Brüel & Kjær Vibro

Product Information

VDAU-6000 - 16-Channel Condition Monitoring System

The **VDAU-6000** family of monitoring systems is based on the 16-channel VDAU-6000 series of data acquisition and conditioning units, and includes the VDAU-6000 Condition Monitoring and Analysis series. These condition monitoring systems provide scalar condition monitoring functionality for reliable fault detection and trending for various types of rotating machines. The optional analyzer function - **Diagnostic Workstation** – includes a time signal data recorder and powerful software for post-processing online analysis. The versatile **Monitoring Workstation** condition monitoring user-interface software and database are the same as that used in Brüel & Kjær Vibro's Compass condition monitoring systems.

Features & Benefits

- 16-channel parallel processing – no scanning or multiplexing. Up to 16 channels are simultaneously measured

- Scalar condition monitoring functionality reduces diagnostic complexity while enabling early fault detection and identification

- The optional Diagnostic Workstation provides event recorder and analyzer functionality as a permanent online installation

- VDAU-6000 uses Monitoring Workstation, a versatile condition monitoring server platform together with its user friendly interface

- Minimal user setup with a wide range of pre-configured measurements readily available

- The VDAU-6000 hardware units are compact and can be installed as a field monitor or in a cabinet (ATEX Zone II approved)

- Adaptive monitoring strategies enable machines at different speeds and loads to be monitored without false alarms

Figure 1   VDAU-6000 can be used in many different applications.

VDAU-6000 System Applications

There are many machines in industrial plants that are being monitored only by safety systems, yet they play an important role in the plant's productivity. These systems can adequately protect the machines but provide no information on their current condition or the early development of faults. The VDAU-6000 uses the vibration signals from the buffered outputs of these safety systems and provides a comprehensive scalar condition monitoring strategy that rivals even that provided by more costly rack-based systems.

Due to the high-channel density and scalar condition monitoring capability, VDAU-6000 is also ideal for monitoring auxiliary machines and balance-of-plant machines – with or without an existing safety system. Numerous identical machines such as fin-fans are an ideal application. The design is well suited for both high-speed and low-speed applications.
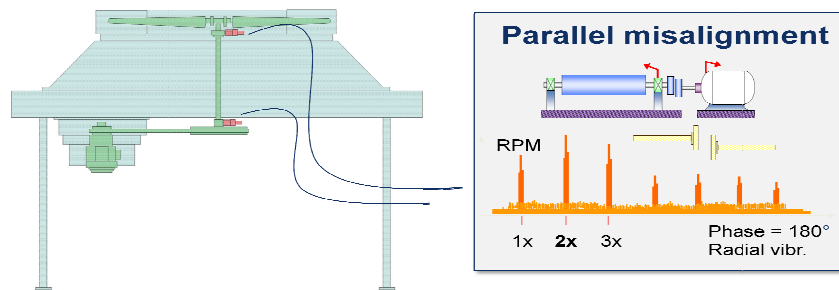

Figure 2. Example of the VDAU-6000 scalar condition monitoring strategy for detecting misalignment on a fin-fan.

Fault detection and Identification

VDAU-6000 is an automatic condition monitoring system that continuously acquires data at fixed user-defined intervals. The scalar measurements consist of broad-band and narrow-band measurements that are optimal for detecting incipient faults in gearboxes and in machines with sleeve and rolling-element bearings. It can also be used for detecting flow disturbances in pumps and compressors, and machine-specific problems such as unbalance, misalignment, defective foundations, resonances, electric motor type problems, structural faults, etc.

Adaptive Monitoring

The effectiveness of a monitoring system lies in the ability to detect developing defects early, without generating false alarms, even during speed and load changes that commonly violate the tight alarm limits that are necessary for early fault detection. VDAU-6000 uses the same proven adaptive monitoring concept that has been successfully used for years in the Compass family of condition monitoring systems.
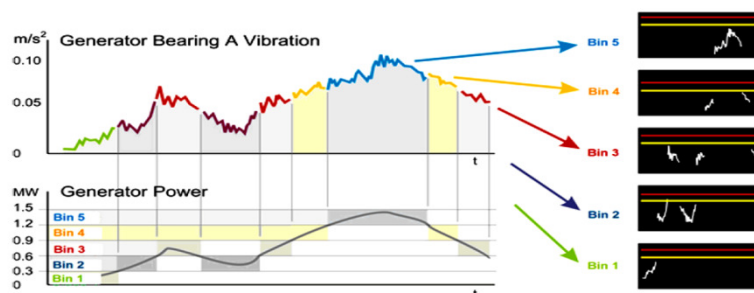

Figure 3. Adaptive monitoring concept.

VDAU-6000 System Configuration

The VDAU-6000 is a networked system consisting of the following:

- VDAU-6000 monitors (several can be connected to a server)
- Condition monitoring server with database and the Monitoring Workstation software
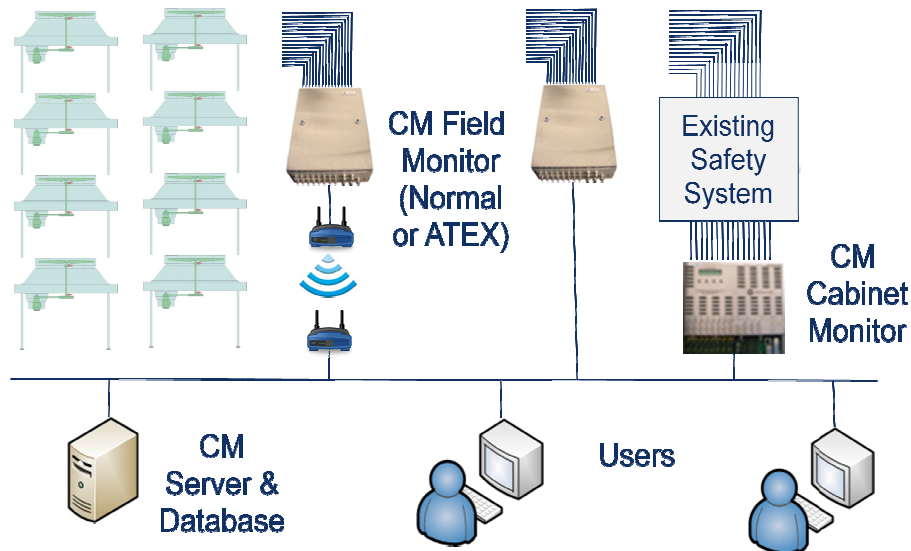- Diagnostic Workstation Analyzer (optional)

Figure 4. VDAU-6000 system configuration.

A wide range of sensors can be used as inputs for the 16 input channels:

- Accelerometers
- Displacement sensors
- Process sensors
- Digital inputs

There are up to 16 pre-defined measurements tasks for each channel, thus minimizing the user setup requirements. The narrow-band vibration measurements are pre-defined to detect the characteristic fault frequencies for the machine it is intended to monitor. The measurement tasks used in VDAU-6000 include:

- DC – Displacement sensor gap voltage, process parameters
- Variable BP - Running speeds, harmonics, tooth/blade passing, etc.
- Vector – Magnitude and phase (0.5x, 1x, 2x, 3x, ...)
- Envelope – Bearing fault detection
- Tacho - Speed/Phase and Reference

VDAU-6000 System Components

The VDAU-6000 hardware acquires scalar vibration data, process parameters and raw time signals (waveforms), and exports these to a remote condition monitoring system server and database for storage, trending, early fault detection and alarming.

The VDAU-6000 units can be installed in an enclosure close to the machines as a field monitor (ATEX compliant), or can import vibration signals from buffered outputs of an existing safety system located in an instrument cabinet.
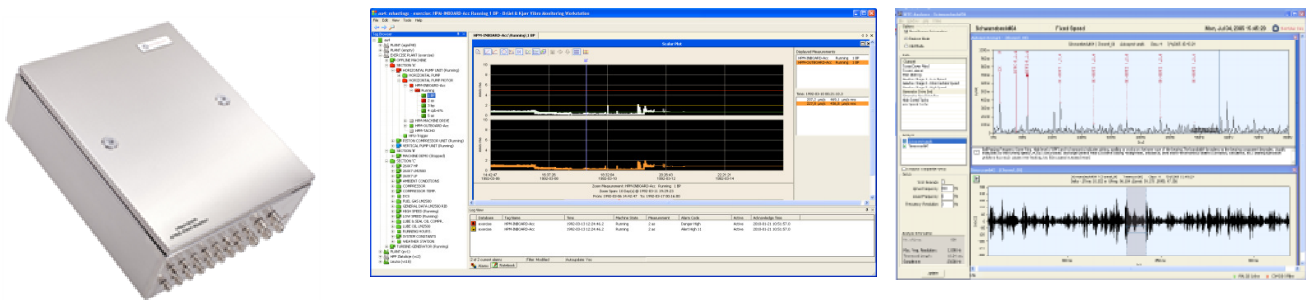

Figure 5. VDAU-6000 data acquisition unit shown in its field monitor enclosure (left), Monitoring Workstation software (centre), Diagnostic Workstation software (right).

There are two software packages available for the VDAU-6000 Monitoring System.

Monitoring Workstation – The daily condition monitoring system user interface software:

- Displays the monitored data
- Display event and alarm information
- Provides attention to events and alarms to the operators/maintenance staff
- It is MS Windows™ based and is installed on the client Windows Workstation (PC)

Diagnostic Workstation – The software provides advanced diagnostic measurement capabilities to perform in-depth analysis:

- Includes time waveform data recording
- Software for post-processing and analyzing of the raw time waveform data
- It is MS Windows™ based and is installed on the client Windows Workstation (PC)

Brüel & Kjær Vibro reserves the right to change specifications without notice

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