UNBALANCE & VIBRATION

UNBALANCE is the unequal distribution of mass within a rotating system. The geometric centerline of rotation does not coincide with its mass centerline.

UNBALANCE DETECTION:

A pure unbalance will generate:

- A signal at the rotation speed, in the radial direction.
- A force at 1× turning speed.
- When severe, harmonics of the 1× turning speed can indicate that heavy unbalance is exacerbating looseness in the bearings or structure.



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AVIB



Initial data to verify an unbalance condition utilizing both the FFT\Spectrum and the Time Waveform.

COUPLE UNBALANCE

OVERHUNG ROTORS

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- Causes deflection or bending of the shaft.

- Causes high 1× level in radial and axial directions.



STATIC UNBALANCE



- Notice the unbalance mass is at the lowest position when the machine is not in operation.
- Produces vibration signal at 1×, in phase readings at both ends of the rotor.



- Caused by two identical unbalance masses located at 180° apart, diagonally opposite that may be statically balanced.
- Vibration at 1x, with opposite phase reading.

Phase Measurement point

DYNAMIC UNBALANCE



- Combines static and couple unbalance.
- Most common form of unbalance.



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Phase

Measurement point