

# Sensor of vibrations with converter ASV5-1(M), ASV5-2(M)

The ASV5 is a single-axis sensor of vibrations with a built-in converter for the current loop which enables

- ♦ to measure absolute vibrations in **standard industrial ranges**
- ♦ to evaluate the **effective or top value of the speed of vibrations** and to convert this value to the passive current loop signal of **4-20mA**
- ♦ to create the measuring point of vibrations in connection with a **standard device for evaluation of the current output**
- ♦ in relation to the approved security barrier it is possible to use the sensor in **environments with risk of explosions** (methane, hydrogen) with a permanently present hazardous atmosphere
- ♦ to measure the vibrations of drives, engines, pumps, ventilators and other industrial equipment



## Description of the sensor

The ASV5 sensor of vibrations is a sensor containing built-in electronics which provides a standard industrial 4-20mA signal proportional to the measured value of vibrations effecting in the rotary axis of the sensor. It is used for the monitoring of vibrations of machines and industrial devices in industrial environments.

## Measured value, various types

The sensors are produced in two modifications – the ASV5-1 and the ASV5-2, i.e. in the basic variant indicated as ASV5-1 and ASV5-2, and in the variant "M" indicated as ASV5-1M and ASV5-2M. The ASV5-1(M) modification measures the effective value of the speed of vibrations; the ASV5-2(M) measures the top value of the speed of vibrations. The "M" variant is used only for environments with the risk of explosion of methane, but it can also be used in the evaluation circuit with a higher impedance of the loop (impedance of the current input up to 250Ω). The outside mechanical construction and the manner of installation for both modifications of the sensor are identical.

## Using the sensor

The ASV5 sensor is used for the measurement of the vibrations of industrial devices, in particular rotary machines – engines, ventilators, pumps, compressors, generators, alternators, turbines, mills, as well as equipment with linear motion – generators of vibrations, vibration feeders, etc. It is connected to the measured object by screwing the sensor into a hole 1/4 – 18 NPT with a depth of 20mm so that the axis of sensor is identical with the direction in required for measuring the vibrations. The point for the reading of vibrations should be selected in such a manner that the value of the vibration corresponds to the vibration of the machine and, at the same time, at this point is the possible minimum dynamic deformation of the measured surface and the point should be located away from the direct effects of fast temperature changes. During operation it is necessary to comply with the working conditions of the sensor.

## Processing of the signal from the sensor

The signal from the sensor is processed in the sensor and exits the sensor through the passive current 4-20mA loop.

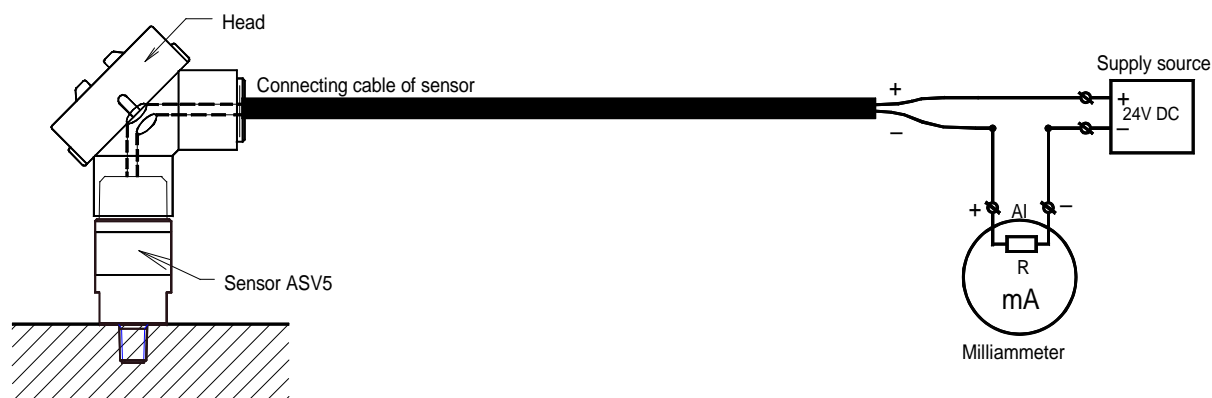
By connecting the sensor to the supply source, the sensor will take from this source a current from 4mA to 20mA proportional to the measured value of the vibrations from 0 mm/s to the maximum value.

The measured value is an integral (slow) value and it is possible to measure it using a milliammeter or the standard current analogue input of the computer system although it does not make sense to evaluate if it is more frequent than 1 x per second.

The current loop does not provide the actual value of the vibrations and it is not possible to use it for subsequent fast processing (time sample, FFT analysis, etc.).

## Using the sensor in a normal environment

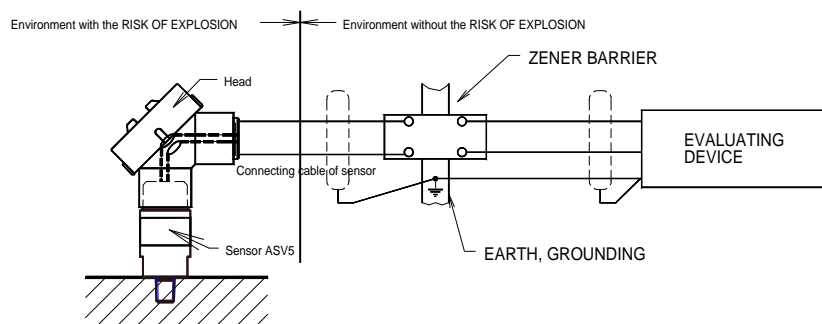
The ASV5 sensor can also be used in environments without the risk of explosion so that it is connected directly to the source of 24V supply voltage and to the input of the evaluation device (milliammeter, input of the control system) according to the following diagram:



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## Using the sensor in an Ex environment

ASV5 sensor can be used in Ex environment so that it is connected to the panelmeter (miliampermeter or control system input with the 24V DC power supply) through an approved Zener barrier or Ex separator. While using Ex separator is necessary to fulfill the condition that the power supply of Ex separator has to be able to power the sensor to supply the instant power at least 360mW. This power is usually limited. If the restriction of this power is under the mentioned limit, the sensor electronics needn't to start and the sensor needn't to work right.



## Technical specification ASV5-1(M), ASV5-2(M)

Measured value:	ASV5-1(M) : effective speed of vibrations (EFF) ASV5-2(M) : top speed of vibrations (PEAK)
Measuring range of vibrations:	0 ÷ 25.4 mm/s, possible to set in production
Current output:	4 ÷ 20mA, passive, 2 wires
Frequency range	5 ÷ 1500 Hz
Supply voltage:	12.6 ÷ 34 V dc
Maximum impedance of loop:	50.(Vs – 15) Ω      Variant M: 50.(Vs – 12.6) Ω
Galvanic separation:	500 V measuring circuit against shell
Electrical connection:	2 conductors, wires, cross-section 0.5mm <sup>2</sup> , length 800 mm
Thermal range:	-40°C ÷ +100°C, for use in zone 0 maximum ambient temperature 60°C
Coverage	IP65
Material of the case	ANSI 304 stainless steel
Working conditions in terms of Ex	I M1 Ex ia I Ma (Ta=-20°C to +60°C) II 1G Ex ia IIC T4 Ga (Ta=-20°C to +60°C) – -specification is not valid for the M variant connection through an approved safety barrier or separator: U <sub>max</sub> =28V, I <sub>max</sub> =93mA, R=300Ohm
EMC compatibility	is declared as within CE
<div> <div> <b>Mechanical construction</b>  Pic.1 – ASV5 sensor  </div> <div> <b>Obr.2 – sensor with head</b> </div> </div>	

