

# ATR (Air Transport Rack)



## PRODUCT OVERVIEW

Continuing to innovate in the manufacturing of ruggedized, modular, COTS systems platforms, Elma's full line of convection and conduction cooled ATR (Air Transport Rack) enclosures offer a standardized, cost effective solution for VME, VME64x, VXS, MicroTCA, cPCI and cPCI Express based applications. Available in 1/2, 3/4, 1 and 1 1/2 ATR tall long or tall short formats per ARINC 404A, ARINC 600 and IEEE 1101.10 specifications, the modular design concept allows for a wide range of customization options without the cost and lead time penalties associated with custom designs.

The all-aluminum ATRs are made from punched and formed sheet metal and milled plates. A removable front panel allows I/O customization to exact application requirements and increased configurability. The ATR enclosures use electrostatic dust filters, honeycomb EMI filters and a narrow screw spacing to seal off every external seam to ensure compliance to MIL-STD-461D. The rugged designs meet the requirement for shock, vibration and structural integrity per MIL-STD-810F, MIL-STD-167 and MIL-STD-901D.

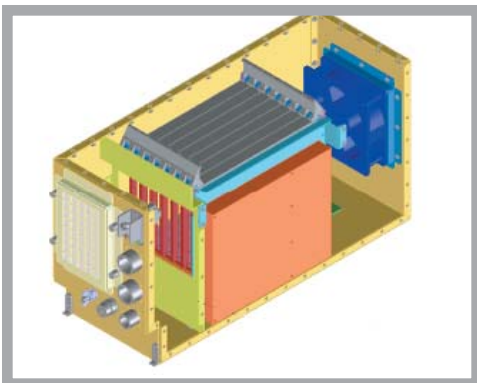
In addition to the full range of available case sizes, standard options include: 5-15 slot 6U x 160mm card cages, 150-750 watt power supplies, 28VDC or 90-230VAC (440 Hz) input, up to 470 CFM cooling systems and configurable I/O. All Elma Electronic Inc, system platforms come fully assembled and wired offering a "turnkey" packaging solution.

Elma's ATR products incorporates Mil-grade components like Mil-38999 connector, integrated sensors, line filters, on/off and reset switches, LEDs, fuses, breakers, etc. Fan options include the use of full Mil-grade high altitude fan tray can operate under extremely harsh temperature conditions. Depending on applications specific equipments either commercial, industrial or Mil-grade power supplies can be used.

## MIL-STD

- MIL-STD-5400: General standard for Aerospace Electronic Equipment
- MIL-STD-810F: Environmental Test Methods and Engineering Guidelines
- MIL-STD-461E: Requirements for the control of EMI Emissions and Susceptibility
- MIL-STD-704E: Aircraft Electric Power Characteristics
- MIL-STD-1275A: Characteristics of 28 Volt DC Electrical Systems in Military Vehicles

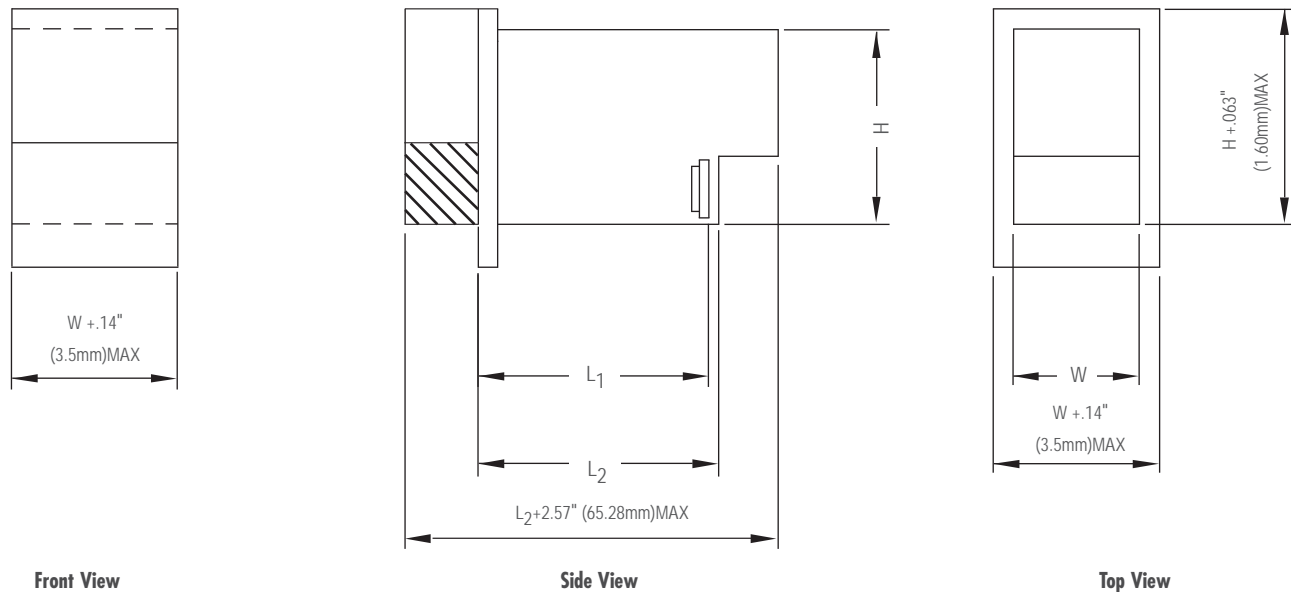
## APPLICATION EXAMPLES



## ATR PRODUCT SELECTION

ATR ORDER NUMBER	ATRATL05...	ATRBTS07...	ATRBTL07...	ATRCTL12...	ATRDTL15...
<b>Size</b>	1/2 ATR Tall, Long	3/4 ATR Tall, Short	3/4 ATR Tall, Long	1 ATR Tall, Long	1 1/2 ATR Tall, Long
<b>Slots</b>	4	7	11	12	15
<b>Backplane</b>	VME,VME64x,cPCI	VME,VME64x,cPCI	VME,VME64x,cPCI	VME,VME64x,cPCI	VME,VME64x,cPCI
<b>Width</b>	123.95mm (4.9")	190.5mm (7.5")	190.5mm (7.5")	257.05mm(10.12")	390.65mm (15.38)
<b>Height</b>	269.88mm (10.625")	269.88mm (10.625")	269.88mm (10.625")	269.88mm (10.625")	269.88mm (10.625")
<b>Depth</b>	498mm (19.6")	320.5mm (12.62")	498mm (19.6")	498mm (19.6")	498mm (19.6")
<b>Power Supply</b>	250 watts 5V@30A 3.3V@30A +12V@4A -12V@4A	350 watts 5V@30A 3.3V@30A +12V@8A -12V@8A	350 watts 5V@30A 3.3V@30A +12V@8A -12V@8A	500 watts 5V@60A 3.3V@30A +12V@8A -12V@8A	700 watts 5V@80A 3.3V@60A +12V@8A -12V@8A
<b>Weight (without boards)</b>	17lbs.	22 lbs.	25lbs.	33 lbs.	45 lbs.

## STANDARD ATR CASE DIMENSIONS



ATR Size	Approx. Volume		Width(W)		Length(L1)		Length (L2)		Height (H)	
	in <sup>3</sup>	liter <sup>3</sup>	±.03in	±0.76mm	±.04in	±1mm	in	mm	in	mm
1/2 Short	470	7.70	4.88	123.95	12.52	318.0	12.62	320.5	10.625	269.88
1/2 Long	725	11.88	4.88	123.95	19.52	495.8	19.62	498.3	10.625	269.88
3/4 Short	720	11.80	7.50	190.50	12.52	318.0	12.62	320.5	10.625	269.88
3/4 Long	1120	18.36	7.50	190.50	19.52	495.8	19.52	498.3	10.625	269.88
1 Short	975	15.98	10.12	257.05	12.52	318.0	12.62	320.5	10.625	269.88
1 Long	1510	24.75	10.12	257.05	19.52	495.8	19.62	498.3	10.625	269.88
1 1/2 Long	2295	37.62	15.38	390.65	19.52	495.8	19.62	498.3	10.625	269.88

Notes: Per ARINC characteristic 561 INS, the standard dimension 'H' = 7.62" may be increased to a maximum 'H' dimension of 10.625" (269.88mm) when necessary for equipment reasons.

## ATR PRODUCT OVERVIEW

### POWER SUPPLY FEATURES

- Low Noise FM Control
- Military Specification Compliance  
(MIL-STD-461C: EMI/RFI, MIL-STD704A, 1275A: Transients & Spikes, MIL-I-45208: Quality System)

Parameter	Min.	Typ.	Max.	Units	Notes
Input Characteristics					
28 VDC Input Modules:					
Steady State Input	18	28	50	VDC	20ms,50W per MIL-STD704A 100ms,15mJ per MIL-STD1275A
Input Spike Limit	-600		+600	VDC	
	-250		+250	VDC	
Input Surge Limit:			100	VDC	60ms,0.5Wper MIL-STD1275A
Overvoltage Shutdown		50			100ms Automatic Recovery
Inrush Current		110	125	%IIN	Steady state IIN 10ms
EMI/RFI Characteristics; (MIL-STD-461D, Class A1b)					
Input Power Leads:					
Conducted Emissions	CE03				MIL-STD-461D
Conducted Susceptibility	CS02				MIL-STD-461D
Radiated Susceptibility	RS03				
Output Characteristics					
Load/Line Regulation		0.2%	0.5%	VNOM	LL to HL, NL to 10%
		0.05%	0.2%	VNOM	LL to HL, 10% to FL
Thermal Characteristics					
Efficiency		77	81	%	

### FAN FEATURES

- High performance axial fan
- Feathered edge for lower noise
- High reliability ball bearings
- Range: 80 - 350 CFM
- Operating temperature: -10°C to +70°C
- Per MIL-STD-461D meets EMI standards per FCC Part 15, Subpart J of Docket 20780, Class A & B radiated and conducted emissions, meets EMI standards per VDE Spec. 0871/6.78 for cat. A&B requirements
- Isolated tachometer output-square wave output equal to two pulses per revolution

### ENVIRONMENTAL SPECIFICATIONS

PARAMETER	I GRADE	M GRADE	APPLICABLE SPECIFICATION
Temp, Operating	-10° to +55°C	-55 ° to +85°C	MIL-STD-810F (Methods 501.3 & 502.3)
Temp, non-Operating	-30° to +85°C	-55 ° to +85°C	MIL-STD-810F (Methods 501.3 & 502.3)
Shock	15 g 11ms	25g 11ms	MIL-STD-810F (Method 516.4)
Vibration	15 to 2,000 Hz at .1g2/Hz (RMS – 12G)	15 to 2,000 Hz at .1g2/Hz (RMS – 12G)	MIL-STD-810F (Method 514.4)
Altitude, Operating	15,000 ft	55,000 ft	MIL-STD-810F (Method 500.3)
Humidity	0-95% non-condensing	0-95% non-condensing	MIL-STD-810F (Method 507.3)
Salt fog	Limited	Conformal Coating 5% for 48 hours	MIL-STD-810F (Method 509.3)
Wiring	Limited Toxicity	Limited Toxicity	MIL-C-24643
EMC	MIL-STD-461D	Tempest	MIL-STD-461D Tempest

# ATR Products



## 3/4 ATR PLATFORM, TALL/LONG

- Backplane in VME/64x, cPCI, VXS, VPX or MicroTCA up to 7 slots
- Vertical card mounting (top loading) 6U x 160mm
- Up to 400 watts of power with 28VDC or optional AC input
- Bottom patch panel offers access to P2 section of the backplane
- Integral cooling with front-to-rear airflow
- Mil-grade high-performance Ametek Rotron fan, capable of providing over 15 CFM per slot at altitudes over 35000 feet and operating temperature of 55°C to 85°C
- Integral cooling with front-to-rear airflow
- **Order Number: ATR7507V645XP28VDC**



## 1 ATR PLATFORM, TALL/LONG

- Vertical card mounting (top loading) 6U x 160mm VME64x compliant
- Backplane in VME/64x, cPCI, VPX, VXS, or MicroTCA, up to 8 slots
- Standard 28 VDC Power Supply, 400 W
- Measures 10.12" w x 10.62" h x 19.6" d
- P2 and P0 backplane backside connector pins required
- Minimum 2.0 inches required below the backplane (2.5 inches preferred)
- Bottom patch panel offers access to P2 section of the backplane
- Integral cooling with front-to-rear airflow
- Indicator/I-O front panel
- DC input connector, power on/off toggle switch, elapsed time meter and voltage indicators with voltage monitor
- Front-mounted carrying handles and mounting hooks
- Fan fail indicator and reset switch (optional)
- **Order Number: ATRCTL100PNXVTNZ46U**



## 1 1/2 ATR PLATFORM, TALL/LONG

- Backplane in VME/64x, cPCI, VPX, VXS or MicroTCA in sizes up to 15 slots
- Vertical card mounting (top loading) 6U x 160mm
- Power Supply: 120 VAC or 28 VDC
- Measures 15.38" w x 12" h x 19.6" d
- P2 and P0 backplane backside connector pins
- Bottom patch panel offers access to P2 section of the backplane
- Integral cooling with front-to-rear airflow
- AC input connector, power on/off toggle switch, elapsed time meter and voltage indicators with voltage monitor, status indicator I-O front panel
- Front-mounted carrying handles and mounting hooks
- Fan fail indicator and reset switch (optional)