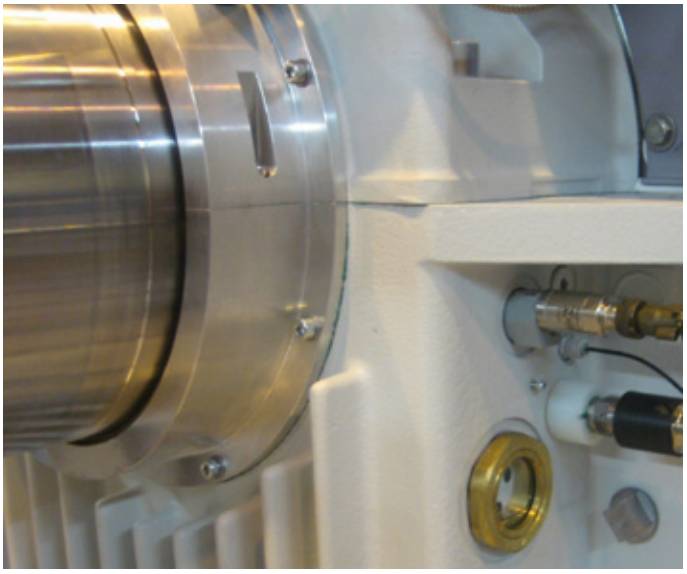
Technical note
Synchronous generators for steam and gas turbines
Pre-engineered generators - Vibration monitoring

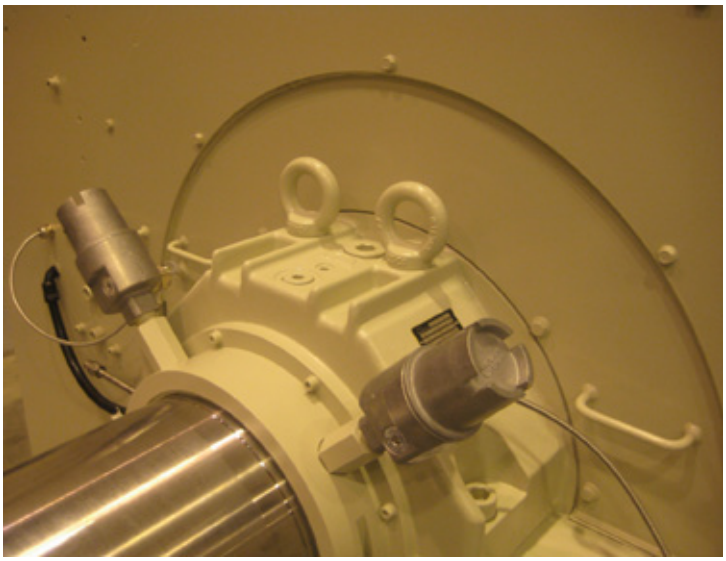
ABB is a leading supplier of synchronous turbine-driven generators to power utilities, paper mills, sugar plants, oil and gas installations, and many other sectors. We have been manufacturing generators for more than 120 years and have extensive application experience with tens of thousands of installations all over the world. ABB offers reliable and efficient power generation with worldwide support.



Seismic vibration detectors

Pre-engineered generators can be provided with two different types of vibration detector: seismic (Velomitors) and/or inductive (Proximitors). Seismic vibration detectors are used for measuring horizontal vibrations on the bearing housing during operation. Even if no vibration detectors are included in the scope of supply, ABB will perform vibration acceptance level tests on the bearings and exciter housing before the generator is dispatched from the factory. ABB conducts these tests at full speed and no load in its own ABB test facility (rigid foundation). The table below shows the maximum structural vibration levels.

	Operating speed [r/min]	Bearing housing vibrations [mm/s rms]	Exciter housing vibrations [mm/s rms]
AMSb 900 50Hz	1500	Horizontal: 2.3 Vertical: 2.3 Axial: 1.8	4.5
AMSb 900 60Hz	1800	Horizontal: 2.3 Vertical: 2.3 Axial: 1.8	4.5



Proximity type vibration detectors

ABB Test facility

Shaft vibrations

If proximity type vibration probes are included in the scope of supply, ABB will perform acceptance level tests for combined electrical and mechanical shaft run-out, measured in V-blocks during slow roll (300rpm). Additional tests for shaft run-out will also be performed at full speed and no load during testing of the complete generator. Pre-engineered generators can be supplied with two different levels of combined electrical and mechanical run-out, 16 µm or 22 µm (peak to peak). The vibrations are measured with eddy-current probes (proximitor type).

The surface of the shaft at the location of the eddy-current probe is prepared to ensure that it is smooth and free from any geometric discontinuities, metallurgical non-homogeneities and local residual magnetism, which can cause false signals (so-called electrical run out). This is achieved by burnishing the surface at the probe location.

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