

**UNIVERSITI TEKNOLOGI MARA**

**AUTOMATED AIR VENTILATION**

**MUHAMMAD DANISH HAKIM BIN ZAHARUN**

Dissertation submitted in partial fulfillment  
of the requirements for the degree of  
**Diploma**  
**(Mechanical Engineering)**

**College of Engineering**

**Jul 2023**

## **ABSTRACT**

The weather at this time is getting hotter by the day. Poor quality air flow will cause various diseases that harm our health. Therefore, automated air ventilation was created to improve air flow in closed places so that good air flow can enter and can remove poor quality air from automated air ventilation. The objective emphasized in the project is that I can design automated air ventilation by using suitable materials such as motors, sensors, aluminum profiles and so on. In addition, I will also analyze the quantity and critical parts that are in the automated air ventilation. Aluminum profile is cut into pieces arranged according to the size that fits the closed room. The motor and sensor are also installed on automated air ventilation to make it easier for users. I expect that the automated air ventilation can work well and provide benefits to users.

## **ACKNOWLEDGEMENT**

First of all, I would like to thank God for giving me health and the ability to gain knowledge in the field of mechanical engineering diploma and completing this long and journey successfully. In addition, I am also very grateful to the supervisor, Ts. Dr. Hasannuddin bin Abd Kadir who always gave me many ideas and helped me in the most important subject in the field of mechanical engineering which is the final year project. I am also very grateful to my friends who gave me support to rekindle my passion in learning mechanical engineering.

Finally, this dissertation is dedicated to my father and mother which is Zaharun Bin Awang and Norhaliza Binti Talib for their vision and earnestness in educating me to make me more outstanding. All the sacrifices made by my parents will be rewarded when I am successful one day. In Sha Allah.

# TABLE OF CONTENTS

	<b>Page</b>
<b>CONFIRMATION BY SUPERVISOR</b>	<b>3</b>
<b>AUTHOR'S DECLARATION</b>	<b>4</b>
<b>ABSTRACT</b>	<b>5</b>
<b>ACKNOWLEDGEMENT</b>	<b>6</b>
<b>TABLE OF CONTENTS</b>	<b>7</b>
<b>LIST OF TABLES</b>	<b>9</b>
<b>LIST OF FIGURES</b>	<b>10</b>
<b>LIST OF ABBREVIATIONS</b>	<b>11</b>
<b>CHAPTER ONE : INTRODUCTION</b>	<b>12</b>
1.1 Background of Study	12
1.2 Problem Statement	13
1.3 Objectives	13
1.4 Scope of Study	14
1.5 Significance of Study	14
<b>CHAPTER TWO : LITERATURE REVIEW</b>	<b>15</b>
2.1 Benchmarking/Comparison with Available Products	15
2.2 Review of Related Manufacturing Process	17
2.3 Patent and Intellectual Properties	18
2.4 Summary of Literature	20
<b>CHAPTER THREE : METHODOLOGY</b>	<b>22</b>
3.1 Overall Process Flow	22
3.2 Detail Drawing	24
3.3 Engineering Calculation and Analysis	27
3.4 Bill of Materials and Costing	28
3.5 Fabrication Process	29

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of Study

Ventilation is the process by which shallow air is replaced with fresh air and controls excess moisture. Indoor air quality plays an important role in maintaining a healthy and productive environment.

Poor ventilation can lead to the accumulation of pollutants, including, allergens, pathogens and other harmful particles. Inadequate air circulation can also lead to increased humidity, mold growth and unpleasant odors.[1] These factors can have a negative impact on human health, productivity and overall quality of life.[2] Therefore, an efficient air ventilation system is essential to create a safe and comfortable indoor environment. Stating the structure is a legal requirement under the Building Regulations and requires it to provide the correct ventilation rate position to the structure.

In addition, if the weather in the place is hot, the heat in the room will be trapped which causes the temperature in the room to rise.[3] So it will cause a person fatigue, poor concentration and dizziness due to the hot surrounding temperature entering the body. Some people who can afford it can overcome the problem by installing devices such as air conditioners and ceiling fans so that the room temperature can be reduced.[4] But for people who cannot afford to buy air conditioners and ceiling fans, it will be difficult to reduce the heat in the room.

In order to solve the problem and not require too high costs, the creation of Automated Air Ventilation can further improve the ventilation system (air flow and heat) in the room. This Automatic Air Ventilator is made of aluminum. So the use of Automatic Air Ventilators can last longer because in terms of mechanical aspects, this tool is in the form of a set of square-shaped pieces that are able to rotate so that heat can be released through the Automatic Air Ventilators. The motor is also used as a tool to open or close the Automatic Air Ventilator door.