



**victron energy**  
BLUE POWER

## More current on board

### Balmar high output alternators

Balmar is the renowned American producer of professional high output alternators, intelligent charge regulators and other accessories. A high output alternator can be an excellent alternative for a small AC generator. The alternator does not require valuable floor space, will cost less and will be more reliable.

### Intelligent regulator needed

The standard alternator on the main engine is intended for charging the starter battery. Starting the engine requires a high current, but during a very short time, so that the battery remains nearly fully charged.

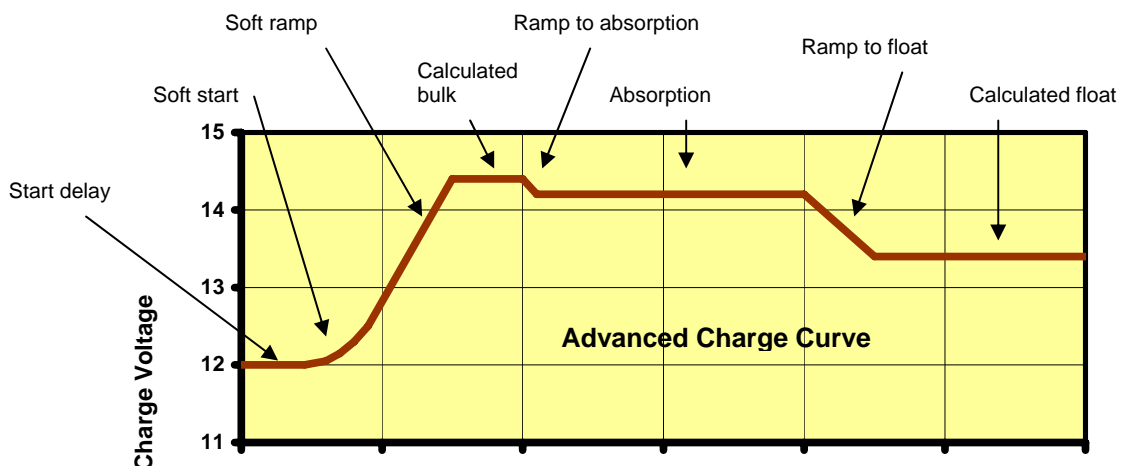
The starter battery can therefore be recharged to its full capacity with a low output alternator and a simple single stage regulator. The charge voltage is in general set at approximately 14 V or 28 V.

The service battery in general has a much higher capacity and will often be deeply discharged. At the same time the requirement is to recharge the service battery as fast as possible. This can only be achieved with a high output alternator and increased charge voltage. Under these conditions an intelligent multi step regulator will be needed to avoid early failure of the battery bank.



### The strong points of Balmar

- Breadth of product range and installation flexibility.
- Compact and fully isolated alternators.
- Internal constant-voltage regulator does not need to be removed when connecting an intelligent external regulator (6-series alternators only). The internal regulator remains available as a back up if ever the external regulator would fail.
- The intelligent regulators are completely encapsulated: waterproof, shockproof and ignition protected. The advanced charge curve is the result of many years of experience.



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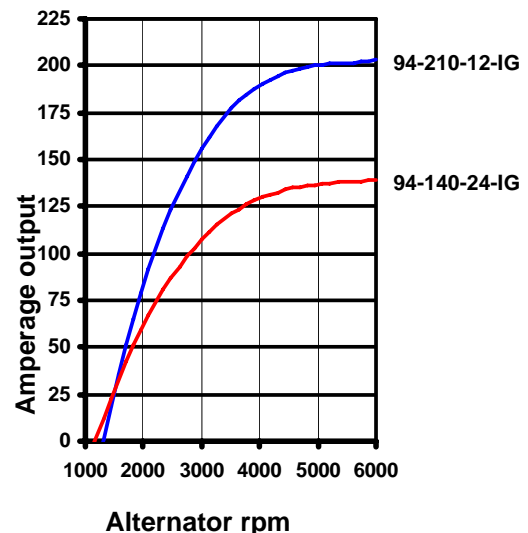
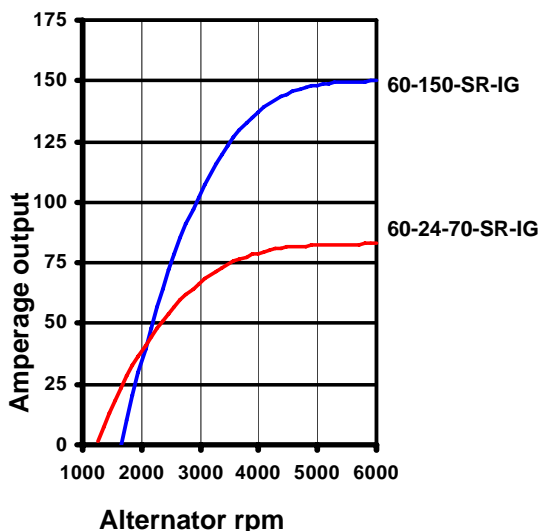


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### What to do before installing a high output alternator

- Seek the advice of your engine supplier.
- The engine to alternator pulley diameter ratio determines at what engine rpm the alternator will begin to charge. If the alternator is required to deliver a substantial output at low engine rpm, check that the engine has sufficient reserve power at low rpm.
- Most batteries should not be charged at a rate exceeding 30% of their Ah capacity (example: 120 A max. charge current for 400 Ah battery bank). A high charge rate will reduce service life. If a high charge rate is nevertheless required, always apply temperature compensation, which will lower the charge voltage when the temperature of the battery increases.
- One or more high output alternators and a sizeable battery bank plus DC-AC inverters can replace an AC generator. Our book 'Energy Unlimited' explains how data about the expected daily energy consumption can be used to determine battery capacity and engine-alternator run hours. The book is available free of charge and can also be downloaded from our website [www.victronenergy.com](http://www.victronenergy.com).
- There are many ways to charge two or more battery banks with one alternator, and to isolate the battery banks from each other when one or more are being discharged. You may install Victron Diode or FET battery isolators, Cyrix microprocessor controlled battery separators or the Duo Charge from Balmar, please see the relevant datasheets and Tech Info pages on [www.victronenergy.com](http://www.victronenergy.com).

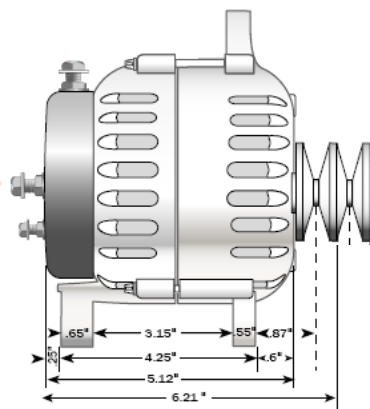
Alternator model	60-150-SR-IG	60-24-70-SR-IG	94-210-12-IG	94-140-24-IG
Alternator model	604-150-SR-IG	604-24-70-SR-IG		
Alternator model	621-150-SR-IG	621-24-70-SR-IG		
Rated current	150 A	70 A	210 A	140 A
Nominal output voltage	12 V	24 V	12 V	24 V
Maximum rpm	15.000	15.000	6500	6500
Dual vee pulley	yes	yes	yes	yes
Pulley diameter	6,8 cm (2,7 inch)	6,8 cm (2,7 inch)	6,8 cm (2,7 inch)	6,8 cm (2,7 inch)
Rotation	Bi-directional	Bi-directional	Clockwise	Clockwise
Weight	5,5 kg	5,5 kg	8 kg	8 kg



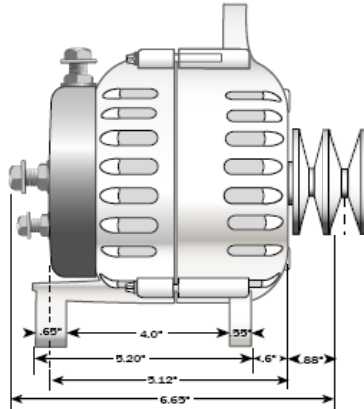


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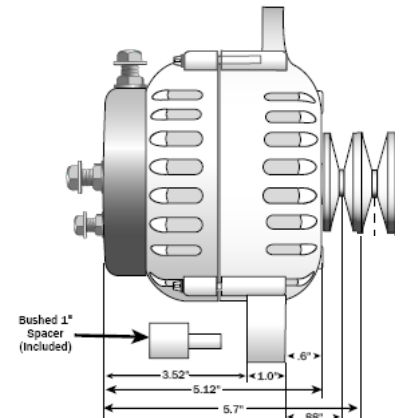
Dimensions (in inches, 1 inch = 2,54 cm)



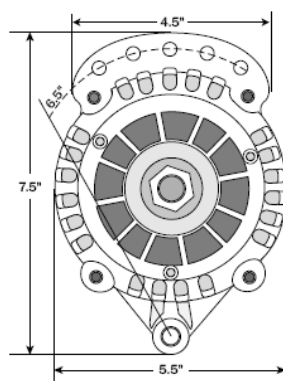
Side view type 60



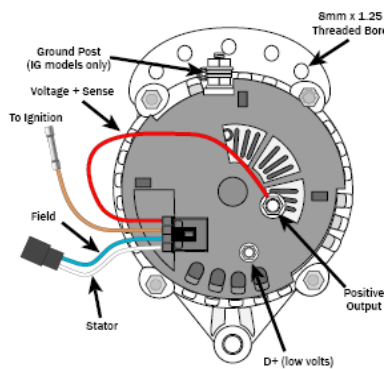
Side view type 604



Side view type 621

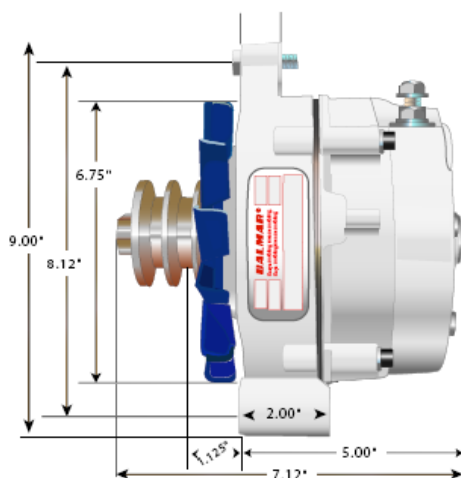


Front view series 6



Rear view series 6

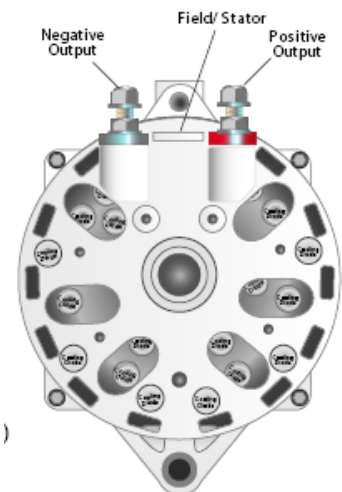
(delivery with internal regulator, and wiring and connectors as shown, for smart regulator connection)



Side view type 94



Front view type 94



Rear view type 94

Standard with 6,8 cm diameter dual vee pulley. Other pulleys and alternators: at request. See Tech Info on [www.victronenergy.com](http://www.victronenergy.com) for more information.

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### Charge regulators ARS-4 and MC-612

- **Start delay and soft voltage ramp**  
A time adjustable start delay and soft voltage ramp ensure minimal engine and belt fatigue.
- **4-step charge characteristic**  
At the end of the bulk phase, the batteries are charged during 36 minutes at high voltage. This additional step in the charge curve is used to bring the battery as quickly as possible to a 80-90% recharged state. The normal absorption period starts after this "fast charge" phase. (see advanced charge curve on page 1)
- **All time and voltage values are adjustable**  
ARS-4: system time and voltages.  
MC-612: all time and voltage values individually.
- **Lower output amperage setting**  
The field current can be programmed to reduce the output (MC 612 only), or be reduced to 50% with a switch (both models). These features can be used when engine reserve power is limited or in case of chronic belt slippage.
- **Three protections against overheating**  
A high current can cause overheating. Three temperature sensors can be wired to a MC 612 regulator: 2 for the batteries and 1 for the alternator.  
(ARS-4: alternator sensor only)
- **Temperature compensation**  
Batteries get hot when charged at high rate. Temperature compensation (the charge voltage decreases with increasing battery temperature) is a must in case of high rate charging to prevent thermal runaway. One of the two battery temperature sensors of the MC 612 is also used for temperature compensation.
- **Voltage sense: measuring the charge voltage directly on the battery**  
Some voltage drop is inevitable in case of high currents. The result will be a lower voltage at the battery terminals, and therefore also a lower charge current. The voltage drop can be compensated for by increasing the output voltage of the alternator. Voltage sense is needed for this feature. (available on MC 612 models only)
- **Alarm and advisory information**  
Dash lamp: over voltage, under voltage and temperature alarms.  
MC 612 only: additional terminal for status information.
- **Easy to install, and back up internal regulator (6-series alternators only)**  
A cable harness for easy installation is included. The 6-series alternators have an internal constant-voltage regulator that does not need to be removed when connecting an intelligent external regulator. The internal regulator remains available as a back up if ever the external regulator would fail.

### Duo Charge

For charging a second battery, independently from the main battery. The Duo Charge is suitable for both 12 V and 24 V systems, has 4 built-in battery programs and a battery temperature sensing option. The maximum output is 30 A.

### Centerfielder

For the highest charge current. The Centerfielder enables two alternators to work together to supply a balanced charging current to a large battery bank. Suitable for both 12 V and 24 V systems.

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Charge regulator ARS-4-H (12 Volt only)					
Article number	ALT072121100				
Charge curve (1)	Pro-1 Universal factory program	Pro-2 Deep cycle flooded lead acid	Pro-3 Gel cel	Pro-4 Absorbent Glass Mat (AGM)	Pro-5 Cylindrical cel (AGM)
Start delay	45 seconds				
Soft ramp	60 seconds				
Bulk voltage (V) (2)	14,10	14,60	14,10	14,40	14,60
Bulk time (3)	36 minutes				
Absorption voltage (V) (2)	13,90	14,40	13,90	14,20	14,40
Absorption time (3)	120 minutes				
Float voltage(V) (2)	13,40	13,40	13,70	13,40	13,40
Float time (3)	6 h (36 minutes absorption period after 6 h float period)				
Over voltage alarm (V)	15,20	15,60	15,10	15,40	15,60
Under voltage alarm (V)	12,80	12,80	12,80	12,80	12,80
Battery temperature alarm	Not available (see regulator MC-612)				
Alternator temperature alarm) (6)	Yes, 107°C / 225°F (50% reduction of field voltage in case of alarm)				
Battery temperature compensation	Not available (see regulator MC-612)				
Adjustable output current	Yes, 50% reduction of field voltage with external switch				
Voltage sense	Not available (see regulator MC-612)				
Alarm	Yes, dash lamp / buzzer				
Equalisation charge mode	Yes	Yes	No	No	No

1. The preset voltages are intended for boats and vehicles where the engine is used for long periods of time and batteries are not often deeply discharged. If the shortest possible recharge time is required, the charge voltage can be increased by up to 0,3 V (12 V battery) or 0,6 V (24 V battery).

If a high charge rate is required, always apply temperature compensation, which will lower the charge voltage as the temperature of the battery increases. Example: apply the AGM setting to charge Victron or Exide / Sonnenschein gel batteries.

Always ask the advice of your battery supplier.

2. System voltage is adjustable.

3. System time is adjustable.

4. The charge cycle resets when the engine is stopped.

5. Delivery includes 1,3 meter cable harness.

6. Alternator Temperature Sensor is optional.



### Charging more than one battery bank

An overview of the options:

- **Victron Cyrix battery separator:** microprocessor controlled relay that interconnects two batteries during charging. This is the simplest solution, which does not require any modification in the existing wiring.
- **Victron Diode or FET battery isolator:** diode battery isolators allow simultaneous charging of two or more batteries from one alternator, without connecting the batteries together.
- **Balmar Duo Charge:** for charging a second battery, independently from the main battery. The Duo Charge has 4 built-in battery programs and a battery temperature sensing option. The maximum output is 30 A. Suitable for 12 V and 24 V systems.



Article number: ALT070011400

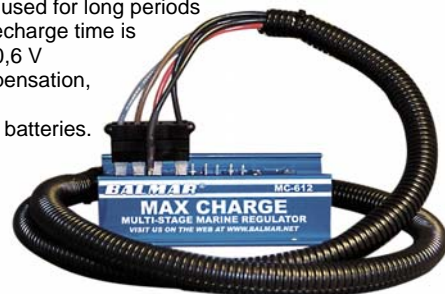


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Charge regulators MC-612-H (12 V) en MC-624-H (24 V)							
Article numbers	ALT072121000 (MC-612-H) and ALT072241000 (MC-624-H)						
Charge curve (1)	Pro-1 Universal factory program	Pro-2 Deep cycle flooded lead acid	Pro-3 Gel cel	Pro-4 Absorbent Glass Mat (AGM)	Pro-5 Cylindrical cel (AGM)	Pro-6 Standard flooded lead acid	Pro-7 Low voltage (halogen lighting)
Start delay	45 seconds						
Soft ramp	60 seconds						
Bulk voltage (V) (2)	14,10/28,20	14,60/29,20	14,10/28,20	14,40/28,80	14,60/29,20	14,40/28,80	14,00/28,00
Bulk time (3)	36 minutes						
Absorption voltage (V) (2)	13,90/27,80	14,40/28,80	13,90/27,80	14,20/28,40	14,40/28,80	14,20/28,40	13,50/27,00
Absorption time (3)	120 minutes						
Float voltage(V) (2)	13,40/26,80	13,35/26,70	13,70/27,40	13,40/26,80	13,40/26,80	13,40/26,80	13,50/27,00
Float time (3)	6 h (36 minutes absorption period after 6 h float period)						
Over voltage alarm (V)	15,20/30,40	15,60/31,20	15,10/30,20	15,40/30,80	15,60/31,20	15,40/30,80	15,00/30,00
Under voltage alarm (V)	12,80/25,60	12,80/25,60	12,80/25,60	12,80/25,60	12,80/25,60	12,80/25,60	12,80/25,60
Battery temperature alarm	Yes, 52°C / 125°F, for 2 batteries (includes temperature compensation on 1 battery)						
Alternator temp. alarm (6)	Yes, 107°C / 225°F (50% reduction of field voltage)						
Battery temp compensation	Yes						
Adjustable output current	Yes, 50% reduction of field voltage with external switch, and programmable limit						
Voltage sense	Yes						
Alarm	Yes, dash lamp/buzzer						
Advisory alarm	Yes, full alternator output, 50% field reduction, equalization voltage						
Equalisation charge mode	Yes	Yes	No	No	No	Yes	Yes

1. The preset voltages are intended for boats and vehicles where the engine is used for long periods of time and batteries are not often deeply discharged. If the shortest possible recharge time is required, the charge voltage can be increased by up to 0,3 V (12 V battery) or 0,6 V (24 V battery). If a high charge rate is required, always apply temperature compensation, which will lower the charge voltage as the temperature of the battery increases  
Example: apply the AGM setting to charge Victron or Exide / Sonnenschein gel batteries. Always ask the advice of your battery supplier.
2. All voltages are adjustable.
3. All time values are adjustable.
4. The charge cycle resets when the engine is stopped.
5. Delivery includes 1,3 meter cable harness.



### Centerfielder: balances two alternators to charge one battery bank

When 2 alternators are connected to one battery bank, the alternator with the highest output voltage will do most of the work.

The **Centerfielder** enables two alternators to work together to supply a balanced charging current.

Both alternators must have an ARS-4 or a MC-612 regulator. If ever a regulator would fail, the Centerfielder will make sure that both alternators continue to operate on the remaining regulator.

Suitable for 12 V and 24 V systems.

Article number: ALT070011600



### Temperature sensors

**Alternator Temperature Sensor** with 1,5 meter cable, type MC-TS-A, article number: ALT080001000 (alarm temperature 107°C, 50% reduction of alternator output)

**Battery Temperature Sensor** with 6 meter cable, type MC-TS-B, article number: ALT080001100 (suitable for MC 612 only, temperature alarm for 2 batteries, temperature compensation for 1 battery)

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