USER'S MANUAL

WP-ACR

Whisper Power Alternator Charge Regulator

Boost your alternator power and extend your battery life time

Suitable for all WhisperPower alternators

Prepared for RPM input

DUTCH QUALITY PRODUCT
MADE IN THE NETHERLANDS

3-step

- **Optimal 3-stage** charge algorithm
- Self adjustment **temperature compensation**
- **Charging** status interface
- **Simple** to operate and control
- Easy installing with **Plug and Play** cable loom

CONTENTS:

- **PLEASE READ THIS USER GUIDE CAREFULLY BEFORE USING THE CHARGER.**
- **USE PROTECTIVE EYEWEAR WHEN HANDLING BATTERIES**

1 INTRODUCTION

Thank you for choosing a professional quality product from WhisperPower. This advanced and user-friendly charge regulator will boost your alternator power and extend your battery lifetime.

This manual serves as a guideline for the safe and effective operation, maintenance and possible correction of minor malfunctions of the WP-ACR.
This manual is valid for the following models:

Part number	Discription
60115100	WP-ACR 12
60115200	WP-ACR 24

This intelligent charge regulator can be used to regulate most types of alternators up to 160A.

For more information about WhisperPower and our product, visit www.whisperpower.com

2. INSTALLATION

During installation and commissioning of the WP-ACR, the Safety Guidelines & Measures are applicable at all times.

Unpacking

In addition to the WP-ACR the delivery includes:

- The WP-ACR
- A cable harness
- The WP-BTS temperature sensor
- This user's manual

After unpacking, check the contents for possible damage. Do not use the product if it is damaged. If in doubt, contact your supplier. Check from the identification labels whether the nominal DC voltage is equal for all applied components (e.g. a 12V alternator with a 12V WP-ACR and a 12V battery set).

NOTE!

- Use the supplied cable harness for connection of the WP-ACR
- DC Cables to connect the Battery to the alternator are not included in the delivery.
- The alternator wiring is electrically isolated from ground.
- Before wiring make sure the alternator is installed correctly.

Wiring instructions

1. Run the DC-cables between the battery set and the alternator. A DC-fuse must be integrated in the positive cable (see the installation drawing). Do not install the DC-fuse of the DC-distribution before the entire installation is completed. Connect the red cable between the B^+ terminal of the alternator and the positive (+) pole of the battery. Connect the black cable between the B^- terminal of the alternator and the negative (–) pole of the battery.
2. Connect the black wire of the cable harness between the [gnd] terminal of the WP-ACR and the B^- terminal of the alternator.
3. Insert the two pole connector of the cable harness into the field connector of the alternator. Take adequate measures to assure a strain relief for this connector. Connect the blue wire of the cable harness to the [field] terminal of the WP-ACR.
4. Connect the red wire of the cable harness between the [+bat] terminal of the WP-ACR and the positive (+) pole of the battery or the B^+ terminal of the alternator.
5. Connect the cable of the BTS-temperature sensor tot the BTS connector and firmly install the temperature sensor to the battery.
6. Connect the brown wire of the cable harness to the [ON] terminal of the WP-ACR, supply a +12V ignition/activation signal to this wire.
7. Optional connect the green wire of the cable harness between the [W] output of the alternator and the [W-RPM] terminal of the WP-ACR.

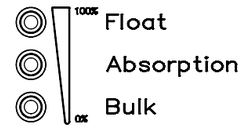
NOTE! If a battery isolator is used to charge more than one battery, the red wire of the cable loom should not be connected to the B+ terminal of the alternator but to the positive (+) pole of the battery instead.

3. INSTRUCTIONS

Follow all steps in order of succession as described below:

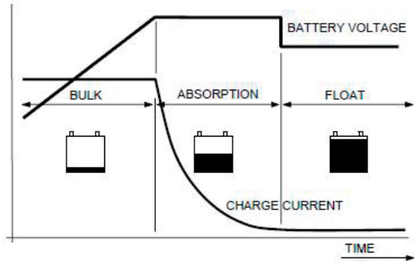
1. Measure and record the battery voltage at idle.
2. Start the engine.
3. Check for abnormal noise or vibration.
4. The yellow [bulk] LED on the WP-ACR will illuminate, indicating that the charge-cycle begins.
5. Measure and record the battery voltage. The battery voltage should be higher than measured before at step 1. The battery voltage rises until the yellow [abs] LED illuminates.
6. When the yellow [abs] LED illuminates the absorption mode commences. Measure and record the battery voltage (at 25°C / 77°F). It should stabilize at 14.25 ± 0.05V for a 12V alternator or 28.50 ± 0.10V for a 24V alternator.
7. An absorption timer starts to keep the WP-ACR in the absorption mode. The factory setting of this timer is 4 hours.
8. When absorption time has elapsed, the green [float] LED will illuminate. This means that the float mode has started. If you have passed the above mentioned tests, the charging system is ready for operation. Else check chapter 7 for trouble shooting.

NOTE!
For testing you might want to reduce the absorption time temporarily, see chapter 5.



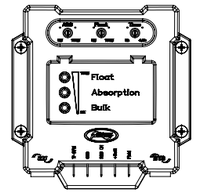
4. CHARGING CURVE

The WP-ACR controls the alternator's output voltage. It is designed for optimal recharging of both wet, gel and AGM batteries. Battery charging is accomplished in three automatic stages: BULK, ABSORPTION and FLOAT. Simple, automatic operation is made possible by the microprocessor which is the brain of the WP-ACR.



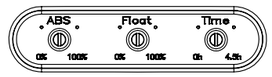
5. ADJUSTMENTS

Both the WP-ACR 12 and 24 volt are preset from the factory with settings that will work fine for most batteries. The WP-ACR has three potentiometers to adjust the charging system according to the demands of the electrical installation.



CAUTION!
Invalid settings of the potentiometers can cause serious damage to your batteries. Adjustments of settings may be undertaken by authorized personnel only! Keep a record of setting changes in this manual.

CAUTION!
Use a 0.4 x 2.5mm flat blade screwdriver to adjust the potentiometers. Do not attempt to drive the settings past the indicated limits. You will damage the potentiometers.



The WP-ACR uses the [on] terminal and the [gnd] terminal for measurement of the battery voltage. As the field current flows through the [gnd] terminal as well, a voltage drop may occur on the black cable which is connected to the [gnd] terminal. This will affect the charge voltage. To minimize this voltage drop, a 4mm² black cable is used. Under all circumstances the voltage-drop may not exceed 0.01 Volts.
Absorption and float voltage adjustments are only possible with a fully charged battery. If the batteries are fully charged, the field current will be low and this will minimize the voltage-drop over the GND cable.
The temperature-sensor must be removed so that there will not be a temperature correction. Use a hand-held digital meter to measure the voltage on the battery-terminals. To avoid wrong measurements, do not measure on the alternator output, neither on the terminals of the regulator

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Absorption voltage adjustment

The factory-settings for the absorption voltage are 14.25V for 12V battery and 28.50V for 24V batteries (at 25°C / 77°F). When the yellow absorption LED is on, increase the engine rpm slightly to verify that the charge voltage does not increase. If it does either wait for the battery to become fully charged or find a high enough rpm where the voltage does not change with increasing rpm. Rotate the [abs] potentiometer slightly clockwise to increase or counter clockwise to decrease the absorption voltage until the desired value is set. With good wiring and good voltage sensing the resolution will be within 0.03 Volts. Do not adjust the charge voltage above the recommended limits of the battery manufacturer. Also note that too high voltages may damage sensitive equipment that is connected to the batteries.

Float voltage adjustment

The factory-settings for the float voltage are 13.25V for 12V battery and 26.50V for 24V batteries To change the float-voltage, you can minimize the absorption time by turning the [time] potentiometer fully counter clockwise so that the regulator switches over to float mode in about 2 minutes. When the green float LED illuminates, you should wait for approximately 10 minutes because it takes some time before the battery voltage has dropped. Then you can adjust the float voltage by rotating the [float] potentiometer. If the float voltage is set near 13.0V you may have to switch on some DC loads to get the alternator to turn on because it takes some time for the voltage to settle from the higher absorption voltage. Be sure to return the [time] potentiometer to its initial setting when finished.

Absorption time adjustment

Factory setting of the absorption timer: 4 hours. This is appropriate for most systems. Exceptions might be:

- Extension of the absorption time to do some intentional overcharging to regain lost capacity.
- Shorten the time if you stop and start the engine often each day.
- Temporary time reduction for testing purposes
  From the factory, the slot from the potentiometer will be close to the 10 o'clock position. If you require a different time, you may interpolate the scale and make a new setting. Adjustable range: 2 minutes up to 4.5 hours

6. ADDITIONAL FEATURES

- Straight forward installing: The easy installing of the WP-ACR because of the 4 mounting-holes design. This mounting pattern does also fit to the WP-ACR DIN rail mounting Kit (this is an optional accessory).
- Battery temperature sensor: The temperature affects the batteries ability to receive charge. This product is delivered with the WP-BTS Temperature sensor to optimize the charging process so that the life time of the battery will be extended. If the temperature sensor registers a temperature below -20 or above 50 degrees will the WP-ACR automatically be turned off.
- RPM readout and compensating: If your alternator is able to read out the RPM you can optimize your battery charging even further by the automatic adjustment of the charge voltage.
- Standard and BOSCH compatible: The harness cable is compatible for a standard connection to the alternator and for a BOSCH connection.

7. MAINTENANCE

The WP-ACR is entirely maintenance-free. It has no user-serviceable parts. The Device may be cleaned using a soft, damp cloth. The charge regulator must be disconnected when being cleaned.

Electrical connections

Check the wiring at least every six months. Defects such as loose connections, corroded connections, burned cables etc. must be corrected immediately.

8. TROUBLE SHOOTING

In case of any fault, we recommend consulting the Maintenance chapter first (see chapter 7). If you cannot solve a problem with the aid of the table below, contact your local Whisperpower Service Centre. See www.whisperpower.com

Problem	Possible cause	Solution
No voltage at all, LED's are off.	Battery fuse is blown. Battery connections are bad. Black [gnd] wire is loose.	Replace the fuse. Clean connections, if burned replace. Reconnect black [gnd] wire.
No output power, all LED's of the WP-ACR are off. Terminal of the regulator is 0V.	Engine is not running. Fuse in brown wire is blown. Brown [reg on] wire is loose.	Start the engine. Check the fuse and replace if necessary. Check brown [on] wire.
No output power, one of the LED's of the WP-ACR regulator is on.	Fuse in red wire is blown. Two pole field connector is loose (red and blue wire). Problem in the wiring. Blue [field] wire is loose. Field windings of the alternator are defective.	Check the fuse and replace if necessary. Check field connector on the alternator. Check red and blue wires to the field connector. Check the blue wire Check resistance of field windings. Replace alternator.
No output power, all LED's of the WP-ACR are off. Terminal of the regulator is 12/24V.	Black [gnd] wire is loose. WP-ACR defective.	Check black [gnd] wire. Replace WP-ACR.
Regulator is in bulk mode all the time.	Alternator is overloaded. Defective batteries, short circuit between cells. Capacity of the charging system is too low. Defective WP-ACR.	Switch off a load. Check batteries and replace if necessary. Use an alternator with more capacity. Consult your Whisperpower representative for advice. Replace WP-ACR.
WP-ACR does not return to bulk mode when a high load is switched on.	Once the regulator is in absorption mode a timer is started and after this time the regulator will switches to float and will stay in this mode.	Nothing: this is a normal situation. If necessary switch off engine and start again.
Output voltage is too high.	The regulator measures a too low battery voltage and tries to compensate. Wrong setting of the charge voltage. Battery temperature sensor not connected or not attached to the batteries.	Check wiring for corrosion. The line between battery and [on] should not be used by other loads. Adjust the charge voltage. Check the battery temperature sensor.
Charge voltage stays in absorption mode too long/short.	Wrong setting of the absorption timer.	Adjust the absorption timer.
WP-ACR is in float mode, but battery voltage is still at absorption or bulk level.	Any other device is charging the batteries.	Switch off all other charging devices and check the battery voltage again.

9. ACCESSORIES

- The WP-ACR comes with a standard cable harness with a normally used WhisperPower connector to the alternator. An extra accessory is the BOSCH cable harness.
- Furthermore this set includes a temperature sensor to measure the temperature of your battery.

10. TECHNICAL SPECIFICATIONS

VOLTAGE PART*	12VDC - 60115100	24VDC - 60115200
General		
Nominal operation voltage	12 VDC	24 VDC
Temperature sensor	Yes, cable length 6m.	
Cable harness	Yes, length 1.5m	
Connection plug regulator/alternator	WhisperPower Alternator	
Alternator type	WhisperPower, low voltage, brush type	
Electrical		
Charge voltage - Absorption	14.25 VDC	28.50 VDC
Charge voltage - Float	13.25 VDC	26.50 VDC
Absorption Voltage range	13..15 VDC	27..31 VDC
Float Voltage range	13..13.9 VDC	26..27.8 VDC
Absorption time	0h..4.5h	
Temperature Compensation	-30mV/°C	-60mV/°C
Rev counter input	Prepared	
Operation Temperature	-20°C .. 80°C	
Settings/Read out		
Voltage settings	By trimmers on device	
Time settings	By trimmers on device	
Status read-out	LED's	
Communication		
Communication bus	WhisperConnect prepared	
Mechanical		
Dimensions [mm] [L x W x H]	117 x 120 x 26,67	
Dimensions [inch] [L x W x H]	4,60 x 4,72 x 1,05	
Weight [kg]	0.4 Kg	
Packaging dimens. [mm] [L x W x H]	330 x 230 x 65	
Protection Degree	IP65	

11. SAFETY GUIDELINES AND MEASURES

Warnings and symbols

Safety instructions and warnings are marked in this manual by the following pictograms: A procedure, circumstance, etc which deserves extra attention.

CAREFUL!
Special data, restrictions and rules with regard to preventing damage.

Use for intended purpose

The WP-ACR is constructed as per the applicable safety-technical guidelines. Use the WP-ACR only:

- For the charging of batteries and the supply of loads connected to these batteries, in permanent systems.
- With fuses, protecting the wiring between WP-ACR output and battery.
- In a technical correct condition.
- In a closed, well-ventilated room, protected against rain, moist, dust and condensation.
- Observing the instructions in the user's manual.

WARNING
Never use the WP-ACR in locations where there is danger of gas or dust explosion or potentially flammable products!

Use of the WP-ACR other than mentioned "use the alternator/WP-ACR only" is not considered to be consistent with the intended purpose. WhisperPower is not liable for any damage resulting from the above.

Organizational measures
The user must always:

- Have access to the user's manual.
- Be familiar with the contents of this manual.

This applies in particular to chapter 11, Safety Guidelines and Measures.

Maintenance and repair

If the WP-ACR and engine are switched off during maintenance and/or repair activities, they should be secured against unexpected and unintentional switching on:

- Remove the key from the engine ignition switch.
- Switch off the connection with the batteries or remove the DC fuse(s).
- Be sure that third parties cannot reverse the measures taken.

WARNING
When service has to be carried out while the engine is running, be aware of moving parts like V-belts. If maintenance and/or repairs are required, use only original spare parts.

12. CE MANUFACTURER DECLARATION

Product: Whisperpower alternator charge regulator.
Whisperpower guarantees that the unit complies with the relevant standards.

13. LIMITED WARRANTY

Whisperpower guarantees the quality of this product. It is made to meet high industrial production standards for electronics. This limited warranty is made to the original purchaser of this product, and is valid from the date of purchase, meeting the mandatory warranty rights for the country of purchase. If the product has workmanship defects or damages relating tot manufacturing or distribution, contact the store where you purchased the charger for warranty claims. The warranty is void if the unit has been damaged due to careless handling, abuse or unauthorized repair, or has been opened, or labels have been removed. Whisperpower is not responsible for any consequential costs for the return to the place of purchase. Nor is Whisperpower liable under any other warranty than this one. This warranty is not transferrable. Note: Measures such as time, %, lengths etc are approximates.

Art. Nr.	Item
60115101	WP-ACR Cable harness standard
60115102	WP-ACR Cable harness BOSCH - optional
60115105	WP-ACR DIN rail mounting kit
60201201	WP-BTS Temperature sensor + 1.5m cable
60201202	WP-BTS Temperature sensor + 6m cable

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