



FINAL YEAR PROJECT REPORT

INTELLIGENT CONTROLLER FOR HOUSEHOLD/OFFICE DUAL FUEL GENERATOR

**In fulfillment of the requirement
For degree of
BEE (Electronics)**

By

M.AYAZ AKBAR	22856	BEE (ELECTRONICS)
M.MUNIR KHAN	22864	BEE (ELECTRONICS)
S.GHUFRAN HUSSAN	22906	BEE (ELECTRONICS)

SUPERVISED

BY

ENGR.M. UMAIR ARIF

**BAHRIA UNIVERSITY (KARACHI CAMPUS)
2014**

Acknowledgement

First of all we are thankful to Almighty Allah , the most magnificant and the most merciful ,for the completion of our project.

We are thankful to our parents who co-operated with us during our struggle for completion of our project and for their support without which we could not achieve success in completion of the project.

We are thankful to our university's Director Captain Mohsin Hayat Malik for providing us laboratories equipped with up-to-date equipments.

We are also thankful to lab engineers who guide us when we got stuck in complex concepts and also to our teachers who taught us those subjects which were really needed to polish the concepts if they were not have been provided to us in appropriate time then we can't be able to implement those concepts with appropriate method.

We are also thankful to our project supervisor Engr.Mohammed Umair Arif for his co-ordination with us in managing the project and providing us with proper schedule . We are also thankful to Engr.Burhan Ahmed for his co-operation with us in final year project presentation related tasks. We are thankful to Sir Adnan Iqbal who guided us regarding appropriate assembly of components.

Project Abstract

The project basically focuses on providing comfort to the customers who use dual fuel generators. The project consists of modules that will provide user the option to operate the generator in automatic mode or manual mode. The user can operate the generator in petrol or gas depending upon the need using the module. The main building blocks in this project are power switching board and the controller module.

The idea behind this project is to provide people with a panel with dual options so that it can save people time and no manual intervention will be required if desired to operate on auto mode. In short to provide people a new feature i.e. automated generator.

This report includes introduction, background information, literature review, components used, working, aim & statement of the project, analysis and design methodology, testing, results, conclusion, discussion , future work and research paper.

Contents

1. INTRODUCTION	1
1.1. PROBLEM ARISED:	1
1.2. PROPOSED SOLUTION:.....	1
1.3. GOAL:.....	2
1.4. BLOCK DIAGRAM OF WHOLE SYSTEM:	2
1.4.1 BLOCK DIAGRAM OF POWER SWITCHING BOARD:.....	3
1.4.2. BLOCK DIAGRAM OF CONTROLLER MODULE:.....	4
1.5. FUNCTIONAL DESCRIPTION:	4
1.6. COMPONENTS:	5
1.6.1. PANEL LIGHT:.....	5
1.6.2. RELAYS:.....	5
1.6.3. 220V 4A RELAYS:.....	6
1.6.4. 220 V OPERATED RELAY:.....	6
1.6.5. 1N4002 DIODE:	7
1.6.6. MICRO CONTROLLER:.....	8
1.6.7. VOLTAGE REGULATORS:	8
1.6.8. BATTERY	9
1.7. INTELLIGENCE:.....	10
1.8. APPLICATIONS:.....	11
1.9. SCOPE OF THE PROJECT:.....	11
1.10 ADVANTAGES:	11
2. BACKGROUND AND LITERATURE REVIEW:.....	12
2.1. ATS / AMF PANELS:	12
2.1.1. FEATURES:	12

2.1.2. TYPES OF SWITCHES:	12
2.1.3. WORKING:	13
2.1.4. DISADVANTAGE:	14
2.2. RELAYS VS CONTACTORS:	14
2.3. SOLENOID VALVES:	16
2.3.1. TYPES OF SOLENOID VALVES:	16
2.3.2. APPLICATIONS:	17
3. AIM & STATEMENT.....	18
3.1. AIM:.....	18
3.2. STATEMENT OF PROBLEM:.....	19
4. ANALYSIS AND DESIGN.....	20
4.1. STATUS BOARD:	20
4.2. DEVICE OPERATION DISPLAY:.....	21
4.3. MICRO CONTROLLER UNIT:	22
4.4. PETROL AND GAS VALVE:	23
4.5. IGNITION AND TURN ON:.....	24
4.6. LOAD:.....	25
4.7. MAINS AND GENERATOR INTERFACING:	26
4.8. POWER SUPPLY:.....	27
4.9. VOLTAGE REGULATORS:	28
4.10. OPERATOR:	29
4.11. CONNECTORS:.....	29
4.12. NEUTRAL SECTION:	29
4.13. MOTOR DRIVER CIRCUIT:	30
5. IMPLEMENTATION.....	31
5.1. FLOW CHART OF CODING FOR GAS SELECTION:	31
5.2. SOFTWARES:	34

5.3. IMPORTANT ASPECTS OF CODING:	35
6. TESTING	37
6.1. TESTING OF STATUS BOARD:	37
6.2. TESTING OF DEVICE OPERATION DISPLAY:	37
6.3. TESTING OF MICRO CONTROLLER UNIT:	37
6.4. TESTING OF MAINS AND GENERATOR INTERFACE TO MICRO CONTROLLER:	37
6.5. TESTING OF PETROL/GAS MODULE:	37
6.6. TESTING OF TURN ON & IGNITION:	37
6.7. TESTING OF LOAD:	38
6.8. TESTING OF VOLTAGE REGULATORS:	38
6.9. TESTING OF RELAYS OF 220V:	38
6.10. TESTING OF POWER SWITCHING BOARD:	38
6.11. TESTING OF BATTERY:	38
7. RESULTS & DISCUSSION:	39
8. CONCLUSION AND FUTURE WORK.....	41
APPENDIX A.....	42
CODING	42
APPENDIX B	47
ATMEGA 32 MICRO CONTROLLER.....	47
12V 4A RELAY.....	54
GAS VAVLE.....	65
DC MOTOR.....	67
REFERENCES.....	67
LIST OF REFERENCES.....	67
LIST OF BOOKS.....	67