MEGGITT

vibro-meter

**Vibro-Meter SA**
P.O. Box 1701
Rte de Moncor 4
1701 Fribourg
Switzerland
tel +41 26 407 11 11
fax +41 26 407 13 01

www.meggitt.com
www.vibro-meter.com

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# New Air Gap Measurement Systems for Generators

PRESS RELEASE

Vibro-Meter has for many years provided reliable protection systems for all types of rotating machinery, and has gained much expertise in monitoring power generation systems. Now a new design of air-gap sensor can be included alongside vibration, speed, position and displacement transducers, guarding against contact between generator rotor and stator, to provide a complete protection and condition monitoring system. Air-gap monitoring is most often specified for hydro applications, but can be useful in all large machines.

The new sensors measure the air gap using a high frequency oscillating electric field. The design is such that the magnetic field is very small, enabling the sensor to work in high magnetic environments such as inside generators.

The linearity of such sensors is known to be a possible problem. Here, it is achieved through the physical assembly of different cells of transmitters/receivers, adjusted in sizes and dimensions. The electrical addition of the outputs gives a linear response over a wide range, for example 2 to 33mm for sensor type LS 120 and 15 to 65 mm for the LS 121.

A feature of modern generators is higher operating temperatures, and the LS 120/121 design allows for this, with a long-term tolerance up to 125(C/257(F. A suitable adhesive for permanent attachment of the sensors inside the stator has been tested and proven.

The system provides three voltage-based outputs (0 to 10 V), which are available on a screw terminal strip on the matching signal conditioner ILS 730 or 731:

- The POLE PROFILE output indicates the instantaneous value between the transducer and the rotor.
- The ROTOR PROFILE output indicates the minimum value of the air gap for each pole.
- The MINIMUM GAP output reflects the minimum air gap value for all poles of the rotor. In addition, one current output (4 to 20 mA) is provided for any one of the above 3 signals.

These outputs may be fed into local control systems, or into the VM 600, the new digital protection and condition monitoring system from Vibro-Meter.

A protection and condition monitoring system using the new sensor designs was recently successfully installed in a hydropower facility at Koyna in India. This will be described in a paper to be presented at the Hydro 2000 conference and exhibition in Bern, Switzerland, 2nd to 4th October.