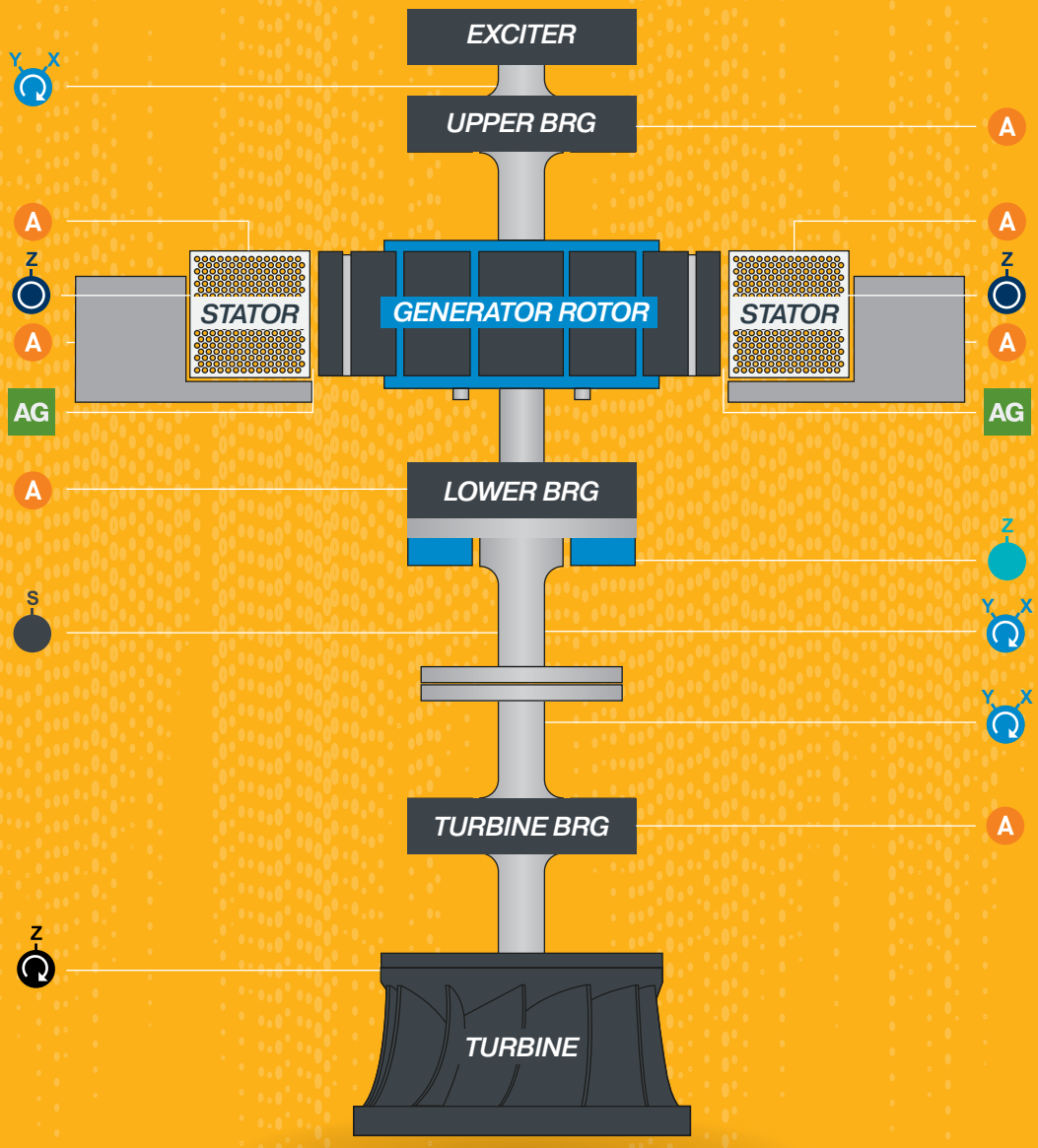
ADVANCED CONDITION MONITORING AND PROTECTION FOR HYDROPOWER PLANTS

vibro-meter

Parker MEGGiTT

VIBRO-METER MEASUREMENT COVERAGE

for Hydropower Applications



Measurements

- A — Absolute Vibration
- Y X — Shaft Relative Vibration
- Z — Thrust/Axial Position
- Z — Stator Expansion
- S — Speed/Phase Reference
- Z — Runner Clearance
- AG — Air Gap

VIBRO-METER SENSOR PORTFOLIO

for Hydropower Applications

vibro-meter's comprehensive range of sensors to monitor hydropower equipment are functional down to very low frequencies, in wet and corrosive environments and in the presence of electromagnetic and radio frequency interference.

Proximity Probes

The TQ series of proximity probes covers a broad measurement range from 2 to 12 mm and are designed to withstand pressures up to 100 bar.

Accelerometers with Integrated Electronics A

The CE and SE series of accelerometers with integrated electronics have excellent low-frequency response (down to 0.2 Hz) and are ideal for smaller hydro units using rolling element bearings and/or speed-reducing gears that require monitoring using accelerometers.

Moving-Coil Velocity Sensors A

Our range of moving-coil velocity sensors have the advantages of being self-powered and providing a strong output signal in native velocity units (50 mV/mm/s for the VE210), so no integration is required and the signal-to-noise ratio is excellent.

Piezo-Velocity Sensors A

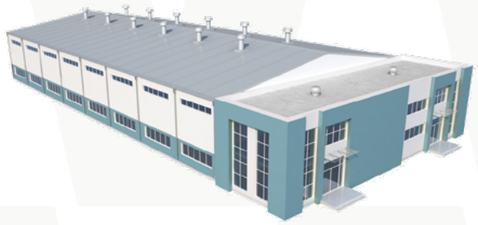
Our range of compact and cost effective piezoelectric velocity sensors enable general-purpose vibration monitoring solutions, for example, PV660 with a voltage output (down to 1.9 Hz (114 rpm)) and PV685 with a 4-20 mA current loop output (down to 3 Hz (180 rpm)).

Air Gap Sensors AG

The LS series of air gap sensors covers a broad measurement range from 5 to 60 mm (linear), features enhanced filtering of noise and spikes and provides outputs for monitoring and protection, including a minimum gap signal for direct protection.

SOLUTION PORTFOLIO

Plant-Wide Ecosystems Integration



SECURE REMOTE CONNECTION

Local or Remote Monitoring Center

Capability to safely transfer acquired data in quasi real-time through a data diode to a remote monitoring center for data analysis and archiving (VibroSight).

VibroSight

As a common data visualization, event management and diagnostic software platform, VibroSight allows plant operators to choose the system or combination of systems that meets the requirements of any given plant.

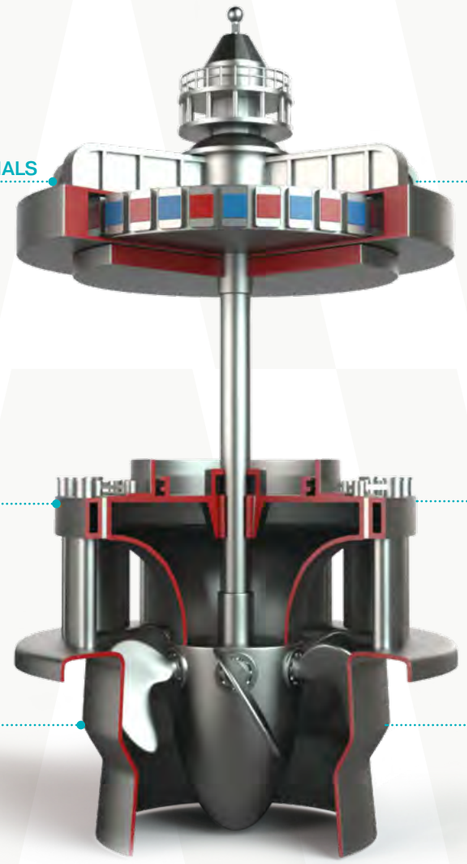
Plant Control System

Capability to communicate with third-party systems such as a DCS or PLC via industry standard protocols like Modbus, Profibus or IEC 61850 GOOSE, or via relays

ETHERNET

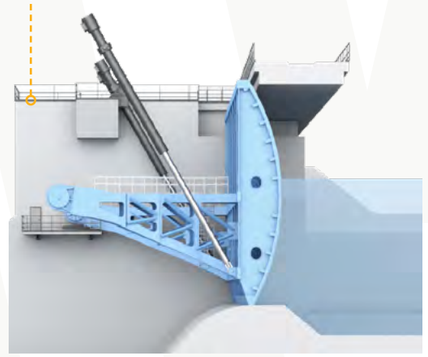
FIELDBUS

SENSOR SIGNALS



VibroSmart

Distributed architecture with a lower channel density. Inputs from all measurement chains are wired to DIN-rail mounted modules typically installed in an industrial housing, closer to or on the machinery being monitored. As a result, sensor cabling is effectively replaced by Ethernet cabling, thereby reducing installation costs.



Balance of Plant Monitoring

- Spillway gate vibration
- Synchronous condenser vibration
- Pump vibration
- Penstock pressure fluctuation

VM600^{MK2}

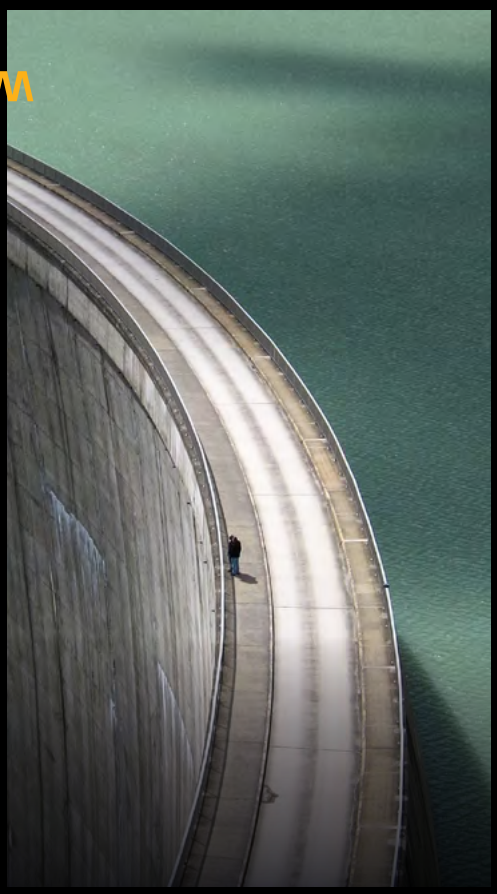
Centralized and modular architecture with a higher channel density that addresses complex installations. Dynamic inputs and auxiliary inputs (tacho, process, other) from proximity probes, accelerometers, velocity and air-gap measurement chains are connected to cards installed in standard 19-inch, 6U racks installed in a cabinet. 1U racks are also available.

vibro-meter solutions are engineered to ensure you get the most from your critical machines.

WHY VIBRO-METER?

Hydropower is an indispensable part of today's power generation infrastructure and for more than 70 years, we've been at the forefront of this industry – developing, installing and supporting the specialized low-frequency monitoring required by hydro turbine-generators. Whether the turbine is **Francis, Kaplan, or Pelton**, and whether the application is pumped-storage, accumulation, run-of-river, or derivational.

Our solutions also extend beyond the turbine-generator, covering spillways and control gates, penstocks, pumps, wicket gates, and more.



HIGHLIGHTS

for Hydropower Applications

- Centralized and distributed machinery protection and/or condition monitoring solutions.
- Easy data communication via Modbus, PROFIBUS, IEC 61850 (GOOSE) and OPC interfaces.
- Cybersecurity as per IEC 62443 standards.
- Optimized operation cost with reduced spare parts inventory.
- Customised configuration of the system and turnkey solutions through vibro-meter's sales network including cabinets and portable systems.
- True rotor and stator circularity measurements according to the CEATI industry standard.
- SIL rated systems that comply with IEC 61508 standards.
- Sensors are designed to operate in extreme environments with greater reliability for long term applications.

Enabling Engineering Breakthroughs

Learn more about
Hydropower Monitoring Solutions