

Concept of Dynamic Mass Balancing

Dynamic balance is the branch of [mechanics](#) that is concerned with the effects of [forces](#) on the motion of a body or system of bodies, especially of forces that do not originate within the system itself, which is also called [kinetics](#). Dynamic balance is the ability of an object to [balance](#) while in motion or switching between positions.



Why need Dynamic Mass balancing ?

The Importance of **Dynamic Balancing** Cross-Sectional View of Rotor. One important reason for **balancing** is that the forces created by unbalance are detrimental to the life of the machine - the rotor, the bearings, and the supporting structure. ... As speeds increase, the force increases.

Mass unbalance create vibration on the rotating machine in different angle. Vibration is harmful for rotating machine. Due to vibration Bearing damage, Shaft breaking , Machine foundation Shearing etc. To reduce vibration due to mass unbalancing of a rotating body require dynamic mass balancing.

What is Vibration?

To and Fro motion of a rotating body is called vibration. This To and Fro motion may be for the rotating part of the machine or part of the stationary body; pipeline or the structure. Vibration can also be expressed as the oscillation or moving back and forth of an object. Vibration Amplitude and Vibration Frequency are the common characteristics. Sometimes a third characteristic, phase. The measurement of these characteristics; amplitude, frequency and phase, provides the source of all kinds of vibrations of our system.

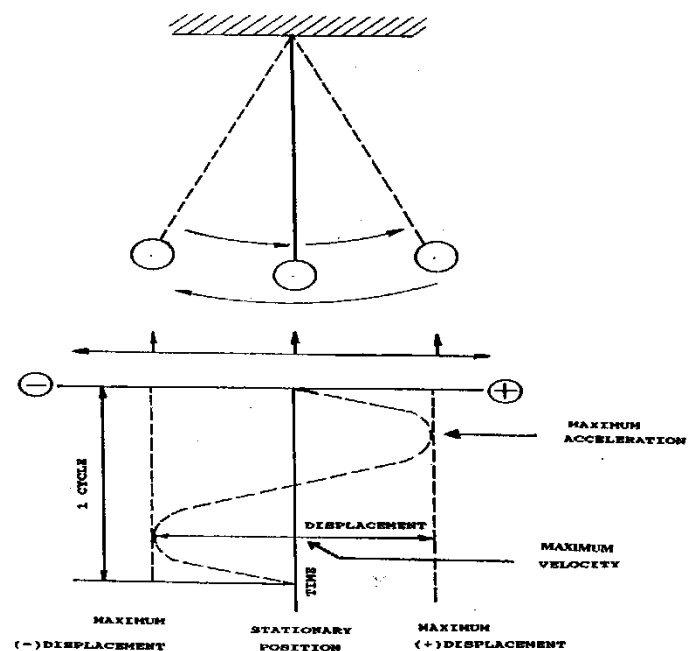


Figure-1 (Motion of a simple pendulum)

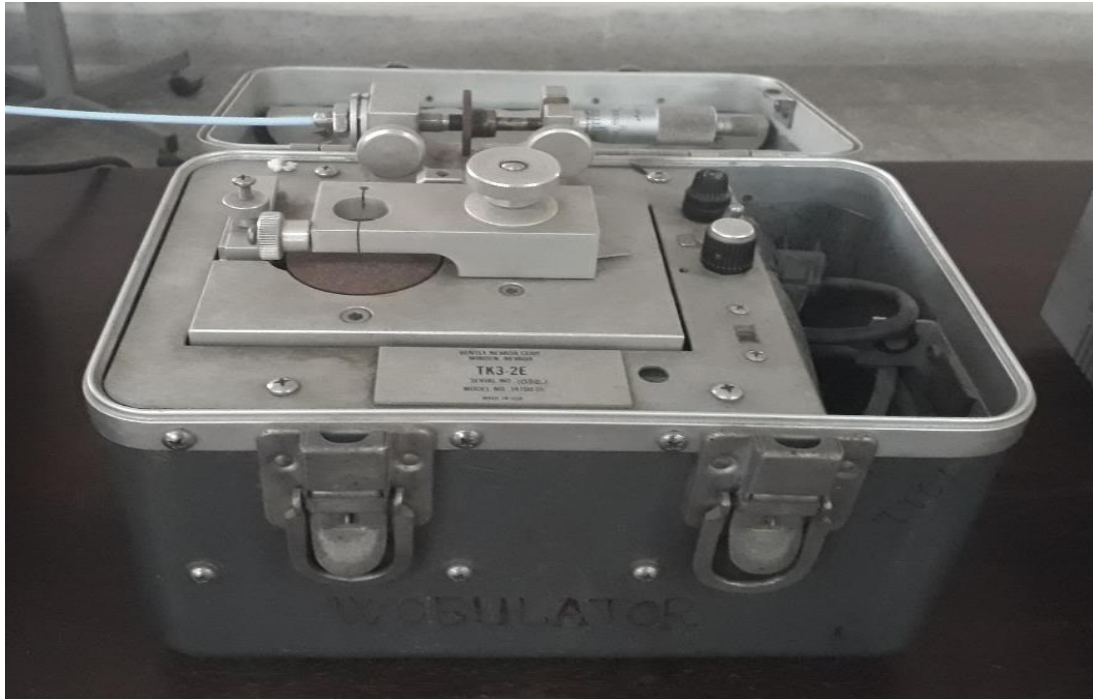
Expert Team for Dynamic Mass Balancing and Vibration Works of TICl

Mechanical Engineering and Instrumentation & Control Engineering Departments of TICl both are involve for Dynamic Mass Balancing and Vibration Works. The Team Member are Flowing

| Mechanical Engineering Department | | |
|---|-------------------------|-------------------------------|
| SN. | Name | Designation |
| 01 | Jasimn Uddin Ahmed Khan | Training Director, TICl |
| 02 | Mostafa Abdul Mazid | DCC (Mech.) |
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| 01 | Md. Anisur Rahman | ACC (Elect.) and Head of ICED |
| 02 | Mohammad Nasimul Gani | DCC (Elect.) |
| 03 | Md. Tushar Hossain | XEN (Elect.) |

Equipment Used for Dynamic Mass Balancing And Vibration Works

- **Calibration:** WOBULATOR



Vibration (displacement, velocity and acceleration) sensor require Calibration. Unit of vibration (mils, Micron) is very small that why vibration sensor should calibration. Vibration sensor calibration done by WOBULATOR.

- **Measurement:** Vibration panel monitor



Panel Monitor: Panel monitor have different channel for different bearing or machine location. Sensor are connected in different location of machine (Turbine, Compressor, Motor, any rotating machine) with fixed and signal send to panel monitor. Operator are easily observe the vibration in different location at a time .

- **Analysis:** Spectrum Analyzer, Data acquisition Interface Unit (DAIU-208P)



Vibration analyzer DAIU-208P (Data acquisition Interface Unit) is connected with a Laptop which are especially software supported. From the software we get Tabular sheet, Spectrum, Polar etc. data. Here use a calculation software to find out calculated mass and angle for dynamic mass balancing.

- **Simulation: Rotor Kit (RK-4)**



To create vibration in a rotation body by making different fault in different location of a rotation body use the rotor kits. Here use two disk and every disk we can make unbalance by extra mass. Due to extra mass create mass unbalance and this signal we can observe. The signal characteristic show the types of vibration. By using balancing software we can mass balance and reduce the vibration.

Dynamic mass balancing in machine shop in TICI site:



Portable rotating device (Motor rotor, Pump impeller, Blower fan, Turbine rotor etc.) mass balancing in TICI site . Client can carry the rotating device to Machine shop of TICI to dynamic mass balancing.

Portable Dynamic Mass Balancing Machine:



TICI expert team are always ready to serve dynamic mass balancing in plant site. Portable vibration measurement and dynamic mass balancing kits use for the job. Mechanical and Instrument expert are physically observe and install the sensor on rotating machine in different location to collect vibration signal. In plant site collected data analysis by portable analyzer and find out exact mass & degree of angle of rotating machine.