

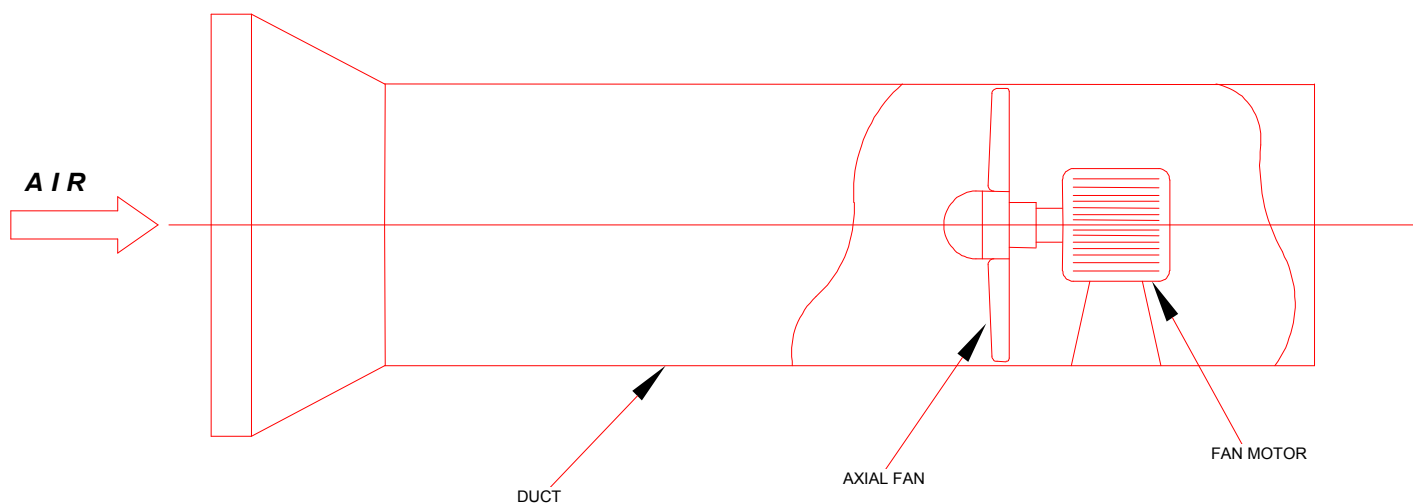
## 01. FAN BASICS

**Axial Flow Fans:** A fan is a device that is designed to move a specific volume of air (flow) against moderate pressure (resistance). A fan induces an airflow by virtue of its blades; a blade moves air by generating a lift force when in motion through the air. An axial flow fan is a fan in which the flow of air is substantially parallel to the axis of rotation.

**Static Pressure:** A fan moving air must work to overcome resistance to the flow that arises due to various obstructions in the flow path. This resistance is termed as Static Pressure. The total Static Pressure is expressed in millimeters or inches of H<sub>2</sub>O.

**Velocity Pressure:** In addition to the above, a fan must also work to accumulate air to its suction side and move it to the discharge side. This work is termed as velocity pressure and is expressed as millimeters of H<sub>2</sub>O.

**Total Pressure:** The total work a fan must do to move a specified volume of air against the static pressure plus the velocity pressure is defined as Total Pressure of the system and is expressed in millimeters or inches of H<sub>2</sub>O.



**Efficiency:** The measure of how well a fan does work against the total pressure to move a given volume of air is termed as Fan Total Efficiency. In general, a non-uniform air stream (flow) results in a less efficient fan. A fan equipped with a duct having proper inlet and outlet shapes, allows for a more uniform air stream (flow) and thus dramatically improves the efficiency of the fan; in fact, if properly designed, a ducted fan can achieve efficiencies of up to 85%.