INSTRUCTION MANUAL
AUTOMATIC VOLTAGE REGULATOR



Thank you for choosing **WELL**. Please read carefully the following instructions and keep them within reach.

Reorder No: AVR-REL-THUNDER500-WL, AVR-REL-THUNDER-1000-WL

1. Important Safety Instructions

This AVR has been designed to provide all the necessary safety conditions needed to protect electronic office equipment including information systems. In case of any questions, refer to your authorized technical service representative.

- In order to avoid any damage to the equipment, it is advised to trans- port it in its own packing.
- In the event of sudden temperature changes such as from cold to the normal working temperature, mist can form inside the AVR. It is absolutely essential that the AVR be dry before switching it on. Due to this reason wait for at least 2 hours before operating it.
- Once it's dry, make sure you observe all the conditions in the environment section of the technical specifications table, before introducing it into the circuit.



Earth cable should be chosen concerning the current capacity. All units' earth connections, which are connected to AVR, should be done with this earth cable.



Without earth connection or unproved earth connected units are dangerous for user health and have high risk of electronic circuit board faults. When installing the AVR to use cable with improper diameter can be dangerous for user's health and safety of the unit.

- Place all the cables in a proper place so that they are not stepped on or get caught into people's feet. Before connecting the AVR to the circuit makes sure you carefully read all the instructions and warnings in the "Installation" section of this manual.
- Don't drop any foreign materials (like clips, nails etc...) into the equipment.
- In emergencies (damage to the cabinet, front panel, or mains connections, splashing of liquid dropping of any foreign materials into the equipment) switch-off the AVR, pull out the plug and inform the authorized service center.
- Do not connect any loads to the AVR, which exceed its power range.
- When input distortion or resistance is too high, AVR may not work properly.
- Keep the packing for maintenance or moving.
- Wiring must be tight, to prevent falling off and oxidation.



The AVR can only be repaired by the authorized technical service personnel. Any attempt to open and to repair by the user on his own could prove to be dangerous.

Intended for installation in a controlled environment.

a) The controlled environment should accord with the requirement of the specification.
b) Do not install or operate your AVR in or near water.
c) Do not place AVR on an unstable cart, stand or table.
d) Do not place AVR under direct sunlight or close to heat emitting sources.
e) Do not place AVR power cord in any area where it may get damaged by heavy objects.



Placing magnetic storage media on top of the AVR may result in data corruption.



Special precautions:

When the AVR input comes from a generator:

a) Output power capacity must be higher than the AVR rating, or the AVR and generator may not work properly;
b) Output frequency of generator must be in range of 48Hz~52Hz or Hz~62Hz, and waveform must be sine wave, otherwise the AVR and generator may not work properly.

2. Specifications

Model No.	AVR-REL-THUNDER500-WL	AVR-REL-THUNDER1000-WL
Capacity	300W	600W
AC Input Voltage	144V~264V (±3V)	144V~264V (±3V)
Input Frequency	45Hz~65Hz	45Hz~65Hz
AC Output Voltage	230V	230V
Output Frequency	Synchronized with mains frequency	Synchronized with mains frequency

Output Precision	+4%, -9% (without load)	+4%, -9% (without load)
Distortion	<3% (compare to input wave form)	<3% (compare to input wave form)
Power Factor	0.6	0.6
Efficiency	>0.95	>0.95
Operating Temperature	-10˚C~40˚C	-10˚C~40˚C
Operating Humidity	0~90%(Non-condensing)	0~90%(Non-condensing)
Noise	≤56dB (full load, distance at 1 meter)	≤56dB (full load, distance at 1 meter)
Delay Time	6/180 seconds selectable	6/180 seconds selectable
Protection	Output Low Voltage Output High Voltage Overheat, Short Circuit (output)	Output Low Voltage Output High Voltage Overheat, Short Circuit (output)
Certification	CE (EMC+LVD)	CE (EMC+LVD)

Remarks:
• Single phase only.
• We reserve the right to change specifications or discontinue models without notice.

3. Before Installation
Each AVR was tested 100% before shipment, check if the AVR has been subjected to any damage after unpacking it according to the following steps:

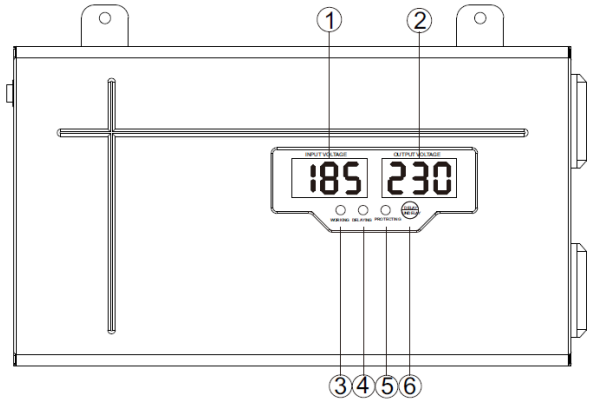
A. Contents
Delivered pack includes:
AVR 1 piece
User's manual 1 piece

B. Visual observation
a) Check the name plate to verify the rated capacity is according to your purchase order.
b) Make sure appearance of the AVR is not damaged. If you notice any damage, contact the transport firm and the authorized dealer.

Do not try to operate the AVR in this situation!
Do not try to repair the AVR by yourself!

4. Introduction to the Regulator
Familiarize yourself with the various features and facilities by studying the two diagrams below to obtain maximum benefit from the regulator.

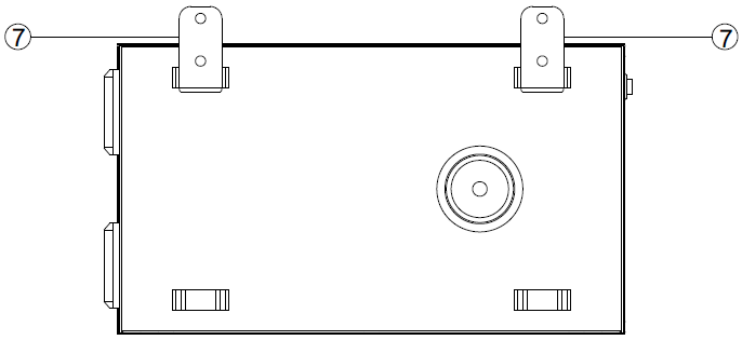
a. Front of the Regulator



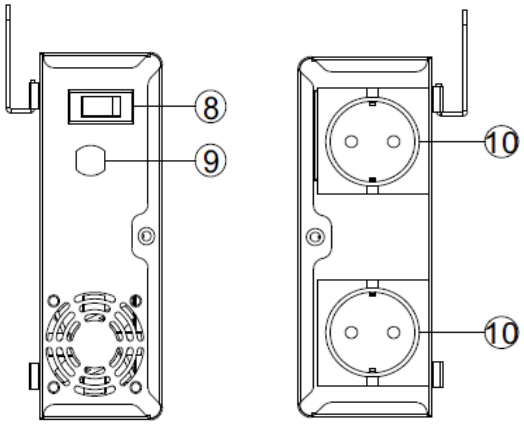
1. Input Voltage Display
2. Output Voltage Display
3. Delay Button
4. Green LED Light (Indicator for "POWER ON")
5. Yellow LED Light (Indicator for "DELAYING")
6. Red LED Light (Indicator for "PROTECTING")

Symbol on POWER SWITCH:
"-" : power on
"O" : power off

b. Back and Side of the Regulator



7. Hanger
8. Power Switch
9. Input Cable
10. Outlet



5. Operation of the AVR

a. Connect the Electrical Appliances to Regulator

• Make sure all appliances are turned "OFF", and put power switch of AVR to “OFF” position.
• Plug the AC mains cord of the appliances into the output socket of AVR, ensuring that the total starting power needed does not exceed the rated maximum output power of the AVR.

b. Connect Regulator to Electrical Mains

Plug the AC mains cord to wall mains socket.

c. Switch on the regulator

Switch the power "ON"

• Put the power switch to "ON" position，the yellow LED will illuminate and blink. At the same time, the digital display will show the elapsing delay time. Generally delay time is set at 6~10 seconds.
• Then the yellow LED lights off and the green will illuminate.
• The digital display will show output voltage supplying to appliances connected to the regulator.
• Switch "ON" the appliances one by one.

In Case of Power Failure:

• Switch "OFF" the regulator and all the appliances.
• Repeat above steps when power is restored.

d. Display of Input Voltage and Output Voltage

•The digital display will show the input voltage and output voltage after the AVR switched on.

e. LED Operation

• When the Green LED is "ON", it indicates Power ON and also that the input voltage and output voltage is normal, the AVR is working.
• When the Yellow LED is “ON” and flash, it indicates that the regulator is in a delay status, the output will be delayed.
• When the Red LED is "ON" and flash, it indicates the regulator is in a protection status.

f. Delay Operation

• This model is designed with a delay feature to protect appliances with compressors which should not be switched on immediately after being switched off.
• The delay time is generally set at from 6/180 seconds. Please select delay or undelay before switch on the AVR.
• When delay time has elapsed, delay LED will switch "OFF" and display will indicate the AC output voltage.

g. Integrated Automatic Protection Circuit (IAPC)

• This model is equipped with a specially designed INTEGRATED
AUTOMATIC PROTECTION CIRCUIT.
• This very specialized and unique circuitry is now redesigned to automatically cut off the input voltage whenever the input voltage is above the input voltage range, rendering full and comprehensive protection to the regulator and connected appliances.
• When the input voltage returns to within Low and Normal ranges, the IAPC will automatically switch the regulator back "ON" and also restore power to all connected appliances.

h. Temperature Protection

• This AVR is equipped with a unique Temperature Protection Circuit designed to protect the transformer, giving you longer and satisfactory use of the Regulator.
• If the internal temperature reaches the limit or above, the output power supply will cut "OFF" automatically. There is no number to be shown in the display.
• When the internal temperature returns to normal range, output power will be restored. After the delay time, the display will indicate output voltage.

i. High Output Voltage Protection

• This AVR is built in with a very specialized feature HIGH OUTPUT VOLTAGE PROTECTION CIRCUIT.
• This special and unique circuitry is designed to protect connected appliances whenever the output voltage is higher than the normal range.
• If the output voltage is over the normal range, the output power supply will cut "OFF" automatically and the display will show "H". At the same time, the Red LED blinks.
• Once the input city power returns to normal range, the AVR will restore the output

j. Low Output Voltage Protection

• When the output voltage is below the normal range, the output will be cut “OFF” automatically and the display will show “L”. At the same time, the Red LED blinks
• Once the input city power returns to normal range, the AVR will restore the output to the loads.

k. Short circuit protection.

• In case of a short circuit or overload, the power switch will trip off the input power supply automatically.
• Please check if the AVR is overloaded, if so, please remove some loads.
• Please check if the appliances are short circuit, if so, please disconnect the appliances.

6. Placement

For safety and better performance and longer lifespan, please handle and place the AVR according to the follow instructions:

a. Moving

a) Cut off input; remove all wires connected to the AVR
b) Do not move the AVR upside down
c) Rough handling is prohibited

b. Environmental
Keep away from unstable base or sources of excessive vibration.
Do not place the AVR under direct sunlight or excessive humidity.
Keep away from fire, heat sources.
Keep the AVR in well ventilated place. Leave at least a distance of 10 cm between the AVR and the walls in order to maintain adequate air-flow.
Operating Temperature: -10˚C~40˚C
Operating Humidity: 0~90% (Non-condensing)
Keep away from corrosive gas or fluid.

Install the AVR in a cool, dry, clean place – away from windows, dust, moisture and cold. To prevent fire or electrical shock, do not expose this unit to rain or water.

7. Maintenances
This AVR is basically maintenance free! But regular maintenance can extend the lifespan of AVR by the following steps:

Regular inspection
Shut down the AVR completely
Use cotton cloth and detergent to clean the body and ventilation holes.
Check all the terminals, replace the abnormal one with that of the same specification.

Extraordinary inspection
When malfunction occurs, or the AVR is abnormal, please measure and check the parameters, refer to the authorized dealer if needed.
In thunder and lightning or rainy season, Extraordinary Inspection should be executed to prevent malfunction.
Maintenance should not be operated when AVR is working.

8. Other
This user's manual is only for E series IC controlled smart automatic voltage regulators.
This AVR is designed and made by strict standards and quality control system for common use, but if apply to purposes may cause any dangerous to human or other lives, include but not limited to the following case, please refer to our company:

a) Apply to traffic system;
b) Apply to medical purpose;
c) Apply to nuclear, power system;
d) Apply to aviation and aerospace;
e) Apply to all kinds of safety devices;
f) Other special usages.



Waste electrical and electronic equipment are a special waste category, collection, storage, transport, treatment and recycling are important because they can avoid environmental pollution and are harmful to health. Submitting waste electrical and electronic equipment to special collection centers makes the waste to be recycled properly and protecting the environment. Do not forget! Each electric appliance that arrives at the landfill, the field, pollutes the environment!

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