## CSI 6500 Machinery Health<sup>™</sup> Monitor Chassis Options

The CSI 6500 Machinery Health Monitor, fully compliant with API 670 and API 618, protects and monitors critical rotating machinery.

Unique abilities include easy 3 step integration of protection information with the DeltaV and Ovation process automation systems, transient analysis for turbomachinery including live, record, pause and replay and awardwinning PeakVue processing for early warning of faults in rolling element bearings and gears.

Chassis configurations include:

- 19" wide protection only chassis includes both a 6U and the industry's only 3U high version.
- 19" wide prediction only chassis is 6U high with either front sensor terminations or rear sensor terminations. Additionally a compact 7.5" wide version is available.
- For combined protection monitoring and predictive monitoring, all chassis are
   19" wide and 6U high.



The CSI 6500, AMS Suite, DeltaV, and Ovation provide a complete solution for critical rotating machines that includes protection, prediction, and performance.

- Fully API 670 and API 618 compliant with machinery health monitoring
- Design ensures that a single circuit failure will not affect more than two channels, including hot swappable module replacement
- Internal timeclock synchronization with plant time included
- Redundant Modbus, TCP or serial, for integration of protection monitors with 3rd party control systems. Additional simplex Modbus output for prediction parameters
- Slots for 16 or 32 shutdown relay outputs

- Two-channel tachometer / key channels
- 12 slots for 3U high two-channel vibration and position monitoring modules for a total of 24 inputs
- 4-20mA outputs and buffered outputs rear and front
- Includes relay bypass and trip multiply configurable per channel
- Power supply external and does not require chassis slot



### **CSI 6500 Configurations**

Chassis Options	API 670 Protection	Rolling Elements & Gears	Transient for Turbo-machinery	Rear Sensor Terminations	Front Sensor Terminations	Small chassis size
A6500 PT	~	~	<ul> <li>Image: A start of the start of</li></ul>	<b>v</b>		
A6500PM	~	~		v		
A6500P-24* *Upgradable to Machinery Health Monitoring	V			V		
IMR600010	~			<b>v</b>		<b>&gt;</b>
IMR600020	~			<b>v</b>		<b>v</b>
IMR600030	~			<b>v</b>		<b>v</b>
A6500MF		~			<ul> <li>Image: A start of the start of</li></ul>	
A6500TF		~	<ul> <li>Image: A start of the start of</li></ul>		<ul> <li>Image: A start of the start of</li></ul>	
A6500MR		~		<ul> <li>Image: A start of the start of</li></ul>		
A6500TR		~	<ul> <li></li> </ul>	<ul> <li>Image: A start of the start of</li></ul>		
A6500MS		~		<ul> <li>Image: A start of the start of</li></ul>		<ul> <li>Image: A start of the start of</li></ul>
A6500TS		~	<ul> <li>✓</li> </ul>	<b>v</b>		V



Module configurations for protection and transient monitoring for turbomachinery, A6500PT, and module configurations for protection and machinery health monitoring for rolling elements and gearboxes, A6500PM.

### Specifications

General System Specifications				
Environmental				
A6560, A6510	0 to 150°F (-17° to 65°C)* 0 - 95% R.H. noncondensing			
A6560-T	0 to 150°F (-17° to 65°C)* 0 - 50% R.H. noncondensing			
A6510-T	0 to 130°F (-17° to 55°C)* 0 - 95% R.H. noncondensing			
Ratings	CE EN50081-2 Emissions noncondensing CE EN50081-2 Emissions CSA (Pending)			
Power				
Chassis Input	18 VDC to 31 VDC (24 VDC Nominal)			
Maximum Input Surge	7 ADC @ 24 VDC for 1 msec 3 ADC @ 24 VDC for 20 msec			
Maximum Power Dissipation	6 W for each protection module, 5 W for Modbus module, 22 W for full set of prediction modules and 33 W for full set of transient modules. (Please see individual spec sheets for additional specifications.)			



Rear side of the A6500PT, A6500PM Machinery Health Monitor. Shown with rear shield panel. If the optional dual termination panel is ordered, the dual termination panel will replace the shield panel shown above.



Note: Dimensions in inches for part numbers A6500PT, A6500PM, A6500P-24, A6500MR, A6500TR, A6500MF, and A6500TF. Chassis part number with splitting kit for combined machinery health and protection monitoring, MHM-85733.



Module configurations for protection only in a 6U high chassis by 19" wide. Upgradable to prediction.



*Rear view of A6500P-24, the machinery protection inputs and outputs.* 



Choose A6500TR-36, A6500TR-48, A6500MR-36, A6500RM-48 for high channel count, rear sensor termination prediction only solutions.



Choose A6500TF-12, A6500TF-24, A6500MF-12, A6500MF-24 for 19" by 6U high wall mount enclosure or front sensor termination prediction-only solutions.

#### **Monitoring Modules**

FIOLECLIOIT MODULES	
A6110	Shaft relative vibration 9199-00001
A6120	Case, seismic vibration 9199-00002
A6125	Case, piezo (accelerometer) vibration 9199-00069
A6140	Shaft absolute vibration 9199-00058
A6210	Thrust, differential expansion, and rod drop 9199-00003
A6220	Shaft eccentricity 9199-00009
A6312	Speed / key (6HP) 9199-00025
A6312-8	Speed / Key (8HP) 9199-00024
A6410	Valve / case expansion 9199-00005
A6620	4-20mA process input 9199-00086
A6630	RTD and thermocouple input
A6740	16 channel relay (12HP) 9199-00035
A6740-10	16 channel relay (10HP) 9199-00091
A6824	Modbus communication (6HP) 9199-00090
A6824R	Modbus communication (4HP), redundant optional 9199-00098
Prediction Modules	
A6510	12-2-2 Machinery Health signal input
A6510-T	12-2-2 Machinery Health signal input, with transient option
A6560	Machinery Health processor for up to 24 channels
A6560-T	Machinery Health processor for up to 24 channels, transient option
A6560-T Optional Items	Machinery Health processor for up to 24 channels, transient option
A6560-T <b>Optional Items</b> Part Number	Machinery Health processor for up to 24 channels, transient option
A6560-T Optional Items Part Number A476514	Machinery Health processor for up to 24 channels, transient option PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels)
A6560-T Optional Items Part Number A476514 A476520	Machinery Health processor for up to 24 channels, transient option PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels) Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels)
A6560-T Optional Items Part Number A476514 A476520 A6068	Machinery Health processor for up to 24 channels, transient option PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels) Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels) Redundant power supply, 100 – 240 VAC input, 24 VDC output
A6560-T Optional Items Part Number A476514 A476520 A6068 MHM-93301	Machinery Health processor for up to 24 channels, transient option PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels) Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels) Redundant power supply, 100 – 240 VAC input, 24 VDC output Single power supply
A6560-T Optional Items Part Number A476514 A476520 A6068 MHM-93301 MHM-6xxx-SMBADTR	Machinery Health processor for up to 24 channels, transient option PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels) Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels) Redundant power supply, 100 – 240 VAC input, 24 VDC output Single power supply SMB to BNC adapters
A6560-T Optional Items Part Number A476514 A476520 A6068 MHM-93301 MHM-6xxx-SMBADTR MHM-6xxx-SMBCABLE	Machinery Health processor for up to 24 channels, transient option          PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels)         Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels)         Redundant power supply, 100 – 240 VAC input, 24 VDC output         Single power supply         SMB to BNC adapters         SMB to SMB signal output cable
A6560-T Optional Items Part Number A476514 A476520 A6068 MHM-93301 MHM-6xxx-SMBADTR MHM-6xxx-SMBCABLE A6910	Machinery Health processor for up to 24 channels, transient option          Machinery Health processor A6560 or A6560T (up to 24 channels)         PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels)         Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels)         Redundant power supply, 100 – 240 VAC input, 24 VDC output         Single power supply         SMB to BNC adapters         SMB to SMB signal output cable         CSI 6500 protection module configuration software
A6560-T Optional Items Part Number A476514 A476520 A6068 MHM-93301 MHM-6xxx-SMBADTR MHM-6xxx-SMBCABLE A6910 D25225	Machinery Health processor for up to 24 channels, transient option          Machinery Health processor A6560 or A6560T (up to 24 channels)         PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels)         Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels)         Redundant power supply, 100 – 240 VAC input, 24 VDC output         Single power supply         SMB to BNC adapters         SMB to SMB signal output cable         CSI 6500 protection module configuration software         A6560 slot blank panel
A6560-T Optional Items Part Number A476514 A476520 A6068 MHM-93301 MHM-6xxx-SMBADTR MHM-6xxx-SMBCABLE A6910 D25225 D25216	Machinery Health processor for up to 24 channels, transient option          Machinery Health processor A6560 or A6560T (up to 24 channels)         PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels)         Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels)         Redundant power supply, 100 – 240 VAC input, 24 VDC output         Single power supply         SMB to BNC adapters         SMB to SMB signal output cable         CSI 6500 protection module configuration software         A6560 slot blank panel
A6560-T  Optional Items  Part Number  A476514  A476520  A6068  MHM-93301  MHM-6xxx-SMBADTR  MHM-6xxx-SMBCABLE  A6910  D25225  D25216  MHM-85708	Machinery Health processor for up to 24 channels, transient option Machinery Health processor A6560 or A6560T (up to 24 channels) PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels) Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels) Redundant power supply, 100 – 240 VAC input, 24 VDC output Single power supply SMB to BNC adapters SMB to BNC adapters SMB to SMB signal output cable CSI 6500 protection module configuration software A6560 slot blank panel A6510 slot blank panel 6 HP wide protection slot blank panel
A6560-T Optional Items Part Number A476514 A476520 A6068 MHM-93301 MHM-6xxx-SMBADTR MHM-6xxx-SMBCABLE A6910 D25225 D25216 MHM-85708 MHM-85730	Machinery Health processor for up to 24 channels, transient option PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels) Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels) Redundant power supply, 100 – 240 VAC input, 24 VDC output Single power supply SMB to BNC adapters SMB to SMB signal output cable CSI 6500 protection module configuration software A6560 slot blank panel A6510 slot blank panel 6 HP wide protection slot blank panel 24 HP wide protection slot blank panel
A6560-T         Optional Items         Part Number         A476514         A476520         A6068         MHM-93301         MHM-6xxx-SMBADTR         MHM-6xxx-SMBCABLE         A6910         D25225         D25216         MHM-85708         MHM-85730         A6500-SS-ENCL	Machinery Health processor for up to 24 channels, transient option          Machinery Health processor A6560 or A6560T (up to 24 channels)         PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels)         Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels)         Redundant power supply, 100 – 240 VAC input, 24 VDC output         Single power supply         SMB to BNC adapters         SMB to SMB signal output cable         CSI 6500 protection module configuration software         A6560 slot blank panel         A6510 slot blank panel         6 HP wide protection slot blank panel         24 HP wide protection slot blank panel         Wall mount enclosure for front termination CSI 6500, A6500MF and A6500TF
A6560-T         Optional Items         Part Number         A476514         A476520         A6068         MHM-93301         MHM-6xxx-SMBADTR         MHM-6xxx-SMBCABLE         A6910         D25225         D25216         MHM-85708         MHM-85730         A6500-SS-ENCL         MHM-85733	Machinery Health processor for up to 24 channels, transient option Medhinery Health processor A6560 or A6560T (up to 24 channels) Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels) Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels) Redundant power supply, 100 – 240 VAC input, 24 VDC output Single power supply SMB to BNC adapters SMB to SMB signal output cable CSI 6500 protection module configuration software A6560 slot blank panel A6510 slot blank panel 6 HP wide protection slot blank panel 24 HP wide protection slot blank panel Wall mount enclosure for front termination CSI 6500, A6500MF and A6500TF Splitting kit (required only to upgrade a prediction-only configuration to include protection)
A6560-T         Optional Items         Part Number         A476514         A476520         A6068         MHM-93301         MHM-6xxx-SMBADTR         MHM-6xxx-SMBCABLE         A6910         D25225         D25216         MHM-85708         MHM-85730         A6500-SS-ENCL         MHM-85733         A6500-M-BP	Machinery Health processor for up to 24 channels, transient option          Machinery Health processor A6560 or A6560T (up to 24 channels)         PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels)         Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels)         Redundant power supply, 100 – 240 VAC input, 24 VDC output         Single power supply         SMB to BNC adapters         SMB to SMB signal output cable         CSI 6500 protection module configuration software         A6550 slot blank panel         A6510 slot blank panel         6 HP wide protection slot blank panel         24 HP wide protection slot blank panel         Wall mount enclosure for front termination CSI 6500, A6500MF and A6500TF         Splitting kit (required only to upgrade a prediction-only configuration to include protection)         Machinery Health backplane
A6560-T         Optional Items         Part Number         A476514         A476520         A6068         MHM-93301         MHM-6xxx-SMBADTR         MHM-6xxx-SMBCABLE         A6910         D25225         D25216         MHM-85708         MHM-85730         A6500-SS-ENCL         MHM-85733         A6500-RSH	Machinery Health processor for up to 24 channels, transient option          Machinery Health processor A6560 or A6560T (up to 24 channels)         PeakVue for Machinery Health processor A6560 or A6560T (up to 24 channels)         Modbus for Machinery Health processor A6560 or A6560T (up to 24 channels)         Redundant power supply, 100 – 240 VAC input, 24 VDC output         Single power supply         SMB to BNC adapters         SMB to SMB signal output cable         CSI 6500 protection module configuration software         A6560 slot blank panel         A6510 slot blank panel         6 HP wide protection slot blank panel         Vall mount enclosure for front termination CSI 6500, A6500MF and A6500TF         Splitting kit (required only to upgrade a prediction-only configuration to include protection)         Machinery Health backplane         Rear sensor shield panel for prediction

# **3U Height Chassis Options**

The 3U height chassis option is perfect for applications where space is an issue, protection only is required, or only a few monitoring modules are required. Three chassis configurations offer flexibility for:

- standard, protection only
- protection only, with high relay count
- process input rack such as temperature monitoring



- 19" wide chassis for standard cabinet mount
- The industry's only 3U high monitoring modules offers more flexibility for installations

### Specifications for IMR6000:



482.6 mm (19 in) (ut 25) um 5721 (ut 25) (ut

465.9 mm (18.34 in)

Figure 2 All dimensions in mm (inches)

Front view:



IMR600010 3U high by 19" wide, protection only solution capable of 16 relay outputs.



IMR600020 3U high by 19" wide, process input, protection only solution capable of 32 relay outputs.



IMR600030 3U high by 19" wide, protection only solution capable of 32 relay outputs.

Model Number	Product Description
IMR 011	19", 14 slot card cage only, no backplane
IMR600010	Standard 14 Slot Rack, 19" Rack. Slot configuration: 1 Tach module, 9 Vibration, Position, or Temperature modules, 1 Blank, 1 (two slot wide) Relay module, 1 Communication module
IMR600020	Process Input Rack, 14 Slot Rack, 19" Rack. Slot configuration: 8 Process input modules, 2 (two slot wide) Relay modules, 1 Blank, 1 Communication module
IMR600030	Standard rack, but with twice the relay output capability: 14 Slot, 19" Rack. Slot configuration: 1 Tach module, 7 Vibration, Position, or Temperature modules, 1 Blank, 2 (two slot wide) Relay modules, 1 Communication module

### **Ordering Information**

### Specifications

General System Specifications				
Environmental				
A6500MS-12	0 to 150°F (-17° to 65°C)* 0 - 95% R.H. noncondensing			
A6500MS-24	0 to 150°F (-17° to 65°C)* 0 - 95% R.H. noncondensing			
A6500TS-12	0 to 150°F (-17° to 65°C)* 0 - 50% R.H. noncondensing or			
	0 to 130°F (-17° to 55°C)* 0 - 95% R.H. noncondensing			
A6500MS-24	0 to 150°F (-17° to 65°C)* 0 - 50% R.H. noncondensing or			
	0 to 130°F (-17° to 55°C) $^{\ast}$ 0 - 95% R.H.noncondensing			
Ratings	CE EN50081-2 Emissions noncondensing CE EN50081-2 Emissions CSA (Pending)			
Power				
Chassis Input	18 VDC to 31 VDC (24 VDC Nominal)			
Maximum Input Surge	7 ADC @ 24 VDC for 1 msec 3 ADC @ 24 VDC for 20 msec			
Maximum Power Dissipation	6 W for each protection module, 5 W for Modbus module 22W, 33W with Transient. (Please see individual spec sheets for additional protection modules power specifications.)			



A6500TS, A6500MS for Small or Remote Prediction Only Applications

- Small width prediction only chassis only 7.5" wide
  - Rolling element bearing and gearbox monitoring and optional transient monitoring
  - Can be configured either in simple transmitter mode for Modbus communication to control system or configured for full integration to AMS Machinery Manager

\*Note: Temperature ratings are for rack electronics only. Cooling is required if enclosure (ambient + enclosure heat rise) temperatures exceed these limits.



Dimensional drawing applicable for part numbers: A6500MS-12, A6500MS-24, A6500TS-12, A6500TS-24

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