ifm electronic

efector® octavis

fluid sensors and diagnostic systems

position sensors and object recognition

bus, identification and control systems

ifm electronic – close to you!

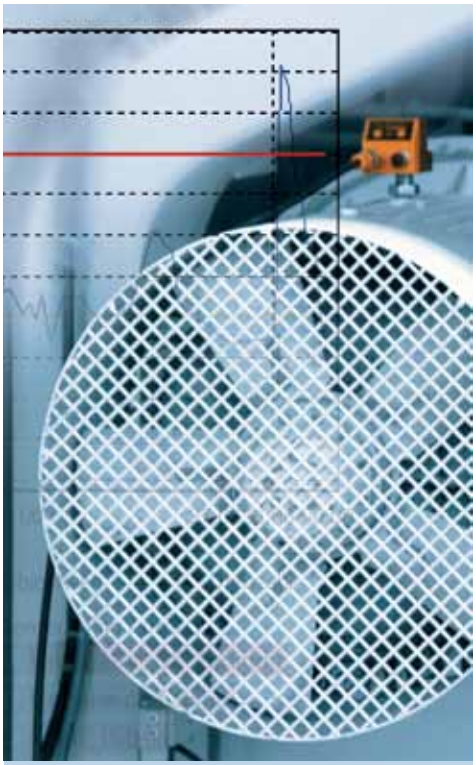
For industrial applications

efector octavis . Intelligent vibration monitoring.

Online condition monitoring

Increase machine uptime,
reduce maintenance costs,
assure production quality.

Online diagnosis of machine condition supports a continuous Predictive Maintenance Strategy. An internal microprocessor tracks up to 24 different machine components. Monitors bearing damage, unbalance, alignment or cavitation issues.
Enables operator to schedule corrective maintenance and avoid unplanned interruptions, increasing uptime.
Seamless integration with higher level data acquisition and control systems via digital and analog outputs or standardized OPC (Open Protocol Communication) interface.



Permanent machine protection.

Protection from environmental hazards
or secondary damage to expensive
fixed assets.

efector octavis can be permanently installed to provide real-time monitoring.
On-board digital and analog alarm outputs for simple system integration.
Provides advance warning of changes to equipment's condition.
Multiple programmable alarm levels (green/yellow/red) offer sophisticated coordination of planned reaction.
Integrated alarming provides automated shutdown before catastrophic failure can occur.
Additional damage to other machinery or dangerous conditions to the facility can be avoided.

Root cause analysis.

Analysis tools to identify causes,
document findings, create reports and
optimize equipment usage.

efector octavis offers multiple tools to identify and document equipment damage and possible causes.
An internal memory records and time stamps monitored equipment components vibration levels.
Detects trends and the progression of wear.
Stored history files graphically identify trends and events such as crashes, over heating, running speed etc.

Increase uptime.
Reduce maintenance costs. Assure production quality.

efector octavis :

Cost effective real-time vibration monitoring.

Multiple form factors: compact field unit (VN/VE/VK) cabinet mount module (VSE).

Easy to use configuration and analysis software.

Direct Ethernet connectivity for remote monitoring (VSE).

Standardized OPC interface for high level integration (VSE).

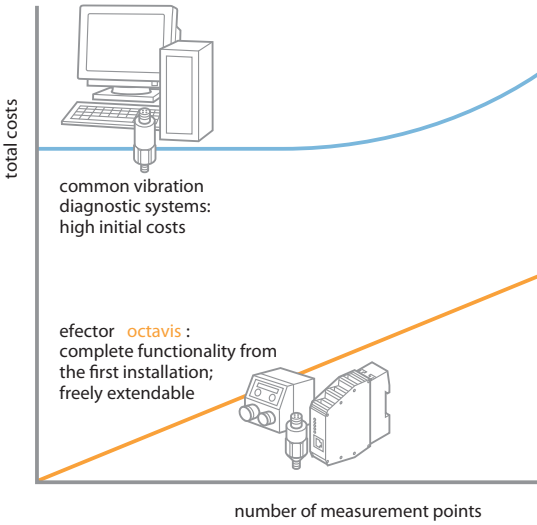
Digital and analog alarm outputs.

Time stamped internal memory for trend history (VN/VE/VK).

efector octavis is an easy to implement vibration monitoring system that collects vibration data and automatically conducts signal analysis for machine diagnosis. The machine condition is determined for transmission to controllers or SCADA systems. The main requirements for modern machine monitoring are fulfilled: Compatibility, modularity and transfer - ability.

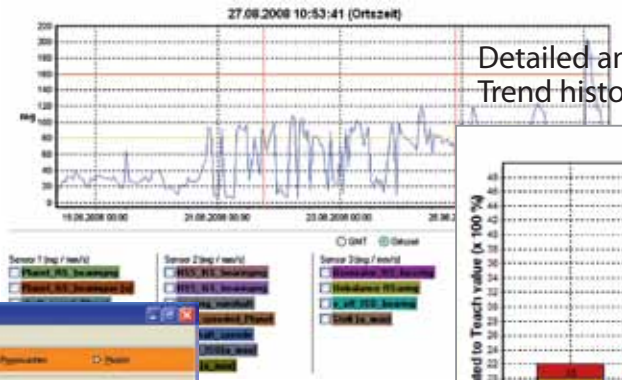
Compatibility with high level control systems is ensured using the standardized OPC compatible server software. The efector octavis modularity allows limitless network expansion.

Programming of the monitor is straight forward using the "wizard" guided con - figuration software. Programmed para- meter sets can be both uploaded from the monitor or downloaded from a PC for safe storage and transferability .

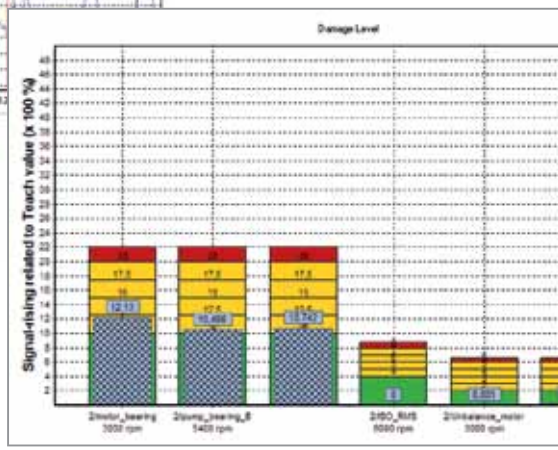


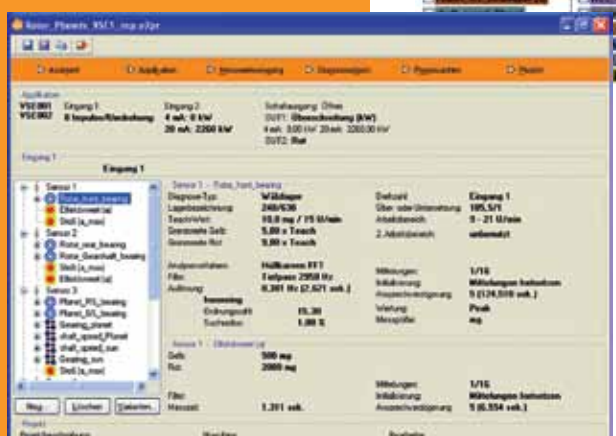
Comparison of system costs per measurement point.

All units belonging to the octavis family (VE/VSE) have an internal trend history. This allows a detailed analysis and equip- ment usage can be optimized without external data recording. The storage inter- vals are freely selectable. This means that the storage length of the nonvolatile ring- memory is adjusted to the requirements.



Detailed analysis: Trend history.





Configuration software with diagnosis screen.

For industrial applications
and for hazardous areas

Leading in integrated vibration diagnosis.

Assure quality: Machine tools.

Source: Gildemeister AG

Spindle monitoring in machine tools.

Target: To safeguard the availability and quality of a linked production process. Reduce the costs for spare parts.

Vibration sensors: Each VSA accelerometer on the spindle housing delivers the vibration data for integrated condition monitoring. The difference is made between permanent monitoring and the operating condition. To determine the root cause analysis the event "crash" is also logged in the internal memory.
The spindle speed supplied for vibration monitoring can also be used for checking unbalance.

Benefits: Damage caused by load can be avoided using the display and or switching outputs as well as root cause analysis and bearing condition monitoring.

Additional ifm sensors: Pressure, flow, temperature, and level sensors for coolant monitoring.

Prevent waste: Steel processing.

Monitoring of reducing mill in cold rolling steel mills.

Target: To assure product quality and prevent material waste.

Vibration sensors: Two VSA accelerometers connected to the diagnostic electronic type VSE to monitor the rolling function on both sides of the wiper rollers.

Benefits: Irregularities are detected in the rolling behaviour at an early stage.

Additional ifm sensors: Inductive sensors for position detection.

Increase uptime: process equipment

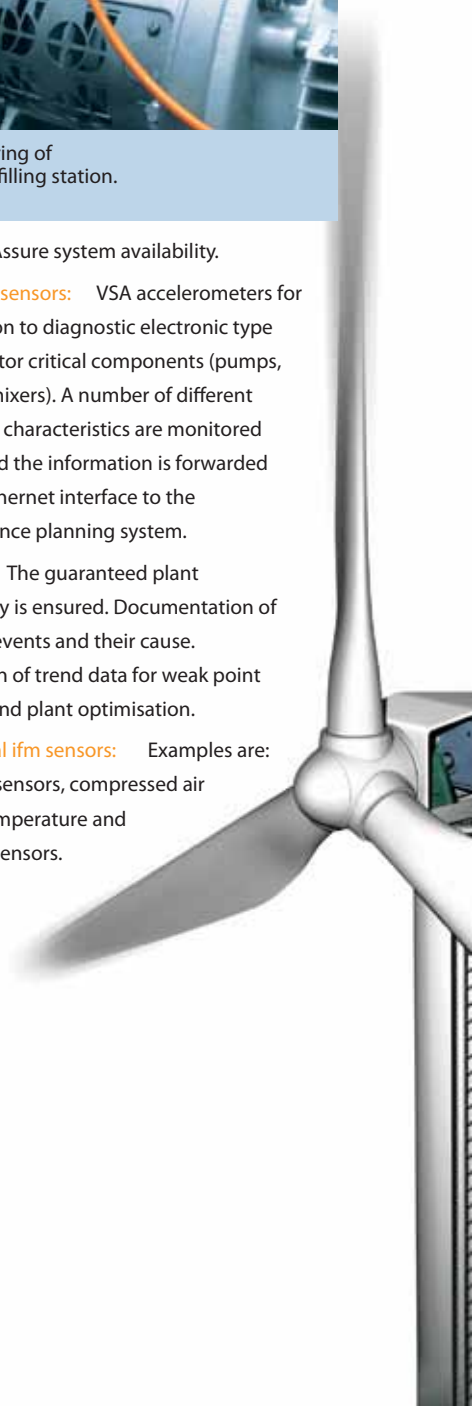
Monitoring of aseptic filling station.

Target: Assure system availability.

Vibration sensors: VSA accelerometers for connection to diagnostic electronic type VSE monitor critical components (pumps, motors, mixers). A number of different diagnosis characteristics are monitored online and the information is forwarded via the Ethernet interface to the maintenance planning system.

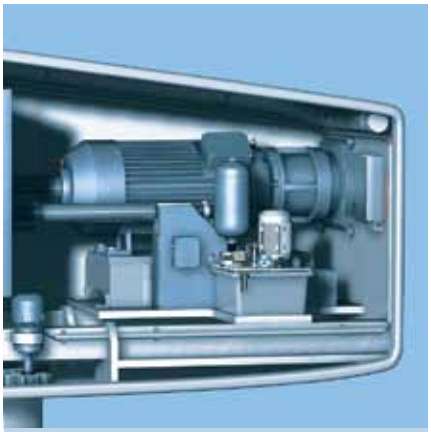
Benefits: The guaranteed plant availability is ensured. Documentation of damage events and their cause. Evaluation of trend data for weak point analysis and plant optimisation.

Additional ifm sensors: Examples are: Pressure sensors, compressed air meter, temperature and position sensors.



Proven industrial performance.

Online centralized monitoring: Wind and water.



Wind turbine
condition monitoring.

Target: Early detection of critical failures. Coordination and scheduling of maintenance and repairs.

Vibration sensors: Up to 8 VSA accelerometers monitor the mechanical condition of main rotor, gears and generator.
The online diagnosis automatically allows for the current speed and performance. Both process factors are connected to the diagnostic electronic type VSE and are set off against the vibration characteristics.

To monitor tower vibration it is possible to use 2 VSA accelerometers and 1 diagnostic electronic type VSE. If machine protection is foremost, it is possible to start with 4 VSA accelerometers and 1 diagnostic electronic type VSE.

Benefits: A complete remote vibration monitoring system that monitors the entire mechanical drive system of today's high power wind turbines for early detection of potential damage and the identification of failing components.

Additional ifm sensors: Inductive sensors and control monitors for speed monitoring.

Permanent condition monitoring in water treatment plants.

Target: Early recognition of damage to critical components in separate, unmanned pump stations.

Vibration sensors: Important pumps, blowers, fans and centrifuges are monitored for bearing damage, unbalance and overall vibration level. For these applications the cabinet module type VSE with sensor type VSA as well as the compact version type VE are suitable. The measuring data are collected and forwarded to a central control station e.g. via Ethernet or bus system.

Benefits: Continual monitoring of critical plant components. Protecting the environment.

Additional ifm sensors: Flow and pressure sensors.

General equipment monitoring.

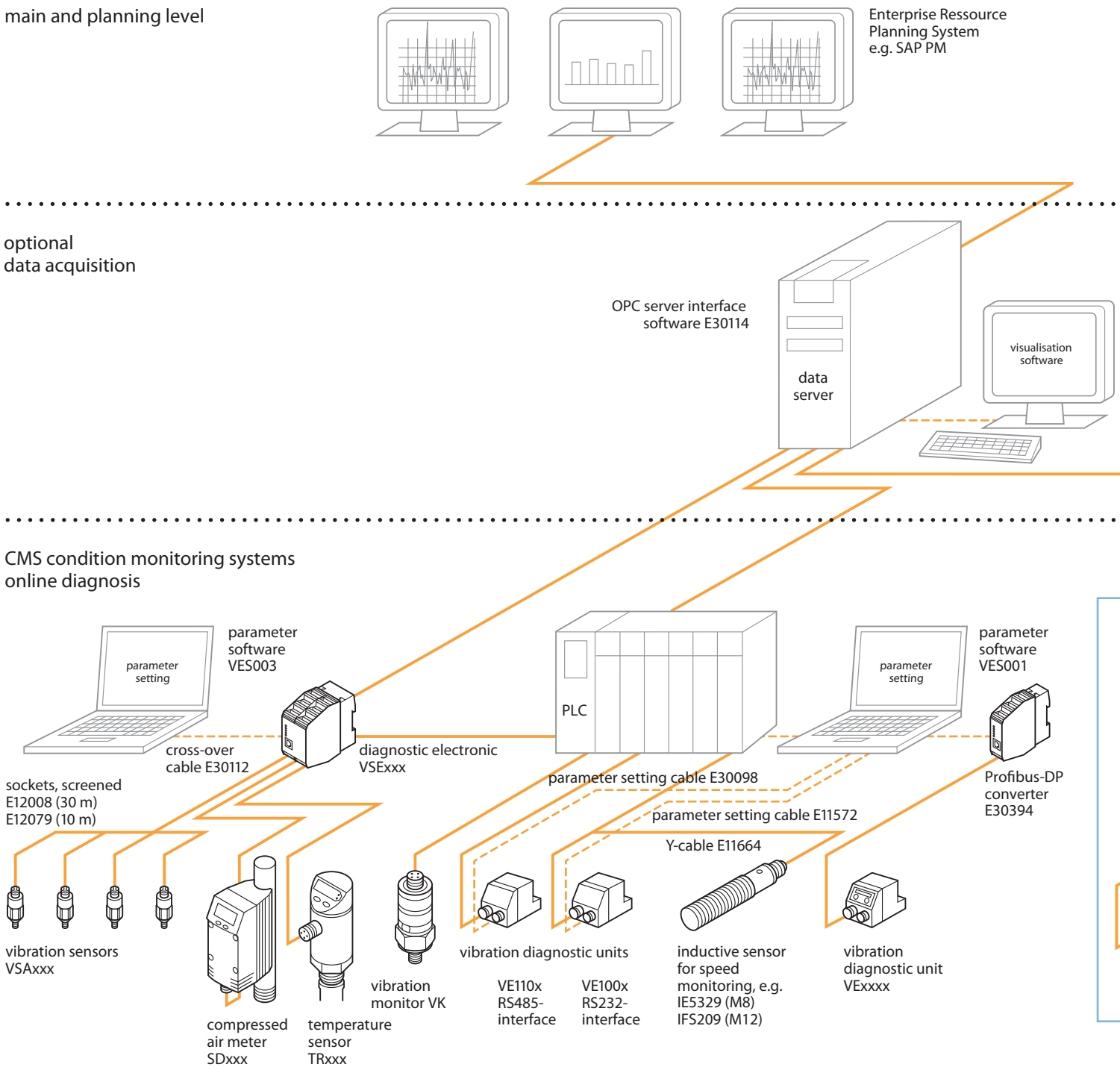
Pump / compressor
monitoring including
hazardous areas.

Coolant towers
and exhaust fans.

Condition monitoring of
screw type compressors.

For industrial applications
and for hazardous areas

Intelligent sensors for condition monitoring.



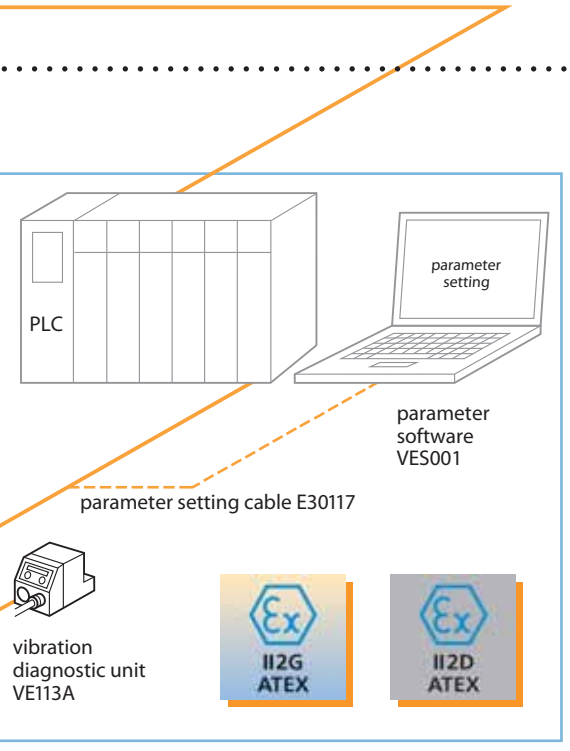
For further information or other intelligent sensors for condition monitoring please refer to our catalogue fluid sensors and diagnostic systems or visit our website www.ifm.com

efector octavis vibration monitoring

The complete range.

Online vibration monitoring:
the right product for the application.

VK and VE units can monitor overall machine vibrations, e.g. according to the new EU machinery directive. The product series VSE provides all options for an integrated complete machine diagnosis – from an automated frequency-selective diagnostic measurement to an integrated trend with time stamp.



Vibration diagnostic units

Type VTV122 – vibration monitoring of machines and equipment to DIN ISO 10816

IP 69K; 2 wire loop powered; 4...20 mA signal output; True rms monitoring of the overall velocity; Frequency range 10...1000 Hz; M12 connector

Vibration diagnostic units

Type VKV021/ VKV022 – vibration monitoring of machines and equipment to DIN ISO 10816

IP 67; 1 switching output and response delay (1...60 s) adjustable via setting ring; 1 analogue output (4 mA = 0 mm/s, 20 mA = 25 mm/s or 50mm/ s); connection M12 connector

Vibration diagnostic units

TOP PRODUCT

Type VNB001 – vibration monitoring Parameter settings via pushbuttons

IP 67; 2 switching outputs or 1 switching output and 1 current output 4...20 mA; analogue intput 4...20mA; frequency range 2...1000 Hz; connection 1 x M8 and 1 x M12 connectors; data interface USB

Vibration diagnostic units

Type VE11xx – vibration monitoring of up to 5 diagnosis values and 2 g-monitors

Integrated history memory; optiona l speed input; RS 485 interface; IP 69K; 2 switching outputs; measuring range +/- 25 g; frequency resolution adjustable 1.25 or 0.125 Hz; speed range 12...12,000 rpm

VE113A – compact unit for applications in hazardous areas; ATEX approval group II, category 2D / category 2G; vibration monitoring of up to 5 diagnosis values and 2 g-monitors

Integrated history memory; optional speed input; RS485 interface; IP 69K; 1 switching output; measuring range +/- 25 g; frequency range 3...6,000 Hz; connection cable 5 m

Diagnostic electronic

VSE002 for vibration sensors type VSA

Control panel mounting; frequency-selective machine monitoring of up to 4 measurement points and 2 more process quantities; Ethernet interface TCP/IP; integrated history memory with real time clock; 2 switching outputs or 1 switching and 1 analogue output

VSE100 for vibration sensors type VSA

Control cabinet mounting; frequency-selective machine monitoring of up to 4 measurement points; Ethernet interface TCP/IP; integrated history memory with real time clock; up to 8 freely configurable I/O; counter function

Vibration sensors

VSA001 for connection to external diagnostic electronic VSE

Measuring range +/- 25 g; IP 69K; frequency range 0...6,000 Hz; connection M12 connector

VSA002/ VSA006 for connection to external diagnostic electronic VSE

Measuring range +/- 25 g; IP 67; frequency range 0...10,000 Hz; connection cable with 2m cable plug M12/ 6m cable

VSA004 / VSA005 for connection to the external diagnostic electronics VSE

Extremely small design; measuring range +/- 25 g; IP 67; frequency range 0...10,000 Hz; connection cable 3 m/ 10m

VSP01A / VSP02A for connection to the external diagnostic electronics VSE

VSP01A: ATEX approval; group II category 1D/ 1G; VSP02A: group 1M measuring range 80g; 2...10 000 Hz; IP 68; for 1D applications IP65/ ZB0633; connection to intrinsically safe supply isolators (Ex ai)

Intelligent vibration switch – simply smart

Online monitoring of vibration severity according to ISO 10816

- Electronic vibration switch with analogue output
- Monitoring, display and recording of vibration values in one compact field unit
- Easy set-up and installation using push-buttons for parameter setting
- Dual measurement point capability, additional process value e.g. temperature
- On-board time stamped history function for data collecting and trending

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Compact vibration sensor

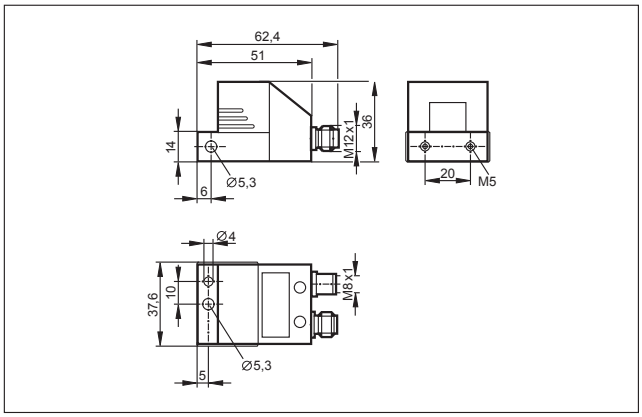
The VNB001 is the first member of a new series of compact vibration sensors. It is used for online monitoring of overall vibration of machines and equipment according to ISO 10816. This unit is distinguished by its simple set-up, requiring no PC software for parameter setting.

Function

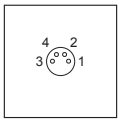
The unit is based on the proven, reliable efector octavis technology and can also be used for applications in the mobile sector. The sensor measures the average vibration velocity (mm/s or in/s). Measurement value and switchpoint conditions are visualised on the LED display. Critical machine conditions are signalled using either 2 switching outputs or alternatively 1 switching and 1 analogue output. Aditionally the operator can use the analogue input to monitor a further process value e.g. temperature. Alternatively the unit can be powered using the integrated USB interface providing the option of using the VN as a hand-held device.

Vibration sensor VN
Process connection via M12 x 1 and M8 x1 connectors
Pushbutton parameter setting

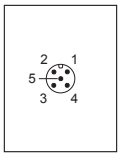
Dimensions



Wiring diagram



Pin 1: 5 V via USB interface
Pin 2: USB_P
Pin 3: L-
Pin 4: USB_M



Pin 1: L+
Pin 2: Out 1 switching output or
current output 4...20 mA programmable
Pin 3: L-
Pin 4: Out 2 switching output
Pin 5: In 4…20 mA DC

Technical data

Vibration sensor VNB001		
Operating voltage	[V]	9.6...30 DC or using USB*
Output		2 switching outputs or 1 switching output and 1 analogue output 4...20 mA (programmable)
Input	[mA]	1 analogue input 4…20
Display		4-digit alphanumeric display
Measuring range	[mm/s]	max. 500 programmable
Measurement values		v peak or v rms 2...1000 Hz / 10...1000 Hz
History memory		8 MB i.e. 342,534 entries, storage interval 5 minutes
Data interface		USB
Ambient temperature	[°C]	-30...60
Protection		IP 67
Selftest		•

* The switching outputs are not active if the unit is powered via USB.

Accessories

Type	Description	Order no.
	USB / M8 cable	E30136
	Adapter UNF / M5 (pack quantity 10 pieces)	E30137
	Power supply	E30080

Connection technology

Type	Description	Order no.
	Socket, M12, 2 m black, PUR cable	EVC073
	Socket, M12, 2 m black, PUR cable	EVC070

Vibration sensor for potentially explosive atmospheres

Vibration monitoring in ATEX zones 1G and 1D

- Protection against permanent machine overloads and unexpected standstills
- Extended measuring range up to 80 g
- For connection to VSE diagnostic electronics
- Optimum price / performance ratio
- System comprising sensor and evaluation unit for monitoring, analysis and documentation

efector octavis

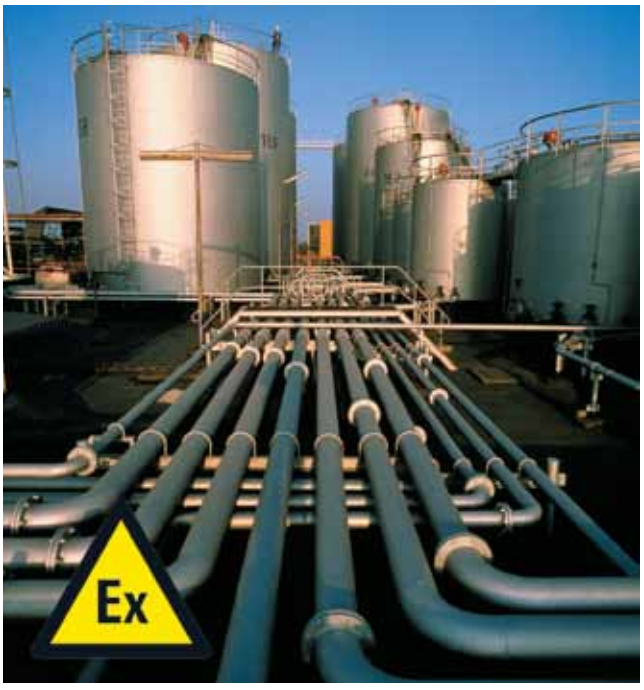
Diagnosis | IP 68 | II1D / 1G ATEX | High-grade stainless steel

Application

The VSP acceleration sensor is used to detect measurement values in atmospheres with a highly explosive potential as in the chemical, pharmaceutical and mining industries.

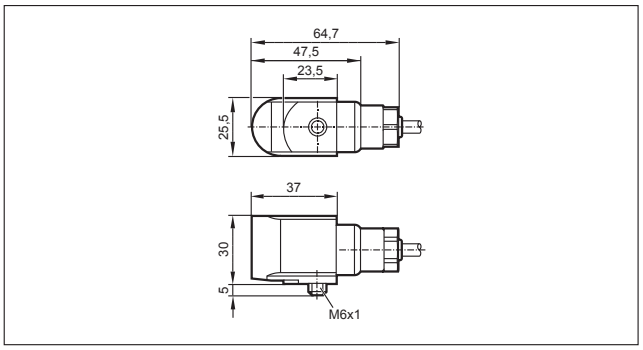
Function

Worn-out rolling element bearings need to be detected as early as possible since they cause high temperatures exceeding the acceptable range. Due to unbalance or misalignment, machine vibration can quickly exceed a permissible level. Result: high risk potential. The VSP sensor receives vibrations up to ± 80 g and transmits them via a splitter box (within the ATEX zone) and an intrinsically safe isolated barrier (outside the ATEX zone) to the IEPE input (= Integrated Electronics Piezo Electric = charge amplifier) of the VSE evaluation electronics (outside the ATEX zone). These evaluation electronics monitor, analyse and document the incoming measured values.



Intrinsically safe VSP vibration sensor monitors the ATEX zone category 1D / 1G.

Dimensions



Wiring diagram

white: sensor supply / signal
black: 0 V
screen: housing over drain wire

Products

Approval	Marking of the unit	Order no.
VSP vibration sensor with ATEX approval group II, category 1D / 1G		
Baseefa12ATEX0248X IECEx BAS 12.0133 X	Ex ia IIC T4 Ga Ex ia IIIC T130°C IP65 Da Ex ia IIC T6 Ga Ex ia IIIC T80°C IP65 Da	VSP01A
Baseefa12ATEX0247 IECEx BAS 12.0132	Ex I M1 Ex ia IMa	VSP02A

Further technical data		
Measuring range	[g]	± 80
Operating voltage	[V DC]	10...12
Frequency range	[Hz]	2...10000
Sensitivity	[mV/g]	100
Protection		IP 68, for 1D applications: IP 65
Shock resistance	[g]	5000
Housing material		stainless steel
Connection		PUR cable,10 m

Accessories

Type	Description	Order no.
	Safety barrier	ZB0633
	Diagnostic electronics for vibration sensors	VSE100
	Parameter setting software for VSE diagnostic electronics	VES003

Visit our website

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Accessories

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