

# WATER-LEVEL CONTROLLER-CUM-MOTOR PROTECTOR



■ GURSHARANJEET SINGH KALRA

**M**any a time we forget to switch off the motor pushing water into the overhead tank (OHT) in our households. As a result, water keeps overflowing until we notice the overflow and switch the pump off. As the OHT is usually kept on the topmost floor, it is cumbersome to go up frequently to check the water level in the OHT.

Here's a microcontroller-based water-level controller-cum-motor protector to solve this problem. It controls 'on' and 'off' conditions of the motor depending upon the level of water in the tank. The status is displayed on an LCD module. The circuit also protects the motor from high voltages, low voltages, fluctuations of mains power and dry running.

## Circuit description

Fig. 1 shows the circuit of the microcontroller-based water-level controller-cum-motor protector. It comprises operational amplifier LM324, microcontroller AT89C51, optocoupler PC817, regulator 7805, LCD module and a few discrete components.

The AT89C51 (IC2) is an 8-bit microcontroller with four ports (32 I/O lines), two 16-bit timers/counters, on-chip oscillator and clock circuitry. Eight pins of port-1 and three pins of port-3 are interfaced with data and control lines of the LCD module. Pins P3.0, P3.1 and P3.6 are connected to RS (pin 4), R/W (pin 5) and E (pin 6) of the LCD, respectively. Pin EA (pin 31) is strapped to Vcc for internal program executions. Switch S2 is used for backlight of the LCD module.

Power-on-reset is achieved by connecting capacitor C8 and resistor R14

to pin 9 of the microcontroller. Switch S1 is used for manual reset.

The microcontroller is operated with a 12MHz crystal. Port pins P2.0 through P2.2 are used to sense the water level, while pins P2.3 and P2.4 are used to sense the under-voltage and over-voltage, respectively. Pin P3.4 is used to control relay RL1 with the help of optocoupler IC3 and transistor T5 in the case of under-voltage, over-voltage and different water-level conditions. Relay RL1 operates off a 12V supply. Using switch S3, you can manually switch on the motor.

The LM324 (IC1) is a quad operational amplifier (op-amp). Two of its op-amps are used as comparators to detect under- and over-voltage. In normal condition, output pin 7 of IC1 is low, making pin P2.3 of IC2 high. When the voltage at pin 6 of N1 goes below the set reference voltage at pin 5 (say, 170 volts), output pin 7 of N1 goes high. This high output makes pin P2.3 of IC2 low, which is sensed by the microcontroller and the LCD module shows 'low voltage.'

In normal condition, pin 1 of N2 is high. When the voltage at pin 2 of N2 goes above the set voltage at pin 3, output pin 1 of N2 goes low. This low signal is sensed by the microcontroller and the LCD module shows 'high voltage.'

Presets VR1 and VR2 are used for calibrating the circuit for under- and over-voltage, respectively.

The AC mains is stepped down by transformer X1 to deliver a secondary output of 12V at 500 mA. The transformer output is rectified by a full-wave bridge rectifier comprising diodes D5 through D8, filtered by capacitor C2, and used for the under- and over-voltage detection circuitry.

## PARTS LIST

Semiconductors:	
IC1	- LM324 quad op-amp
IC2	- AT89C51 microcontroller
IC3	- PC817 optocoupler
IC4	- 7805, 5V regulator
T1-T4	- BC548 npn transistor
T5	- SL100 npn transistor
D1-D14	- 1N4007 rectifier diode
Resistors (all 1/4-watt, 5% carbon):	
R1, R2, R7	-
R11, R12	- 1-kilo-ohm
R3, R9	- 500-kilo-ohm
R4, R5, R8	- 2.7-kilo-ohm
R6	- 330-ohm
R10	- 470-ohm
R13	- 100-ohm
R14	- 10-kilo-ohm
R15-R17	- 500-kilo-ohm
R18-R20	- 2.2-kilo-ohm
R21, R22	- 33-ohm
RN1	- 10-kilo-ohm resistor network
VR1, VR2	- 470-ohm preset
VR3	- 10-kilo-ohm preset
Capacitors:	
C1-C3	- 1000µF, 35V electrolytic
C4	- 220µF, 16V electrolytic
C5, C6	- 33pF ceramic disk
C7	- 100µF, 35V electrolytic
C8	- 10µF, 16V electrolytic
Miscellaneous:	
X1	- 230 AC primary to 12V, 500mA secondary transformer
RL1	- 12V, 1C/O relay
X <sub>osc</sub>	- 12MHz crystal
S1	- Push-to-on switch
S2, S3	- On/off switch
	- LCD module (1×16)

The transformer output is also rectified by a full-wave bridge rectifier comprising diodes D1 through D4, filtered by capacitor C1 and regulated by IC4 to deliver regulated 5V for the circuit.

When water in the tank rises to come in contact with the sensor, the base of transistor BC548 goes high. This high signal drives transistor BC548 into saturation and its collector goes low. The low signal is sensed by

# Water Level Controller Cum Motor Protector

**Swapan Basu,Ajay Kumar Debnath**



## **Water Level Controller Cum Motor Protector:**

**Electronics Projects Vol. 20** ,2009-11      **Electronics Projects Vol. 22 (With CD)** ,2009-11      **Electronics Projects Vol. 15** EFY Enterprises Pvt Ltd,2009-11      **Electronics Projects Vol. 21** ,2009-11      *Public Works Manual* ,1985      *The Electrical Review* ,1927      *Domestic Engineering Plumbing-heating Catalog and Directory* ,1940      **Power Plant Instrumentation and Control Handbook** Swapna Basu,Ajay Kumar Debnath,2019-06-09

Power Plant Instrumentation and Control Handbook Second Edition provides a contemporary resource on the practical monitoring of power plant operation with a focus on efficiency reliability accuracy cost and safety It includes comprehensive listings of operating values and ranges of parameters for temperature pressure flow and levels of both conventional thermal power plant and combined cogen plants supercritical plants and once through boilers It is updated to include tables charts and figures from advanced plants in operation or pilot stage Practicing engineers freshers advanced students and researchers will benefit from discussions on advanced instrumentation with specific reference to thermal power generation and operations New topics in this updated edition include plant safety lifecycles and safety integrity levels advanced ultra supercritical plants with advanced firing systems and associated auxiliaries integrated gasification combined cycle IGCC and integrated gasification fuel cells IGFC advanced control systems and safety lifecycle and safety integrated systems Covers systems in use in a wide range of power plants conventional thermal power plants combined cogen plants supercritical plants and once through boilers Presents practical design aspects and current trends in instrumentation Discusses why and how to change control strategies when systems are updated changed Provides instrumentation selection techniques based on operating parameters Spec sheets are included for each type of instrument Consistent with current professional practice in North America Europe and India All new coverage of Plant safety lifecycles and Safety Integrity Levels Discusses control and instrumentation systems deployed for the next generation of A USC and IGCC plants

**Selected Water Resources Abstracts** ,1987      *Irrigation and Power* ,1986      **Telegraphic Journal and Electrical Review** ,1927      **Air Pollution Abstracts** ,1976      **EPA Publications Bibliography** United States. Environmental Protection Agency,1987      *Monthly Catalog of United States Government Publications* United States. Superintendent of Documents,1978 February issue includes Appendix entitled Directory of United States Government periodicals and subscription publications September issue includes List of depository libraries June and December issues include semiannual index      *Congressional Record* United States. Congress,1998 The Congressional Record is the official record of the proceedings and debates of the United States Congress It is published daily when Congress is in session The Congressional Record began publication in 1873 Debates for sessions prior to 1873 are recorded in The Debates and Proceedings in the Congress of the United States 1789 1824 the Register of Debates in Congress 1824 1837 and the Congressional Globe 1833 1873      **N.A.P.C.A. Abstract Bulletin** United States. Environmental Protection Agency,1971      **English Mechanic and Mirror of Science** ,1883      *Municipal Journal* ,1926

**Air Pollution Abstracts** United States. Environmental Protection Agency,1976      Government Economy and Spending Reform Act of 1976 United States. Congress. Senate. Committee on Government Operations. Subcommittee on Intergovernmental Relations,1976

The book delves into Water Level Controller Cum Motor Protector. Water Level Controller Cum Motor Protector is a crucial topic that needs to be grasped by everyone, from students and scholars to the general public. The book will furnish comprehensive and in-depth insights into Water Level Controller Cum Motor Protector, encompassing both the fundamentals and more intricate discussions.

1. The book is structured into several chapters, namely:
    - Chapter 1: Introduction to Water Level Controller Cum Motor Protector
    - Chapter 2: Essential Elements of Water Level Controller Cum Motor Protector
    - Chapter 3: Water Level Controller Cum Motor Protector in Everyday Life
    - Chapter 4: Water Level Controller Cum Motor Protector in Specific Contexts
    - Chapter 5: Conclusion
  2. In chapter 1, the author will provide an overview of Water Level Controller Cum Motor Protector. The first chapter will explore what Water Level Controller Cum Motor Protector is, why Water Level Controller Cum Motor Protector is vital, and how to effectively learn about Water Level Controller Cum Motor Protector.
  3. In chapter 2, the author will delve into the foundational concepts of Water Level Controller Cum Motor Protector. This chapter will elucidate the essential principles that must be understood to grasp Water Level Controller Cum Motor Protector in its entirety.
  4. In chapter 3, this book will examine the practical applications of Water Level Controller Cum Motor Protector in daily life. This chapter will showcase real-world examples of how Water Level Controller Cum Motor Protector can be effectively utilized in everyday scenarios.
  5. In chapter 4, the author will scrutinize the relevance of Water Level Controller Cum Motor Protector in specific contexts. This chapter will explore how Water Level Controller Cum Motor Protector is applied in specialized fields, such as education, business, and technology.
  6. In chapter 5, the author will draw a conclusion about Water Level Controller Cum Motor Protector. This chapter will summarize the key points that have been discussed throughout the book.
- The book is crafted in an easy-to-understand language and is complemented by engaging illustrations. This book is highly recommended for anyone seeking to gain a comprehensive understanding of Water Level Controller Cum Motor Protector.

<http://www.frostbox.com/book/scholarship/HomePages/The%20Safe%20Boating%20Guide.pdf>

## **Table of Contents Water Level Controller Cum Motor Protector**

1. Understanding the eBook Water Level Controller Cum Motor Protector
  - The Rise of Digital Reading Water Level Controller Cum Motor Protector
  - Advantages of eBooks Over Traditional Books
2. Identifying Water Level Controller Cum Motor Protector
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Water Level Controller Cum Motor Protector
  - User-Friendly Interface
4. Exploring eBook Recommendations from Water Level Controller Cum Motor Protector
  - Personalized Recommendations
  - Water Level Controller Cum Motor Protector User Reviews and Ratings
  - Water Level Controller Cum Motor Protector and Bestseller Lists
5. Accessing Water Level Controller Cum Motor Protector Free and Paid eBooks
  - Water Level Controller Cum Motor Protector Public Domain eBooks
  - Water Level Controller Cum Motor Protector eBook Subscription Services
  - Water Level Controller Cum Motor Protector Budget-Friendly Options
6. Navigating Water Level Controller Cum Motor Protector eBook Formats
  - ePub, PDF, MOBI, and More
  - Water Level Controller Cum Motor Protector Compatibility with Devices
  - Water Level Controller Cum Motor Protector Enhanced eBook Features
7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Water Level Controller Cum Motor Protector
  - Highlighting and Note-Taking Water Level Controller Cum Motor Protector
  - Interactive Elements Water Level Controller Cum Motor Protector

8. Staying Engaged with Water Level Controller Cum Motor Protector
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Water Level Controller Cum Motor Protector
9. Balancing eBooks and Physical Books Water Level Controller Cum Motor Protector
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Water Level Controller Cum Motor Protector
10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
11. Cultivating a Reading Routine Water Level Controller Cum Motor Protector
  - Setting Reading Goals Water Level Controller Cum Motor Protector
  - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Water Level Controller Cum Motor Protector
  - Fact-Checking eBook Content of Water Level Controller Cum Motor Protector
  - Distinguishing Credible Sources
13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

### Water Level Controller Cum Motor Protector Introduction

In this digital age, the convenience of accessing information at our fingertips has become a necessity. Whether its research papers, eBooks, or user manuals, PDF files have become the preferred format for sharing and reading documents. However, the cost associated with purchasing PDF files can sometimes be a barrier for many individuals and organizations. Thankfully, there are numerous websites and platforms that allow users to download free PDF files legally. In this article, we will explore some of the best platforms to download free PDFs. One of the most popular platforms to download free PDF files is Project

Gutenberg. This online library offers over 60,000 free eBooks that are in the public domain. From classic literature to historical documents, Project Gutenberg provides a wide range of PDF files that can be downloaded and enjoyed on various devices. The website is user-friendly and allows users to search for specific titles or browse through different categories. Another reliable platform for downloading Water Level Controller Cum Motor Protector free PDF files is Open Library. With its vast collection of over 1 million eBooks, Open Library has something for every reader. The website offers a seamless experience by providing options to borrow or download PDF files. Users simply need to create a free account to access this treasure trove of knowledge. Open Library also allows users to contribute by uploading and sharing their own PDF files, making it a collaborative platform for book enthusiasts. For those interested in academic resources, there are websites dedicated to providing free PDFs of research papers and scientific articles. One such website is Academia.edu, which allows researchers and scholars to share their work with a global audience. Users can download PDF files of research papers, theses, and dissertations covering a wide range of subjects. Academia.edu also provides a platform for discussions and networking within the academic community. When it comes to downloading Water Level Controller Cum Motor Protector free PDF files of magazines, brochures, and catalogs, Issuu is a popular choice. This digital publishing platform hosts a vast collection of publications from around the world. Users can search for specific titles or explore various categories and genres. Issuu offers a seamless reading experience with its user-friendly interface and allows users to download PDF files for offline reading. Apart from dedicated platforms, search engines also play a crucial role in finding free PDF files. Google, for instance, has an advanced search feature that allows users to filter results by file type. By specifying the file type as "PDF," users can find websites that offer free PDF downloads on a specific topic. While downloading Water Level Controller Cum Motor Protector free PDF files is convenient, it's important to note that copyright laws must be respected. Always ensure that the PDF files you download are legally available for free. Many authors and publishers voluntarily provide free PDF versions of their work, but it's essential to be cautious and verify the authenticity of the source before downloading Water Level Controller Cum Motor Protector. In conclusion, the internet offers numerous platforms and websites that allow users to download free PDF files legally. Whether it's classic literature, research papers, or magazines, there is something for everyone. The platforms mentioned in this article, such as Project Gutenberg, Open Library, Academia.edu, and Issuu, provide access to a vast collection of PDF files. However, users should always be cautious and verify the legality of the source before downloading Water Level Controller Cum Motor Protector any PDF files. With these platforms, the world of PDF downloads is just a click away.

## FAQs About Water Level Controller Cum Motor Protector Books

1. Where can I buy Water Level Controller Cum Motor Protector books? Bookstores: Physical bookstores like Barnes & Noble, Waterstones, and independent local stores. Online Retailers: Amazon, Book Depository, and various online bookstores offer a wide range of books in physical and digital formats.
2. What are the different book formats available? Hardcover: Sturdy and durable, usually more expensive. Paperback: Cheaper, lighter, and more portable than hardcovers. E-books: Digital books available for e-readers like Kindle or software like Apple Books, Kindle, and Google Play Books.
3. How do I choose a Water Level Controller Cum Motor Protector book to read? Genres: Consider the genre you enjoy (fiction, non-fiction, mystery, sci-fi, etc.). Recommendations: Ask friends, join book clubs, or explore online reviews and recommendations. Author: If you like a particular author, you might enjoy more of their work.
4. How do I take care of Water Level Controller Cum Motor Protector books? Storage: Keep them away from direct sunlight and in a dry environment. Handling: Avoid folding pages, use bookmarks, and handle them with clean hands. Cleaning: Gently dust the covers and pages occasionally.
5. Can I borrow books without buying them? Public Libraries: Local libraries offer a wide range of books for borrowing. Book Swaps: Community book exchanges or online platforms where people exchange books.
6. How can I track my reading progress or manage my book collection? Book Tracking Apps: Goodreads, LibraryThing, and Book Catalogue are popular apps for tracking your reading progress and managing book collections. Spreadsheets: You can create your own spreadsheet to track books read, ratings, and other details.
7. What are Water Level Controller Cum Motor Protector audiobooks, and where can I find them? Audiobooks: Audio recordings of books, perfect for listening while commuting or multitasking. Platforms: Audible, LibriVox, and Google Play Books offer a wide selection of audiobooks.
8. How do I support authors or the book industry? Buy Books: Purchase books from authors or independent bookstores. Reviews: Leave reviews on platforms like Goodreads or Amazon. Promotion: Share your favorite books on social media or recommend them to friends.
9. Are there book clubs or reading communities I can join? Local Clubs: Check for local book clubs in libraries or community centers. Online Communities: Platforms like Goodreads have virtual book clubs and discussion groups.
10. Can I read Water Level Controller Cum Motor Protector books for free? Public Domain Books: Many classic books are available for free as they're in the public domain. Free E-books: Some websites offer free e-books legally, like Project Gutenberg or Open Library.

**Find Water Level Controller Cum Motor Protector :**

**the safe boating guide**

*the stones of song the complete series*

~~the small business tax guide~~

**the shepherd of my soul**

the system the system series volume 1

**the similarities between funza lushaka and nsfas**

the sweetest gift the gift book english edition

the sylhet board of suggestion

*the seaside series new adult rocker boxed set english edition*

*the secret of shambhala in search of the eleventh insight*

~~the seven steps to closure english edition~~

the second penguin book of english short stories

the silver star a novel english edition

the silken edge silken edge series book english edition

the song bird siren publishing menage amour

**Water Level Controller Cum Motor Protector :**

Earth Science: The Physical Setting - 1st Edition - Solutions ... Our resource for Earth Science: The Physical Setting includes answers to chapter exercises, as well as detailed information to walk you through the process step ... Earth Science Review Answers | PDF Teachers Guide and Answer Key. Reviewing Earth Science The Physical Setting Third Edition Thomas McGuire. This CD contains answer keys for the Earth Science The Physical Setting Answer Key Fill Earth Science The Physical Setting Answer Key, Edit online. Sign, fax and printable from PC, iPad, tablet or mobile with pdfFiller ☐ Instantly. 6u!ias |B3!sAL|C| am The Answer Key for the Brief Review in Earth Science provides answers to all of the questions in the book, including the sample Regents Examinations ... Earth Science The Physical Setting Answer Key: Books Earth Science: Physical Setting, New York Regents Review Practice Tests with Answers and Explanations (Based on NYS Core Guide) 2009-2010 Edition. Earth Science: the Physical Setting: Answer Key 2005 Focusing on the Earth Science content tested on the Regents Examination, this thorough review guide contains extensive vocabulary, review questions, ... Earth Science: The Physical Setting Answer Key (Prentice ... Earth Science: The Physical Setting Answer Key (Prentice Hall Brief Review for the

New York Regents Exam) by Prentice Hall - ISBN 10: 0133200353 - ISBN 13: ... Regents Exams and Answers: Earth Science--Physical ... Review questions grouped by topic, to help refresh skills learned in class; Thorough explanations for all answers; Score analysis charts to help identify ... Review Book: Earth Science: The Physical Setting (3 Edition) by T McGuire · Cited by 8 — Record your answers in your Review Book. Be prepared for homework quizzes. The dates for the assignments will be given in class. Earth Science: The Physical Setting (prentice Hall Brief ... Access Earth Science: The Physical Setting (Prentice Hall Brief Review For The New York Regents Exam) 1st Edition Chapter 2 solutions now. Timeshare Agent License - NV Real Estate Division What's New? ... Timeshare Agent License ... Education: 14 hour pre-licensing timeshare education. Exam: Original timeshare passing results (Testing). ... BACKGROUND ... Nevada Timeshare Agent Licensing The state of Nevada requires 14 hours of Timeshare pre licensing education. Key Realty School offers an online training program designed to complete and comply ... Timeshare - BASIC Pre-licensing Package Timeshare - BASIC Pre-licensing Package. Enroll now for \$119.00. This 14-hour course is designed for students seeking to obtain their Nevada time share license. Pearson Vue - NV Real Estate Division Pearson VUE. To register for the following licensing exams: Salesperson Broker Property Management Business Broker Community Management Timeshare Test #1 Flashcards In Nevada who may sell a developer's timeshare interest? A. OPC Representative B. Real Estate Salesman/Broker and Timeshare Sales Agent C. Out of state broker Timeshare Test part2 Flashcards What is the Nevada timeshare law called? NRS 119a ; How much is the renewal fee for a timeshare agent license? \$200 ; How many hours of continuing education must ... Timeshare License Exam Flashcards Study with Quizlet and memorize flashcards containing terms like How long is a TSA license valid for?, If a timeshare AGENT initially becomes licensed on ... Timeshare Test #2 | 50 Questions with 100% Correct ... Jun 4, 2023 — The Nevada Revised Statute that deals with the timeshare industry in Nevada is titled: A. ... Exam (elaborations) - Timeshare test 1 study guide ... Nevada Timeshare License Qualifications - Sapling You must pass the Nevada timeshare test administered on a computer by PSI. It is a 90-minute test, and taking it costs \$100. Nevada Real Estate Division May 29, 2023 — Pearson VUE delivers certification exams for Nevada Real Estate ... Timeshare Agent. Real Estate Practice Tests. Pearson VUE offers Broker and ... Biostatistics for the Biological and Health Sciences Biostatistics for the Biological and Health Sciences | Second Edition. Marc M. Triola and Mario F. Triola. 3.9 out of 5 stars 6. Paperback. \$29.41\$29.41. Biostatistics for the Biological and Health Sciences Biostatistics for the Biological and Health Sciences, 2nd edition. Published by Pearson (December 10, 2020) © 2018. Marc M. Triola NYU School of Medicine ... Biostatistics for the Biological and Health Sciences Jul 5, 2023 — Biostatistics for the Biological and Health Sciences brings statistical theories and methods to life with real applications, a broad range of ... Biostatistics for the Biological and Health Sciences Amazon.com: Biostatistics for the Biological and Health Sciences: 9780321194367: Triola, Marc M, Triola, Mario F: Books. Biostatistics Biostatistics for the Biological and Health Sciences -- Rental Edition, 3rd Edition. By Marc M. Triola, Mario F. Triola, Jason Roy. ISBN-10:

0-13-786410-8 ... Biostatistics for the Biological and Health Sciences - Triola, ... Biostatistics for the Biological and Health Sciences by Triola, Marc; Triola, Mario; Roy, Jason - ISBN 10: 0134039017 - ISBN 13: 9780134039015 - Pearson ... Biostatistics for the Biological and Health Sciences Biosta ... Rent Biostatistics for the Biological and Health Sciences 2nd edition (978-0134039015) today, or search our site for other textbooks by Marc M. Triola. Biostatistics for the Biological and Health Sciences ... health professions educational technology development and research. Mario F. Triola is a Professor Emeritus of Mathematics at Dutchess Community College ... Biostatistics for the Biological and Health Sciences by M.D. ... Biostatistics for the Biological and Health Sciences (2nd Edition). by M.D. Triola Marc M., Mario F. Triola, Jason Roy. Hardcover, 720 Pages, Published 2017. Triola - Biostatistics for the Biological and Health Sciences ... This text book is a comprehensive user friendly and easy to read introduction to biostatistics and research methodology meant for undergraduate and postgraduate ...