchangers
- 16 integrated Heat Pipes
- Up to 1.5 kW total Power Dissipation
- Up to 150 Watts per slot

- Integrated Temperature Control Unit
- Dramatically increases payload MTBF
 - 2 User defined PSU 100W DC outputs
 - 25°C less than heat exchanger ATRs
 - 50°C less than conventional ATRs
 - In-line EMI/EMC MIL-STD 461E Filter
 - Stand alone low weight solution
 - Customizable to specific requirements
 - Mounting Tray with quick release system

THE WIDEST RANGE OF MILITARY CERTIFIED PSUSFOR EACH APPLICATION

		Vin O	ptions		Backpla	ane DC		Suggested BUS		
		28VDC	отнея	+5VDC	+3.3VDC	+12VDC	-12VDC	VME64	cPCI	VPX
Aodels 1/2 ATR PSU Models	A-475W	•		40A	22A	8A	8A	•		
	A-575W			40A	22A	12A	12A	•		
	B-450W	٠		20A	45A	8A	8A			
	B-550W			20A	45A	12A	12A			
	C-475W			20A	22A	16A	8A			•
	C-575W		•	20A	22A	21A	12A			•
	A-675W			80A	22A	8A	8A	•		
	A-775W			80A	22A	12A	12A	•		
	B-565W			20A	80A	8A	8A			
	B-665W			20A	80A	12A	12A			
	C-675W			20A	22A	33A	8A			•
SU N	C-825W			20A	22A	41A	12A			•
1 ATR PSU Models 3/4 ATR P	D-550W	٠		40A	45A	8A	8A	•		
	D-650W			40A	45A	12A	12A	•		
	E-550W	٠		20A	45A	16A	8A			•
	E-650W			20A	45A	21A	12A			•
	F-575W	•		40A	22A	16A	8A	•		
	F-675W			40A	22A	21A	12A	•		•
	A-950W	•		80A	45A	16A	16A	•	•	
	A-1050W			80A	45A	21A	21A	•		•
	B-1065W	•		80A	80A	16A	16A	•		
	B-1165W			80A	80A	21A	21A	•		•
	C-1225W	•		80A	160A	16A	16A	•		
	C-1425W			80A	160A	21A	21A	•		•
	D-1350W	•		160A	80A	16A	16A	•		
	D-1550W			160A	80A	21A	21A	•		•
↑ All Inputs except 28VDC; such as 48VDC / 270VDC / or										









CM chassis are designed using an advanced 3D CAD facility. This includes thermal modeling and environmental testing. All chassis materials and electronic parts are fully compliant to manned space flight requirements. All CM products have a 2 year warranty and are delivered Tested and Certified by independent authorized Labs per **MIL-STD-461E & MIL-STD-810F** for immediate deployment in the US Navy & US Air Force Military UAVs, Fighters and Helicopters.

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CERTIFICATION

CE MARKED

ISO 9001 CERTIFICATION NATO SUPPLIER Nº 7684B DGAM SUPPLIER Nº 9015 NCAGE CODE REGISTERED VITA REGISTERED MEMBER D&B D-U-N-S REGISTERED VXWORKS APPROVED PARTNER CENTRAL CONTRACTOR CERTIFICATION US DEPARTMENT OF DEFENCE APPROVED

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