

UNBALANCE & VIBRATION

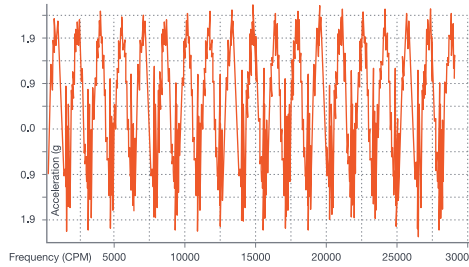
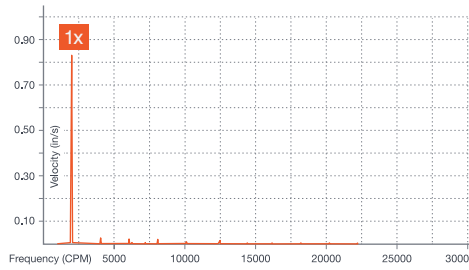


UNBALANCE is the unequal distribution of mass within a rotating system. The geometric centerline of rotation does not coincide with its mass centerline.

UNBALANCE DETECTION:

A pure unbalance will generate:

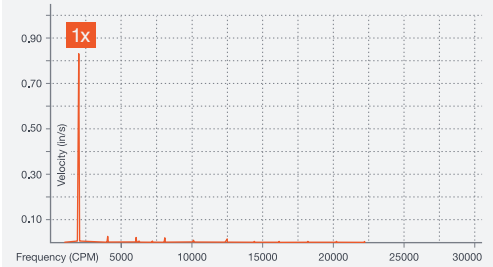
- A signal at the rotation speed, in the radial direction.
- A force at 1x turning speed.
- When severe, harmonics of the 1x turning speed can indicate that heavy unbalance is exacerbating looseness in the bearings or structure.



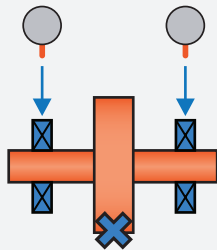
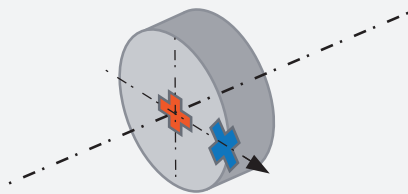
Initial data to verify an unbalance condition utilizing both the FFT Spectrum and the Time Waveform.

OVERHUNG ROTORS

- Causes deflection or bending of the shaft.
- Causes high 1x level in radial and axial directions.



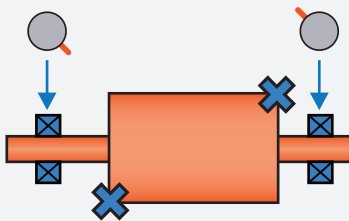
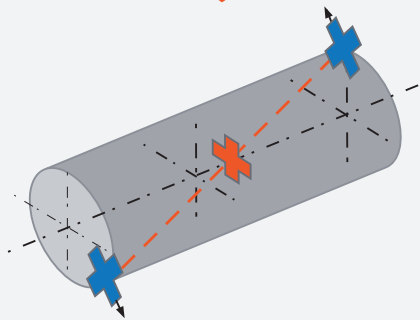
STATIC UNBALANCE



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

Phase 
Measurement point

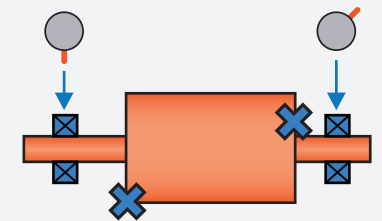
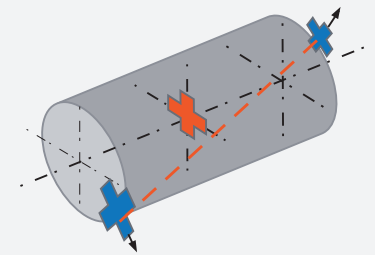
COUPLE UNBALANCE



- 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.

Phase 
Measurement point