**A PROJECT REPORT ON**

**SHROUDED MICRO WIND TURBINE**

SUBMITTED TO SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE

IN THE PARTIAL FULFILLMENT FOR THE AWARD OF THE DEGREE

OF

**BACHELOR OF ENGINEERING**

**IN**

**ELECTRICAL**

**BY**

**mr. DIGVIJAY DESAI B120422511**

**mr. sANKET KHATAL B120422530**

**mr. SHARAD SURYAWANSHI B120422556**

**mr. ravindra shete B120422557**

**Under The Guidance of**

**Prof. A.V. TAMHANE**



**DEPARTMENT OF ELECTRICAL ENGINEERING**

**Sinhgad Institute of Technology, Lonavala**

**Gat No. 309/310, Kusgaon(Bk.),Off Mumbai-Pune Expressway,**

**Lonavala, Tal. Maval, Dist. Pune - 410 401**

**2017 - 2018**

CERTIFICATE

This is to certify that the Project Entitled

**SHROUDED MICRO WIND TURBINE**

Submitted by

mr. DIGVIJAY DESAI B120422511

mr. SANKET KHATAL B120422530

mr. SHARAD SURAWANSHI B120422556

mr. RAVINDRA SHETE B120422557

is a bonafide work carried out by students under the supervision of PROF. A.V. TAMHANE and it is submitted towards the partial fulfillment of the requirement of Bachelor of Engineering (ELECTRICAL ENGINEERING) Project.

This project report has not been earlier submitted to any other Institute or University for the award of any degree or diploma.

PROF. A.V. TAMHANE PROF. A.A. KALAGE

Project Guide Head of Department

PROF. Dr. M.S.GAIKWAD

External Examiner Principal

Date: SIT LONAVALA

**ABSTRACT**

A traditional wind turbine extracts only 50% of the available wind energy in the given area it occupies. Conventional wind turbine technology has been a bit out of reach for most residential consumers living in urban areas until now.

A micro-wind turbine technology is small enough for private use in both rural and urban environments. Unlike large-scale wind turbines, the micro-wind turbines are light, compact (25 cm rotor diameter), and can generate power with wind speeds as low as 2 meters/second.

This is the thinking behind Flo-Design's idea of wind turbine which is approximately 3-4 times more efficient that the current standard. Though Flo-Design remains rather secretive about the technology we understand that the potentially ground breaking technology is based on a shrouded propulsion system

Moreover, Flo-Design based micro wind turbines are much smaller than traditional turbines, allowing for easier , cheaper manufacturing and transport. The turbines compact size allow for them to be placed much closer together, enabling the deployment of the Flo-Design turbines in a wider range of locations, including urban areas.

These flo-Design based micro wind turbines also known as shrouded wind turbines can be cascaded into modules of 6 turbines, 8 turbines, 14 turbines or any number of turbines as required in the actual demand situation. Structure-wise, each turbine is framed within a honey-comb shape ejected aluminium alloy. The base plate of individual wind turbine was designed as a hinge to join the supporting beam of the frame. The whole structure has been tested to sustain on real time air blow. Electric-wise, a slip ring device was inserted inside the base plate in order that the generated electricity can pass through the hinge joint to the stored battery sets. These shrouded wind turbines and its supporting frame can be easily dismantled or assembled.

Keywords: shrouded wind turbine, Flo-Design, power generation from small unit wind turbine (light weight).



**ACKNOWLEDGMENTS**

I have a great pleasure in presenting this report on “**SHROUDED MICRO WIND TURBINE**” and to express my deep regards towards those who have offered their valuable time and guidance in our hour of need.

I would like to express our sincere and whole hearted thanks to my project guide PROF. A.V. TAMHANE, head of department PROF. A.A. KALAGE and my project coordinator PROF. N.M. RAO for contributing valuable time, knowledge, experience and providing valuable guidance in making this project a success.

I am also glad to express my gratitude and thanks to our Principal Dr. M.S.GAIKWAD for their constant inspiration and encouragement.

Finally, before ending I would like to express once again my gratitude and thanks to all my friends who are involved directly and indirectly in making my project success.

**LIST OF FIGURES**

Figure 1:Shrouded wind turbine

Figure 2: Block diagram of system

Figure 3: Micro wind turbine

Figure 4: Bearing

Figure 5:Gears

Figure 6: Dynamo

Figure 7: Battery

Figure 8: Derlin material sheet

Figure 9: Designing figure 1

Figure 10: Designing figure 2

Figure 11: Designing figure 3

Figure 12: Designing figure 4

Figure 13: Designing figure 5

Figure 14: Charging Circuit for shrouded micro wind turbine

Figure 15: Diode

Figure 16: Capacitor

Figure 17 :LM317T

Figure 18: Zener Diode

Figure 19: Potentiometer

Figure 20: Future Scenario

**INDEX**

1. Chapter1:Introduction………………………….……………………….1
2. Chapter 2: Literature Review……………………………………………2
3. Chapter 3: Model of Shrouded Micro Wind Turbine …………………..3
4. Chapter 4: Components used……………………………………………….4

**4.1**Micro wind turbine……………………………………...…..5

**4.2**Bearing…………………………………………..……….6

**4.3**Gears………………………………………..……………7

**4.4**Dynamo……………………………………...………………8

**4.5**Battery……………………………………...………………..9

1. Chapter 5: Material used for turbines…………………………………...10
2. Chapter 6: Calculations………………………………………………....11
3. Chapter 7: Designing …………………………………………………..12
4. Chapter 8: Charging Circuit……………………………………………13

**8.1**Diode……………………………………………………..…17

**8.2**Capacitor………………………………………………..…..18

**8.3**LM317T………………………………...……………..……19

**8.4**Zener Diode…………………………………..…………...20

**8.5**Potentiometer……………………………………………...21

**8.6**Charging Circuit Specifications ……………………....23

1. Advantages and Disadvantages………………………………………25
2. Chapter 9: Future Scenario…………………………………………....26
3. Chapter 1: References ……………………………………………..…27