

# MC-612-DUAL Voltage Regulator



## Product Features:

Dual field outputs for dual alternator operation on a single engine

### Selectable Programs For

Factory Default (Universal)

Deep Cycle Flooded

Gel

Absorbed Glass Mat (AGM)

Spiral Wound (Optima)

Standard Flooded

Halogen (Voltage Sensitive)

### Belt Load Manager

Reduces maximum field potential in nine total increments (approximate 3% reduction per step of reduction).

### Display Type

Short Display (Default)

Long Display

### Advisory Modes

Select between internal system failure criteria (high voltage, low voltage, high battery temperature), and/or stator voltage as indicator for charging failure.

### Advanced Programming

Charge Delay Duration

High Voltage Limit

Voltage Compensation Limit

Bulk Voltage Value

Fixed Bulk Duration

Absorption Voltage Value

Fixed Absorption Duration

Float Voltage Value

Fixed Float Duration

Low Voltage Limit

Field Threshold (Bulk/Absorb)

Field Threshold (Float/Absorb)

Alternator Temp. Threshold

Battery Temp. Threshold

Slope Voltage Correction

Designed to provide field current to two alternators on the same engine, the Balmar MC-612-DUAL voltage regulator features a unique dual harness design that eliminates the complication of wire splicing. In addition, the MC-612-DUAL can be programmed to offer alternator temperature sensing at two alternators.

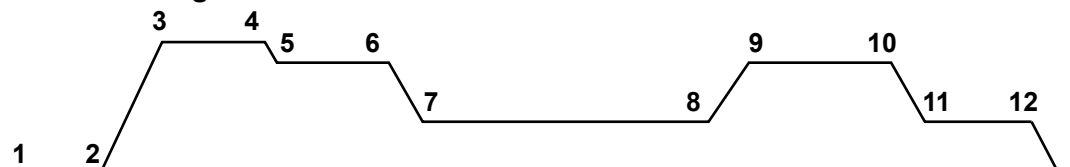
The regulator initiates the charging process with a user-adjustable start delay that allows the engine and belts to warm up before the alternator applies horsepower load to the system. The regulator then gently ramps up to bulk charging voltage.

The bulk charging mode is where the lion's share of aggressive charging output occurs. Once the requirements of the batteries being charged, the MC-612-DUAL regulator reduces charging voltage to absorption voltage, and later, to float voltage -- where the charging system is able to supply enough charging current to replace whatever electrical load the vessel demands.

The Max Charge uses a combination of timed and calculation-based segments to ensure that the regulator remains in each stage of charge for as little or as long is required in the bulk, absorption, and float stages. In other words, the regulator will remain in bulk charge for a minimum time period (12 minutes is standard). At the end of that 12 minutes, the regulator considers a number of criteria; whether target voltage has been achieved, if the regulator was able to maintain that voltage for a given time, and how hard the alternator has to work to maintain that voltage. When all criteria are met, the regulator will advance to the next charging stage. Like a smart shorepower charger, the MC-612-DUAL uses advanced software programming to provide individualized charging profiles, depending on the battery type being charged. By setting the regulator to the battery program for your battery type, you can rest assured that your batteries will receive optimal charging whenever your engine is running. See the *Regulator Specifications* on Page 2 for additional details.



## MC-614 Charge Profile



1. Start Up / Start Delay

2. Soft Ramp To Bulk

3. Bulk Voltage (Timed/Calculated)\*

4. Ramp To Absorption Voltage

5. Absorption Voltage (Timed/Calculated)\*

6. Ramp To Float Voltage

7. Float Voltage (Timed/Calculated)\*\*

8. Ramp To Absorption Voltage\*\*\*

9. Absorption Voltage (Timed/Calculated)\*

10. Ramp To Float Voltage

11. Float Voltage (Timed/Calculated)\*\*

12. Shut Down

\* Bulk and absorption time duration is a combination of set (12 min.) set and variable calculated time periods. \*\*Float time duration is a combination of set (30 min.) and variable calculated time periods. \*\*\*During calculated float voltage segment, the regulator will ramp up to absorption voltage if demand exceeds the regulator's ability to meet voltage requirements during float charge.

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## MC-612-DUAL Regulator Specifications

**Alternator Compatibility:** 12-Volt, Positive Excitation

**Regulation Type:** Multi-Stage, User Programmable

**Maximum Alternators Controlled:** Two on one engine

**Regulator Housing:** Anodized aluminum heat sink

**Selectable Programs:** Seven

**Battery Programs:** Universal (default), Gel, Absorbed Glass Mat, Deep Cycle Flooded, Standard Flooded, Spiral Wound (Optima), Halogen (Voltage Sensitive)

**Advanced Programming:** Charge Delay Duration, High Voltage Limit, Voltage Compensation Limit, Bulk Voltage Value Fixed Bulk Duration, Absorption Voltage Value Fixed Absorption Duration, Float Voltage Value Fixed Float Duration, Low Voltage Limit, Field Threshold (Bulk/Absorb), Field Threshold (Float/Absorb) Alternator Temp. Threshold, Battery Temp. Threshold Slope Voltage Correction

**Belt Load Manager:** Nine level, user selectable field reduction program, ranging from 100% output to approximately 50% output. Selections range from B-0 (100%) to B-9 (50%)

**Alternator & Battery Temperature Sensing:** User-adjustable programming enables the user to set the regulator to sense temperature at a single alternator and at two battery banks, or to sense temperature at two alternators and a single battery bank. Requires optional alternator and/or optional battery temperature sensors (MC-TS-A and MC-TS-B) to enable temperature sensing function

**Voltage Sensing:** Dedicated Fused (1A) Circuit

**Programming Mechanism:** Magnetic Reed Switch. Magnetic tipped programming tool included with regulator

**Regulator Display:** Three-digit LED alphanumeric readout

**Short Display Mode:** Indicates regulator model, program selection, charging stage, belt load manager setting, battery voltage, target voltage, alternator temperature, battery #1 and battery #2/alternator #2 temperatures

**Long Display Mode:** Indicates regulator model, program selection, charging stage, belt load manager setting, battery voltage, target voltage, alternator temperature, battery #1 and battery #2 temperatures. In addition, long mode displays; field output percentage, software revision, set points for alternator and battery temperatures, slope, regulator hours, field thresholds and error/advisory codes

**Regulator Wiring:** Included with MC-612-DUAL-H regulator model. Wiring harnesses (2) include Power, Field, Ignition, Stator, Ground wires, and fused sense wire pigtail. Wiring harnesses measure 54" in length

**Required Fusing:** 10A on Power Wire, 1A on Sense Wire; included with Model MC-612-DUAL-H

**Alternator Temperature Sensing:** Automatically reduces regulator field output when alternator temperature exceeds set limits. Over-temperature condition activates dash lamp circuit. Requires optional Alternator Temperature Sensor (MC-TS-A) to enable temperature sensing functions

**Battery Temperature Sensing:** Allows the MC-612-DUAL to automatically adjust charging voltage to match the ambient temperature of the battery bank being charged, ensuring safe and optimal charging throughout the charge cycle. In addition, the regulator has the ability to shut down regulator field output if battery temperature exceeds set limits. Over-temperature condition activates dash lamp circuit. Requires optional Battery Temperature Sensor (MC-TS-B) to enable temperature sensing functions

**Small Engine Mode:** Reduces maximum field output by approximately 50%. Requires user-supplied ON/OFF switch mounted between positive and negative alternator temperature sensor terminals

**Dash Lamp:** Negative 500 mA circuit, activated when regulator detects low voltage, high voltage, high alternator temperature or high battery temperature. Can be toggled to activate when alternator fails to provide stator output

**Aux. 2 Lamp:** Negative 500 mA circuit, activated when regulator is in Small Engine Mode or regulator is delivering full field output

**Adjustable Start Delay / Soft Ramp:**

**Maximum Safe Operating Temperature:** 145 °F

**Maximum Field Output:** 15A Continuous

**High Voltage Shutdown:** 15.5 volts

**Low Voltage Shutdown:** 10.8 volts

**Regulator Power Requirement:** 480 mA

**Regulator Dimensions:** 4.8"L x 3.25"W x 1.5"H

**Ship Weight:** 1.5 lbs. (regulator only),  
2.0 lbs. (MC-612-DUAL-H)

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# MC-614 Voltage Regulator



## Product Features: Selectable Programs For

### Battery Type

Factory Default (Universal)  
Deep Cycle Flooded  
Gel  
Absorbed Glass Mat (AGM)  
Spiral Wound (Optima)  
Standard Flooded  
Halogen (Voltage Sensitive)

### Belt Load Manager

Reduces maximum field potential in nine total increments (approximate 3% reduction per step of reduction).

### Display Type

Short Display (Default)  
Long Display

### Advisory Modes

Select between internal system failure criteria (high voltage, low voltage, high battery temperature), and/or stator voltage as indicator for charging failure.

### Advanced Programming

Charge Delay Duration  
High Voltage Limit  
Voltage Compensation Limit  
Bulk Voltage Value  
Fixed Bulk Duration  
Absorption Voltage Value  
Fixed Absorption Duration  
Float Voltage Value  
Fixed Float Duration  
Low Voltage Limit  
Field Threshold (Bulk/Absorb)  
Field Threshold (Float/Absorb)  
Alternator Temp. Threshold  
Battery Temp. Threshold  
Slope Voltage Correction

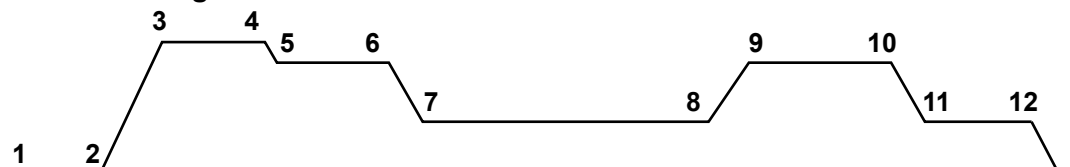
Unlike the regulators found in automotive and OEM marine alternators, Balmar's smart, multi-stage Max Charge MC-614 voltage regulator uses its ability to modify charging voltage to meet the condition, technology and ambient temperature of large marine battery banks to ensure that those batteries charge quickly and safely. The MC-614 regulator starts the charging process with a user-adjustable start delay that allows the engine and belts to warm up before the alternator applies horsepower load to the system. The regulator then gently ramps up to bulk charging voltage.



The bulk charging mode is where the lion's share of aggressive charging output occurs. Once the requirements of the batteries being charged, the MC-614 regulator reduces charging voltage to absorption voltage, and later, to float voltage -- where the charging system is able to supply enough charging current to replace whatever electrical load the vessel demands.

The Max Charge uses a combination of timed and calculation-based segments to ensure that the regulator remains in each stage of charge for as little or as long is required in the bulk, absorption, and float stages. In other words, the regulator will remain in bulk charge for a minimum time period (12 minutes is standard). At the end of that 12 minutes, the regulator considers a number of criteria; whether target voltage has been achieved, if the regulator was able to maintain that voltage for a given time, and how hard the alternator has to work to maintain that voltage. When all criteria are met, the regulator will advance to the next charging stage. Like a smart shorepower charger, the MC-614 uses advanced software programming to provide individualized charging profiles, depending on the battery type being charged. By setting the regulator to the battery program for your battery type, you can rest assured that your batteries will receive optimal charging whenever your engine is running. See the *Regulator Specifications* on Page 2 for additional details.

### MC-614 Charge Profile



1. Start Up / Start Delay
2. Soft Ramp To Bulk
3. Bulk Voltage (Timed/Calculated)\*
4. Ramp To Absorption Voltage
5. Absorption Voltage (Timed/Calculated)\*
6. Ramp To Float Voltage
7. Float Voltage (Timed/Calculated)\*\*
8. Ramp To Absorption Voltage\*\*\*
9. Absorption Voltage (Timed/Calculated)\*
10. Ramp To Float Voltage
11. Float Voltage (Timed/Calculated)\*\*
12. Shut Down

\* Bulk and absorption time duration is a combination of set (12 min.) set and variable calculated time periods. \*\*Float time duration is a combination of set (30 min.) and variable calculated time periods. \*\*\*During calculated float voltage segment, the regulator will ramp up to absorption voltage if demand exceeds the regulator's ability to meet voltage requirements during float charge.

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## MC-614 Regulator Specifications

**Alternator Compatibility:** 12-Volt, Positive Excitation

**Regulation Type:** Multi-Stage, User Programmable

**Maximum Alternators Controlled:** 2

**Regulator Housing:** Anodized aluminum heat sink

**Selectable Programs:** Seven

**Battery Programs:** Universal (default), Gel, Absorbed Glass Mat, Deep Cycle Flooded, Standard Flooded, Spiral Wound (Optima), Halogen (Voltage Sensitive)

**Advanced Programming:** Charge Delay Duration, High Voltage Limit, Voltage Compensation Limit, Bulk Voltage Value Fixed Bulk Duration, Absorption Voltage Value Fixed Absorption Duration, Float Voltage Value Fixed Float Duration, Low Voltage Limit, Field Threshold (Bulk/Absorb), Field Threshold (Float/Absorb) Alternator Temp. Threshold, Battery Temp. Threshold Slope Voltage Correction

**Belt Load Manager:** Nine level, user selectable field reduction program, ranging from 100% output to approximately 50% output. Selections range from B-0 (100%) to B-9 (50%)

**Voltage Sensing:** Dedicated Fused (1A) Circuit

**Programming Mechanism:** Magnetic Reed Switch. Magnetic tipped programming tool included with regulator

**Regulator Display:** Three-digit LED alphanumeric readout

**Short Display Mode:** Indicates regulator model, program selection, charging stage, belt load manager setting, battery voltage, target voltage, alternator temperature, battery #1 and battery #2 temperatures

**Long Display Mode:** Indicates regulator model, program selection, charging stage, belt load manager setting, battery voltage, target voltage, alternator temperature, battery #1 and battery #2 temperatures. In addition, long mode displays; field output percentage, software revision, set points for alternator and battery temperatures, slope, regulator hours, field thresholds and error/advisory codes

**Regulator Wiring:** Included with MC-614-H regulator model. Wiring harness includes Power, Field, Ignition, Stator, Ground wires, and fused sense wire pigtail. Measures 54" in length

**Required Fusing:** 10A on Power Wire, 1A on Sense Wire; included with Model MC-614-H regulator

**Upgraded fusing:** 15A when regulator is controlling dual alternators

**Alternator Temperature Sensing:** automatically reduces regulator field output when alternator temperature exceeds set limits. Over-temperature condition activates dash lamp circuit. Requires optional Alternator Temperature Sensor (MC-TS-A) to enable temperature sensing functions

**Battery Temperature Sensing:** Allows the MC-614 automatically adjust charging voltage to match the ambient temperature of the battery bank being charged, ensuring safe and optimal charging throughout the charge cycle. In addition, the regulator has the ability to shut down regulator field output if battery temperature exceeds set limits. Over-temperature condition activates dash lamp circuit. Requires optional Battery Temperature Sensor (MC-TS-B) to enable temperature sensing functions

**Small Engine Mode:** Reduces maximum field output by approximately 50%. Requires user-supplied ON/OFF switch mounted between positive and negative alternator temperature sensor terminals

**Dash Lamp:** Negative 500 mA circuit, activated when regulator detects low voltage, high voltage, high alternator temperature or high battery temperature. Can be toggled to activate when alternator fails to provide stator output

**Aux. 2 Lamp:** Negative 500 mA circuit, activated when regulator is in Small Engine Mode or regulator is delivering full field output

**Adjustable Start Delay / Soft Ramp:**

**Maximum Safe Operating Temperature:** 145 °F

**Maximum Field Output:** 15A Continuous

**High Voltage Shutdown:** 15.5 volts

**Low Voltage Shutdown:** 10.8 volts

**Regulator Power Requirement:** 480 mA

**Regulator Dimensions:** 4.8"L x 3.25"W x 1.5"H

**Ship Weight:** 1.5 lbs. (regulator only),  
2.0 lbs. (MC-614-H)

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# MC-624 Voltage Regulator



## Product Features:

### Selectable Programs For

Factory Default (Universal)  
Deep Cycle Flooded  
Gel  
Absorbed Glass Mat (AGM)  
Spiral Wound (Optima)  
Standard Flooded  
Halogen (Voltage Sensitive)

### Belt Load Manager

Reduces maximum field potential in nine total increments (approximate 3% reduction per step of reduction).

### Display Type

Short Display (Default)  
Long Display

### Advisory Modes

Select between internal system failure criteria (high voltage, low voltage, high battery temperature), and/or stator voltage as indicator for charging failure.

### Advanced Programming

Charge Delay Duration  
High Voltage Limit  
Voltage Compensation Limit  
Bulk Voltage Value  
Fixed Bulk Duration  
Absorption Voltage Value  
Fixed Absorption Duration  
Float Voltage Value  
Fixed Float Duration  
Low Voltage Limit  
Field Threshold (Bulk/Absorb)  
Field Threshold (Float/Absorb)  
Alternator Temp. Threshold  
Battery Temp. Threshold  
Slope Voltage Correction

Balmar's Max Charge MC-624 voltage regulator delivers smart, multi-stage charging performance for 24-volt marine electrical systems.

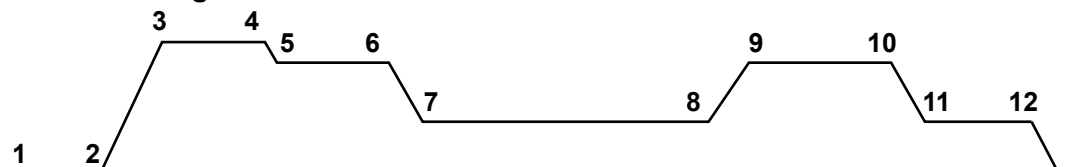
The regulator initiates the charging process with a user-adjustable start delay that allows the engine and belts to warm up before the alternator applies horsepower load to the system. The regulator then gently ramps up to bulk charging voltage.

The bulk charging mode is where the lion's share of aggressive charging output occurs. Once the requirements of the batteries being charged, the MC-624 regulator reduces charging voltage to absorption voltage, and later, to float voltage -- where the charging system is able to supply enough charging current to replace whatever electrical load the vessel demands.

The Max Charge uses a combination of timed and calculation-based segments to ensure that the regulator remains in each stage of charge for as little or as long is required in the bulk, absorption, and float stages. In other words, the regulator will remain in bulk charge for a minimum time period (12 minutes is standard). At the end of that 12 minutes, the regulator considers a number of criteria; whether target voltage has been achieved, if the regulator was able to maintain that voltage for a given time, and how hard the alternator has to work to maintain that voltage. When all criteria are met, the regulator will advance to the next charging stage. Like a smart shorepower charger, the MC-624 uses advanced software programming to provide individualized charging profiles, depending on the battery type being charged. By setting the regulator to the battery program for your battery type, you can rest assured that your batteries will receive optimal charging whenever your engine is running. See the *Regulator Specifications* on Page 2 for additional details.



## MC-624 Charge Profile



1. Start Up / Start Delay
2. Soft Ramp To Bulk
3. Bulk Voltage (Timed/Calculated)\*
4. Ramp To Absorption Voltage
5. Absorption Voltage (Timed/Calculated)\*
6. Ramp To Float Voltage
7. Float Voltage (Timed/Calculated)\*\*
8. Ramp To Absorption Voltage\*\*\*
9. Absorption Voltage (Timed/Calculated)\*
10. Ramp To Float Voltage
11. Float Voltage (Timed/Calculated)\*\*
12. Shut Down

\* Bulk and absorption time duration is a combination of set (12 min.) set and variable calculated time periods. \*\*Float time duration is a combination of set (30 min.) and variable calculated time periods. \*\*\*During calculated float voltage segment, the regulator will ramp up to absorption voltage if demand exceeds the regulator's ability to meet voltage requirements during float charge.

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## MC-624 Regulator Specifications

**Alternator Compatibility:** 24-Volt, Positive Excitation

**Regulation Type:** Multi-Stage, User Programmable

**Maximum Alternators Controlled:** Two. Twin engine, dual alternator applications used in conjunction with Balmar' Centerfielder will require two MC-624 voltage regulators

**Regulator Housing:** Anodized aluminum heat sink

**Selectable Programs:** Seven

**Battery Programs:** Universal (default), Gel, Absorbed Glass Mat, Deep Cycle Flooded, Standard Flooded, Spiral Wound (Optima), Halogen (Voltage Sensitive)

**Advanced Programming:** Charge Delay Duration, High Voltage Limit, Voltage Compensation Limit, Bulk Voltage Value Fixed Bulk Duration, Absorption Voltage Value Fixed Absorption Duration, Float Voltage Value Fixed Float Duration, Low Voltage Limit, Field Threshold (Bulk/Absorb), Field Threshold (Float/Absorb) Alternator Temp. Threshold, Battery Temp. Threshold Slope Voltage Correction

**Belt Load Manager:** Nine level, user selectable field reduction program, ranging from 100% output to approximately 50% output. Selections range from B-0 (100%) to B-9 (50%)

**Voltage Sensing:** Through power wire

**Programming Mechanism:** Magnetic Reed Switch. Magnetic tipped programming tool included with regulator

**Regulator Display:** Three-digit LED alphanumeric readout

**Short Display Mode:** Indicates regulator model, program selection, charging stage, belt load manager setting, battery voltage, target voltage, alternator temperature, battery #1 and battery #2/alternator #2 temperatures

**Long Display Mode:** Indicates regulator model, program selection, charging stage, belt load manager setting, battery voltage, target voltage, alternator temperature, battery #1 and battery #2 temperatures. In addition, long mode displays; field output percentage, software revision, set points for alternator and battery temperatures, slope, regulator hours, field thresholds and error/advisory codes

**Regulator Wiring:** Included with MC-624-H regulator model. Wiring harnesses (2) include Power, Field, Ignition, Stator, Ground wires, and fused sense wire pigtail. Wiring harnesses measure 54" in length

**Required Fusing:** 10A on Power Wire

**Alternator Temperature Sensing:** Automatically reduces regulator field output when alternator temperature exceeds set limits. Over-temperature condition activates dash lamp circuit. Requires optional Alternator Temperature Sensor (MC-TS-A) to enable temperature sensing functions

**Battery Temperature Sensing:** Allows the MC-624 to automatically adjust charging voltage to match the ambient temperature of the battery bank being charged, ensuring safe and optimal charging throughout the charge cycle. In addition, the regulator has the ability to shut down regulator field output if battery temperature exceeds set limits. Over-temperature condition activates dash lamp circuit. Requires optional Battery Temperature Sensor (MC-TS-B) to enable temperature sensing functions

**Small Engine Mode:** Reduces maximum field output by approximately 50%. Requires user-supplied ON/OFF switch mounted between positive and negative alternator temperature sensor terminals

**Dash Lamp:** Negative 500 mA circuit, activated when regulator detects low voltage, high voltage, high alternator temperature or high battery temperature. Can be toggled to activate when alternator fails to provide stator output

**Aux. 2 Lamp:** Negative 500 mA circuit, activated when regulator is in Small Engine Mode or regulator is delivering full field output

**Adjustable Start Delay / Soft Ramp:**

**Maximum Safe Operating Temperature:** 145 °F

**Maximum Field Output:** 15A Continuous

**High Voltage Shutdown:** 31 volts

**Low Voltage Shutdown:** 21.6 volts

**Regulator Power Requirement:** 480 mA

**Regulator Dimensions:** 4.8"L x 3.25"W x 1.5"H

**Ship Weight:** 1.5 lbs. (regulator only),  
2.0 lbs. (MC-624-H)

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