

NEW

MC-618 Voltage Regulator

Integration with the SG200 Battery Monitor

- Monitor Alternator/Regulator Activity from the SG200
- Setup Regulator from 2" Color Display or the Balmar App
- Advanced Programming from the Smartphone App
- All the Same Regulation Features as the MC-614
- New Carbon Foam Battery Profile
- Improved High Temperature Alternator Control
- Protects Lithium Batteries Below Freezing Temperatures



Balmar has upgraded its legendary MC-614 Voltage Regulator to communicate with the SG200 Battery Monitor! Now you can see how the **New MC-618 Regulator** is directing your alternator charging activity from either the SG200 2" Color Display and/or the optional Bluetooth® Smartphone App. Basic setup functions can be accomplished from the SG200 Color Display, Balmar App or the traditional on-regulator programming tool. Advanced Programming functions are available from the Balmar App.

Monitor your Alternator's Performance with Real-Time Data

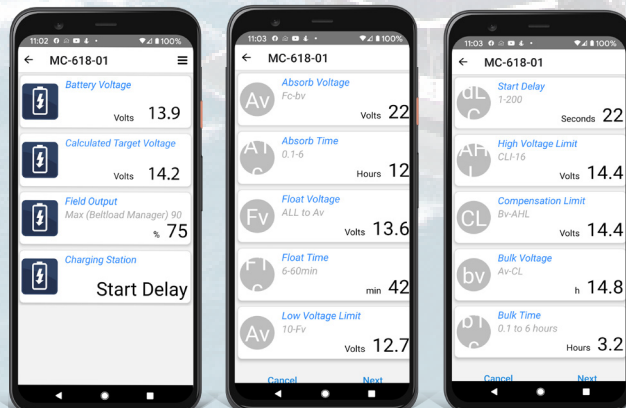
- Charging Stage
- Compare Actual Voltage against Target Voltage
- Monitor Field Output Percentage
- Set Maximum Field Percentage



Add the Optional Bluetooth® Gateway to Enable Advanced Programming on the Balmar App

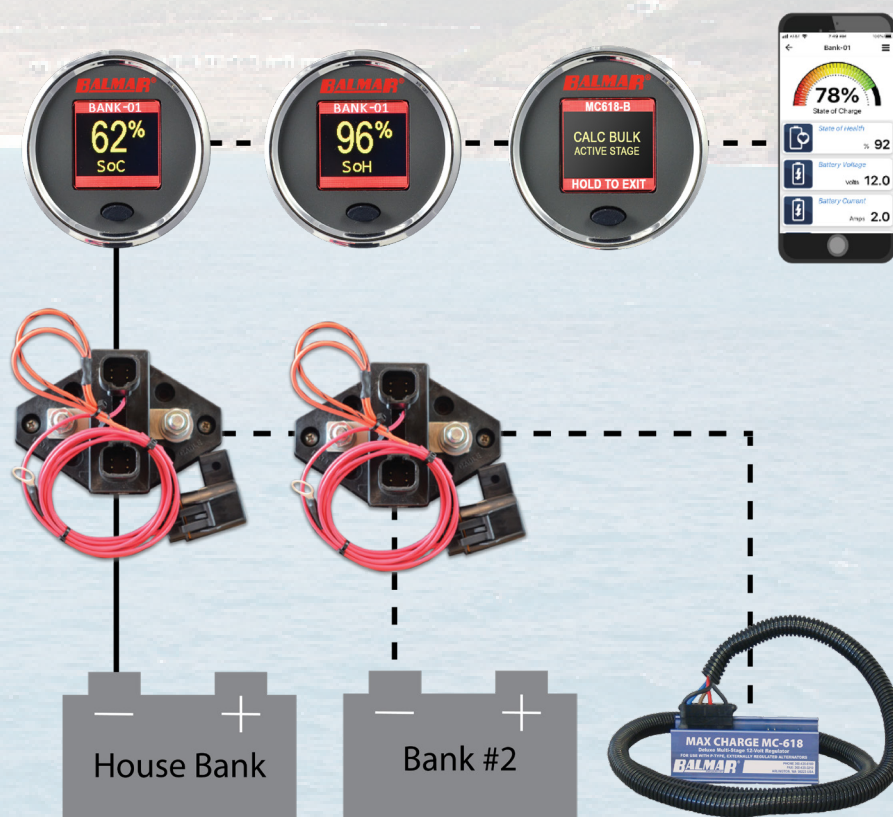
- Configure ALL Regulator Parameters
- Save and Recall Regulator Programs
- Monitor Regulator Performance from your Smartphone
- Collect and Share Diagnostic Information

Best of all, the **New MC-618** is priced the same as the MC-614. Merely purchase a 5M (SG2-0403) or 10M (SG2-0400) data cable to connect to the SmartLink™ Network.



SG200 Battery Monitor and MC-618 Regulator

SmartLink™ Network for Charging and Monitoring



- Build your own charging and battery monitoring network!
- Add Color Displays for viewing data in different locations.
- All charging and battery information can be displayed anywhere on the SmartLink™ Network.
- SG200 Firmware upgrades available via downloads through the Balmar App and Bluetooth® Gateway.
- Dual engine applications are easily supported by connecting both MC-618 regulators to the SmartLink™ Network.
- Add SmartShunts if you have multiple banks.
 - Stern or Bow Thruster Banks
 - House Bank #2

SG200 Specifications

Standard Configuration:	1 Bank per SmartShunt Device 2 Start/Auxiliary Voltage Sense Lines (Up to 32 devices including Displays and SmartShunts can be added to a single network.)	Display Values:	State of Charge (SoC%) State of Health (SoH%) Voltage (V) Charge/Discharge Current (A) Time Remaining (Hrs) History, Faults & Alerts (Consult User Manual)
Supply Voltage Range:	8V - 60V DC	Max Ah Capacity:	1310 Ah (per SmartShunt)
Average Supply Current:	Display On: 20 mA @12V Sleep Mode: 10 mA @12V	Communications Cable:	4 wire, 22 AWG, Shielded 4 pin Deutsch DT Style
SmartShunt Operating Temperature:	-40°C - +85°C (-40°F - +185°F)	Grounding:	Negative Battery Connection
SmartShunt Max Current:	600A Instantaneous (10 minutes @ ambient) 350A Continuous (For Higher Currents Consult User Manual)	SmartShunt Dimensions:	Length: 4.87" (123.7 mm) Width: 3.34" (84.8 mm) Height: 2.01" (50.9 mm)
Weight:	SmartShunt: 0.62lbs (0.28kg) Color Display: 0.16lbs (0.07kg)	Color Display Dimensions:	Bezel Diameter: 2.37" (60 mm) Base Diameter: 2.05" (52 mm) Depth with Cable Attached: 2.75" (70 mm)
Standards Compliance:	CE EMC Directive 2014/30/EU RoHS 2 Directive 2011/65/EU	Protection Rating:	IP65 (Display), IP67 (SmartShunt)

Balmar Voltage Regulation Technology

High output alternators are an important part of your system for battery care, but they are definitely not the only part. Without proper voltage regulation, battery charging can be a slow process, or even worse, an ideal recipe for early battery failure.

All commercial alternators come with an internal rectifier/regulator circuit that:

- (1) converts AC current generated by the alternator to DC current, and
- (2) fixes the voltage output to a static level – typically 14.2 volts.

There are several deficiencies with internal regulators:

- (1) Not all battery technologies want to receive 14.2 volts.
- (2) All battery types have an optimal charging “profile”, which means they want different voltages and currents at different stages of their charging cycle, as well as variations when battery temperatures change.
- (3) Once fully charged, batteries can overheat if they are supplied with continuous current at a fixed charge voltage.

Balmar’s patented Max Charge and ARS-5 Voltage Regulators provide a dynamic method for monitoring battery condition and apply the correct level of alternator control (voltage and current) to ensure that your batteries are charged quickly and safely.

During engine operation, Balmar regulators step through the following stages to ensure proper battery charging:

Stage 1: Start Delay – After engine startup, the regulator waits for several seconds before applying field current to the alternator. This allows the engine and belts an opportunity to warm up before the alternator load is applied.

Stage 2: Soft Ramp – The regulator slowly increases field excitation of the alternator to reduce belt stress.

Stage 3: Bulk Charging – The regulator increases field output to the maximum safe level, allowing the alternator to reach maximum amperage output based on the target limits of the battery type being charged. Target voltage ranges from 14.1V to 14.6V depending on the battery type selected (24V bulk charging voltages range from 28.2V to 29.2V). Bulk time is a factory set at 18 minutes, and is fully adjustable in advanced programming mode.

Stage 4: Calculated Bulk - At the end of the set bulk time period, the regulator calculates the state of charging based on the alternators ability to reach and maintain target voltage, and the percentage of field output required to maintain that voltage. This stage will maintain bulk charging until all criteria are met, at which point the regulator will ramp down to absorption voltage.

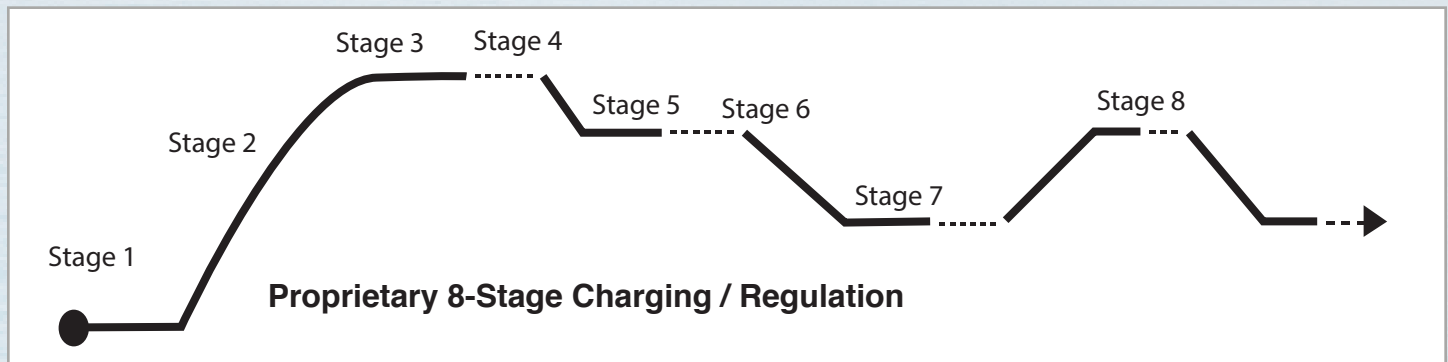
Stage 5: Absorption Voltage – Typically two tenths of a volt below bulk target voltage, absorption voltage allows the alternator to drive current into the almost fully charged batteries without overcharging. Absorption time is preset at 18 minutes, and is adjustable in the regulator’s advanced programming mode.

Stage 6: Calculated Absorption – At the end of the set absorption time period, the regulator calculates the state of charging based on the alternator’s ability to reach and maintain the target voltage and the percentage of field output required to maintain that voltage. This stage will maintain the absorption charging voltage until all criteria are met, at which point, the regulator will ramp down to float voltage.



Stage 7: Float Voltage – Typically one (1) volt below bulk target voltage, float voltage allows the alternator to drive current into fully charged batteries sufficient to replace any battery capacity used while under way. Float time is preset at 18 minutes, and is adjustable in the regulator's advanced programming mode.

Stage 8: Calculated Float – At the end of the set float time period, the regulator calculates the state of charging based on the alternator's ability to maintain the target float voltage and the percentage of field output required to maintain that voltage. If all of the calculation criteria are met, the regulator will continue to maintain float voltage. If the calculation indicates that the alternator is failing to maintain battery voltage, the regulator will return to absorption voltage.



Additional Features

User-Selectable Preset Battery Programs

Balmar provides multiple charge profiles to ensure optimal charging. Simply select the battery program that matches your battery technology. The Max Charge regulator family contains 8 preset charge profiles, including a new standard program for lithium batteries. The ARS-5 contains 5 preset profiles. See the chart on page 16 for a listing of battery programs.

Advanced Programming Modes

Balmar multi-stage regulators feature a broad range of advanced regulator adjustments. By accessing the advanced programming function, the user can modify charging times and voltages in all stages of charge, adjust start delay times, temperature compensation limits, temperature compensation slopes, and modify set points for alternator over-temperature response.

Alternator and Battery Temperature Sensing and Control

Balmar multi-stage regulators have the ability to automatically correct charging output to ensure that batteries are properly charged regardless of ambient temperature. If battery temperatures exceed safe operating levels, Max Charge and ARS-5 Voltage Regulators will automatically reduce charging outputs to avoid dangerous thermal runaway conditions.

Maximum Field Percentage (Belt Load Management)

Balmar multi-stage regulators can protect the engine and belt by enabling the user to de-rate the alternator's output in small increments by adjusting the Max Field Percentage. Adjustable in 5% increments, the Max Field Percentage reduces the regulator's field pulse bandwidth, thereby reducing load on the drive belt. The Max Field Percentage can also be used to protect the alternator in applications where battery capacity exceeds ideal charging ratios.

Balmar Max Charge and ARS-5 Voltage Regulators

Max Charge MC-618 Voltage Regulator

- 9 Selectable Programs for Marine Batteries
- 15 Amp Maximum Field Current
- Advanced Programming Modes (see page 19)
- Alternator & Battery Temperature Sensing & Control
- Exclusive Belt Load Manager Function
- Integrates with SG200 for Programming and Data Display
- Can be Used in Twin-Engine Applications with Centerfielder II



Max Charge MC-624 Voltage Regulator

- Designed for 24 Volt Applications
- 10 Amp Maximum Field Current
- Optional 15 Amp Unit Available
- Can be Used in Twin-Engine Applications
- All the Same Functions as the MC-618



Max Charge MC-612-Dual Voltage Regulator

- Designed to Control 2 Alternators on a Single Engine
- Dual Alternator & Battery Temperature Sensing
- Twin 54" Wiring Harnesses Provided
- All the Same Programming Functions as the MC-618



ARS-5 Voltage Regulator

- 5 Selectable Programs for Marine Batteries
- 9 Amp Maximum Field Current
- Appropriate for 6-Series Alternators (120A and below)
- Single Engine, Single Alternator Applications Only
- Similar Programming Functions as the MC-618



Preset, Multi-Stage Battery Programs	Balmar Regulators				Digital Duo Charge	Dual Engine Centerfielder
	12 Volt			24 Volt		
	Part Number:	ARS-5	MC-618	MC-612-DUAL	MC-624	DDC-12/24
Universal Factory Program, Deep Cycle Flooded, Gel Cell, Absorbed Glass Mat (AGM) and Spiral Wound Flooded (Optima)	Yes	Yes	Yes	Yes	Yes	Yes
Standard Flooded, Halogen Systems, Lithium (LiFePO ₄), Carbon Foam AGM	-	Yes	Partial	Partial	Partial	Yes
Balmar Alternator Models						
6-Series Alternators (70A-120A)	Yes	Yes	Yes	Yes	Yes	Yes
XT-Series Alternator (170A-250A)	-	Yes	Yes	-	Yes	Yes
9-Series Large Case Alternators (140A-310A)	-	Yes	Yes	Yes	Yes	Yes
Multiple Alternator/Engine Configurations						
Dual Engine, One Alternator Each	-	Yes (qty 2)	-	Yes (qty 2)	Yes	Yes
Single Engine, Two Alternators	-	-	Yes	Yes (qty 2)	Yes	Yes

Complete part number listings and dimensional specifications are found on pages 30-38.