

VMS-1901

VMS Inductive Sensor

Function principle and design

Function of the inductive sensor is based on eddy current induction in the moving measured target (blade). The sensor contains a permanent magnet, the field of which is affected by moving metallic measured target. As the target (blade) approaches the sensor, the eddy currents are induced in the blade and measured by a coil located in the sensor.

Upon delivery, the sensor could be adjusted to the converter and to the measuring material, thus there is no additional adjustment work necessary for the installation. Only the initial air gap between transducer and measuring target must be adjusted to get the correct signal at the output of the converter. The signal level (amplitude) from sensor strongly depends on air gap between the sensor head and target, speed of the target, temperatures and target material. When recommended conditions are met, the sensor with signal converter provides voltage signal $\pm 10V$.

Applications

Due to the contactless measuring principle, small dimensions, a rugged construction and the endurance against aggressive media, this type of sensor is optimally suitable for the use at all kind of turbo machines. Measuring quantities includes:

- Blade vibration measured from Time of Arrival signals
- Blade untwisting and angle between leading and trailing edge
- Blade lean
- Shaft speed
- Air gaps between rotating and stationary parts (indirect measurement has to be calibrated)
- Temperature measurement
- Torsional shaft vibration

Technical data

Unless stated otherwise, the technical data apply to all versions of the sensor. The air gap between the sensor and the target should not be larger than 7mm. The sensor orientation should be set-up precisely based on the project.

Parameter	Value
Cable length	15 m
Temperature	225 °C
Head diameter	14 mm

Sensor specification

- Time of arrival of blades
- Blade vibration
- Torsional shaft vibration
- Shaft speed
- Temperature (Pt100)

- Meets all industrial requirements.
- Suitable for operating in steam environment up to 225°C

Notes

- The blades have to be demagnetized bellow +/-3Gauss. The demagnetization device or the service could be quoted.
- The sensors are oriented. It means the orientation is very important and you have to pay attention how the sensor is mounted. The sensor position must be specified based on the blade tip profile.

Transducer versions

The following standard versions are available:

- 15 meters cable
- 225°C
- 14mm head diameter
- direct flange

All other versions have longer delivery times! To meet all requirements of measuring tasks and environmental conditions, we offer sensor in several different versions and constructions. The available sensor versions can be found in the order matrix. Depending on the chosen version, the sensors have got the following characteristics: different housing (with thread, different head diameter, ...), axial cable length, different flanges.

Accessories

Soft steel tubes

The soft steel tubes provides protection against steam and other influences. Typical diameters are 6 or 8 mm.

Different flanges

We can manufacture the flanges according to customer design to fit the sensor to customer solution.

Vacuum penetration

To go through the turbine walls.

Flexible pipes

To cover the cable out of the turbine.

Clamps

To attach the soft steel tubes (weldable or screw).

Cables

Cables from signal converter to main system.

Screws

To attach the flange.

Servises

Sensor installation

On site sensor installation – sensor orientation, stainless steel tube bending and installation into the stator parts, sensor-converter connection, sensor test.

Determination of sensor position

Equal or arbitrary

Blade demagnetization

See the notes



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