

PRESSURE SENSORS FOR WIND ENERGY APPLICATION





SIGNIFICANCE OF SMALL COMPONENTS

Pressure and temperature sensors, might appear insignificant when contrasted with the grand scale of wind turbines. However, even the smallest sensor malfunction can lead to turbine shutdowns, resulting in substantial downtime, high repair costs, and revenue losses. Therefore, selecting the right components for critical turbine functions is crucial. These components must meet stringent standards for precision during daily operations and demonstrate long-term durability, often under demanding conditions.



CHALLENGES

Ensuring Stability and Durability:

The sensor must maintain accuracy and reliability in the demanding and harsh environments typical of wind turbine generators.

Withstanding Extreme Conditions:

The sensor needs to resist significant temperature fluctuations, endure high levels of vibration, and remain compatible with various kinds of media.

ADVANTAGES OF OUR SENSOR SOLUTIONS

Precision Engineering: Provides high-accuracy sensors specifically engineered for wind turbines, capable of measuring both absolute, relative and differential pressure with precision.

Robust Durability: Designed to withstand significant shock and vibration, ensuring reliable performance in demanding environments.

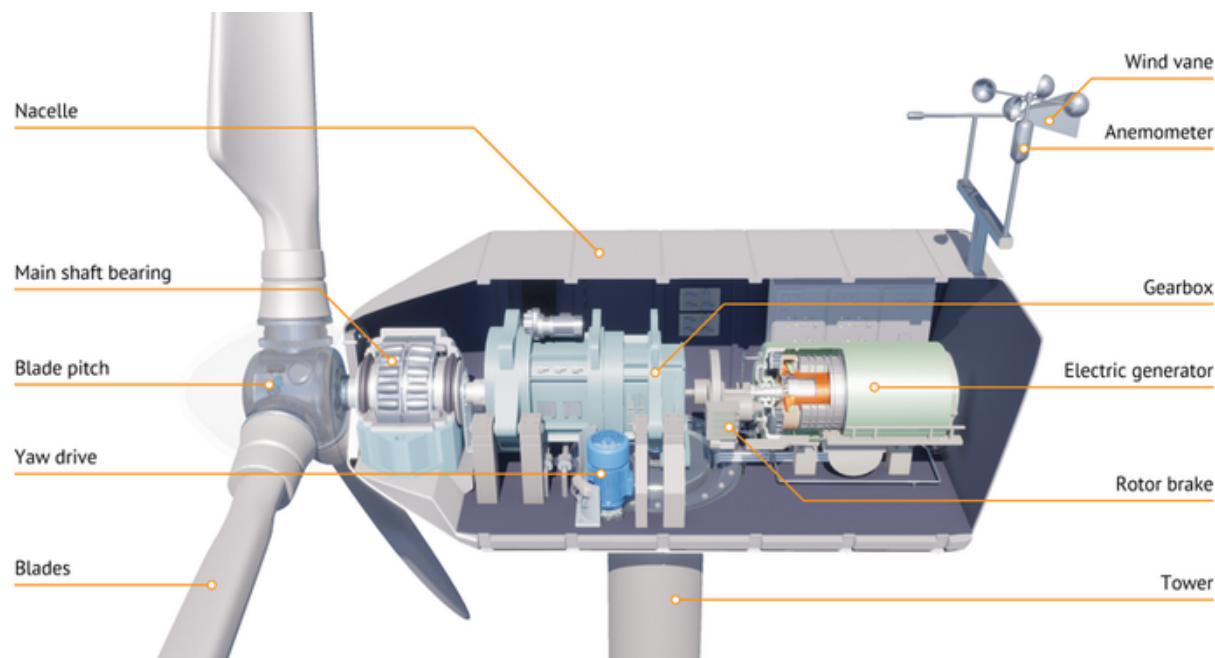
Versatile Applications: Suitable for wide range of measurements such as pressure, temperature, and filter monitoring, making them a versatile solution for wind turbine systems.

Advanced Technologies: Employs cutting-edge technologies to enhance accuracy, durability, and reliability of the sensors.

Integration and Support: Easy integration into existing systems with comprehensive customer support to ensure smooth operation.



GENERAL APPLICATIONS



NACELLE

GEARBOX

Monitoring the temperature of the gearbox oil, which is crucial for ensuring that the gearbox operates within safe temperature limits to avoid overheating and mechanical failure

MAIN BEARING

Measuring the temperature of the main bearing, a critical component that supports the turbine's main shaft. Monitoring its temperature helps in avoiding lubrication failures

GENERATOR

Monitoring the generator's temperature, preventing overheating that could damage the generator

HYDRAULIC SYSTEM

PITCH CONTROL SYSTEM

Monitoring the hydraulic pressure that controls the pitch of the blades, ensuring they adjust correctly to the wind conditions. Monitoring the condition of hydraulic filters to ensure proper fluid flow

YAW SYSTEM

Monitoring the hydraulic pressure and filter condition in the yaw system, which adjusts the turbine's orientation relative to the wind

HYDRAULIC SYSTEM RESERVOIR

Pressure and filter condition monitoring to ensure the pitch and yaw systems function correctly

LUBRICATION SYSTEM

LUBRICATION

Monitoring the pressure and temperature within the lubrication system, ensuring that components like the gearbox and bearings receive adequate lubrication

OIL RESERVOIR

Monitoring the oil temperature to ensure it stays within optimal ranges, preventing both overheating and excessive cooling

LUBRICATION FILTERING SYSTEM

Monitoring of the filter condition by pressure monitoring to detect pollution of lubrication fluid

ROTOR HUB

BLADE BEARINGS

Monitoring the temperature of blade bearings. Important for detecting potential overheating, which could lead to bearing failure

PRESSURE SENSORS

PMP-S111

STANDARD PRESSURE TRANSMITTERS FOR MEDIUM AND HIGH PRESSURE APPLICATION

Purpose: Oil pressure monitoring in lubrication and hydraulic systems.

Key Applications: Blade pitch control, yaw system, lubrication of bearings, and gearbox monitoring.

Function: Measures the pressure of fluids in systems where high pressure, fast temperature changes, and aggressive media are present.

PRESSURE RANGE: 3 – 2000 bar
MEMBRANE MATERIAL: stainless steel 316L or 17-4PH
RESPONSE TIME: 1 ms
ACCURACY (25°C): $\leq 0.5 \%$



Datasheet



PMP-D111

DIFFERENTIAL PRESSURE TRANSMITTERS

Purpose: Filter pressure monitoring in hydraulic and lubrication systems.

Key Applications: Hydraulic oil filters, lubrication system filters.

Function: Monitors the pressure difference across filters to detect clogs or the need for cleaning and replacement.

LINE PRESSURE RANGE: 3 bar...1000 bar
MEMBRANE MATERIAL: stainless steel 316L or 17-4PH
RESPONSE TIME: 1 ms
ACCURACY (25°C): $\leq 0.5 \%$



Datasheet

PMP-D131

DIFFERENTIAL PRESSURE TRANSMITTERS

Purpose: Filter pressure monitoring for low and medium pressure systems.

Key Applications: Similar to PMP-D111 but optimized for lower pressure environments.

Function: Secondary filtration systems, auxiliary hydraulic systems.

LINE PRESSURE RANGE: 70 mbar...100 bar
MEMBRANE MATERIAL: stainless steel 316L, 17-4PH or silicon
RESPONSE TIME: 1 ms
ACCURACY (25°C): $\leq 0.5 \%$

TEMPERATURE SENSORS

PMT-S111

STANDARD STAINLESS STEEL TEMPERATURE SENSORS

Purpose: Temperature monitoring in lubrication and pressurized systems, generic temperature monitoring.

Key Applications: Lubrication systems, gearbox monitoring, and hydraulic systems.

Function: Measures the temperature of to prevent overheating or undercooling, ensuring smooth operation.

TEMPERATURE RANGE: -40°C to 200°C, covering the typical operating temperatures in wind turbines.
MATERIAL: High-strength stainless steel construction, offering durability in harsh environments.
Low Static and Thermal Errors: Ensures accurate temperature readings.
Additional: pressure resistant of up to 160 bar



Datasheet



PMT-C111

COMPACT STAINLESS STEEL, SAFE TEMPERATURE TRANSMITTERS

Purpose: Oil temperature monitoring in lubrication and pressurized systems, generic temperature monitoring

Key Applications: Lubrication systems, gearbox monitoring, and hydraulic systems.

Function: Measures the temperature of oil to prevent overheating or undercooling, ensuring smooth operation.

TEMPERATURE RANGE: -50°C to 150°C, allowing for use in colder climates.

MATERIAL: Stainless steel, ensuring compatibility with various liquids and gases.

Low Static and Thermal Errors: Provides reliable temperature readings.

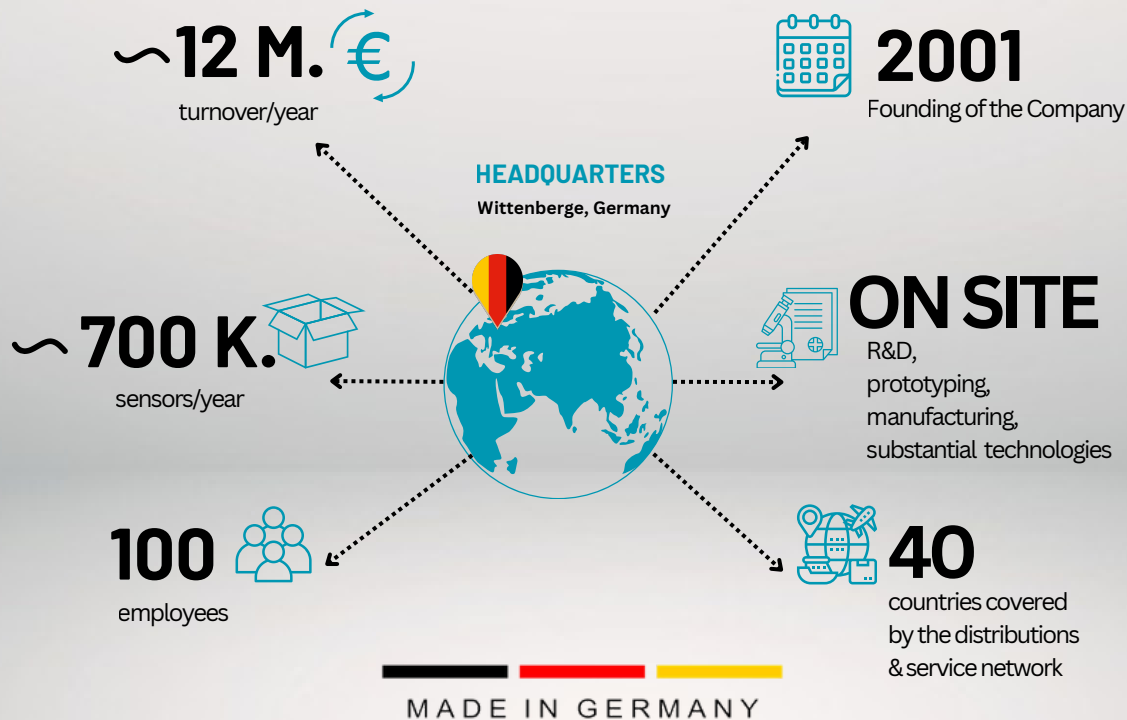


Datasheet

Important clarification of sensor photos

The sensor photos in this brochure are for informational purposes only. Each sensor photo shows only one of the possible sensor designs. Each sensor in our range has several variants of mechanical and electrical connections. This provides a wide range of possibilities for individual customization and seamless integration of the sensors into various systems and devices.

ABOUT US



We are a socially responsible, global manufacturer of sensors. We have a modern structure that uses all the power of innovation and in-house R&D.

Prignitz Mikrosystemtechnik develops, manufactures, and sells pressure sensors, temperature transmitters, and level probes with very high added value *"from chip to calibrated transmitter"*. Therefore, unlike many other companies on the market, we can guarantee a high level of security of supply even in today's turbulent times.

- Based on our R&D, we offer our customers from a variety of industries the best possible customized solutions that fully meet their needs.
- Our high quality management standards have been certified according to *DIN EN ISO 9001*.
- Our sensors have certification with highest protection classes *ATEX, IECEx, CSA*.
- The approval according to the European Directive EC79/2009 officially seals the suitability of our sensors for measuring hydrogen pressure with nominal pressures between vacuum and 600 bar.
- We have received the *BSFZ-Seal*. The BSFZ certificate (Bescheinigungsstelle Forschungszulage) in Germany indicates companies that achieve special technological results due to their R&D activities. The BSFZ works on behalf of the Federal Ministry of Education and Research of Germany.

Feel free to reach out to us. We are ready to individual solutions tailored to your needs. For further information visit our website **www.prignitz-mst.de** or contact us.

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A photograph of two large offshore wind turbines standing in the ocean under a clear blue sky. The turbines are white with three blades each. The water is a deep blue, and the sky is a lighter blue with some faint clouds. The text is overlaid in the center of the image.

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