MOTOR FAULT DETECTION USING SOUNDS SIGNALS ANALYSIS IN DC MOTOR

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ABSTRACT

The fault checking techniques are generally applied to detect the various types of motor faults such as short winding fault, air gap eccentricity fault, load fault, rotor fault bearing fault, etc.
Fault checking and monitoring of any motor is very challenging task for the engineers and for researchers in industries. There are various methods are available including vibrations analysis, thermal monitoring, chemical monitoring etc. but all these methods required costly sensors ,spatial tools. Among these methods, vibration analysis, current analysis and Sound signature analysis are the most popular due to their easy measurability, high accuracy, and reliability.

Keyword :- *ATMEGA 16 ARDUINO, MOTOR, MIC, LCD.*

1.INTRODUCTION

DC motors are mostly used electrical machines in industry because of cost of dc motor is so cheep ,
And the other advanges of dc motor small size, easy operation with an available power supply and the , low maintenance cost . Although these DC motors are very reliable but various types of faults can be occure in motors . these faults may be internal or external conditions ,The Inherent faults may be are due to the mechanical or electrical forces acting on the machine enclosure. If a fault is not detected or if it is allowed to develop further it may lead to a failure of system . so in this project we detect that faults by using sounds signals of motors. We compare that faults with healthy sound of motor for checking motor healthy or not , after comparing with healthy further we compare with faulty sounds for checking which faults are present in the motor

1.1 LITERATURE REVIEW

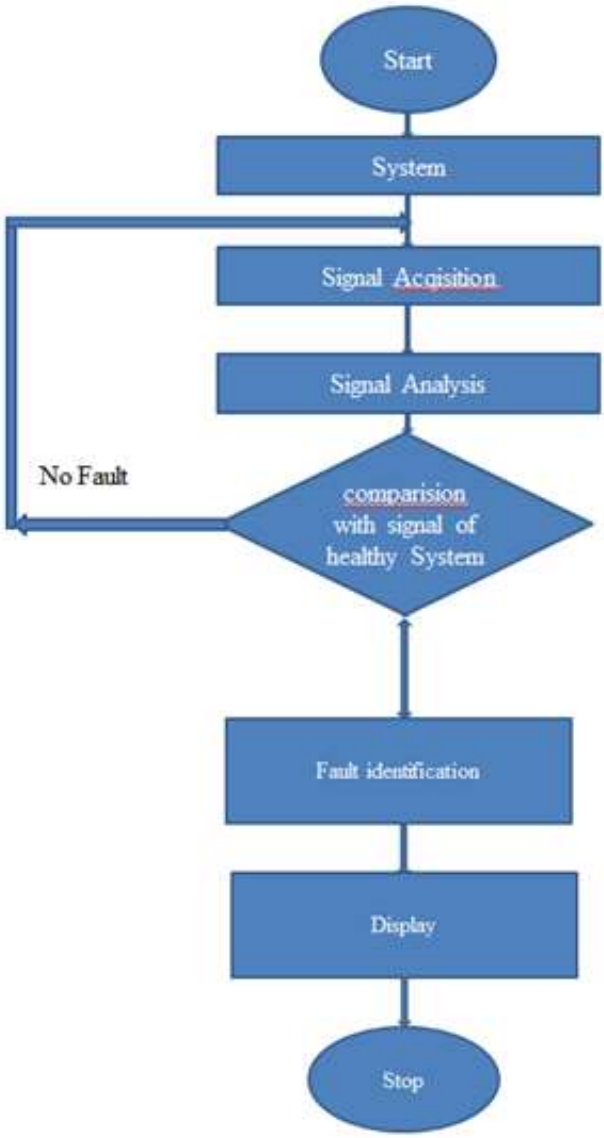
SR NO.	PUBLISHER'S NAME	PAPER'S DETAILS	STATEMENTS
1	➢ D. K. Chaturvedi, ➢ Akash Gautam, ➢ Sharif Iqbal.	➢ Dept. of Electrical Engineering, Faculty of Engineering, Dayalbagh Educational Institute ➢ Email: dkc.foe@gmail.com	On Line Fault Identification of Induction Motor using Fuzzy System
2	➢ Basavaraj S. Anami1, ➢ Veerappa B. Pagi	➢ KLE Institute of Technology, Hubli ➢ anami_basu@hotmail.com, veereshpagi@yahoo.com	Multi-stage Acoustic Fault Diagnosis of Motorcycles using Wavelet Packet Energy Distribution and ANN

1.2 EASE OF USE

present recent developments in the field of motor fault signature analysis, with particular regard to Sound signature analysis of motor of fan. The different types of fan faults that can be identified from the sound signature analysis , for example, rotor faults, bearing faults, unbalances wings etc. Corresponding to the above-mentioned faults, many types of machine fault signature analysis techniques have been proposed for motor faults detection and diagnosis. These techniques include vibration monitoring, motor current signature analysis (MCSA) electromagnetic field monitoring, chemical analysis, temperature measurability, infrared measurement, acoustic noise analysis, and partial discharge measurement.

Among these methods, vibration analysis, current analysis and Sound signature analysis are the most popular due to their easy measurability, high accuracy, and reliability.

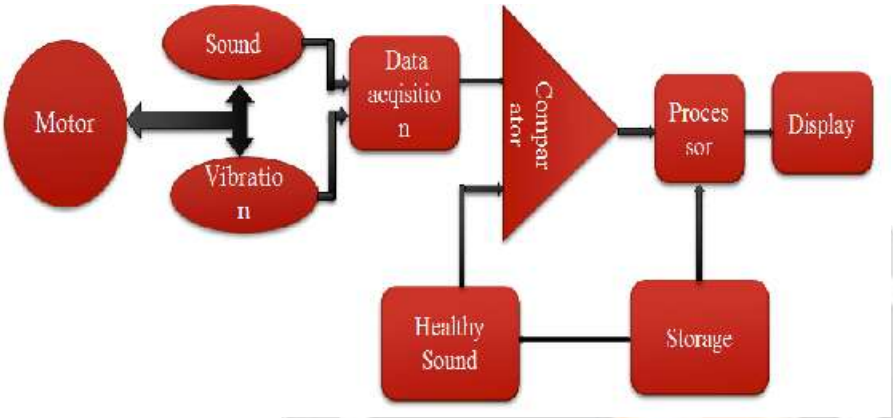
2. FLOWCHART



2.1 Flowchart explanation

1) START
2) Initialize all the devices LCD, Processor induction motor.
3) Take the input (Sound) from induction motor.
4) Check the motor is in fault condition or not.
5) If the fault is not occure then go to the step 3
6) And if the fault occure then goto the next step
7) Identify the fault by using processor.
8) Display the fault name.

3. BLOCK DIAGRAM



3.1 MOTOR

We use 12V DC motor as a input for sound generation ,this motor generates differents types of sounds this can faulty or healthy. And the output of the motor gives to the data acquisition block.

3.2 COMPARATOR

Comparator takes input from motor . The input in the form of sonds , generated sounds may healthy or fault.

Now the comparator compare the sound from motor with the healthy sound,and produce output .

3.3 PROCESSOR

Processor checks the output of comparator , if the output of comparator is " 0" . Then the the processor gives output as there is no fault in motor. But if the processor gives output in some integer value , then processor gives output there is fault in motor.

3.4 DISPLAY

Display is just for the display the output , Means motor faulty or not **.** And which fault is present in the motor.

4. HARDWARE AND SOFTWARE REQUIRMENT

4.1 HARDWAR

ATMEGA 16
MOTOR
MIC
LCD
LED

4.2 SOFTWARE

PROTEUS
EAGLE
MPLAB

4.3 ADVANTAGES

Indicate particular fault which occures in the DC motors through buzzer.
This project will help to reduce manpower.

4.4 APPLICATION

This project helpful in the industry.

This project is use in continuous tracking of induction motor.

5. REFERENCES

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