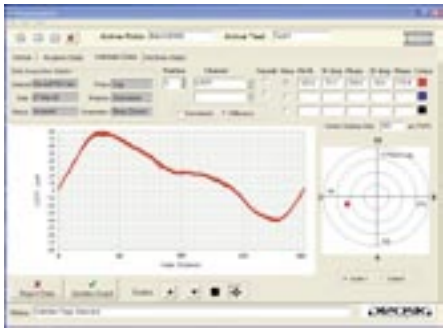
# Rotor Runout

- **Accurate, portable data capture system**
- **LVDT or eddy current probes**
- **Easy setup**
- **Automatic analysis & reports**

Vibration measurement of rotating components is well known and largely understood due to online vibration monitoring systems such as Prosig's PROTOR system. One major component of such systems is the ability to measure shaft vibration using non-contact probes such as eddy-current shaft proximity probes. These probes measure the distance between the probe tip and the shaft surface. One important aspect to be aware of when using this type of probe is a phenomenon known as Runout. Runout is the combination of the inherent vibration measurement of a rotating object together with any error caused by the measurement system. Runout may consist of two components:



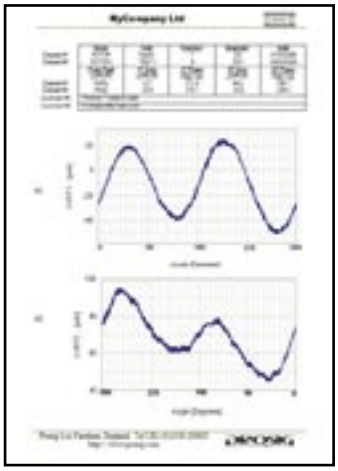
**Mechanical Runout**. - An error in measuring the position of the shaft centerline with a displacement probe that is caused by out-of-roundness and surface imperfections.

**Electrical Runout**. - An error signal that occurs in eddy current displacement measurements when shaft surface conductivity varies.

That is, any measurement made by a probe of this type is subject to error which is due both the surface and shape of the object being measured and also due to its electromagnetic properties.

The Prosig Rotor Runout system is based on Prosig's P8000 hardware and the DATS analysis and reporting package. The Rotor Runout software consists of two main modules – Capture and Report.

The hardware can accept inputs from either contact probes, LVDT (for mechanical runout) or eddy-current proximity probes (for electrical runout). Data is collected at very low speeds (<10RPM) such that no dynamic vibration is present. Data is collected over complete revolutions of the shaft using a phase marker or tachometer signal to define the start and end positions. Signal processing techniques are used to measure the important runout parameters such as peak-peak amplitudes, RMS energy and the amplitude & phase of the main harmonic components. Runout measurements are analyzed and presented in a variety of forms.



Runout data is generally captured for one or more revolutions at a number of different positions along the shaft. The software allows easy setup of the test conditions, for example shaft descriptor, model, type, manufacturer, test description, position number or description and direction of rotation of the shaft.

Subsequent to a test or set of tests for a complete rotor an extensive set of summary and review reports may be generated both on-screen and in the form of printable reports created with both Microsoft Word® and Excel® using Prosig's Intaglio report generation mechanism.

In summary Runout is an important phenomenon when analyzing shaft vibration particularly when using proximity probes. Provided runout can be measured accurately then it is possible to apply runout compensation by performing a vector subtraction to vibration measurements to produce a runout-free measure.

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North America
Prosig USA Inc.
Sales & Engineering Office
Suite 100A, 29200 Southfield Rd
Southfield, MI 48076, USA
T: +1 (248) 443 2470
F: +1 (248) 443 2706
E: prosigusa@prosig.com

Europe & Worldwide
Prosig Ltd.
Link House, High St.
Fareham, Hants
England, PO16 7BQ
T: +44 (0)1329 239925
F: +44 (0)1329 239159
E: sales@prosig.com

**www.prosig.com**