UNIVERSITI TEKNOLOGI MARA

360-DEGREE FIRE PROTECTION SYSTEM

NUR AQILAH AMIRAH BINTI AIDIL

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

College of Engineering

Feb 2024

ABSTRACT

Nowadays there are many fire protection systems that work to prevent fires from spreading such as smoke fire detectors and sprinklers. However, the amount of water in the sprinklers was not able to control the fire from spreading everywhere and also not able to cover the entire building involved in the fire. Thus, the objective is to improve the existing fire protection to a 360-degree fire protection system. The system is designed to provide complete coverage, which means it can detect and extinguish fires from any direction quickly and effectively. This is accomplished by strategically placing sensors and other fire suppression equipment in high-risk areas. By applying the above method, we can prevent the occurrence of a larger fire.

.

ACKNOWLEDGEMENT

First and foremost, thanks to all Almighty Allah, for giving me the strength, knowledge, ability, and opportunity to embark on my diploma and survive this challenging journey until Semester 5.

Besides, I would like to express my deepest gratitude to my respected supervisor, Sir Mohd Ghazali bin Mohd Hamami for guiding me by giving me valuable ideas and new knowledge about the project and because of his professional attitude, it helps me to complete this dissertation and project throughout the years.

I am also indebted to my classmates, CEEM1105D for their useful suggestions about my project, moral support, and companionship to my late-night work. Besides, I am thankful for all lectures, and the assistant engineers that guide me to use the machine because of their supervision, any accidents can be avoided in the workshop. Lastly, I would be remiss in not mentioning my family, especially my parents. Their never-ending support and love keep me always motivation high to continue my project and also their generous support by financing my research to complete my project.

TABLE OF CONTENTS

		Page
CONFIRMATION BY SUPERVISOR		**ii**
AUTHOR'S DECLARATION		**iii**
ABSTRACT		**iv**
ACKNOWLEDGEMENT		**v**
TABLE OF CONTENTS		**vii**
LIST OF TABLES		**viii**
LIST OF FIGURES		**ix**
LIST OF ABBREVIATIONS		**x**
CHAPTER ONE: INTRODUCTION		
1.1	Background of Study	1
1.2	Problem Statement	2
1.3	Objectives	2
1.4	Scope of Study	2
1.5	Significance of Study	3
CHAPTER TWO: LITERATURE REVIEW		
2.1	Benchmarking/Comparison with Available Products	4
2.2	Review of Related Manufacturing Process	5
2.3	Patent and Intellectual Properties	6
2.4	Summary of Literature	9
CHAPTER THREE: METHODOLOGY		
3.1	Overall Process Flow	10
3.2	Detail Drawing	12
3.3	Engineering Calculation and Analysis	15
3.4	Bill of Materials and Costing	20
3.5	Fabrication Process	21

CHAPTER ONE
INTRODUCTION

1.1 Background of Study

Nowadays, there are many buildings that install fire protection systems for safety purposes. Fire protection systems consist of equipment, devices, and protocols designed to prevent, detect, and suppress fires while reducing their impact on people and property. It includes fire alarms, sprinkler systems, fire extinguishers, smoke detectors, fire doors, and emergency evacuation plans. The primary objective of a fire protection system is to protect life and property by reducing the risk of fire, providing early warning, and facilitating rapid response and fire containment.

In Malaysia, fires involving buildings are increasing every day. Among the causes of fires that often occur are electrical sources and large-scale buildings [1]. Usually, large-scale buildings do not have a fire protection system that can prevent the fire from spreading. Most buildings in Malaysia install smoke detectors and sprinklers to detect fires. But this becomes a problem when there is a big fire, which causes the building to be damaged and causes huge losses.

Therefore, there is a need to design and develop a 360-degree fire protection system for every building. This protection system is a type of security or surveillance system that provides complete coverage and protection in all directions.