HYDROELECTRIC POWER GENERATION

IMI SENSORS
A PCB DIVISION

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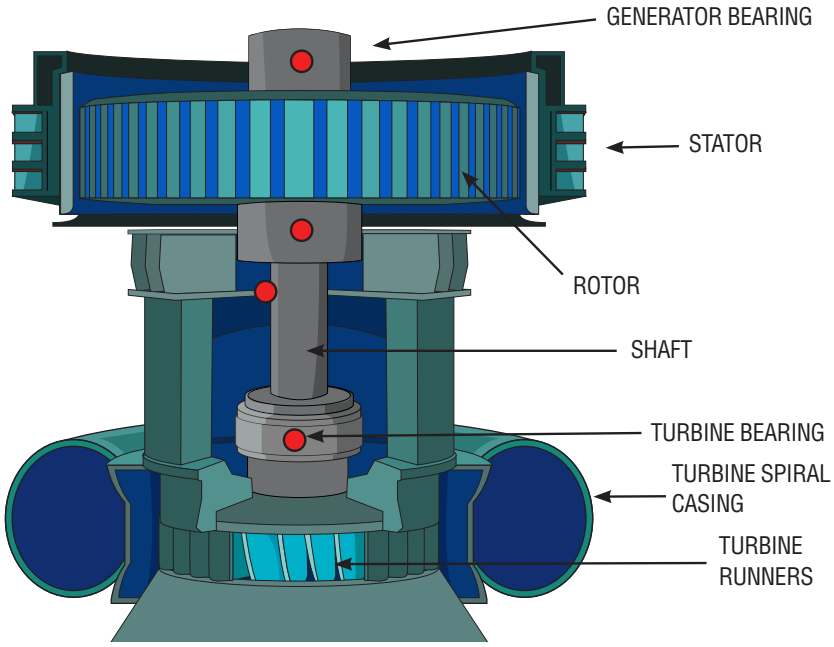
HYDROELECTRIC POWER GENERATION

The core of a typical hydroelectric power plant is the turbine. As water runs through the penstock on its way from the reservoir to the outflow, it circulates past the turbine runner. The water flow causes the runner blades to rotate, thereby turning the turbine shaft. The turbine shaft subsequently turns the generator shaft, creating electricity.

Hydro turbines rotate slowly, typically at an operating speed of 75 to 1000 rpm. Turbines are often required to operate at partial load in order to meet fluctuating electricity demands. This part load operation can increase the potential for water pressure pulsations, turbulence and cavitation. Runner components are prone to fatigue and damage because of the errant vibration caused by these fluctuations. In addition to runner components, turbine and generator shafts and bearings are also prone to vibration. Those vibrations can be faults including unbalance, misalignment, bearing fatigue and/or overload and insufficient bearing lubrication.



Suggested Sensor Placement

ICP® ACCELEROMETERS & 4-20 mA TRANSMITTERS

LOW COST ICP® ACCELEROMETERS

MODELS 602D01 & 603C01

- Easy installation in tight spaces
- General purpose, hermetically sealed
- M12 connector version available

PRECISION ICP® ACCELEROMETER

MODEL 622B01

- Full frequency sweep calibration with 5% sensitivity deviation tolerance
- 15 kHz high frequency response ideal for early detection of bearing faults
- Intrinsically safe options available

PRECISION ACCELEROMETERS WITH VELOCITY OUTPUT

MODELS VO622B01 & VO625B01

- 100 mV/ips sensitivity
- Low frequency response ideal for monitoring of slower speed equipment

LOW COST TRIAXIAL ACCELEROMETER

MODEL 604B31

- General purpose, hermetically sealed accelerometer
- Perfect for permanent mount application

PRECISION TRIAXIAL ACCELEROMETER

MODEL 639A91

- 13 kHz high frequency response on all three axes
- Extremely small footprint (0.95" x 0.95" excluding the side exit connector)

DUAL OUTPUT VIBRATION & RESISTANCE TEMPERATURE DETECTOR (RTD)

MODELS RTD602D91, RTD602D11

- Ceramic Shear ICP® Accelerometers w/ or w/o integral polyurethane cable
- Sensitivity (±10%): 100 mV/g (10.2 mV/(m/s²))
- Measurement Range: ±50 g (±490 m/s²)

BEARING FAULT DETECTOR

MODEL 682C05

- Provides early warning of bearing and gear faults
- Operates with PLC, DCS, SCADA, alarm and control systems
- Outputs 4-20 mA signals for peak acceleration and overall vibration

4-20 MA OUTPUT DISPLACEMENT SENSOR

MODEL 653A01

- Outputs 4-20 mA signal proportional to displacement
- 2 to 40 mil pk-pk measurement range
- 1.5 to 300 Hz frequency range

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3425 Walden Avenue, Depew, NY 14043 USA

pcb.com/imi-sensors | imi@pcb.com | 800 959 4464 | +1 716 684 0003

IMI-APP-HydroPowerGen-0823