MEGGiTT

Enabling the Extraordinary
To Fly To Power To Live

vibro-meter

SENSORS & CONDITIONERS

Sensors / measurement chains for turbomachinery & essential rotating equipment

Presenter:

Title:

Date:

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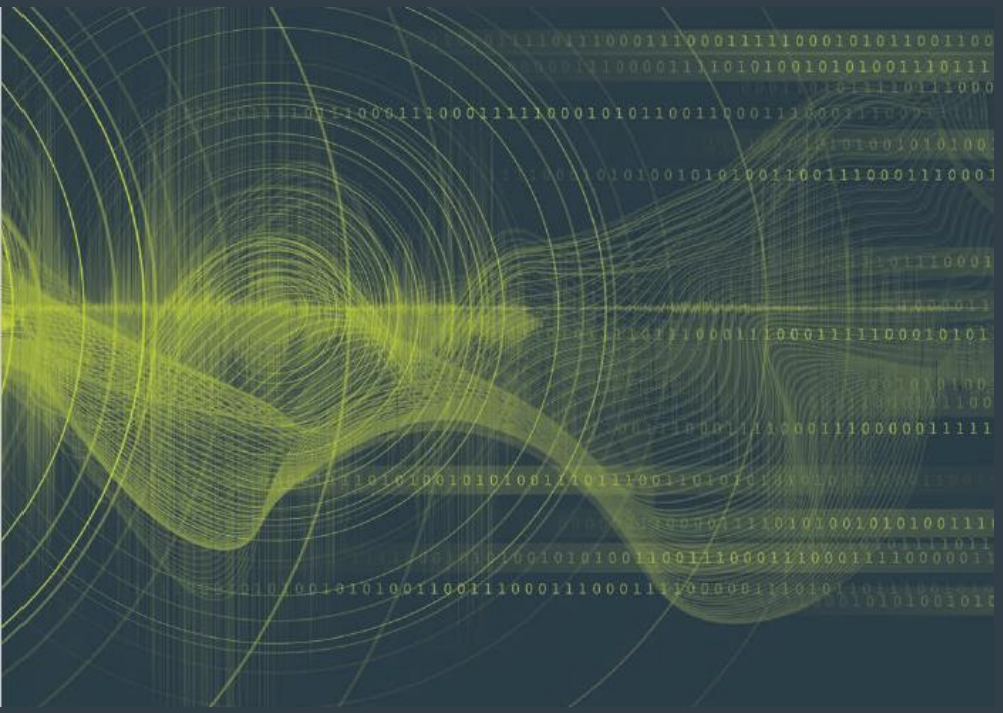

Our comprehensive Sensors & Conditioners product portfolio includes **complete measurement chains for absolute and relative vibrations** such as acceleration, velocity, displacement or gap.

We provide accurate, safe and reliable solutions for **extreme environments and critical applications** such as bearing and relative shaft vibration protection of rotating equipment, gas turbine online combustion tuning, generator air-gap monitoring, housing expansion, etc.

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Product lines overview

Sensors & Conditioners

Sensing solutions to monitor critical plant and equipment

Protection & Monitoring Systems

Protection and monitoring system hardware for critical rotating machinery

Software Solutions

Advanced machinery protection and condition monitoring software

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Portfolio overview

SENSING | PROTECTION | MACHINERY PROTECTION & CONDITION MONITORING | ASSET MANAGEMENT

Absolute vibration

Dynamic pressure

Air gap

Speed/Relative vibration

Sensors and measurement chains

SpeedSys300

Modular overspeed protection system

VM600^{Mk2}

Rack-based monitoring systems

VibroSmart®

Distributed monitoring system

VibroSight®

Data analysis and visualisation

A WORLD LEADER IN SENSING AND MONITORING SOLUTIONS FOR THE ENERGY INDUSTRY

- Continuous product improvement • Complete turnkey solutions
- Support for industry standards (machinery monitoring, communications and cybersecurity)
- Services and support • Factory acceptance tests (FATs)

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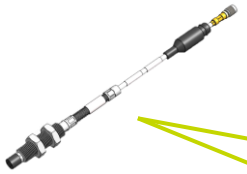
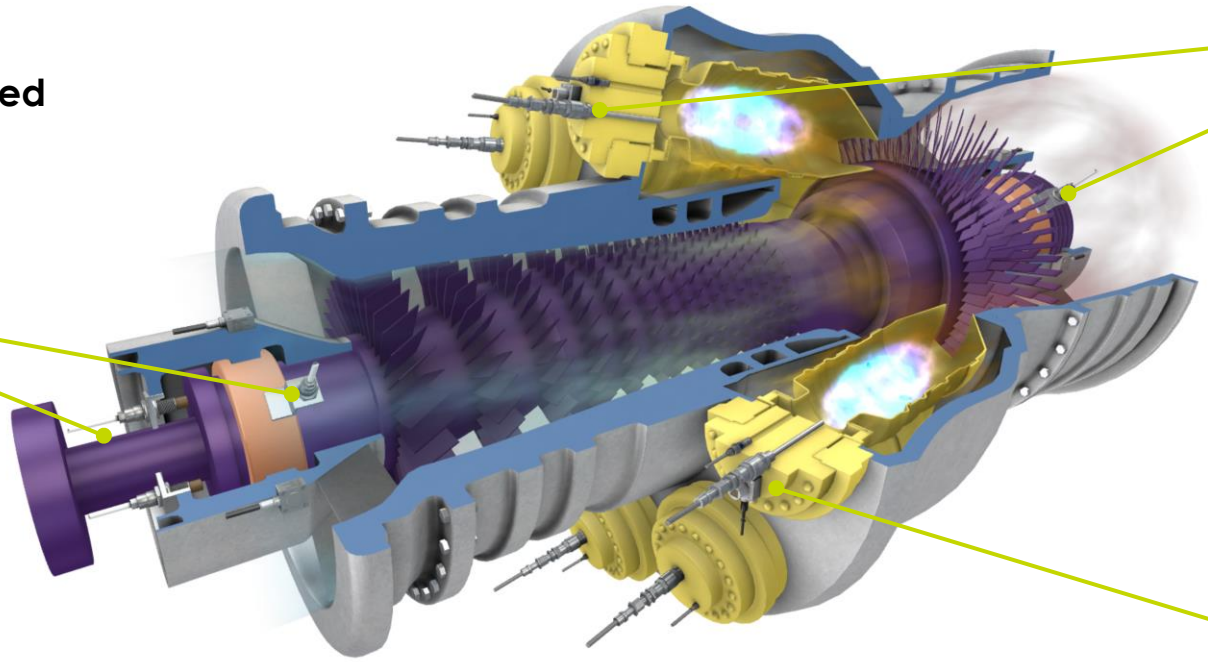
SENSING SOLUTIONS FOR HARSH ENVIRONMENTS

Gas turbines

Absolute vibration
(accelerometers)

Displacement - Position - Speed
(proximity sensors)





Combustion
(dynamic pressure sensors)

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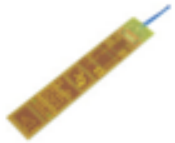
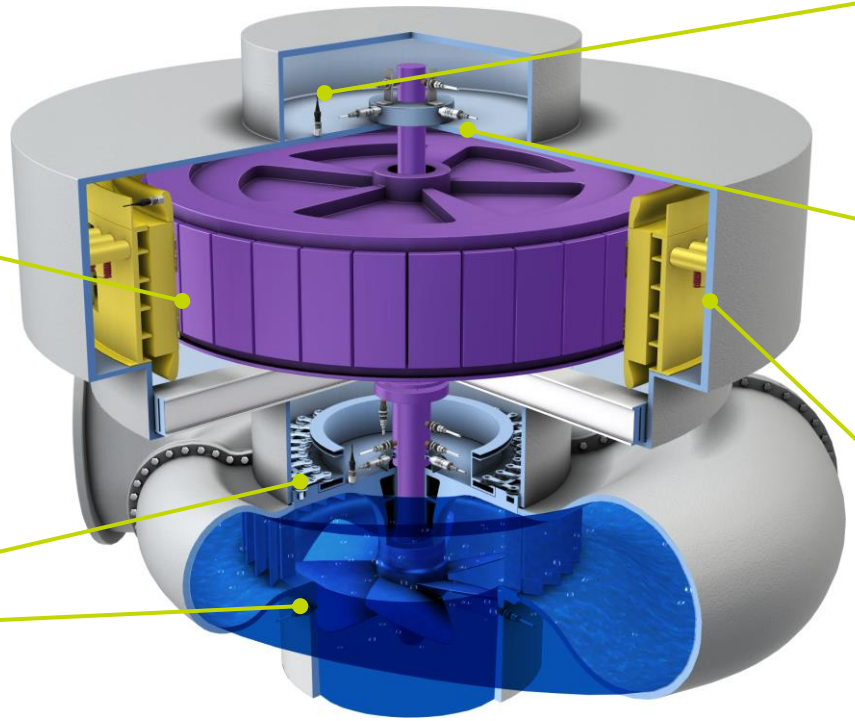
SENSING SOLUTIONS

Hydro turbines

Absolute vibration
(accelerometers)

Rotor-stator gap
(air-gap sensors)





Vibration as velocity
(velocity sensors)

Displacement - Position - Speed
(proximity sensors)

Winding current
(partial discharge)

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ABSOLUTE VIBRATION

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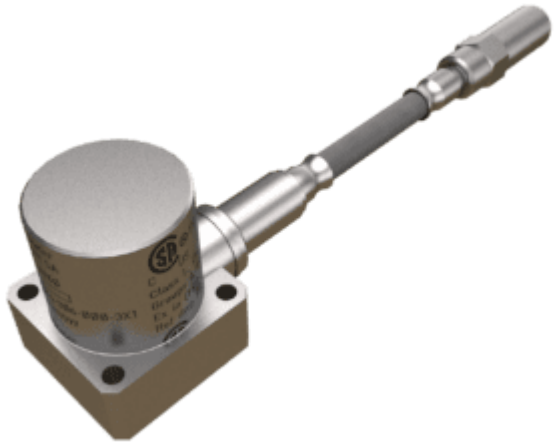
High-temperature piezoelectric accelerometers

CA series

Our piezoelectric-based accelerometers are designed for the long-term measurement and monitoring of absolute vibration in the most severe of environments



Key features and benefits	
Safety standards	Ex certified Up to SIL 2 (using IPC707 signal conditioner)
Operating temperatures	Up to 700 °C for sensors and 85 °C for IPC707 signal conditioner
Sensitivities	From 10 to 100 pC/g
Measurement ranges	From 0.001 to 500 g (dynamic) Up to 1000 g (overload)
Frequency responses	From 0.5 to 10,000 Hz
Signal conditioner	IPC707 has optional diagnostics (built-in test equipment (BITE)), required for SIL 2. Uses external IPC707 signal conditioner.
Linearity (typical)	± 1%
Transverse sensitivity	< 5%
Sensitivity tolerance	± 5%

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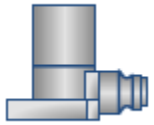
Accelerometers and velocity sensors

With attached or integrated electronics



For applications that do not require the temperature capabilities of a CA series sensor, this series provides a more cost-effective and easier to install solution

Key features and benefits		
	With attached electronics	**With integrated electronics**
Safety standards	Ex certified	Ex certified
Operating temperatures	Up to 350 °C	Up to 140 °C
Sensitivities	From 5 to 50 µA/g	From 50 to 500 mV/g (CE6xx) From 4 mV/mm/s (PV660)
Measurement ranges	From 0.001 to 400 g (dynamic) Up to 2000 g (overload)	Up to 80 g (CE6xx) Up to 100 mm/s (PV6xx)
Frequency responses	From 2 to 10,000 Hz	From 2 to 10,000 Hz
Signal conditioning	Uses attached or integrated electronics. *Note: No external signal conditioner, so no connectors close to the machinery being monitored and easier to install.*	

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Accelerometers overview

With attached or integrated electronics

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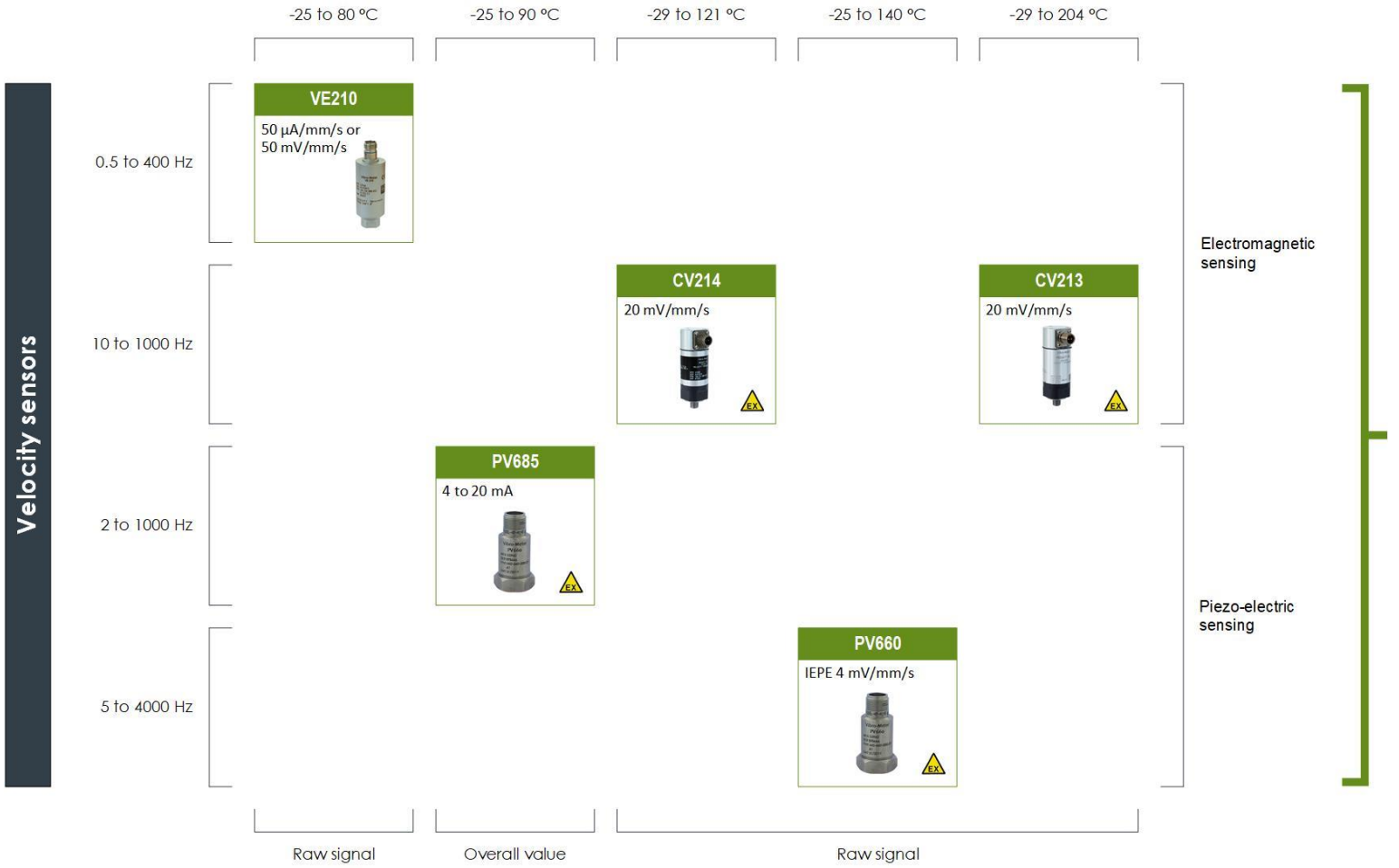
Velocity sensors overview

With attached or integrated electronics



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DYNAMIC PRESSURE

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Piezoelectric dynamic pressure sensors

CP series

Our piezoelectric-based dynamic pressure sensors are designed for the long-term measurement and monitoring of combustion in gas turbines: combustor pulsations and combustion dynamics.

Key features and benefits	
Safety standards	Ex certified Up to SIL 2 (using IPC707 signal conditioner)
Operating temperatures	Up to 700 °C for sensors and 85 °C for IPC707 signal conditioner
Sensitivities	From 25 to 750 pC/bar
Measurement ranges	From 0.00005 to 250 bar (dynamic) Up to 350 g (overload)
Frequency responses	From 2 to 15,000 Hz
Linearity (typical)	±1%. *Note:* Low sensitivities to acceleration.
Signal conditioner	Uses external IPC707 signal conditioner. IPC707 has optional diagnostics (built-in test equipment (BITE)), required for SIL 2.

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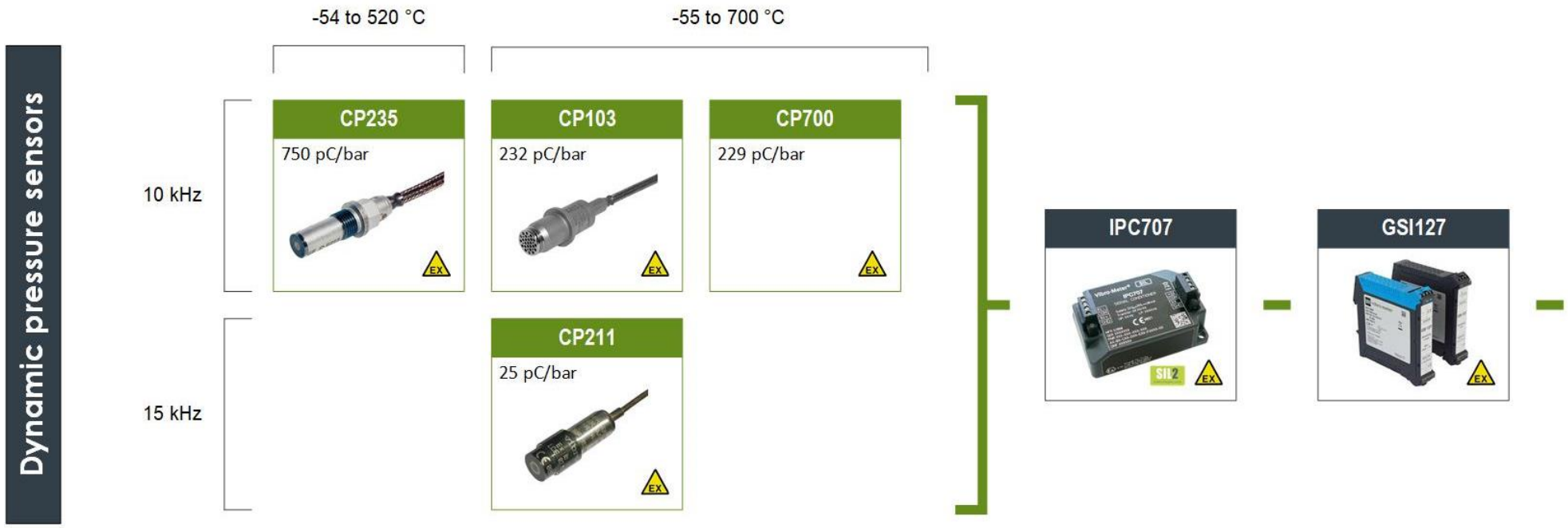
CP series overview



Patented acceleration-compensated designs with the highest temperatures and pressure sensitivities in the industry

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RELATIVE VIBRATION

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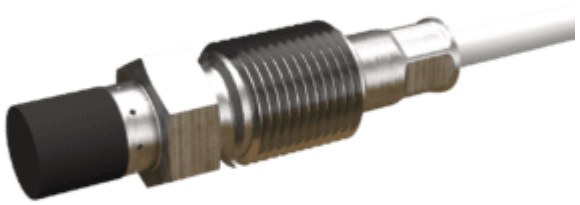
Proximity measurement chains

TQ9xx / IQS900 series

Our eddy-current based sensors are designed for the contactless measurement of the relative displacement of moving machine elements



Key features and benefits	
Safety standards	API 670 5th edition compliant Ex certified Up to SIL 2 (using IQS900 signal conditioner)
Operating temperatures	−40 to 180 °C for sensors and cabling −40 to 85 °C for signal conditioner
Measurement ranges	• TQ9x1: 2 mm range with 8 mV/µm or 2.5 µA/µm sensitivity (Ø 5 mm tip) • TQ9x2: 2 mm range with 8 mV/µm or 2.5 µA/µm sensitivity *or* 4 mm range with 4 mV/µm or 1.25 µA/µm sensitivity (Ø 8 mm tip) • TQ9x3: 12 mm range with 1.33 mV/µm or 0.417 µA/µm sensitivity (Ø 18 mm tip)
Frequency response	DC to 20,000 Hz
Mounting	Standard, reverse or right-angle (90°) mounting
Pressure	Up to 100 bar (tip) for high-pressure applications
Signal conditioner	Uses IQS900 signal conditioner. IQS900 has optional diagnostics (built-in test equipment (BITE)), required for SIL 2.
Signal transmission	Up to 1000 m (IQS900 configured with current output)

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Proximity measurement chains overview

Comprehensive radial vibration, axial position, rotational speed and phase reference (1/ REV pulse) measurement solutions

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AIR GAP

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Air gap sensor measurement chains

LS12x / ILS73x series

Electric field (capacitance) technology for the contactless measurement of air gap (rotor and stator) in hydroelectric generators and other large machines

Key features and benefits

- **Contactless measurement:** No wear-out
- **Measurement ranges:** 30 or 60 mm versions
- **Three voltage output signals**: Pole profile, Rotor profile and Minimum gap (suitable for direct protection)
- **One current output signal:** Configurable as one of Pole profile, Rotor profile or Minimum gap
- **Easy, fast and reliable installation**
- **Enhanced filtering of noise and spikes induced by high excitation currents**

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HOUSING EXPANSION PROBES

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Housing expansion probes

AE119

Eddy-current technology for the contactless measurement of absolute housing expansion on medium to large thermal machines such as gas turbines and steam turbines

Key features and benefits

- **Contactless measurement:** No wear-out
- **Measurement ranges:** 50 or 100 mm versions
- **Integrated electronics:** Current output signal
- **Splash proof:** IP54 protection rating

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THANK YOU

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Business legal entity, Business address

Legal entity registration information as appropriate

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