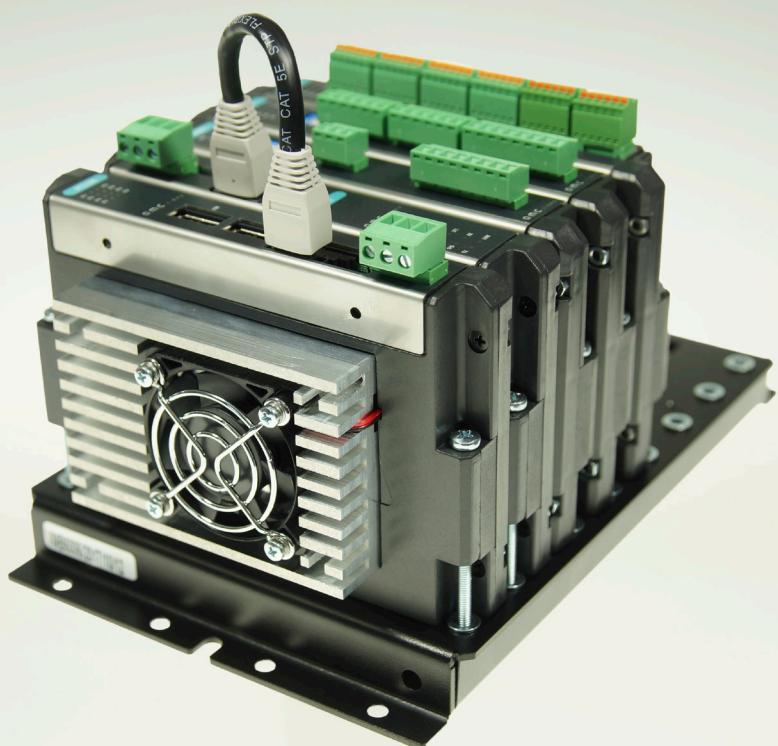




M O N I T O R 4 0 0 0

AV MONITOR 4000

modular, multichannel,
and autonomous system
design for advanced
diagnostics of rotor
machines



overview

AMC VIBRO offers machinery condition monitoring, diagnostics and maintenance products and services. Our solutions support maintenance departments at industrial facilities around the world. We offer our own AMC VIBRO brand of vibration-based condition monitoring and diagnostics system, as well as laser shaft alignment, ultrasound, oil analysis and electrical current analysis systems. We represent Easy-Laser, General Electric, Meggitt, UE SYSTEMS, IFM, FLIR, PdMA, and Monitran brands and other well-established Polish and international vendors.

CONDITION MONITORING

Condition monitoring is a profitable investment. Find out why:

23%

of entrepreneurs
confirm that they
**suffer losses due
to machine failures**

90%

of entrepreneurs, who
use condition monitoring
confirm that **they have
reduced their downtime
at least by half**

14%

of entrepreneurs
estimate, that thanks to
condition monitoring they
**have avoided critical
failure**

av monitor 4000

AV MONITOR 4000 (AVM 4000) is an intelligent platform for online condition monitoring, failure protection and vibration-based diagnostics of machinery.

The platform allows to:



**reduce the number of failures
and downtime by up to 70%**

**decrease the maintenance
costs by up to 20%**

**increase lifetime of monitored
machines by up to 30%**

AVM 4000 works with **VIBnavigator** software.

Due to its modular design the system easily adapts to functional needs and financial capacities of the customer. Furthermore, the ease of expansion allows to spread out the investment in time. Owing to this unique business benefit, the customer can start from affordable basic version of the system and then gradually build up to an advanced platform for remote diagnostics of the entire enterprise.





avm 4000

applications / key features

APPLICATIONS

- pumps, gear boxes, ventilators, drives
- compressors
- wind turbines

AVM 4000 IN A NUTSHELL



affordable monitoring,
safety and diagnostics



modular
architecture



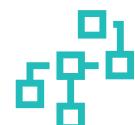
reduction
of false alarms



automatic failure
diagnostics



real-time
processing



advanced diagnostic
algorithms



access from any place
in the world



access to historical
data



compatibility with systems
from other manufacturers

avm 4000 specification

AVM 4000 is a modular, multichannel and autonomous system operating close to the monitored machine. The system monitors and protects operating machines through conditioning, high quality acquisition of signals and process parameters, all well as their continuous analysis. Due to True Data Validator™, the real-time data validation technology, as well as automated machine operational states detection and advanced diagnostic analyses, the system effectively detects anomalies in an early development phase, and significantly reduces the number of false alarms.

Expansion of the system is possible through adding or exchanging hardware feature cards. The base version of the system is named AVM 4000 EU, and is comprised of: processing card, server card and measurement card.

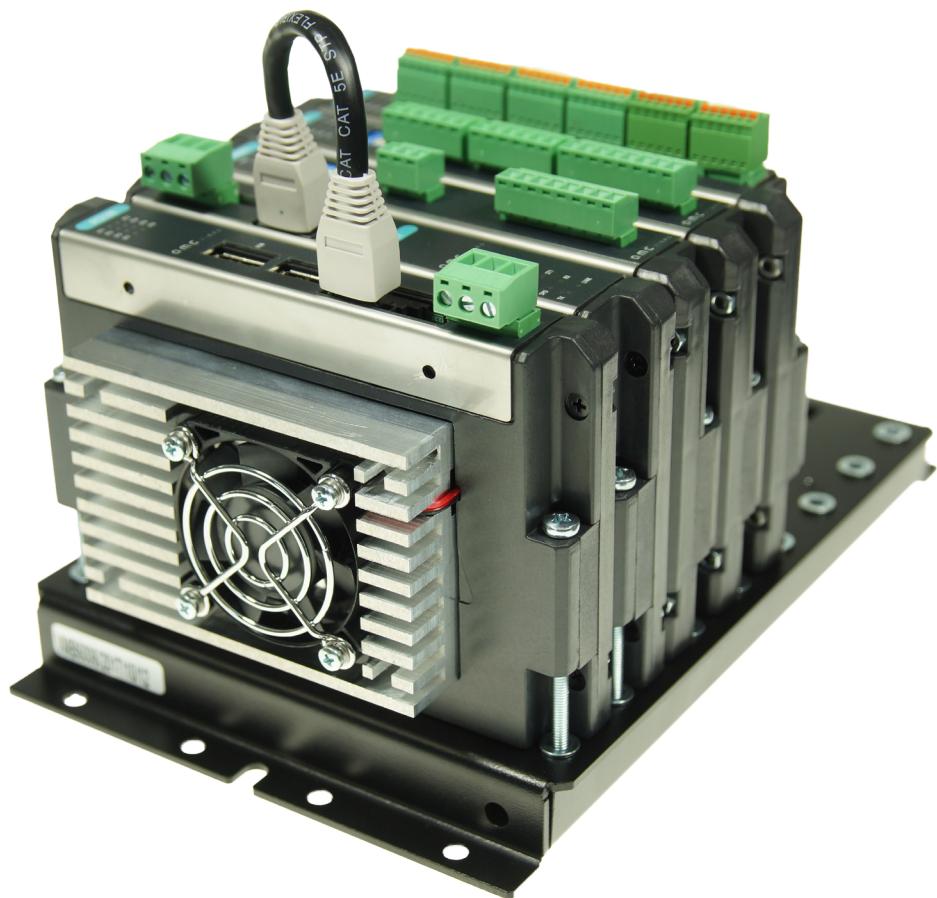
AVM 4000 ENTRY UNIT SPECIFICATION

PARAMETER	DESCRIPTION
Inputs	4 measurement inputs (expandable up to 24) <ul style="list-style-type: none">• Input type: IEPE (ICP)• Resolution 24bit• Synchronized sampling 25/50/100kHz• Spectrum resolution down to 0,002Hz• Parallel processing• 1 phase marker
Outputs	Modbus TCP
Estimates available for each channel	Wideband <ul style="list-style-type: none">• RMS• VRMS• PP• Crest• Kurtosis• Narrowband (up to 20 per channel)
Casing	IP code: IP65 Prepared for optional LCD panel
Power supply and environmental conditions	Power supply: 24V DC 25W Operational temperature: from -40°C to +85°C Vibration resistance: group 1B

avm 4000

unique features

-
- _01_** Continuous real-time data processing
 - _02_** Built-in diagnostic analyses
 - _03_** Parallel data processing for each signal
 - _04_** Reduction of false alarms
 - _05_** Modular structure based on functional cards
 - _06_** Historical data recording
 - _07_** 24bit measurement resolution, sampling up to 100kHz
 - _08_** Integration with SCADA systems
 - _09_** Relay outputs for protection
 - _10_** Access from any place in the world (Ethernet)

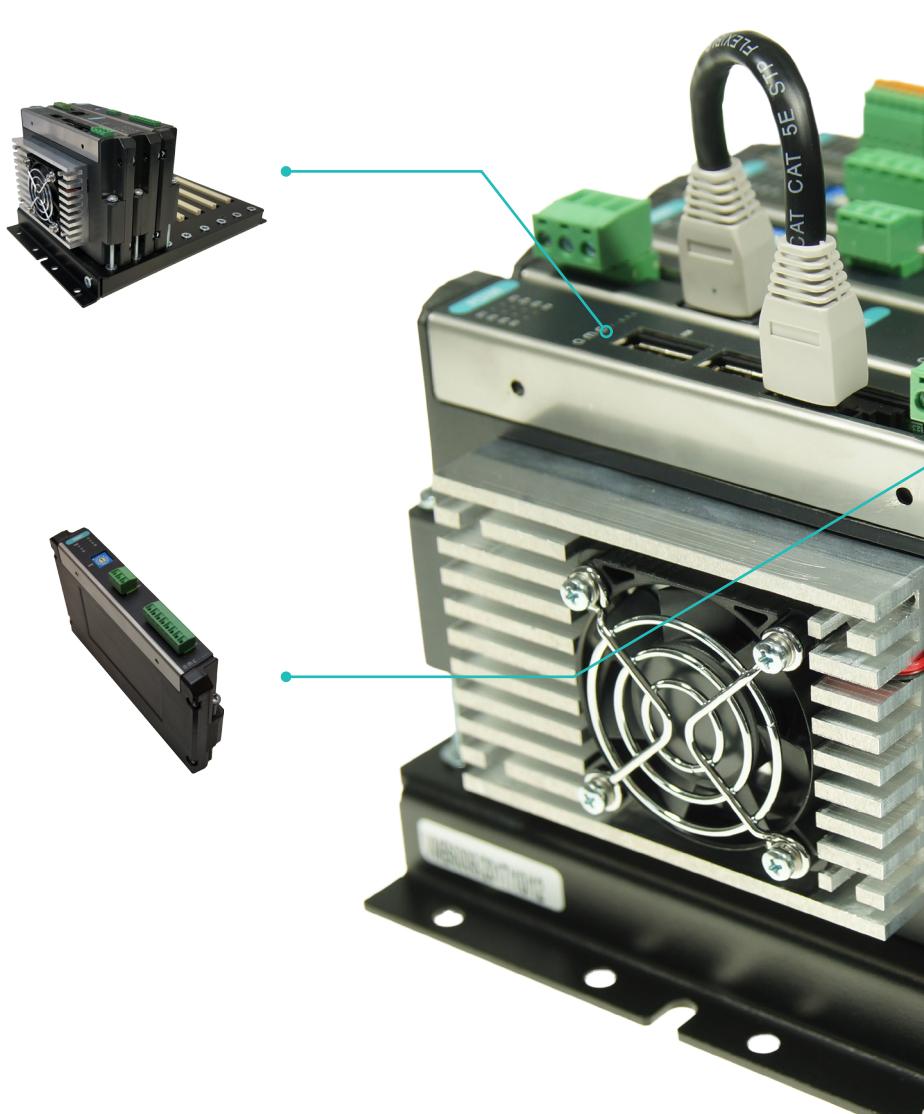


available feature cards and expansions

AVM 4000EU

Integrated system for measurement data processing

- Continuous monitoring of measurement data stream
- Configurable analysis module
- Recording of trends
- Remote access to AVM 4000 system



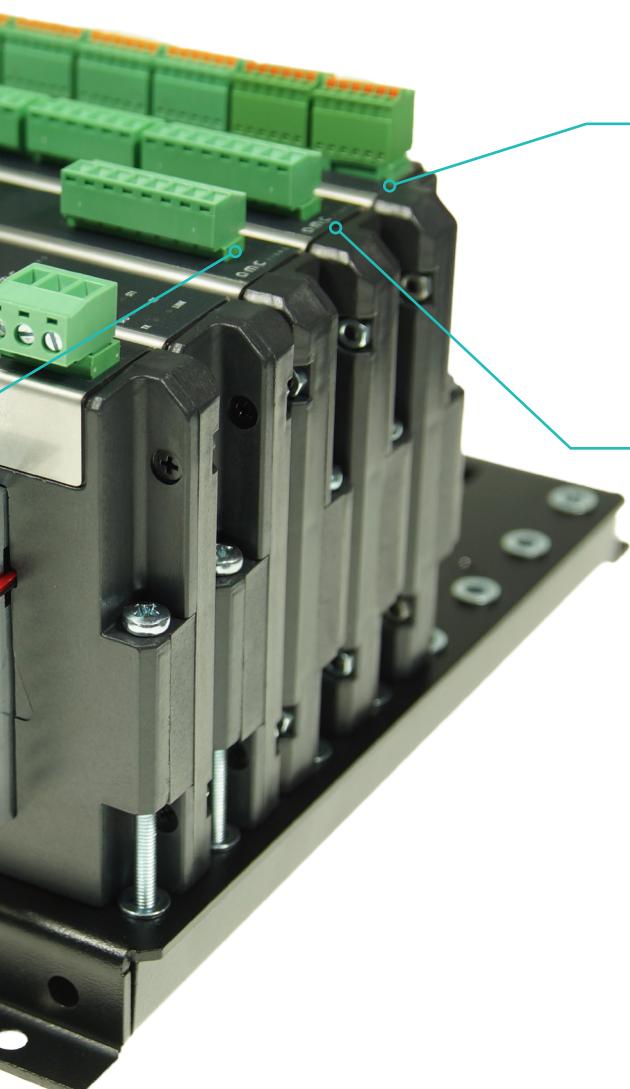
AVM 4000+V

4 measurement inputs (expandable up to 24)

- Input type: IEPE (ICP)
- Resolution: 24bit
- Synchronic sampling: 25/50/100kHz
- Spectrum resolution: down to 0,002Hz
- Parallel processing

1 phase marker





AVM 4000+U

4 analog outputs: 4-20mA

8 digital outputs:

- Contacts load 24VDC 100mA NO/NC



AVM 4000+P

4 analog inputs

- Standard: 0-10V or 4-20mA
- Resolution: 16bit
- Sampling frequency: 1kHz
- Parallel processing

2 digital inputs

- 24VDC OC

3 relay outputs

- Contacts load: 24VDC 100mA NO/NC



LCD PANEL

Visualization of estimate: RMS, PP, Kurtosis, VRMS, Envelope RMS

Visualization of settings and exceeded thresholds

vibnavigator software

VIBnavigator is the user interface of the AVM 4000 platform. It is primarily used for event monitoring, data viewing, configuration and administration of the system. On one hand interactive and easy to use browser ensures intuitive handling for the operator. On the other it offers maintenance and diagnostic teams a wide functionality for processing and analysis of signals. High degree of configurability and automation of operations make it very easy to verify the causes of an alarm.



VIBNAVIGATOR IS:

- _01_** Clear and modern interface
- _02_** Access to live and historical data
- _03_** Management of warnings and alarms
- _04_** Graphical editor of kinematics

VIBNAVIGATOR UNIQUE FEATURES:

- _01_** Displaying data from time periods of an unlimited length
- _02_** Displaying time signals and trends on the same plot
- _03_** Viewing of continuous time signal
- _04_** Displaying characteristic frequency bands on spectrum plots
- _05_** Rejection of data not matching validation criteria
- _06_** Filtration of data according to machine operational states
- _07_** Spectrum calculation from selected fragments of signals
- _08_** Comments on data and configuration





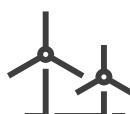
amc vibro

expertise care

AV EXPERTISE CARE (AVE CARE) is a service delivered 24/7 by AMC VIBRO engineers, supporting customer's maintenance team. Thanks to the use of the **AVM 4000**, AVE CARE allows for remote, online analysis and assessment of machines' technical condition. With AVE CARE service, the customer receives immediate notifications about early symptoms of emerging threat to the machine's operation. The analysis of monitored parameters also allows for detection of failures related to wear or damage of individual elements.

As a part of the package, the client receives both event-related and periodical reports on the current state of each supervised machine. The reports contain relevant guidelines on further use of the machine and a list of elements which should be handled with special care in the next period. Our skilled and qualified team of diagnostics professionals is always at client's disposal, ready to assist with any issues related to machinery health.

FACTORY



diagnostic system



diagnostic system



diagnostic system

REMOTE DATA CENTER



diagnostic team



data



results analysis



configuration >

data <

> data

< configuration

VIBNAVIGATOR

CUSTOMER HEADQUARTERS



24/7 contact



periodic reports



email notifications



alarm notifications



access to historical data

implementation of the system

PROJECT

Implementation of the AVM 4000 system for condition monitoring and diagnostics of natural gas compressor station at Baltic Beta offshore platform

In November 2007, we implemented and commissioned a diagnostic system on the Baltic Beta offshore platform. Currently AVM 4000 is used for online condition monitoring of bearings, valves, driveshaft, and other mechanical elements of a four-stage Dresser-Rand reciprocating compressor, which is the "heart" of the natural gas compressor station.



"The cooperation between the companies proceeds without interruptions, and the monitoring conducted by the diagnostic engineers is reliable and professional. We are satisfied with the quality of the system." - **Zbigniew Olejniczak**,
Deputy Managing Director, Head of the Maritime Team / Energobaltic Sp. z o.o.

CASE STUDY

In 2008 the condition monitoring system alarmed about elevated vibration level on the compressor and the motor. Data review indicated high level of wide band analyses suggesting failure of mechanical components generating vibration in the range of the first three revolutionary frequencies of the driveshaft. According to recommendations of our diagnostic engineers, together with the Baltic Beta platform crew, the compressor was inspected from the outside and the control measurements were made on the housing and cylinders using a hand-held meter. Subsequently, due to the absence of visible failures, the gas extraction was halted and the inspection covers were open. The shaft was cracked.

The shaft cracked in a way, that the broken parts got clinched together again and the gas compression process was not stopped. Based on the alarm report, and in cooperation with the platform's crew, a decision was made to temporarily shut the compressor down, and to replace the shaft. Without the AVM 4000 vibration monitoring system, and without a good cooperation with the platform's crew, the abnormality in the machine's operation would not have been detected. Such situation could have caused significant or complete damage of the machine, very expensive repair or even necessity to replace the machine (housing value of approx. 500 000 USD) in open sea conditions.

Our diagnostic solutions are used, among others, by:



ALSTOM



LOTOS



BRAMMER

BOSCH



contact us

WOULD YOU LIKE TO SEE HOW IT WORKS?

We offer a **free demonstration of the product!** Schedule it now and don't forget to ask about our **free of charge technical support service!**

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