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CM-ATR-3U/HES-FBL-HP Series High Power VPX Military Chassis

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FOUR HEAT EXCHANGERS

FITTED WITH HIGH AIRFLOW DUAL MILITARY REAR FANS

SLOT HEAT PIPES

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100G GEN 4 BACKPLANES PCIe GEN 4,100GBASE-KR4 SPEED PERFORMANCE

INTERNAL AIR RECIRCULATION



SEALED FOUR HEAT EXCHANGER + HEAT PIPES 3U ATR ENCLOSURE

- » Designed expressly for Gen-4 SOSA high wattage military VPX systems
- » Progressive, 3, 5, 7 & 9 slot versions for 1" pitch VPX modules
- » No risk, hermetically sealed externally integrated heat pipes (4, 8, 12 & 16 Ø8mm)
- » Front-to-back loaded, accepts conduction-cooled payloads up to 110 watts per slot
- » Oversized forced-air heat exchanger sidewalls, top cover & rear panel
- » Expressly suited for dry air contaminant-free SWaP applications
- » Input Power MIL-STD-461G EMI/EMC Lab matched filter installed and wired
- » High airflow dual redundant military PX2 rear fans (130-240 CFM)
- » Overhead internal forced-air recirculation for reduced payload hot spots
- » Optionally delivered fully wired with Backplane & I/O automatically tested
- » Up to 500 watts payload power dissipation in 9 slot version



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ON	SYSF	PWF	RUN
TSPW	TSDI	TSLO	TSHI

Panel LED	Name/Function	Panel LED	Name/Function
ON (GREEN)	POWER ON - PSU DC output OK, within voltage tolerances	TSPW (YELLOW)	TSU POWER SUPPLY - TSU power ON
SYSF (RED)	SYSTEM-FAIL - Payload Built-In-Test not successful	TSDI (YELLOW)	TSU DISABLE - Remote 'Battle-Short' switch ON
PWF (RED)	POWER FAIL MONITOR - External voltage below minimum	TSLO (RED)	LOW TEMP FAIL - System temperature below Low threshold
RUN (GREEN)	DATA TRANSFER - Backplane bus/data traffic activity	TSHI (RED)	HIGH TEMP FAIL - System temperature above High threshold

HES-HP - FRONT TO BACK LOADED 3U ATR

Heat Exchanger + Heat Pipes 3U ATR - Contaminant-free Enclosure suitable for very high wattage VPX & cPCI-S applications with 0.8, 0.85 & 1" pitch 3U eurocards

Our 3U FBL-HP *Four Heat Exchanger + Heat Pipes* sealed conventional card-cage enclosures have been designed for latest generation conduction-cooled systems that require the most extreme power dissipation. This family of size-scalable chassis are ideal for advanced SWaP military systems operating in hostile air environments.

AVAILABILITY

The CM 3U HES-FBL + Heat Pipes ATR is available in 3, 5, 7 & 9 slot versions, supporting our latest 1" pitch Gen-4 military VPX Backplanes fitted with VITA 46.30 MULTIGIG-RT3 connectors and high power SOSA military Power Supply Units.

LAYOUT & DESIGN

Internal layout is divided into 4 independent metallic partitions: I/O section at the front, card-cage, PSU section, and 2 exhaust fans at the rear. This isolates the card-cage, improves EMI/EMC and reduces PSU heat & electrical noise on system electronics.

DISSIPATION & COOLING

Heat within the enclosure is conducted to slot heat pipes and hollow sidewalls, top cover and rear panel forced-air heat exchangers where it is dissipated to the environment. Internal recirculation fans ensure dry air is forced across payload modules, minimizing hot-spots and dissipating heat homogeneously.

RECOMMENDED PAYLOAD POWER RATINGS

(SELF DISSIPATING @ 55°C AMBIENT: NO EXTERNAL AIRFLOW OR COLD PLATE PROVIDED)

CM-ATR-3U/HES-FBL9-HP (9 SLOT)				≤ 5	00 w	atts
CM-ATR-3U/HES-FBL7-HP (7 SLOT)			≤ 45 () wa	tts	
CM-ATR-3U/HES-FBL5-HP (5 SLOT)		≤ 4 00	0 watt	S		
CM-ATR-3U/HES-FBL3-HP (3 SLOT)	≤ 320 [°]	watts				

*Chassis can be optionally cold plate mounted to increase power dissipation rates by approximately 5%.

CM HES-FBL-HP COTS SERIES

Heat Exchanger Sidewalls + Heat Pipes 3U ATR Series Specifications

	CM-ATR-3U/ Hes-FBL3-HP	CM-ATR-3U/ Hes-FBL5-HP	CM-ATR-3U/ Hes-FBL7-HP	CM-ATR-3U/ Hes-FBL9-HP		
SLOTS HEAT PIPES	3 4-HP	5 8-HP	7 12-HP	9 16-HP		
WIDTH	144.2 mm	144.2 mm	144.2 mm	144.2 mm		
HEIGHT	257.5 mm	257.5 mm	257.5 mm	257.5 mm		
DEPTH	254.6 mm	305.4 mm	356.2 mm	407 mm		
WEIGHT	5.2 Kg	6.0 Kg	6.8 Kg	7.7 Kg		
CGTR THERMAL RES.	$\Delta T/W = 0.09^{\circ}C$	$\Delta T/W = 0.075$ °C	∆T/W = 0.066°C	$\Delta T/W = 0.06$ °C		
PSU POWER	Up to 825 watts in AC versions, 48 VDC, 270 VDC Up to 775 watts in 28 VDC versions					
V-INPUT (±30%)	28 VDC, 48 VDC, 270 VDC, 90-132 VAC RMS & 180-264 VAC RMS @ 47-880 Hz, 3-Phase 200 VAC @ 47-880 Hz					
EMI/EMC FILTER	20A DC / 6A AC Dual-stage MIL-STD-461G Lab Certified in-line input filter (fitted as standard)					
SLOT/BOARD FORMAT	3U 1" pitch (3, 5, 7 8	x 9 slot) - MULTIGIG RT 3 - PCI	e 16 Gbaud & 100 GBASE-KR	4 (25.78125 Gbaud)		
INTERNAL FAN	13.5 CFM	27 CFM	40 CFM	54 CFM		
REAR FAN	130 CFM (2 x 65 CFM) Rotron PX2 Standard 240 CFM (2 x 120 CFM) Rotron PX2 Optional					
USER I/O AREAS	Front Panel connector area: 9	6 mm x 158 mm I Front Panel r	ear I/O area: 46 mm I Bottom C	over wiring clearance: 50 mm		
I/O SUPPORTED	VITA 46 65 66 HDMI/DVI/DP USB 2.0 & 3.	67 - <i>check with factory for hi</i> 0 SATA up to 100GbE up t	<i>igh speed custom I/O or readily</i> o 100G Optical RF Serial G	<i>available solutions</i> PIO SAS PCle 1553 etc		
CM FRONT PANEL I/O	6 Power Pins (13 Ar	np) & 382 I/O Pins (5 Amp) sta	ndard Custom Front Panel av	ailable upon request		
TEMPERATURE SPECS	-40 °C to -	-85 °C Operating, -55 °C to 10	00 °C Storage, main TSU fitted	as standard		
MTBF	25° GB 86,000 Hours, 65° AIC 28,000 Hours					
MIL-STD-461G/810H	CE101, CE102, RE101, RE102, CS101, CS114, CS116, RS101, RS103 / 501.4, 502.4, 507.4, 508.5, 509.4, 515.5, 516.5					
MOUNTING TRAY	CM-TR-3U/HES-FBL3-HP	CM-TR-3U/HES-FBL5-HP	CM-TR-3U/HES-FBL7-HP	CM-TR-3U/HES-FBL9-HP		

DUAL TEMPERATURE SUPERVISORY UNIT

A main Temperature Supervisory Unit (TSU) protects payload electronics against extreme climatic conditions, switching power supply OFF (standby) when the internal temperature is under or over the user defined limits. Chassis remote operation allows setting PSU to 'standby' or 'battle short'.

OPTIONAL ITEMS

Chassis may fit cold start-up heaters, a secondary TSU to regulate rotation speed of rear cooling fans, a mounting tray with shock absorbers and quick release mechanism, etc.

PART NUMBER EXAMPLE:

CM-ATR-3U/HES-FBL9-HP/VPX/28VDC/S-575W/CMP/HETC/HBC/CCS/ F115-400/BLU

- 9 slot, 3U Avionics Enclosure.
- Sealed Four Heat Exchanger Enclosure + 16 Heat Pipes.
- 9 slot OpenVPX Backplane for 3U 1" boards.
- 28VDC Power Supply Unit with 575W (+12VDC @ 41A, +3.3VDC @ 22A).
- CM Front Panel fitted with MIL-DTL-38999 connectors.
- Heat Exchanger Top Cover.
- Bottom Cover (50mm wiring clearance is standard in HES-FBL-HP Series).
- Conduction-cooled Card-cage Slots (conduction-cooled modules only).
- 2x Rotron PX2 military AC fans installed at the rear (130 CFM total).
- EMI shielded finger guards.
- Enclosure color: Dark Blue.

PRODUCT ORDERING INFORMATION

3U Military ATR Chassis Ordering SWaP military aerospace enclosure part number configuration

Please carefully follow our chassis ordering guide for configuring your 3U ATR part number. Note that all CM 3U Backplanes integrate a functional Temperature Supervisory Unit (TSU) that controls Power Supply and Fan operation. Remote optoisolated control switches for 'Battle-short' and chassis PSU 'on/standby' are also fitted as standard.

CHASSIS GENERIC PART NUMBER:

CM-ATR-3U /CT /B /I /W /FP /TC /BC /CS /F /C

/CT Enclosure Cooling Technique

Standard Sealed 3U Enclosure

SEF-18HP: Sealed with Extended Fins + 18 Heat Pipes 3U Enclosure HES: Sealed Four Heat Exchangers 3U Enclosure HES-FBL(3-5-7-9): Sealed Four Heat Exchangers 3U Enclosure HES-FBL(3-5-7-9)-HP: Sealed Four Heat Exchangers + Heat Pipes 3U Enclosure FAC: Flowthrough Air Cooled 3U Enclosure (open, non-sealed)

/B Backplane Type

VME64x: Military VME64x Backplane (5 Slot 3U 1" Pitch) *cPCI-S:* Military Compact PCI Serial R.2.0 Backplane (3-5-7-9 Slot 3U 1" Pitch) *VPX:* VITA 46 Military VPX Backplane (3-5-7-9 Slot 3U 1" Pitch) *VPX-6:* VITA 46 Military VPX Backplane (6 Slot 3U 0.85" Pitch)

/I PSU Input Power Voltage

28VDC: 28 VDC Input 48VDC: 48 VDC Input 270VDC: 270 VDC Input 90-264VAC: Autorange 90-264 VAC @ 47-880 Hz Input 200VAC-3Ph: 200 VAC 3 Phase @ 47-880 Hz Input

/W Power Supply Unit Watts

A-475W: 28 VDC (+5 VDC @ 40A, +3.3 VDC @ 22A, ±12 VDC @ 8A) A-575W: All PSUs (+5 VDC @ 40A, +3.3 VDC @ 22A, ±12 VDC @ 12A) A-675W: 28 VDC (+5 VDC @ 80A, +3.3 VDC @ 22A, ±12 VDC @ 8A)* A-775W: All PSUs (+5 VDC @ 80A, +3.3 VDC @ 22A, ±12 VDC @ 12A)

 B-450W: 28 VDC (+5 VDC @ 20A, +3.3 VDC @ 45A, ±12 VDC @ 8A)

 B-550W: All PS Us (+5 VDC @ 20A, +3.3 VDC @ 45A, ±12 VDC @ 12A)

 B-564W: 28 VDC (+5 VDC @ 20A, +3.3 VDC @ 80A, ±12 VDC @ 8A)^

 B-664W: All PSUs (+5 VDC @ 20A, +3.3 VDC @ 80A, ±12 VDC @ 12A)

C-475W: 28 VDC (+5 VDC @ 20A, +3.3 VDC @ 22A, +12 VDC @ 16A,-12 VDC @ 8A) *C-575W:* All PSUs (+5 VDC @ 20A, +3.3 VDC @ 22A, +12 VDC @ 21A, -12 VDC @ 12A) *C-775W:* 28 VDC (+5 VDC @ 20A, +3.3 VDC @ 22A, +12 VDC @ 41A, -12 VDC @ 8A)^A *C-825W:* All PSUs (+5 VDC @ 20A, +3.3 VDC @ 22A, +12 VDC @ 41A, -12 VDC @ 12A)

D-550W: 28 VDC (+5 VDC @ 40A, +3.3 VDC @ 45A, ±12 VDC @ 8A)[▲] *D-650W:* All PSUs (+5 VDC @ 40A, +3.3 VDC @ 45A, ±12 VDC @ 12A)[▲]

E-550W: 28 VDC (+5 VDC @ 20A, +3.3 VDC @ 45A, +12 VDC @ 16A, -12 VDC @ 8A)[▲] *E-650W*: All PSUs (+5 VDC @ 20A, +3.3 VDC @ 45A, +12 VDC @ 21A, -12 VDC @ 12A)[▲]

F-575W: 28 VDC (+5 VDC @ 40A, +3.3 VDC @ 22A, +12 VDC @ 16A,-12 VDC @ 8A)^A *F-675W*: All PSUs (+5 VDC @ 40A, +3.3 VDC @ 22A, +12 VDC @ 21A, -12 VDC @ 12A)^A

S-575W: All PSUs + 28 VDC (+3.3 VDC @ 22A, +12 VDC @ 41A) * <u>SOSA</u> All PSUs = All PSUs except 28 VDC input | 28 VDC = 28 VDC input only *PSU not available for CM-ATR-3U/FAC chassis model

MOUNTING TRAY GENERIC PART NUMBER: CM-TR-3U /CT

/FP Front Panel Layout

CMP: Standard CM front panel fitted with MIL-DTL-38999 connectors *UDP:* User-defined front panel layout (requires customer drawing)

/TC Chassis Top Cover

STC: Standard Top Cover. Wiring clearance 13mm *FTC:* Standard Top Cover. Wiring clearance 13mm. (Std. on SEF-18HP) *HTC:* High profile Top Cover. Wiring clearance 35mm *HETC:* Heat Exchanger Top Cover.

/BC Chassis Bottom Cover

SBC: Standard Bottom Cover. Wiring clearance below backplane 24mm *HBC:* High profile Bottom Cover. Wiring clearance below backplane 50mm

/CS Chassis Card-Cage Slot

MCS: Mixed Card-cage Slots (mixed conduction-cooled & air-cooled boards) *CCS:* Conduction-cooled Card-cage Slots (conduction-cooled boards only) - *MCS is not available for CM-ATR-3U/HES-FBL chassis models*

/F Rear-Mounted Fan Assembly

STDF: 2x60 CFM DC Rugged fans (HES, HES-FBL) <u>or</u> 1x60 CFM DC Rugged fan (FAC)

- *F115-400:* 2x65 CFM 115 VAC @ 400Hz Rotron PX2 Military fans (HES-FBL, HES & HES-FBL-HP) <u>or</u> 1x65 CFM Rotron PX2 Military fan (FAC)
- F200-400: 2x120 CFM 200 VAC 3PH @ 400Hz Rotron PX2 fans (HES-FBL, HES & HES-FBL-HP) or 1x120 CFM Rotron PX2 Military fan (FAC)
- No rear fan required for CM-ATR-3U/S & /SEF-HP, omit option from part number.
- Rugged fans are fitted with aluminum housing. Operating range: -40°C to +85°C
- Full military Rotron PX2 AC fans. Operating range: -54°C to +125°C

/C Chassis Color

B: Black, G: Navy Grey, E: Army Dark Earth, W: White, R: Red, PT: Platinum, W: Yellow, GN: Green, BLU: Dark Blue, CR: Chromate MIL-C-5541 or O: Other

PART NUMBER EXAMPLE:

CM-ATR-3U/SEF-18HP/VPX/28VDC/A-475W/UDP/FTC/SBC/CCS/E

- 5 slot, Sealed with Extended Fins + 18 Heat Pipes 3U Avionics Enclosure.
- 5 slot, 3U VPX 1" Pitch backplane. 28VDC input power supply.
- A-475W power supply (+5 VDC @ 40A, +3.3 VDC @ 22A, ±12 VDC @ 8A).
- User-defined front panel layout (requires drawing).
- Finned Top Cover (\$13mm). Standard Bottom Cover (backplane \$25mm).
- Conduction-cooled Card-cage Slots (conduction-cooled boards only).
- Enclosure color: Army Dark Earth.

LEARN MORE: WWW.CMCOMPUTER.COM OR CALL : +34 954 253 116 | +34 954 253 119