

**Online Monitoring and diagnosis of critical machines**


The self-contained and intelligent ACOEM MV-060 and MV-120 systems are intended for continuous multi-channel monitoring of rotating machinery, enabling the early detection of faults, even on the most complex machines. It is the culmination of ACOEM's 30 years' experience of machinery monitoring throughout the industrial sector.

MV-060 and MV-120 are versatile systems offering 6 and 12 data acquisition channels\* for all signal types (IEPE, AC voltage, DC voltage, 4-20 mA, tacho). With its flexible configuration options and extensive calculation capacity, this system makes it possible to implement intelligent and targeted localized monitoring.

**Condition Monitoring System**

<b>Monitoring</b>	Number of channels	6 and 12 synchronous channels*
	Analog inputs	Customizable input type. All sensors needed for an efficient monitoring can be connected : Accelerometers, Tachometers, Current clamp, Thermocouple... Each channel can be configured individually to adapt to any type of input: IEPE AC, IEPE DC, 4-20 mA, voltage input (AC+DC, DC), impulse counter, tacho input (0,2Hz to 17kHz).
	Management of variable operating conditions	Up to 10 operating conditions can be defined per machine for a tailored monitoring. A fallback condition in case of communication loss with the PLC or OPC server allows storing data for more security. Data can be easily compared over time through trends filtered by operating conditions.
	Number & type of operating parameters	Up to 6 parameters (3 scalars + 3 binary)
	Monitoring	Continuous or Real-time
	Long-time waveform	Up to 82 s of signal on 12 channels regardless of the sampling frequency with a max of 4 M samples
	Low-speed shaft monitoring	Suited for low-speed shafts starting from a few RPM. Automatic early fault detection with Shock Finder algorithm
	Prevention against false alarms	Customizable parameters: Hysteresis, stabilization delay, operating condition time-out Management of alarm thresholds per operating condition up to 4 alarm levels per indicator (pAL, AL, DG and error)
	Storage to database	Periodic, condition-based, alarm-based, on demand (manually) Scalar values can be stored at a higher periodicity than raw signals (customizable)
	<b>Modbus</b>	Type
Master		inputs from 3 TCP servers, outputs up to 16 TCP clients
Slave		inputs from 1 TCP client, outputs up to 16 TCP clients
<b>Inputs</b>	Numerical inputs (Modbus TCP)	Values of operating parameters; Values of indicators (temperature...) can be collected from the PLC. Up to 255 parameters per system.
	Logical inputs	4 logical inputs
<b>Outputs</b>	Available data on Modbus TCP server	Number of indicators, Values of indicators, Status of indicators, Units of indicators, Values of operating parameters, values of thresholds. Always published
	Logical output	4 logical outputs
	OPC Server (through NEST software)	Publishing of machine alarm status and expert advice; publishing of parameters values and alarm statuses
	Management of communication loss	Data integrity guaranteed with embedded storage and automatic retry in case of communication failure. 3G compatible.
	E-mail notification	On any alarm status change or aggravating status change only, through NEST software.
	Integrity relay	NC or NO it provides hardware status
<b>Network</b>	Ethernet	10/100 base T ports can be used; compatible with Wi-Fi, 3G modems.
	Number of Ethernet ports	2 ports. Typical use: 1 for the PLC Modbus TCP, 1 for the office network and communication with NEST software

\*Please check with your local ACOEM sales representative if MV-060 is available in your country

## Acquisition & embedded processing details

<b>General</b>	A/D Converter	24 bits
	Frequency range	50 Hz; 100 Hz; 200 Hz; 500 Hz; 1 kHz; 2 kHz; 5 kHz; 10 kHz; 20 kHz.
	Number of lines	400; 800; 1,600 or 3,200
	Number of averages	from 1 to 4,096
	Multichannel acquisition type	independent or synchronous
	Type of average	linear, exponential, peak
	Overlap	0%; 50%; 75%
	High-pass filter	None, 2 Hz; 10 Hz; 3 kHz
	Integration	none, 1 or 2
	Zoom factor	none; x2; x4; x8; x16; x32; x64; x128; Maximum resolution: 30 MHz
	Windowing	Hanning; Rectangular; Flat-top
	Synchronous analysis	YES
	Envelope detection	YES
<b>Monitoring indicators</b>	Standard indicators	Acceleration, velocity, absolute displacement, relative displacement, relative position, bearing defect factor. High pass and low pass filters can be selected depending on the type of indicator.
	Value calculated per indicator (customizable)	RMS value; "equivalent peak" value; "equivalent peak-to-peak" value; "true peak" value; "true peak-to-peak" value
<b>Embedded processing on Time waveforms</b>	SFI (Shock Finder™)	Automatic abnormal periodic shock detection: gives a binary result (presence of shocks Y/N) and the number of shocks detected.
	Kurtosis	Classic shock detection indicator. Kurtosis alarming can be smoothed thanks to band-kurtosis indicator available as post processing in NEST software
	Others	Statistical analysis and filtering are available as post processing in NEST 3.0 software
<b>Embedded processing on FFT</b>	Number max of post-processed parameters	Up to 10 indicators can be defined from a spectrum
	Broadband energy indicators	RMS, equivalent peak or equivalent peak-to-peak level between two fixed frequencies
	Narrow band peak extraction indicators	RMS, equivalent peak or equivalent peak-to-peak level defined over a few spectral lines centered on a fixed or variable frequency the number of lines can be parameterized the center frequency is defined by two coefficients, A and B (integer), and by the following formula: $F_c = A.F_0 + B$ (with $F_0$ = rotation frequency)
<b>Real-time processing</b>	High-pass filter	2 Hz or 10 Hz
	Signal integration	0 or 1
	Low-pass filter	1,000 Hz or no filter (i.e., 20 kHz)
	Processing	RMS, pk or pk-pk
	Averaging	continuous exponential with time constant between 1 s and 25 s averaged DC level (for process and GAP signals)
	BGI indicator (Blade Guard Index)	Specific indicator dedicated to the monitoring of structural resonance, particularly suitable for wind turbine blades
	GCI indicator (Gearbox Condition Index)	Oil particle counting interface with GASTOPS METALSCAN unit. The following indicators are available: GCI-h: number of particles detected in the last hour GCI-d: number of particles detected in the last 24 hours (performed in a slipping mode) GCI-t: Total number of detected particles
	Broad band and narrow band extraction on real-time FFT	FFT 400 pts, 800 pts, 1,600 pts or 3,200 pts FFT 1 kHz, 2 kHz, 5 kHz, 10 kHz or 20 kHz, FFT with 50% fixed overlapping
<b>Time wave on event</b>	Fixed sampling rate	51.2 kHz.
	Length	1s to 80s on 12 channels simultaneously. Up to 480 s on 2 channels
	Pre-trigger duration	0 to total time wave length

**General**

<b>Physical</b>	Model	MVX1030100
	Dimensions	371 x 171 x 65 mm (14.6 x 6.89 x 2.56 in)
	Weight	2.96 kg
	Mounting	DIN TS 35 rail
	Power supply	24 VDC - 1,5A
	Embedded storage solution	Flash memory (No spinning HDD): up to 100 full measurements sets (incl. FFT and Time waveform)
	Cooling system	Thermally-driven with electro-galvanic steel casing (No fan).
	Casing matter	Painted galvanised steel
<b>Environmental</b>	Protection	IP20 ; must be installed inside an enclosure
	Operating temperature	from -20 to +60°C
	Storage temperature	from -20 to +70°C
	Altitude	Up to 4000 m
	Humidity	95% max, non-condensing at 60 ° C
	Compliances	Refer to EC marking certificate
<b>Evolutivity</b>	Extension of the number of channels	Firmware upgrade capability from MV-060 à MV-120



**Software management**

<b>Software Post-processing</b>	On time waveforms	Filters: High Pass, Low Pass, Band Pass, Shock Finder smart filter High Resolution Spectra (400 to 6,400 lines) Automatic parameters: Statistical levels (RMS, peak, peak-peak, mean...), Kurtosis and band-Kurtosis
	On spectra	Automatic parameters: Peak Extraction, Energy Narrow band Level, Energy broadband Level Bearings frequencies, gear frequencies Cepstra (automatic or manual) FFT concatenation (merged spectrum) for productive analysis
	On parameters	Logic combination of parameters
<b>Advanced thresholds</b>	Alarm thresholds levels	4 levels (pre Alarm, Alarm, Danger, Error)
	Standard thresholds types	HIGH level thresholds, LOW level threshold, IN RANGE thresholds, OUT OF RANGE thresholds,
	Advanced thresholds types	Evolution vs. previous control, Evolution vs. reference date, Statistics, Forecast
<b>Data mining</b>	Operating condition	Trends filtered per operating condition for variable operating condition machines
	History	Trends, waterfall Filter on control history from parameter trend.
	Comparison	Superimposition of parameters, spectra, time waves from one or several machines
	Quick access to results	Health matrix: the machine condition in one view of all alarm status

VERSIONS & SPECIFIC ACCESSORIES



**Pre-equipped cabinet**  
500 x 500 x 260mm  
With 24VDC - 3A power supply

