



## PRODUCT INFORMATION

### MIL8700 Series Multi-Channel Machinery Protection Monitor – API670 Compliant

The MIL8700 series of Machinery Protection Monitors, designed to meet API670, continue to provide industry with reliable machinery protection. Since launch, the system has given unrivalled reliability with zero failures in service when commissioned by MIL's Engineers who can also configure the monitor at site. Over the past 20+ years the MIL8700 has taken advantage of technology improvements to offer greater flexibility and quality. The system's remarkable performance endorses Mechanalysis (India) Ltd. as a leading supplier of on-line vibration measurement and TSI parameters with essential functionality at competitive prices. Since Mechanalysis sources its components from local manufacturers it is able to guarantee after sales support for at least 20 years and beyond.

Part number **M87001** Vibration Monitoring System (VMS) consists of a 19" Main Rack Frame, panel mounting type. It houses up to a maximum of eight vibration modules with the proven moving coil Analogue display for easy viewing machine status, especially during start-up. When loaded with up to eight dual channel modules, a maximum of 16 channels are available. The rack has common alarm relays but there is available a Relay Expander, Part Number M87952 which has Epoxy sealed DPDT contacts rated 5A at 230VAC resistive load for each channel and alarm condition.



Part number **M87002** Turbine Supervisory Instrumentation System (TSI) and (VMS), consists of a 19" Main Rack Frame, panel mounting type. It houses a maximum of eight vibration modules with the digital displays for precise indication of signal levels. When loaded with up to eight dual channel modules, a maximum of 16 channels are available. The rack has common alarm relays but there is available a Relay Expander, Part Number M87952 which has Epoxy sealed DPDT contacts rated 5A at 230VAC resistive load for each channel and alarm condition.



Part number **M87004** is a 11<sup>3</sup>/<sub>4</sub>" Main Rack Frame for those installations where space is a constraint and as a direct replacement for the model IRD5806 monitor. It can be offered with either Analog or Digital Displays. All the VMS and TSI modules of the MIL8700 Series are compatible with the MIL8704 Rack. When loaded with up to four dual channel modules a maximum of 8 channels are available. The rack has common alarm relays but there is available a Relay Expander, Part Number M87952 which has Epoxy sealed DPDT contacts rated 5A at 230VAC resistive load for each channel and alarm condition.





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### SYSTEM OPTIONS

The Mechanalysis-On-Line machinery protection system offers a range of customised solutions. These include:

- Cabinets for Vibration Monitoring System or for Turbine Supervisory System (TSI)
- Cabinets or Panels for Digital Panel Meters (DPM)
- Enclosures (IP55 or IP65 protection)
- DPM's for remote and local panel indication
- Redundant Power Supply  $\pm 24V$  DC SMPS
- Un-interrupted Power Supply (UPS)
- Current Isolators single or dual
- Intrinsically Safe Barriers
- Recorders (Strip Chart, Pen and Paperless types)
- Sensor Signal Interface Amplifier for MIL544M Sensor (for distance exceeding 330m)
- Sensor signal Converter for MIL544M (output 100mV RMS/mm/sec)
- Wireless Transmission system for Analog / Digital data
- RS485 and RS232 connectivity for DCS and SCADA.

In addition to the above options we have considerable expertise in designing customised mounting brackets for TSI applications. In particular for plant Renovation & Modernisation (R&M) projects.

### AVAILABLE MACHINERY PROTECTION MODULES:

The table below summarises the model numbers for vibration and turbine supervisory instrumentation designed to meet API670 specification. The suite of modules provides a comprehensive range of sensor inputs, measured units and ranges. Proposals will specify the part number to meet the end user's specific requirements.

Models	FUNCTION	Chls	Display	Sensors	UNITS
MIL8710	Vibration	1	Analog	Velocity Sensor Accelerometer ECP	microns Pk-Pk mm/sec Pk g Pk
MIL8720	Vibration	2	Analog or Digital		
MIL8730	Axial Shift	2	Digital	ECP	mm
MIL8740	Cam Valve	2	Digital	Rotary Potentiometer	%User Defined
MIL8750	Differential Expansion	2	Digital	ECP	mm
MIL8760	Eccentricity	2	Digital	ECP	microns Pk-Pk
MIL8770	Other Parameters	2	Digital	4 - 20mA DC	User Defined
MIL8780	Shell Expansion	2	Digital	LVDT	mm
MIL8790	Speed Monitor	2	Digital	ECP-User Defined	RPM *

\* Requires a tooth wheel fitted to the main drive shaft for accurate speed indication.



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### SPECIFICATION OF MODEL 8701/2/4 MAIN RACK WITH POWER SUPPLY

Part Numbers M87001 M87002 or M87004

#### Construction

Designed to meet API670 for on-line machinery protection, the MIL8700 Series has a rugged construction with top and bottom aluminium extruded channels and ABS press fitted guides maintain module / connector alignment. Extruded aluminium frame members and substantial formed aluminium structural parts. Conduit entry holes at the base provide easy access for installation and wiring. The epoxy-glass circuit boards with gold plated connector contacts, all solid-state circuitry and virtually wire-free modular assembly enhances reliability.

#### Channels

The model M87001 (VMS) 19" Rack accepts 8 Single or Dual Channel Analog Display Modules while the model M87002 (TSI & VMS) accepts 8 Single or Dual Channel Digital Display modules for vibration and turbine supervisory. A total of 16 channels of measurements are possible. The MIL87004 11<sup>3/4</sup>" Rack accepts 4 Single or Dual Channel Analog Modules giving 8 channels of measurements per rack.

#### Configuration of System

The MIL8700 series are high integrity integrated electronic systems that are factory set at time of order. However, the units are also site configurable. Range, measurements and band pass filters can be adjusted on site followed by system calibration traceable to National Standards.

#### Communications

The MIL8700 Series provides industry standard 4-20mA DC signal output for interfacing with Distributed Control System (DCS) and RS485 and RS232 connectivity for DCS and SCADA. The Vibration Signals are converted to 0-5V DC. Also a "D" connector is built in to the backplane to connect the Time Wave Form signals direct to the Beran's On-Line Simultaneous Diagnostic Systems offering Dual Redundancy Parallel Processing (DRPP).

#### Common Alarm Relay

Electromagnetic Common Alarm Relay operates when any module alarm occurs. One change-over (SPDT) potential free contacts rated at 5A resistive @ 230V AC are provided, normally de-energized (non fail safe), field changeable to normally energize (fail safe). Reset is manual and is actuated only when the signal level goes below the pre-set alarm level.

#### Common Trip Relay

Electromagnetic Common Trip Relay operates when any module trip occurs. Two change-over (DPDT) potential free contacts rated at 5A resistive @ 230V AC are provided, normally de-energized (non fail safe), field changeable to normally energize (fail safe). Reset is manual and is actuated only when the signal level goes below the pre-set trip level.

#### Common Circuit Fault Relay

Electromagnetic Common Trip Relay operates when any circuit fault is detected by Module "OK" light circuits. One change-over (SPDT) potential free contacts rated at 5A resistive @ 230V AC are provided, normally de-energized (non fail safe), field changeable to normally energize (fail safe). Reset is automatic when fault condition returns to normal.

#### Remote Reset

Alarm and trip relays may be reset using contacts connected to Remote Reset Terminals.



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### Test

A spring loaded Test Switch on the Control Module front panel is provided to check the healthiness of the individual modules for which internally generated test signal is applied to all the modules. Relays are automatically deactivated during the test.

### Trip Override

Concealed toggle switch located at rear of main rack frame inhibits common Trip Relay during servicing or troubleshooting. Flashing red front panel indicator advises operatives.

### Start-up Attenuation

Start-up control bus activates 1/3<sup>rd</sup> attenuator (attenuates signal input to 1/3<sup>rd</sup> that is used for Alarm set level comparison, display, and 4-20mA output) in all modules equipped with this feature in response to users control switch. Control panel LED lamp indicates that start-up function is activated.

### Power Supply

90 – 270V AC, 50/60Hz, single phase, 200 watt.  
 SMPS power supply furnishes ± 24 volt power to monitor modules.

### Wiring

Barrier terminal strips for all external wiring. Conduit holes are provided on Main Rack Frame

### Environmental

Storage temp : - -18°C to 65°C  
 Operating temp : - 0°C to 50°C ambient  
 Humidity : - 95% none condensing  
 Type Tests : - Comprehensive range ask for current certifications

### Weight & Dimensions

Rack & Power Supply : - 6.8 Kg  
 Module - 2 Channels : - 0.45 Kg  
 Rack with 8 modules: - 10.0 Kg  
 Dimensions : - P/N MIL87001 - 482mm (W) x 177mm (H) x 355mm (H)  
 : - P/N MIL87004 - 254mm (W) x 177mm (H) x 355mm (H)

Type Tests : - All primary type tests have been passed for the MIL8700 system

Mechanalysis (India) Ltd continues to be the industry leading provider of Condition management Solutions. With over 30 years experience in machinery vibration and associated technologies, the company designs and manufactures proven instrumentation suitable for rugged industrial environments.

The Vibration People of Mechanalysis (India) Ltd can be contacted at any one of the following Branches

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