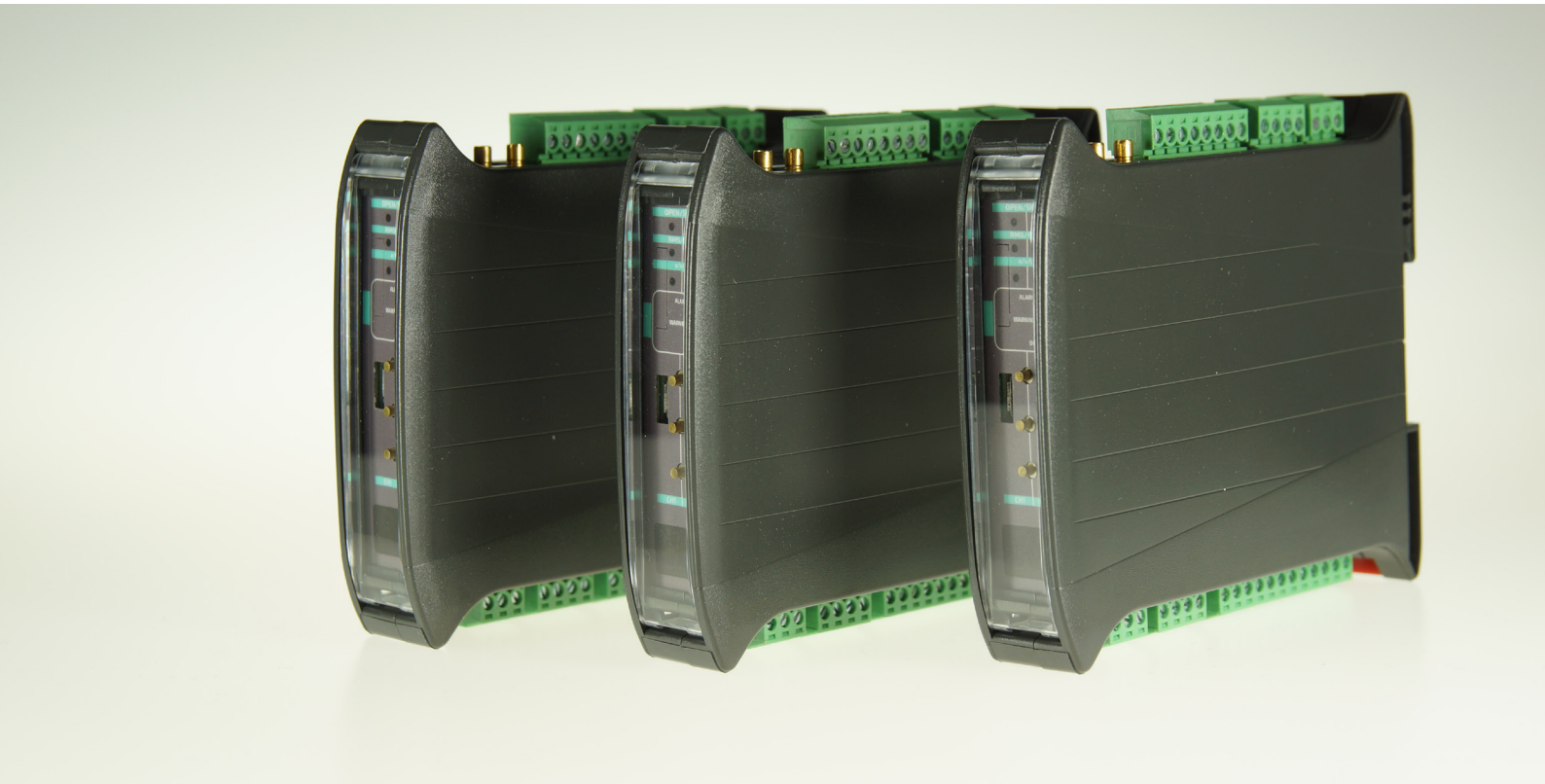
MONITOR 2000

AV MONITOR 2000

dual channel devices for monitoring and diagnostics of rotating machinery



system description

AMC VIBRO MONITOR 2000 series is a dual-channel, fully programmable device for online condition monitoring of rotating machinery. It is designed for a small or large rotating machines with fixed or variable rotational speed. One of AVM 2000 versions is specially suited for reciprocating compressors. This device detects and locates among other things: bearing faults, gearbox faults, unbalance, misalignment, looseness, overload and cavitation.

ALL VERSIONS OF AVM 2000 HAVE:

- 2 IEPE (ICP®) analog input channels,
- 2 speed/ phase marker input channels (PM),
- 5 relay outputs,
- 2 analog outputs (4-20mA),
- RS-485 MODBUS data interface.

BASIC FEATURES OF AVM 2000:

- fully configurable and independent relay outputs,
- warning and alarm for each channel and each analysis,
- IEPE open-loop/short-circuit detection,
- easy integration with PLC systems,
- dedicated PC configuration software,
- compact design and DIN rail installation,
- embedded LED display,
- buffered outputs for raw vibration signals.

VERSIONS:

- **AV MONITOR 2105D** – for general purpose constant speed rotating machines (fans, pumps, compressors etc.). The device can detect damage of the monitored machine.
- **AV MONITOR 2105DV** – for general purpose rotating machines (fans, pumps, compressors, etc.). The device enables to detect and locate of machines damage, i.e. indicate a specific gear stage or a damaged bearing. This version can save calculated estimates / analysis to the SD memory card.
- **AV MONITOR 2105DK** – for reciprocating compressors. The device performs measurements in 36 sections of full rotation of the machine. It has built-in rotational speed stability analysis function to avoid false alarms. The DK type works in accordance with the IEPE (ICP®) standard. This version allows to save calculated estimates / analysis to the SD memory card.
- **AV MONITOR 2115DA** – for accurate monitoring of machines with variable rotational speed. The device carries out calculations of advanced estimates: harmonics amplitude and order, as well as spectrum analysis. There is option to measure temperature. This version allows to save calculated estimates / analysis to the SD memory card.

technical data

PARAMETER	DESCRIPTION
Power supply	+24 VDC
Operating temperature	-20 °C... +80 °C
I/O insulation	1 kV
Power consumption	max. 4W
Degree of enclosure protection and device installation	IP20 | DIN rail
Low-power status / warning / alarm relay outputs	**4 x relay output:** • contacts type: NC or NO • maximum switching voltage: 32 VDC • rated current: 100 mA • maximum contact resistance: 8 Ω (typical 4.8 Ω) • maximum switching power: 400 mW
High-power status /warning / alarm relay output	**1 x relay output:** • three contacts: NC, Common, NO • maximum switching voltage: 32 VDC • rated current: up to 2 A • maximum switching power: 50 W
IEPE (ICP®) inputs – D, DV, DK, DA versions	**2 x IEPE (ICP®) vibration sensor input:** • working with IEPE 2-wire sensors, • measuring range setting is possible by the operator panel (10, 25, 100 at 100mV/g sensors), • parallel processing of 2 channels, 16bit, 40 kSPS , • sensor circuit status: OPEN/SHORT/OK, • changing of IEPE sensor sensitivity is possible by the panel from 10 mV/G to 990 mV/G (default 100 mV/g). • **The maximum standard measuring range is 100** (mm/s, m/s2) for 100mV/g sensors.
4-20 mA outputs	• 2 x current output (4-20 mA) • current loop (voltage range: +7.5 to +36 VDC, resolution 12 bits)
Speed/ Phase Marker (PM) inputs	• 2 x Phase Marker (PM) OC PNP (PushPull) • the input frequency range for low speed machinery phased-locked mode is 60 - 1200 rpm
Measurement	**Measured value is vibration acceleration. Calculated estimates:** • RMS - 0-Peak vibration acceleration (m/s2) • RMS - 0-Peak vibration velocity (mm/s) • Envelope RMS and Peak-Peak • Analysis in 8 defined bands (BEC) - DV and DA version • Measurements in 36 sections of full rotation – DK version • Order and harmonics amplitude analysis – DA version • Capability to average 1-10 measurements • Learning option - automatically setting alarm and warning thresholds (except version D)
Temperature measurement (optionally for DA version)	The measurement using resistance temperature detector – Pt100. For the RTD input can be chosen 2-, 3- or 4-wire measurement. 15-bit resolution (0.003125°C).
Interfaces	• RS485 – Modbus RTU protocol • USB – service and configuration • microSD memory card (except version D)
Panel	• 2 x 7-segment display with decimal points • 3 x configuration buttons • 9 x LED Signal / Status

technical data

	AVM 2105D	AVM 2105DV	AVM 2105DK	AVM 2115DA
Inputs	2 x IEPE (ICP®)) | 2 x Speed/ Phase Marker (PM) 1 x Temperature measurement (optionally for DA version)			
Outputs	5 x Relay (NO, NC) | 2 x Analog (4-20mA) | RS-485 MODBUS data interface			
SD card	✗	✓	✓	✓
Sensor type	IEPE accelerometer			
Damage detection	✓	✓	✓	✓
Damage location	✗	✓	✓	✓
	CALCULATED ESTIMATES			
Acceleration and velocity RMS	✓	✓	✓	✓
Acceleration and velocity 0-Peak	✓	✓	✓	✓
Envelope RMS and Peak-Peak	✓	✓	✓	✓
Acceleration or velocity RMS in 8 bands (BEC)	✗	✓	✗	✓
Sections of full rotation	✗	✗	✓	✗
Order spectrum analysis	✗	✗	✗	✓
Amplitude analysis	✗	✗	✗	✓
Application	General for rotating machines	General for rotating machines	Reciprocating machines	Variable speed machines and/ or sliding bearings
Examples of monitoring machines	• fans • pumps • compressors • motors	• fans • pumps • compressors • motors	• reciprocating compressors, • piston engines	• wind turbines • industrial steam turbines, • complex gears
Examples of detected failures	• increase in the vibration energy	• damage to the bearing • unbalance • cavitation	• valve analysis • detection of the piston ring degradation	• diagnosis of damage of individual bearing components • identification of gear failure • cavitation

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