

Automatic Testing Blower

Mr. R. Somasundaram¹, V. Supriya², M. Ramani³, S. Sumina⁴

Assistant Professor, Department of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India ¹,

UG Student, Department of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India ^{2,3,4}

ABSTRACT - Centrifugal Blowers are the ideal answer for vacuum or compacted air applications. Centrifugal blowers give dry, clean, sans oil air and require low vitality utilization. Dissimilar to compacted air frameworks, this arrangement is protected to run at low weight, and takes into consideration sped up or levels. The blower accompanies fired half and half course, rotatable outlet release. Right now, enters the focal point of a turning impeller and is isolated between the impeller's vanes. As the impeller turns, it quickens the air outwards utilizing radial power. This high-speed air is then diffused and eased back down in the encompassing blower lodging to make pressure. These valuable modern diffusive blowers are confronting an absence of exactness in the yield stream parametric estimations. To acquire the exactness, the weight measure, Noise level meter and a simple to Digital convertor can be utilized. It makes the precise computerized estimation of the yield parameters.

KEYWORDS: Centrifugal blower, accurate measurement, output parametric calculations, automation.

I. INTRODUCTION

Industrial Centrifugal Blower are utilized in those applications where the need of air for suction, blowing, blend, dust assortment and scrubbers and so forth. They are predominantly structured with impellers of in reverse and advance bended sharp edges, aluminum, gentle steel, FRP, and Heat safe materials. These blowers are equipped with particularly advance motor and organized with strong metallic body to guarantee its generosity and robustness. In light of its astonishing handiness, high profitability, less upkeep and long time span of reasonable ease of use, these Centrifugal Air Blowers are commonly required in the market. Center outspread air blowers had three varieties which are 1. Direct Drive (DD) 2. Belt Drive (BD) 3. Coupling Drive (CD).

Outward Fans and Blowers routinely have one of eight sorts of wheels that carry the air into the bay of the blower dwelling, through the wheel, and discharges it at 90 degrees out through the arrival of the housing. The two most fundamental types of Centrifugal Blowers are Pressure Blowers and Volume Blowers. Weight Blowers are expected to draw or push air at high loads, assessed in static weight water check (SPWG). Volume Blowers are planned to draw or push greater volumes of air, assessed in cubic feet of air each minute (CFM), at lower static loads than Pressure Blowers. Outward Blowers are usually made of fabricated steel, treated steel or cast aluminum.

II. WORKING

A. PRESSURE TRANSDUCER

A pressure transducer, often called a **pressure transmitter**, is a transducer that converts pressure into an analog electrical signal. Although there are various types of pressure transducers, one of the most common is the strain gage base transducer.

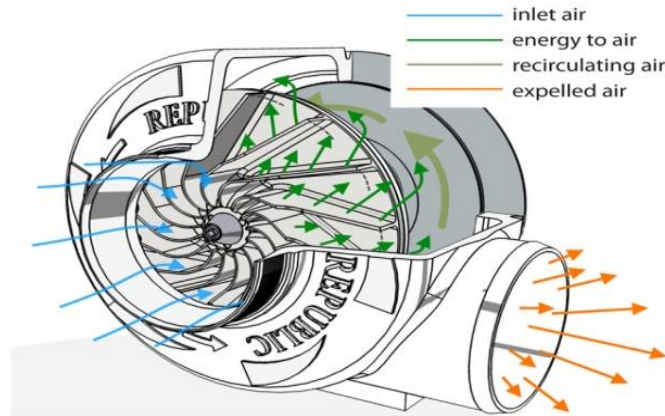


Fig.1 Industrial Centrifugal Blower

A pressure transducer, regularly called a pressure transmitter, is a transducer that changes over pressure into a simple electrical signal. There are different sorts of pressure transducers, one of the most ordinarily utilized is the strain gage base transducer.

The transformation of weight into an electrical sign is accomplished by the physical misshapening of strain gages which are fortified into the stomach of the weight transducer and wired into a Wheatstone connect setup. Weight applied to the weight transducer delivers an avoidance of the stomach which acquaints strain with the gages. The strain will deliver an electrical obstruction change relative to the weight. The got electrical sign can be changed over to advanced estimation. Pressure transducers are commonly accessible with three kinds of electrical yield. millivolt, enhanced voltage and 4-20mA. A short time later, it is important to change over an electric yield into a building unit, for example, PSI or bars.



Fig.2 pressure transducer

A resistive pressure transducer has strain checks clung to the outside of the non-media reached side of the with the diaphragm goal that any adjustment in pressure will cause a transient distortion of the flexible material bringing about a difference in the obstruction of the strain measure that is changed over into a useable electrical sign between the two plates which shifts the capacitance (ΔC). This adjustment in capacitance is then changed over into a usable sign for the user.

B. SOUND LEVEL METER

The SLM comprises of a receiver, electronic circuits and a readout show. The mouthpiece distinguishes the little gaseous tension varieties related with sound and changes them into electrical signs. These signs are then prepared by the electronic hardware of the instrument. The readout shows the sound level in decibels. The SLM takes the sound weight level at one moment in a specific area.



Fig.3 sound level transducer

To take estimations, the SLM is held at a manageable distance at the ear tallness for those presented to the clamor. With most SLMs it doesn't make a difference precisely how the mouthpiece is pointed at the clamor source. The instrument's guidance manual discloses how to hold the mouthpiece. The SLM must be adjusted when each utilization. The manual likewise gives the alignment method.

With most SLMs, the readings can be taken on either SLOW or FAST reaction. The reaction rate is the timespan over which the instrument midpoints the sound level before showing it on the readout. Work environment clamor level estimations ought to be taken on SLOW reaction. A Type 2 SLM is adequately precise for modern field assessments. The more exact and substantially more costly Type 1 SLMs are basically utilized in building, lab and research work. Any SLM that is less exact than a Type 2 ought not be utilized for work environment clamor estimation.

An A-weighting channel is commonly incorporated with all SLMs and can be turned ON or OFF. Some Type 2 SLMs give estimations just in dB(A), implying that the A-weighting channel is ON forever (see the OSH Answers on Noise - Basic Information for increasingly about A-weighted decibels dB(A)). A standard SLM takes just prompt commotion estimations. This is adequate in working environments with constant clamor levels. In any case, in work environments with motivation, discontinuous or variable clamor levels, the SLM makes it hard to decide an individual's normal presentation to commotion over a work move. One arrangement in such working environments is a clamor dosimeter.

Moving coil is made out of vibrating diaphragm, changeless magnet and transformer. The vibrating diaphragm starts to vibrate after the acoustic weight and drives the versatile loop with it to vibrate in the attractive field to create an instigated current. This current differs relying upon the size of the acoustic weight of the vibrating diaphragm. The more noteworthy the sound weight, the more prominent the current created, the littler the sound weight, the littler the current produced.

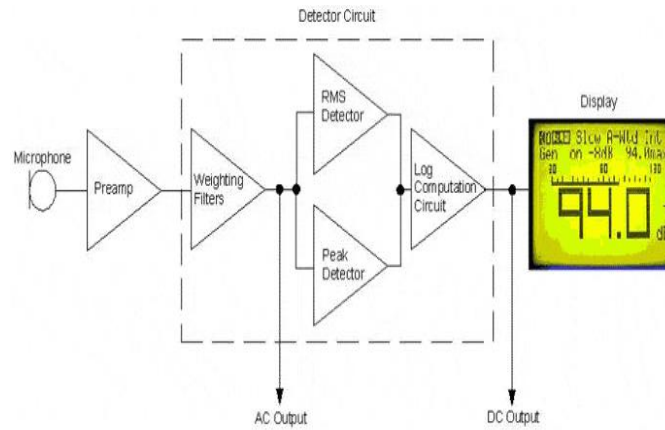


Fig.4 sound level meter

Capacitive microphone is chiefly made out of metal diaphragm and near the metal electrode, is basically a level capacitor. Metal diaphragm and metal electrode establish the plate capacitance of the two plates, when the diaphragm by the sound pressure, the diaphragm will be distorted, with the goal that the separation between the two plates have changed, so changed the capacitance, The voltage in the bit estimation circuit has additionally changed to understand the impact of changing over the sound weight signal into a voltage signal. Capacitive microphone is a perfect amplifier in acoustic estimation. It has the upsides o huge unique range, straight recurrence reaction, high affectability and great steadiness all in all estimation condition. As the yield impedance of the condenser amplifier is high, it is important to help out the impedance change through the pre-amplifier. The pre-amplifier is introduced inside the sound level meter close to where the condenser amplifier is introduced.

III. PROPOSED METHOD

The proposed system is using the combination of pressure transducer and sound level meter. By using these two devices the user can easily monitor the outflow of current, voltage, noise level and air pressure transducer from the blower accurately. The devices then connected to analog to digital convertor to fetch the data digitally.

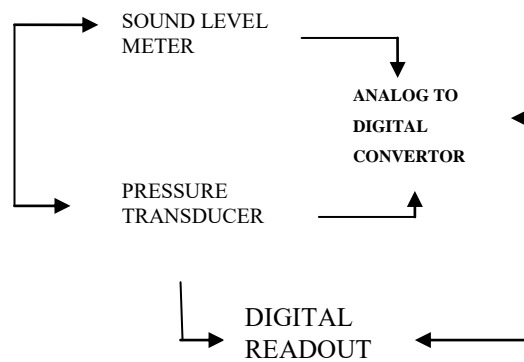


Fig.5 Block diagram of automatic testing blower

Organized by

Department of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India

IV. RESULT AND DISCUSSION

These industrial centrifugal blowers can be used by the individual user. This arrangement can be easily implemented to the blower for the continuous fetching of accurate digital data. This arrangement is less in cost and provides more efficient results. These results are accurate and efficient. The industrial centrifugal blower with this setup reduces manpower and saves time effectively.

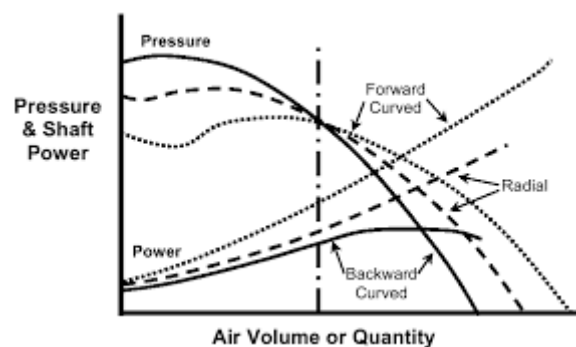


Fig.6 Graphical Representation Of A Blower Activity

V. CONCLUSION AND FUTURE ENHANCEMENT

In current scenario this proposed system will be more efficient than manual testing of a blower. In future this automation can be implemented in many industrial blower projects.

REFERENCES

1. Jayapragasan, C.N.; Manojkumar, A.; and Reddy, K.J. (2015). Design optimization and parametric study on the alternative blower of travelling cleaner. *International Journal of Innovative Science, Engineering & Technology*, 2(4), 76-84.
2. Vijaypratap, R.S.; Zinzuvadia, M.J.; and Saurian, M.S. (2014). Parametric study and design optimization of centrifugal pump impeller: A review. *International Journal of Engineering Research and Applications*, 4(1), 216-220.
3. Fernandez, X.R.; and Nirschl, H. (2013). Simulation of particles and sediment behaviour in centrifugal field by coupling CFD and DEM. *Chemical Engineering Science*, 94, 7-19.
4. Ragoth, S.R.; and Nataraj, M. (2012). Optimizing impeller geometry for performance enhancement of a centrifugal blower using the Taguchi quality concept. *International Journal of Engineering Science and Technology*, 4(10), 4308-4314.
5. R.G. McCurdy, "STANDARDIZATION OF NOISE METERS", *ELEC. ENGG. (A.I.E.E. TRANS.)*, vol. 54, jan. 1935.