

Subject Name - Basic Mechanical Engineering

Subject code - MEE105B

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Experiment No-6

* Name of the experiment - Trial on reciprocating compressor.

* Aim - To calculate the compression ratio for the air-compressor.

* objective - To understand the different parts and working of air-compressor and calculate the pressure ratio.

Summary

* About the compressor -

An Air compressor is a device, which sucks the air from the atmosphere and compresses it and delivers it to a reservoir tank. It compresses the air by the means of a reciprocating piston, which reciprocates inside a cylinder. It can be single stage or multistage. It can be single acting or double acting. Two-stage air compressor test rig consists of two cylinders and pistons and a reservoir tank. An A.C motor drives it. Thermometers are provided at inlets and outlets. To find out the inlet volume of air an orifice is provided. To streamline the intake a diaphragm base manifold is provided. Pressure gauge is provided at reservoir tank. Safety valve and auto power switch is provided for the safety factor.

* Specifications -

Motor	3 H.P
Type	AB 7.75
compressor	Double stage single acting
cylinder No1	Diameter 93.5mm, Stroke 78mm
Energymeter	3200 Pulses/kWh constant (Emc)

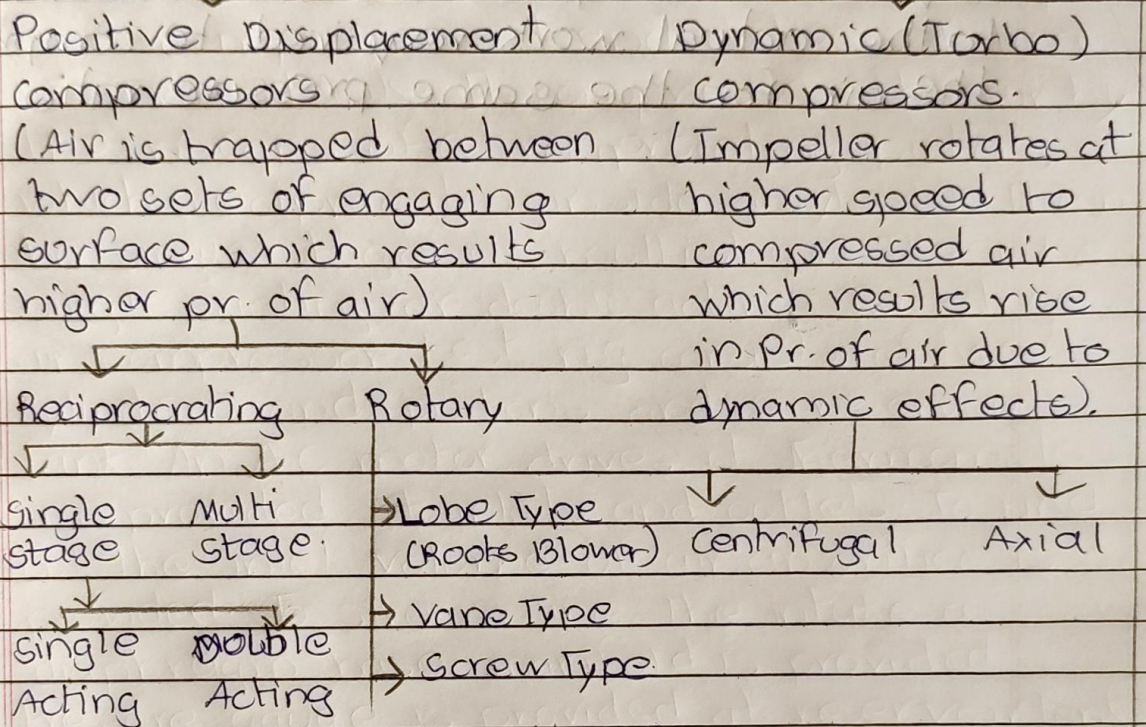
* Theory -

In two stages compressor air is partially compressed in low-pressure cylinder this air is passed through between the first stage and the second stage so that air at the inlet of the second stage is at lower temperature than the first stage outlet. This is done to reduce the work of compressor in second stage. Final compression in the second stage. Also the compressors are provided with clearance volume, two stage compressors can achieve higher volumetric efficiency than a single stage compressor because of lower compression per stage. As the compressed air is used in a wide range in industrial, domestic, aeronautics, fields, etc. so compressors are applied in a wide range. compressors are used where the air is required at high pressure.

Questions

Q1) How the air compressors are classified?

Ans → Air compressors are classified as -



Q2) What is volumetric efficiency of air-compressor?

Ans → The volumetric efficiency represents the efficiency of a compressor cylinder to compress gas. It may be defined as the ratio of the volume of gas actually delivered to the piston displacement, corrected to suction temperature and pressure.

Q3) what is isothermal efficiency of air compressor?

Ans) Isothermal efficiency -

It is the ratio of work (or power) required to compress the air isothermally to the actual work required to compress the air for the same pressure ratio.