

USER MANUAL

AC. AUTOMATIC VOLTAGE REGULATOR



THERMOCOOL
ENGINEERING COMPANY

**WDR-500VA/1000VA/1500VA/2000VA/3000VA
5000VA/8000VA/10000V (Metal case)**

Before operating this product, please read these instructions carefully.

AC. Automatic Voltage Regulator

Metal case:

WDR-500VA/1000VA/1500VA/2000VA/3000VA/5000VA/8000VA/10000VA

Important safety instructions

This manual contains important safety instructions that should be followed during the installation and maintenance of the AVR. Please read this manual thoroughly before attempting to install or operate this AVR.

This equipment can be installed and operated by individuals without previous training.

1. This equipment is available for 220-240VAC supply voltage and loads. Please verify that this model matches your AC mains / load voltage requirements.
2. This equipment is designed for commercial use only. The manufacturer neither recommends nor knowingly sells this product for use in critical life support applications.
3. This AVR must be earthed at all times during operation. Connect only to a mains supply socket outlet with an earth connector. A means of disconnection of the mains supply should be within 2 meters of the AVR
4. The AVR relies on your building wiring over-current protection, which must be rated between 5-70 amperes.

5. CAUTION:

Although your AVR has been designed and manufactured to assure personal safety, improper use can result in electrical shock or fire. To insure safety,

please observe the following rules:

- ◆ Turn off and unplug your AVR before cleaning. Do not use liquid or aerosol cleaners. A dry cloth is recommended to remove dust from the surface of your AVR, do not install or operate your AVR near water.
- ◆ Do not place the AVR on an unstable cart, stand or table.
- ◆ Do not place the AVR under direct sunlight or close to heat emitting sources.
- ◆ Do not place the AVR power cord in any area where it may get damaged by heavy objects.
- ◆ Do not overload or short circuit the AVR .
- ◆ Follow all warnings and instructions marked on the AVR.

6. ATTENTION:

Turn off and unplug your AVR from the outlet and contact qualified service personnel if:

- ◆ The power cord or plug damaged.
- ◆ Liquid has been spilled on the AVR or it emits a strange smell from inside.
- ◆ The fuse blows frequently or the circuit breaker trips frequently
- ◆ The AVR does not operate even when user follows the operating instructions.

Introduction

This device is a high-speed wall mountable automatic voltage regulator that having an up-to-date range of functions. It is based on most advanced CPU integrated SMT circuit with relay based tap controlling technology. It is intended for provision of power supply for both household and commercial office devices and systems. In case of mains voltage variation within a range of 100~260Vac, this device supports a level of output voltage of 230Vac \pm 8%. This device has a complete range of protection including overloading, short circuit, over temperature, over current ect. An accurate selectable delay function offer the user 6 seconds or 180 seconds delay time choices. Two digital LED meters shows the input voltage from the mains to the voltage regulation and the output voltage from the AVR connected devices.

This device is supposed to be installed onto the wall, wall mountable racks are integrated in the product housing, Please follow the strictly to the installation instructions to place this unit.

When choosing a voltage AVR it would be necessary to take into account the power of the equipment which is to be connected to the unit(further referred to as the load). We recommend to select a voltage AVR capacity being 20%~30% higher than the estimated power of the load. in case of connection of electrical motors(asynchronous motors, compressors, pumps, etc.) it would be necessary to consider high starting currents, and select capacity of the voltage AVR 2.5~4 times higher than the power of the load.

Performance

Automatic Voltage Regulator

Automatically regulate the input voltage to a more stable level for your appliances to avoid damages to the appliances.

Microprocessor Control

By means of innovative software control programs, the complicated hardware circuitry is inlaid in the powerful microprocessor. Apart from reduced size, it also lowers the defective rate of AVR and the accuracy in the regulations.

Voltage Display

Through a analogue meter or a LED meter, shows the input or output voltage of the device.

Delay Time

Upon the switching on or resuming from the protections, the AVR will wait 6 seconds or 180seconds(selectable) before it give output voltage, this time is called Delay time, the delay function is designed to avoid the transfer to the load of surges and spikes and distortions of sine wave voltage occurring upon the switching on of the device. The default delay time is 6 seconds. We recommend a 180seconds delay time selection where the unit is designated for the protection of a motor based appliance.

Surge Protection

Shields hardware from damage.

Operation Principle

The CPU based intelligent circuit samples the input voltage and controls the action of the relays and opening of the tap of the transformer in a proper combination to adjust the output voltage. The output voltage adjusting is performed based on the following algorithm:

- ◆ If the mains voltage stays within the range of $100\pm 5\text{Vac}$ to $260\text{V}\pm 5\text{Vac}$, then the output voltage being regulated to $230\text{V}\pm 10\%$
- ◆ If the input voltage drops below 100Vac , then the output voltage equals to the mains voltage increases by 30% until it reaches the value of $180\text{V}\pm 5\text{Vac}$.
- ◆ If the mains voltage raises above 260Vac , then the output voltage equals to the mains voltage decreases by 10% until it reaches the value of $255\text{V}\pm 5\text{Vac}$, which is the upper threshold of the AVR. If the output voltage exceed $255\text{V}\pm 5\text{Vac}$, the output will complete cut off.

The loading capability of the AVR vary from the input voltage:

- ◆ If the mains voltage stays within the range of $200\pm 5\text{Vac}$ to $260\text{V}\pm 5\text{Vac}$, then the AVR performs a maximum loading capacity to its rated level
- ◆ If the mains voltage drops below 200Vac or exceed 260Vac , then the loading capacity of the AVR drops accordingly to the input voltage dropping or exceeding percentage.

Installation

Inspection

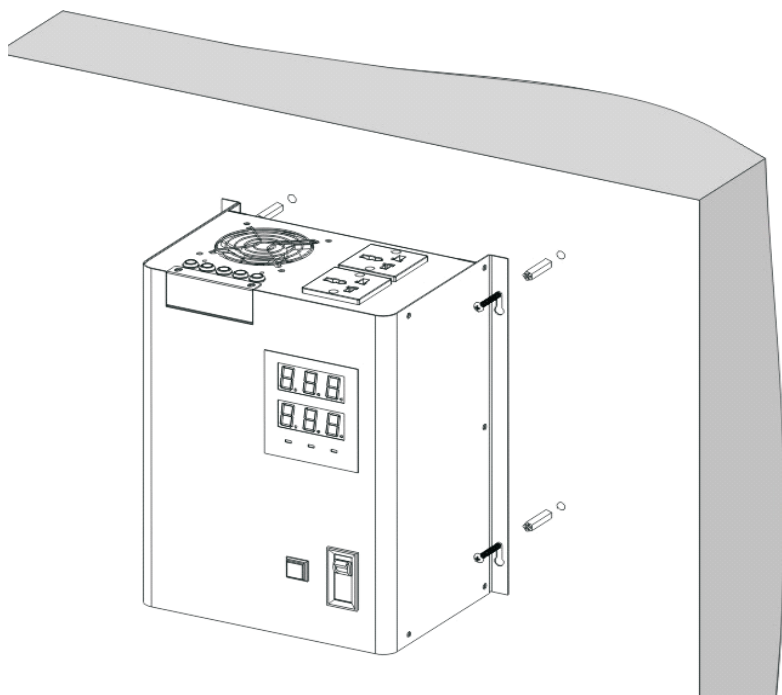
Inspect the AVR upon receipt. The packaging is recyclable. Save it for reuse or dispose of it properly.

Placement

Install the AVR in a protected area with adequate airflow, and away from direct sunlight and excessive dust. Do not operate the AVR where the temperature and humidity is outside the specified limits in the *Specifications Table*.

This device requires the user to strictly follow the steps for installation:

1. Take out the installation hole plan paper and mark the installation holes position on the wall.
2. Use an air drill to drill the designated holes on the wall.
3. Insert the anchor bolts onto the holes.
4. Place the AVR onto the wall, and secure it with the enclosed self thread screws.(see the picture below)



Connect to Utility

Connect the AC input power connector to utility power to power up the AVR. The AVR can be connected to the utility power via the attached power cord and plug. Follow the steps below:

1. Make sure that the AVR do not have any mechanical damages.
2. If necessary perform grounding of the casing of the AVR by connecting grounding wire to the corresponding terminal, or at least make sure that the mains outlet is grounded and available with 3 pins connection.
3. Plug in the AVR to 230Vac mains electricity outlet
4. Select the proper delay time, default selection is 6 seconds.
5. Switch on the AVR and read the voltage meter if it has output.
6. Switch off the AVR

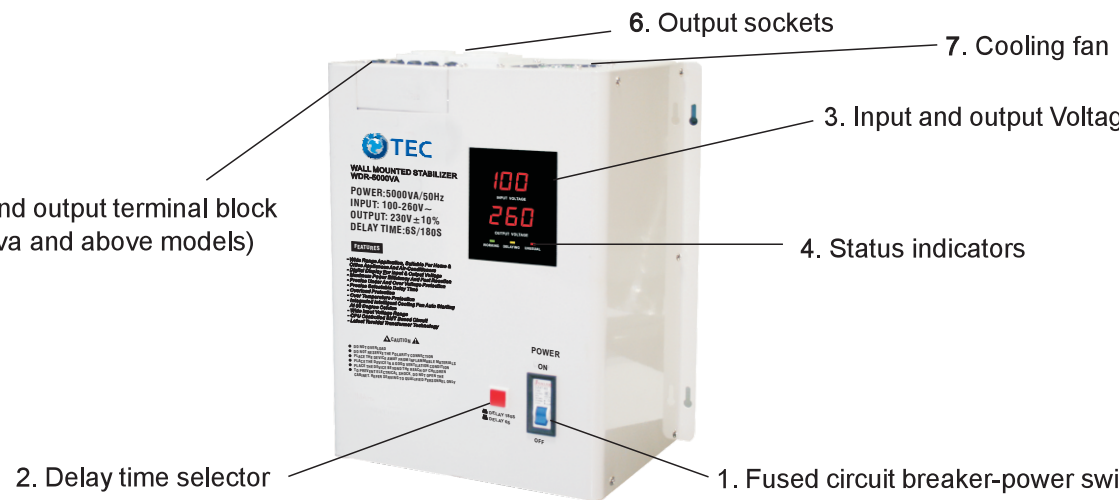
Connect the loads

Plug the loads into the output sockets of the AVR. Switch on the AVR and then

Caution:

a. Total power of the connected load should not exceed the capacity of the AVR.
b. Check the marks on the AVR, identify the bypass sockets, make sure that the load connected to the bypass outlets are unessential appliances which do not necessarily require voltage regulation

Presentation



Indications

Voltage meter

Display the input or output voltage values by LED.

LED

Green LED"Power"

Indicating power ON/OFF:lights up at switching the "ON" button; if the mains voltage is available, it lights continuously.

Yellow LED"Delay"

Blink upon the switching on of the AVR until the delay time finish, or upon the restoration of the mains voltage. During delay, this LED blinks, the AVR has no output voltage, when delay time finish, this LED goes off.

Red LED"Protection"

Indicating the AVR is executing protection: Lights up when the output voltage of the AVR drops beyond the allowable limits and the load is disconnected. After restoration of the output voltage within allowable limits, the load is connected automatically, this LED goes off.

Specification				
Characteristic	Specification			
Model	500VA	1000VA	1500VA	2000VA
Power Capacity	500VA	1000VA	1500VA	2000VA
Input Range	100~260Vac/140-260Vac			
Frequency	50/60Hz			
Output Voltage	230V±10%			
Efficiency	>98%			
Number of phase	1			
Display	LED			
Power LED	Yes			
Protection LED	Yes			
Delay LED	Yes			
Delay Time	6seconds/180seconds selectable			
High voltage cut	250V±5V			
Temperature protection	120±10 degrees celsius			
Operation Temperature	7	0~40degrees celsius		
Relative Humidity		10%~102%		
Atmospheric Pressure		84~107Kpa		
Dimension	280x230x190mm			
Weight	2.8kgs	3.0kgs	3.8kgs	4.4kgs

Specification				
Characteristic	Specification			
Model	3000VA	5000VA	8000VA	10000VA
Power Capacity	3000VA	5000VA	8000VA	10000VA
Input Range	100~260Vac/140-260Vac			
Frequency	50/60Hz			
Output Voltage	230V±10%			
Efficiency	>98%			
Number of phase	1			
Display	LED			
Power LED	Yes			
Protection LED	Yes			
Delay LED	Yes			
Delay Time	6seconds/180seconds selectable			
High voltage cut	250V±5V			
Temperature protection	120±10 degrees celsius			
Operation Temperature	0~40degrees celsius			
Relative Humidity	10%~102%			
Atmospheric Pressure	84~107Kpa			
Dimension	370x285x215mm		425x330x250mm	
Weight	7.7kgs	9.8kgs	15.5kgs	16.4kgs

 **Specifications are subject to change without prior notice**