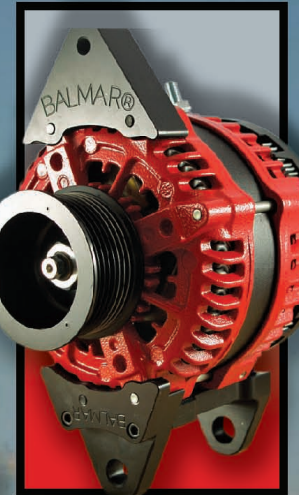
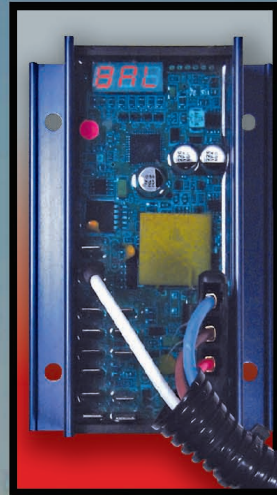
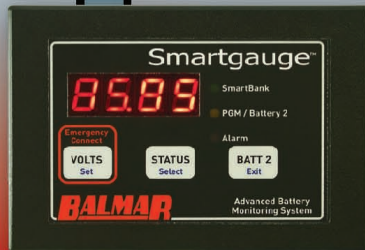
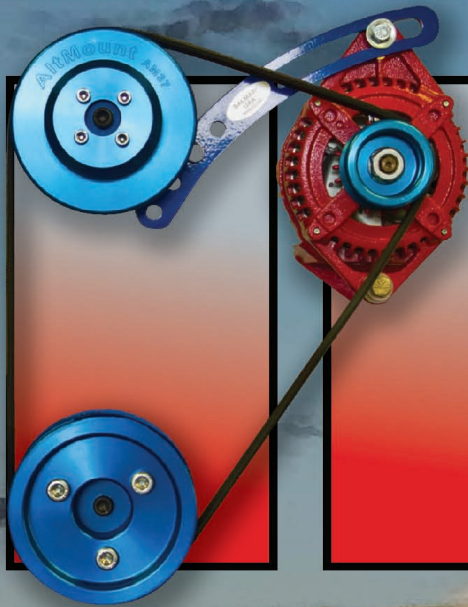


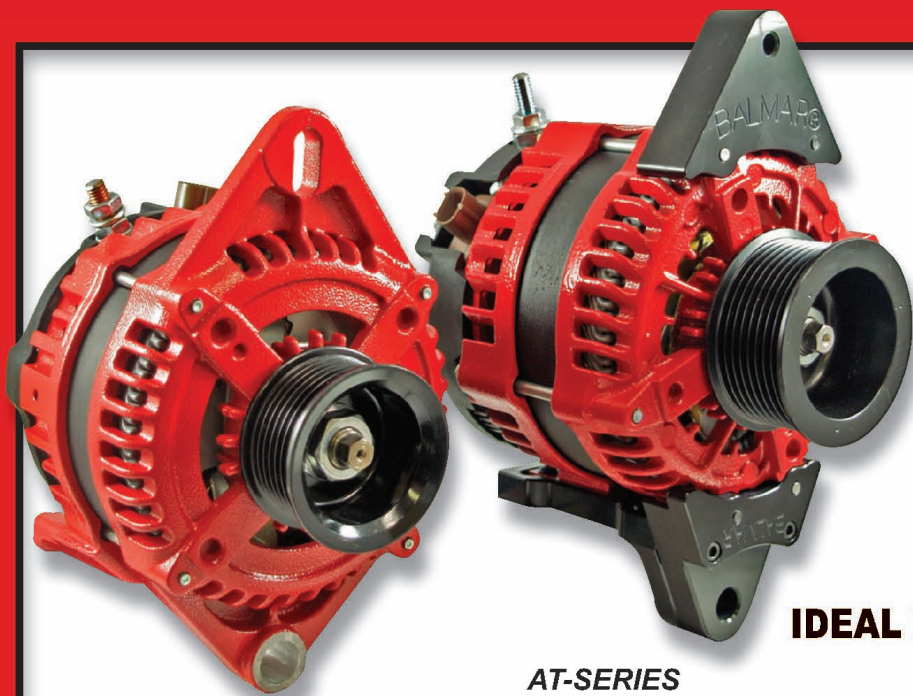
AltMount™

BALMAR

Performance Power Systems



2015



AT-SERIES ALTERNATORS

DUAL FAN COOLING
UP TO 125A AT IDLE
25% MORE EFFICIENT
HIGH AIRFLOW FRAME
MOST POPULAR MOUNTS

IDEAL FOR HIGH TECH BATTERIES

AT-SERIES

ADVANCED TECHNOLOGY ALTERNATORS

Welcome to the newest generation of high output alternator technology! Balmar AT-Series alternators bring together the latest innovations in alternator design to deliver incredible charging power in a compact, marine friendly package.

AT-Series alternators feature a unique hairpin stator design which uses densely-wound square copper wire to generate exceptional output in the smallest area possible. Hairpin stators feature 96 slots, compared to 36 slots in S-wound stators, allowing the hairpin wound stator to develop superior electromagnetic energy and efficiency superior to other traditional alternator designs.

New AT-Series alternators feature a dozen 50-amp capacity, externally-mounted avalanche diodes, dual internal fans, and massive heat sinking designed to ensure essential cooling under high load demands.

Scaled to fit in most original-position installations, 165-amp AT-Series alternators are available in 3.15" ID or 4" ID dual foot, and 1" and 2" single-foot mounting styles. Larger, 200-amp alternators are housed in a 139 mm diameter frame and feature a single 2" mounting foot or a 3.15" ID or a 4" ID dual foot mount.

AT-Series alternators are designed to be used with Max Charge MC-614 voltage regulators, and should only be used in dual vee belt or multi-groove serpentine belt applications. New Balmar serpentine pulley kits provide the ability to upgrade many engine models to support AT-Series alternators.



**TRADITIONAL
S-WOUND STATOR**



**ADVANCED
HAIRPIN STATOR**

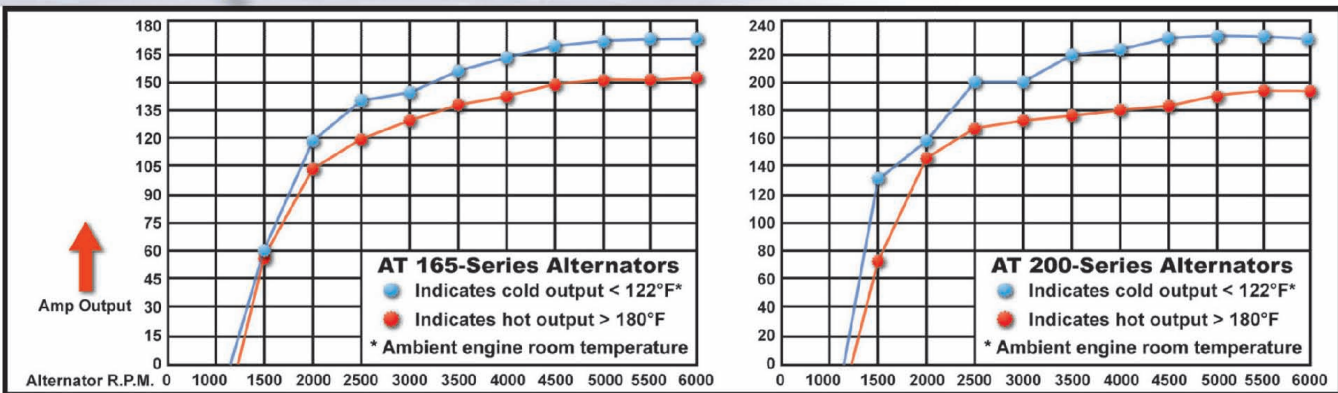
**SEE PAGE 7 FOR DETAILED ALTERNATOR MOUNTING
AND SIZING RECOMMENDATIONS**

AT-SERIES ALTERNATOR PACKAGES



AT-Series packages combine high output 165-amp or 200-amp AT-Series alternators with our intelligent MC-614 multi-stage regulator, along with alternator and battery temperature sensors, to deliver a pre-matched system that's ready to take on the tough charging challenges. Packages are available in single-foot, or dual-foot saddle style mounting configurations.

- **ENGINEERED FOR HIGH-DEMAND ELECTRICAL SYSTEMS**
- **EXTREME LOW-RPM OUTPUT**
- **SINGLE-FOOT AND DUAL-FOOT SADDLE MOUNTS**

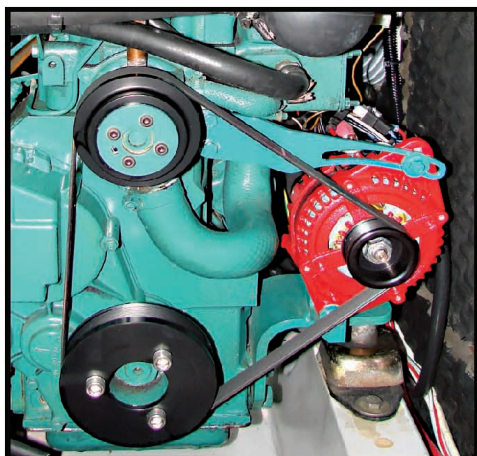


AT-Series Alternators						
Model #	Mounting Style	Alt. Output @ 2,000 rpm (Idle)*	Alt. Output @ 6,000 rpm (Cruise)	Max. Rated Output Amps	Frame Diameter	Voltage Regulation
AT-SF-165-12-IG	Sgl. Ft. 1 1/2"	75	155	165A	129mm	External only
AT-SF-200-12-IG	Sgl. Ft. 2"	125	189	200A	139mm	External only
AT-DF-165-12-IG	Dual Ft. 3.15"ID	75	155	165A	129mm	External only
AT-DF-200-12-IG	Dual Ft. 3.15"ID	125	189	200A	139mm	External only
AT-DF4-165-12-IG	Dual Ft. 4" ID	75	155	165A	129mm	External only
AT-DF4-200-12-IG	Dual Ft. 4"ID	125	189	200A	139mm	External only

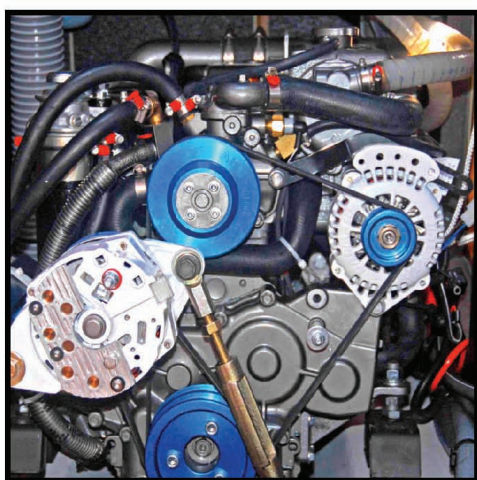
AT-Series Packages	
Model #	Description
AT-SF-165-12-MC-KIT	Single Foot (1" or 2") 165A alternator, MC-614-H voltage regulator & harness, MC-TS-A, MC-TS-B
AT-DF-165-12-MC-KIT	Dual Foot (3.15"ID Saddle) 165A alternator, MC-614-H voltage regulator & harness, MC-TS-A, MC-TS-B, 6-0020 hardware kit
AT-SF-200-12-MC-KIT	Single Foot (2") 200A alternator, MC-614-H voltage regulator & harness, MC-TS-A, MC-TS-B
AT-DF-200-12-MC-KIT	Dual Foot (3.15"ID Saddle) 200A alternator, MC-614-H voltage regulator & harness, MC-TS-A, MC-TS-B, 6-0020 hardware kit
AT-DF4-165-12-MC-KIT	Dual Foot (4" ID Saddle) 165A alternator, MC-614-H voltage regulator & harness, MC-TS-A, MC-TS-B
AT-DF4-200-12-MC-KIT	Dual Foot (4" ID Saddle) 200A alternator, MC-614-H voltage regulator & harness, MC-TS-A, MC-TS-B

SERPENTINE PULLEY CONVERSION KITS SECOND ALTERNATOR BRACKET KITS

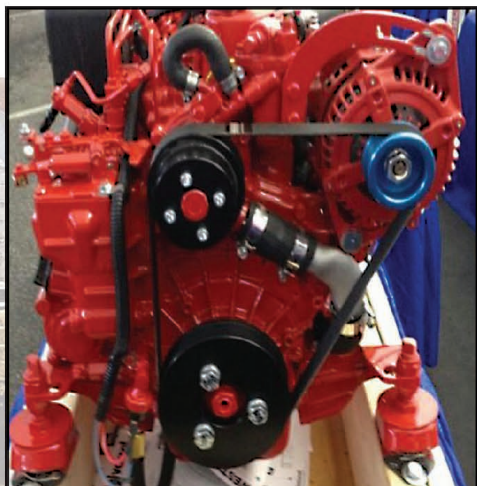
AltMount™



Volvo D2040



Yanmar 4JH4



WESTERBEKE 30C



Balmar is proud to announce the addition of AltMount to the Ballard Commercial Industries family of companies.

Since its introduction in 2008, AltMount has been a leading designer and manufacturer of aftermarket serpentine pulley kits for marine diesel engines. Our acquisition of AltMount allows us to expand the range of available pulleys based on AltMount's proven, patented designs.

Crafted from aircraft grade aluminum alloy and treated with high-quality anodizing, AltMount pulleys install easily and deliver a marked improvement in power transfer while reducing noise and engine vibration.

In addition to pulley kits, which allow the user to increase the output capacity of the original position alternator, the AltMount second alternator kits provide the ability to add a high-output second alternator for increased charging output. These kits are an ideal upgrade for serious cruisers and others that depend on the propulsion engine for substantial battery charging needs.

ALTMOUNT SERPENTINE PULLEY CONVERSION KITS

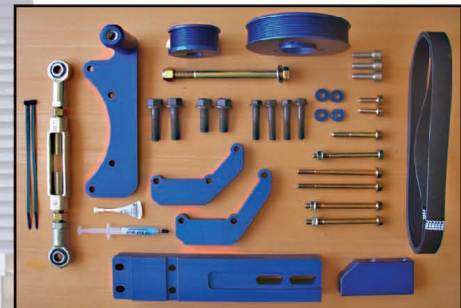
Serpentine Conversion Kit

Second Alternator Kit

YANMAR SERPENTINE PULLEY KITS	
Model	Engine Model(s)
48-YSP-6LY-A	6LY, 6LYA-STP, 6LY2-STP
48-YSP-4JH-A	4JH5
48-YSP-4JH-B	4JH4HTE, TE, DTE
48-YSP-4JH-C	4JH4-E
48-YSP-4JH-D	4JH3, TE, HTE
48-YSP-4JH-E	4JH2, TE, HTE, DTE, UTE
48-YSP-4JH-F	4JHE, TE, HTE, DTE
48-YSP-4JH-G	4JH
48-YSP-4LH-A	4LH-A
48-YSP-3JH-A	3JH5
48-YSP-3JH-B	3JH4-E
48-YSP-3JH-C	3JH2-TE
48-YSP-3JH-D	3JH2-E
48-YSP-3JH-E	3JH3
48-YSP-2GM-A	2GM20
48-YSP-3GM-A	3GM30
48-YSP-3GM-B	3GM30-F
48-YSP-3HM-A	3HM35
48-YSP-3GM-D	3GM-F
48-YSP-3GM-C	3GM
48-YSP-3HM-B	3HM35-F
48-YSP-3HM-C	3HM
48-YSP-3HM-D	3HM-F
48-YSP-3YM-A	3YM20
48-YSP-3YM-B	3YM30
48-YSP-2YM-A	2YM15
UNIVERSAL SERPENTINE PULLEY KITS	
48-USP-M-A	M-25XP
48-USP-M25	M-25
48-USP-M25XPB	M-25XPB
48-USP-M-B	M-35
48-USP-M35B	M-35B
48-USP-M40B	M40B
48-USP-M-50	M-50
48-USP-M50	M50
48-USP-M50A	M50A
48-USP-M50B	M50B
48-USP-5432	5432
48-USP-5444	5444

PERKINS SERPENTINE PULLEY KITS	
Model	Engine Model(s)
48-PSP-410-A	4107
48-PSP-410-B	4108
48-PSP-PR-A	PRIMA
48-PSP-6.345	6.354
VOLVO SERPENTINE PULLEY KITS	
48-VSP-TD-A	TMD-22
48-VSP-D2-A	D2-55A,B,C,D,E,F
48-VSP-PR-A	PRIMA
48-VSP-MD-A	MD2030
48-VSP-MD-B	MD2040
48-VSP-2001	2001
48-VSP-2002	2002
48-VSP-2003	2003
WESTERBEKE SERPENTINE PULLEY KITS	
48-WSP-12C	12C
48-WSP-12D	12D
48-WSP-13A	13A
48-WSP-18	18
48-WSP-20B	20B
48-WSP-21	21
48-WSP-21A	21A
48-WSP-27	27
48-WSP-27A	27A
48-WSP-30-B	30-B
48-WSP-30-C	30-C
48-WSP-33	33
48-WSP-35B	35B
48-WSP-38B	38B
48-WSP-W40	W40
48-WSP-42B	42B
48-WSP-W44-A	W44A
48-WSP-W44-B	W44B
48-WSP-W46	W46
48-WSP-55B	55B
48-WSP-55C	55C
48-WSP-55D	55D
48-WSP-W71	W71
48-WSP-W82	W82

SECOND ALTERNATOR KITS (FOR USE WITH BALMAR 95-SERIES ALTERNATORS ONLY)	
48-YDA-4JH-A	YANMAR 4JH3
48-YDA-4JH-B	YANMAR 4JH4-HTE, TE
48-YDA-4JH-C	YANMAR 4JH4-E
48-YDA-6LY-A	YANMAR 6LY, 6LY-2
VETUS SERPENTINE PULLEY KITS	
48-VSP-M4.17	M4.17
NANNI SERPENTINE PULLEY KITS	
48-NSP-3.3	N3 30
48-NSP-4.5	N-4.5
48-NSP-4.6	N-4.6
48-NSP-4.8	N4.38
48-NSP-4.85	N4.85
48-NSP-100	N100
ALTERNATOR PULLEY ONLY	
48-AM-38	6 Series Alternator
48-AM-39	95 Series Alternator
48-AM-97	Hitachi Alternator
48-AM-102	7 Series Alternator
48-AM-106	AT Series Alternator



New pulley, tensioner, spares kits and bracket kits are currently under development. Visit us at www.balmar.net, or contact us for updated information if your engine is not currently supported in these listings.

SMARTGAUGE™ BATTERY MONITOR

Balmar's new Smartgauge™ Battery Monitor provides at-a-glance information, so you can enjoy accurate and reliable updates on the condition of your batteries. Based on years of experienced engineering and rigorous, independent testing, the Smartgauge delivers dependable data even as your batteries experience extended use and cycling.



Easy to install, and just as easy to program, the Smartgauge™ takes much of the mystery out of battery monitoring; just select the program that matches your battery type, and the Smartgauge™ automatically configures monitoring to your electrical system.

Because of its proprietary computer modeling and battery testing techniques, the Smartgauge™ remains accurate without need for re-synchronization.

The bright LED display and simple controls provide a user interface that's intuitive and understandable, even for the most inexperienced crew member.

Smartgauge™ is equipped with low and high voltage and low charge state alarm outputs which can be used to activate audible or visual alerts (buzzers or lamps), or as a trigger for auto-starting a genset. The Smartgauge™ can be used in 12-volt or 24-volt charging systems. Two-year limited warranty.

PROVEN ACCURATE IN INDEPENDENT TESTING TO WITHIN 3% OVER SIX MONTH'S USE!

DISPLAYS BATTERY VOLTAGE AND STATE OF CHARGE FOR YOUR HOUSE BATTERY BANK - AND VOLTAGE FOR YOUR ENGINE STARTING BATTERY

EXTREMELY EASY TO INSTALL AND USE.

AUTOMATICALLY ADJUSTS FOR 12-VOLT OR 24-VOLT SYSTEMS

ALARMS FOR HIGH AND LOW BATTERY VOLTAGE AND LOW CHARGE STATE

BRIGHT, EASY-TO-READ LED DISPLAY

REQUIRES NO SHUNT OR COMPLEX CABLING - JUST TWO OR THREE WIRES REQUIRED FOR INSTALLATION

LOW VOLTAGE AND CAPACITY ALARM CAN ACTIVATE A RELAY FOR GENSET AUTOSTART FUNCTIONALITY

Smartgauge™ Advanced Battery Monitoring System					
Model	Voltage Range	Temperature Range	Current Draw (Sleep/On)	Battery Programs For	Dimensions
44-SG-12/24	8-40VDC	-25° to 85°C (-13° to 185°F)	5mA/<15mA	Gel, AGM, Std. Flooded, Deep Cycle Flooded, Sealed Maintenance Free, Lead Acid Hybrid	4.3"W x 3.0"H x 1.0"D

LIKE US ON  FOR THE LATEST PRODUCT AND COMPANY INFO!

SELECTING YOUR BALMAR CHARGING SYSTEM

ALTERNATOR MOUNTING STYLES

A primary issue to consider when determining the proper charging system – alternator mounting style – usually falls into one of four possibilities: **(A)** single 1"-foot (Motorola-Style) spindle mount, **(B)** single 2"-foot (Delco-Style) spindle mount, **(C)** 3.15" ID saddle (Hitachi-style) mount, and **(D)** 4"ID saddle (J-180 style) mount. The vast majority of marine gasoline and diesel engines will use one of these four mounting styles. The list below provides a guide for many engine applications, yet we strongly recommend you compare your existing alternator to the alternators at right to ensure a proper match. In some cases, additional spacing or modification to mounting components may be necessary to ensure proper fit or alignment. A full list of alternator dimensions is provided on Page 23 of the Product Guide. While Balmar makes every effort to provide an OEM-compatible product, "drop in" alternator replacement is not guaranteed.

Mounting Style	Typical Compatible Engine Types (By Manufacturer)
1" Spindle (Motorola)	Hino, Lehman, Caterpillar, Atomic 4, Universal, Ford, Crusader, Pathfinder, Westerbeke, Motorola-equipped
2" Spindle (Delco)	Volvo, Cummins, Westerbeke, Perkins, Mercruiser, Yanmar (6LP), Volvo-Penta, GM, Delco-equipped
3.15"ID Saddle Mt.	Mercruiser, Lehman, Yanmar, Westerbeke, Perkins-Sabre, Hitachi-equipped
4"ID Saddle Mt.	Detroit Diesel, Cummins, Caterpillar, John Deere, J-180 Off-Engine Mounts

As indicated in the chart, alternator mounting styles may vary among engine manufacturer's models and by model year. The best way to ensure that you are ordering the proper replacement for your alternator is to verify your engine's mounting configuration and alternator dimensions prior to purchasing your Balmar replacement alternator.

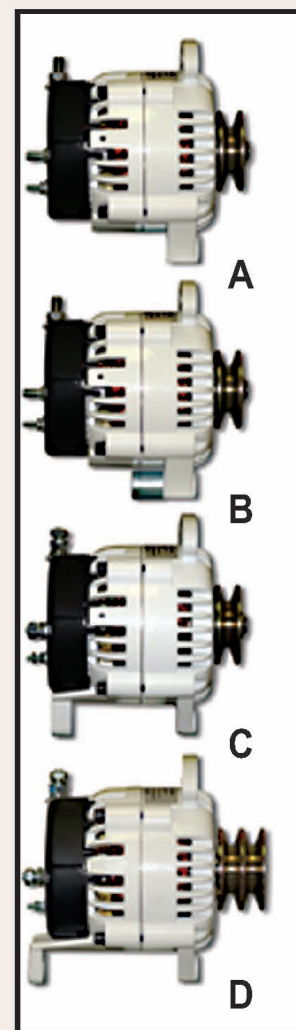
BELT TYPES & SIZES

Engine drive belt width is also a critical factor when selecting a Balmar replacement alternator. Vee belts and multi-groove serpentine belts have specific limitations in regard to amperage and horsepower loads they can support. As a rule of thumb, a 12-volt alternator's ratio of amperage output to horsepower load is 25:1. In other words, an alternator that's producing 25 amps will apply approximately one horsepower of load to its drive belt. When installing an alternator upgrade, it's essential that the alternator selected is limited to the capacity of its drive belt. Failure to do so will result in premature belt wear, belt slippage, and potential damage to the alternator and engine. The following chart provides a general guideline for alternator selection, based on belt type and width. Note that dual vee belts and serpentine belts support substantially larger loads:

Belt Type	Belt Width	Max HP Load	Highest Recommended Alternator Output
Sgl. Vee	3/8"	3.5	80-Amp @ 12-Volt, 30-Amp @ 24-Volt
Sgl. Vee	1/2"	4.5	100-Amp @ 12-Volt, 45-Amp @ 24-Volt
Dual Vee	1/2"	12	310-Amp @ 12-Volt, 220-Amp @ 24-Volt
Serpentine	6-Groove	N/A	210-Amps @ 12-Volt, 100-Amps @ 24-Volt
Serpentine	8-Groove	N/A	310-Amps @ 12-Volt, 220-Amps @ 24-Volt

BATTERY TECHNOLOGY

Each marine battery type, whether it's a gel, Absorbed Glass Mat (AGM), deep-cycle flooded or standard flooded starting battery, has its own unique charging characteristics which impact on the type and size of alternator needed to ensure optimal charging efficiency. Where a deep-cycle flooded battery is able to accept approximately 25 percent of its available capacity, an AGM battery may accept as much as 50 percent of available capacity. As such, an AGM bank of equal capacity to a deep-cycle flooded bank may demand twice the amount of alternator output. Newer technologies, such as Lithium Ion and TPPL batteries feature even greater demands due to their nearly unlimited acceptance rates.



SELECTING YOUR BALMAR CHARGING SYSTEM

BATTERY TECHNOLOGY (CONTINUED)

As a result, these newer battery types MUST be charged with a large case or extra-large case alternator due to their nearly limitless demands. Balmar has responded to the unique needs of these new battery technologies with lithium-ready alternator/regulator combinations designed to meet the needs of these new batteries.

BATTERY CAPACITY

In addition to battery technology, battery bank capacity has a dramatic impact on the size and type of alternator required to keep the batteries healthy. House battery capacity is usually calculated based on the ability to meet approximately three day's worth of typical demand -- or more, if the vessel is unlikely to be plugged into shore power charging for extended periods.

The chart at right provides typical DC marine loads. Accurate load calculations require precise measurement of your vessel's equipment. Refer to equipment manuals for actual load ratings, or consult with a qualified marine electrician to determine your actual needs. Keep in mind that every 100 amps of discharge will require 115 amps of charging current to replenish.

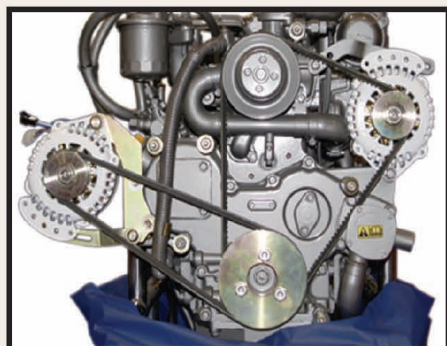
In most cases, alternator output should be equal to the maximum available capacity of your battery bank. In other words, if your house battery bank is made up of deep cycle flooded batteries with a capacity rating of 400 amp/hours, the maximum acceptance rate of those batteries would be approximately 25 percent, or 100 amps; the ideal alternator would also be rated at 100 amps. On the other hand, if your house bank consists of 400 amp/hour capacity AGM batteries, the maximum available capacity would be approximately 45 percent of 400, or roughly 180 amp hours. To maximize charging efficiency, a 180-amp rated alternator would be required. Unfortunately, in many vessels, mounting a large-case alternator is not feasible.

LIMITATIONS ON ALTERNATOR OUTPUT

The size and type of alternator drive belt may limit the rated output of the alternator you choose. If your battery capacity is substantially larger than the output allowed based on belt size, it may be necessary to reduce loads in order to lessen the required battery capacity, or it may be necessary to modify the engine pulley system to allow the use of a larger belt, or multiple belts to drive the alternator.

Many boaters have found that adding a second alternator to their engine provides an excellent solution for charging large battery banks, and several companies offer bracket and pulley sets to support second alternator installations. Balmar's Max Charge voltage regulators offers sufficient field output capability to control two alternators at once. Balmar's new MC-612-DUAL multi-stage regulator has two field output terminals and temperature sensing for two alternators, making it the perfect charge control solution for single-engine, dual-alternator. Visit www.balmar.net for more information.

In twin engine applications, Balmar's Centerfielder II offers an excellent solution for balanced charge control over dual alternators. By monitoring port and starboard alternators and regulators, and controlling field output to both alternators, the Centerfielder II makes it possible to direct the combined output from both alternators to charge a central house battery bank.



Please note: when using the Centerfielder II in any twin engine application, it is essential that it is used in conjunction with Max Charge MC-614 or MC-624 regulators only. DO NOT use MC-614 regulators with older Centerfielder units.

For more information about installing and operating Balmar alternators, regulators, and other Balmar products, visit the Online Manuals section of the Balmar website (www.balmar.net/manuals.html).

Typical DC Electrical Loads	
(Shown In Amps Per Hour)	
VHF Receive	1.5
VHF Transmit	5.0
CB Receive	1.0
CB Transmit	5.0
SSB Receive	1.5
SSB Transmit	25.0
Depth Finder	1.0
GPS	.50
Radar	4.0
Video Sounder	4.0
Weather Fax	2.5
Laptop Computer	6.0
Auto Pilot	4.0
Knot Meter	.10
Wind Speed	.10
Anchor Light	1.0
Steaming Light	1.0
Running Light	3.0
Strobe	.75
Tricolor	2.0
Bilge Pump	5.0
Head	50.0
Wash Down Pump	10.0
Refrigerator	5-10
Hand Spotlight	10.0
Spreader Light	8.0
Small TV	8.0
Large TV	25.0
DVD Player	8.0
Satellite Receiver	12.0

SMALL CASE ALTERNATORS

SMART READY® 6-SERIES

RECREATIONAL DUTY SMALL FRAME ALTERNATORS

We may get in hot water with certain fast food king – but there’s no question that Balmar’s 6-Series alternator is engineered to let you “have it your way”.

Available in outputs ranging from 70 amps to 150 amps, in 12-volt and 24-volt configurations, 6-Series alternators feature patented Smart Ready® internal voltage regulation that allows you to choose between stand alone internally regulated operation, or use with Balmar’s multi-stage Max Charge or ARS-5 voltage regulators to get the most out of your charging system.

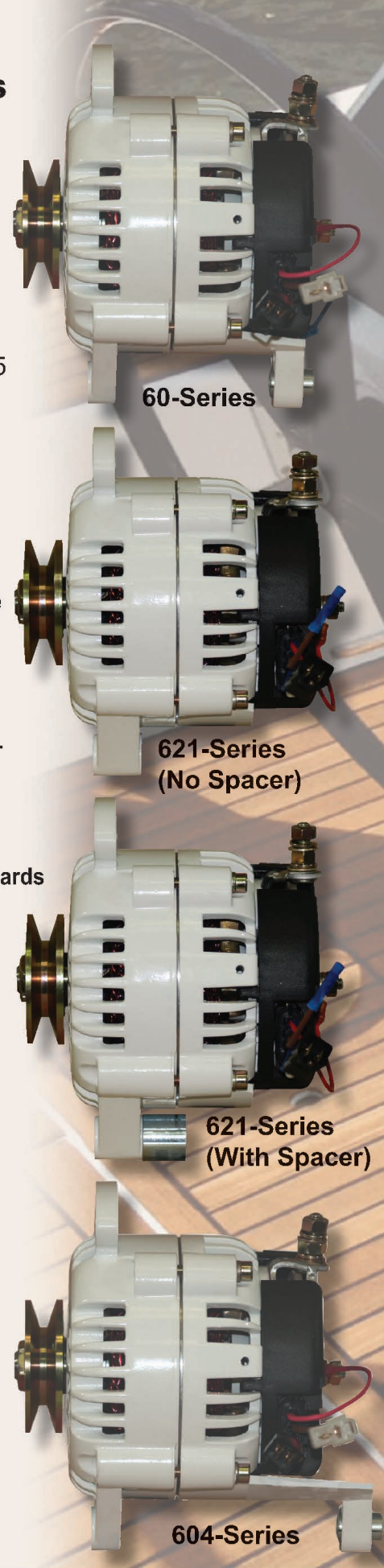
Balmar’s 6-Series alternators come in four mounting styles to fit just about any marine gas or diesel engine application; a 3.15" I.D. saddle style mount that’s perfect for most Yanmar engines and other applications using an Hitachi-type dual foot mount, a spindle style single foot mount that easily converts to replace 1" Motorola or 2" Delco-style mounts, and a 4" I.D. saddle mount for J-180-style engine configurations.

All Smart Ready 6-Series alternators come standard with dual internal cooling fans, fixed voltage internal regulation, dedicated isolated ground, lamp circuit, and multi-position tensioning crown. Durable white powdercoat finish keeps your alternator looking ship-shape. Meets USCG Title 33, J1171, ignition protection standards. One-year limited warranty.

- Patented Smart Ready® regulator
- Isolated ground termination
- For gas or diesel engines
- Safe to 15,000 RPM
- Meets multiple ignition standards
- Constructed in USA
- Four popular mounts
- 12V and 24V models

6-SERIES ALTERNATORS ARE AVAILABLE AS PART OF A CHARGING SYSTEM PACKAGE. SEE PAGE 14 FOR DETAILS.

Model #	Mounting Style	Output Amps/Volts	Includes Regulator	Minimum Belt Width
621-70-SR-IG	Sgl. Ft. 1 1/2"	70A, 12V	Yes	3/8"
621-100-SR-IG	Sgl. Ft. 1 1/2"	100A, 12V	Yes	1/2"
621-120-SR-IG	Sgl. Ft. 1 1/2"	120A, 12V	Yes	1/2" (2)
621-150-SR-IG	Sgl. Ft. 1 1/2"	150A, 12V	Yes	1/2" (2)
621-24-70-SR-IG	Sgl. Ft. 1 1/2"	70A, 24V	Yes	1/2" (2)
<hr/>				
60-70-SR-IG	3.15" Saddle	70A, 12V	Yes	3/8"
60-100-SR-IG	3.15" Saddle	100A, 12V	Yes	1/2"
60-120-SR-IG	3.15" Saddle	120A, 12V	Yes	1/2" (2)
60-150-SR-IG	3.15" Saddle	150A, 12V	Yes	1/2" (2)
60-24-70-SR-IG	3.15" Saddle	70A, 24V	Yes	1/2" (2)
<hr/>				
604-120-SR-IG	4" Saddle	120A, 12V	Yes	1/2" (2)
604-150-SR-IG	4" Saddle	150A, 12V	Yes	1/2" (2)
604-24-70-SR-IG	4" Saddle	70A, 24V	Yes	1/2" (2)



60-Series

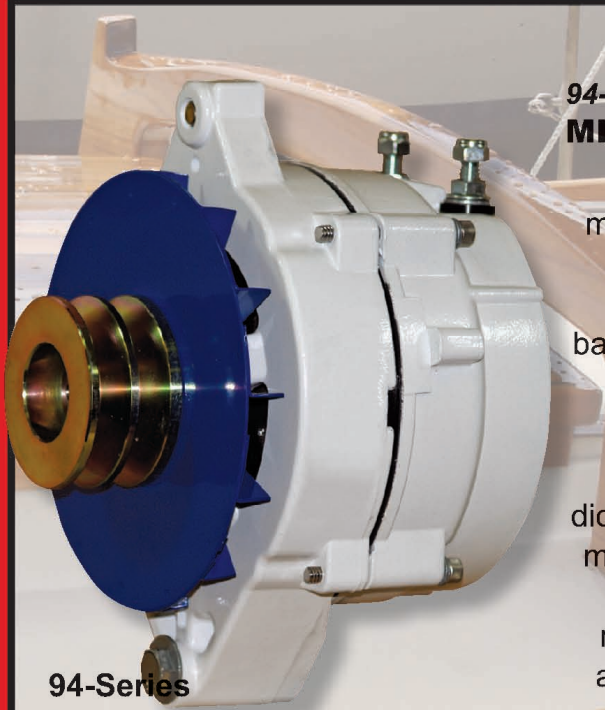
**621-Series
(No Spacer)**

**621-Series
(With Spacer)**

604-Series

LARGE CASE ALTERNATORS

94-SERIES MID-DUTY, LARGE FRAME ALTERNATORS



94-Series

From world-class ocean racers to commercial fishers and military patrol vessels, there aren't many applications where the 94-Series alternator hasn't been. This large-frame alternator has a proven record for supporting large house battery banks and challenging electrical loads under some of the toughest marine conditions imaginable.

These Delco-style, 2" single foot alternators feature extra-large gauge custom wound stators and high amperage diode packs to ensure optimal charging performance. Built to meet USCG Title 33 ignition protection standards, 94-Series alternators deliver excellent low rpm output and terrific response throughout the power band. Twelve-volt units are available in 165 and 210 amp rated outputs. A 24-volt, 140-amp unit is also available. One-year limited warranty.

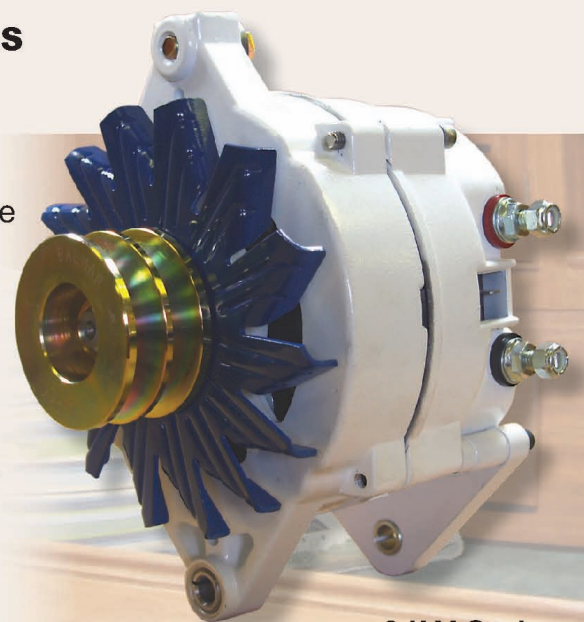
Model #	Mounting Style	Output Amps/Volts	Minimum Belt Width
94-12-165-IG	Sgl. Ft. 2"	165A, 12V	1/2" Dual
94-12-210-IG	Sgl. Ft. 2"	210A, 12V	1/2" Dual
94-24-140-IG	Sgl. Ft. 2"	140A, 24V	1/2" Dual

- Isolated ground termination
- Extra heavy-duty windings, diodes & brushes
- Corrosion-resistant powdercoated finish
- Bi-directional cooling fan
- Assembled at Balmar in Arlington, WA

94LY-SERIES HITACHI®-MOUNT, LARGE FRAME ALTERNATORS

Designed to provide a sizeable charging upgrade for Yanmar's 440-horsepower 6LY-3 engines, the 94-LY combines the rugged dependability of the 94-Series alternator with the popular Hitachi 3.15" saddle mount while delivering as much as 210 amps of potential charging amperage for lobster boats, sportfishers and other vessels using the 6LY-3 and other similar diesels.

Built to meet USCG Title 33 ignition protection standards, 94LY-Series alternators are well equipped to meet large battery loads and onboard electrical demands. Twelve-volt units are available in 165 and 210 amp rated outputs. A 24-volt, 140-amp unit is also available. Uni-directional fan. Isolated ground. Dual vee pulley standard. Includes one-year limited manufacturer's warranty.



94LY-Series

Model #	Mounting Style	Output Amps/Volts	Minimum Belt Width
94LY-12-165-IG	Dual Foot 3.15"ID	165A, 12V	1/2" Dual
94LY-12-210-IG	Dual Foot 3.15"ID	210A, 12V	1/2" Dual
94LY-24-140-IG	Dual Foot 3.15"ID	140A, 24V	1/2" Dual
94LY-0050	Tensioner & Hardware Kit		

- Isolated ground termination
- Extra heavy-duty windings, diodes & brushes
- Corrosion-resistant powdercoat finish
- Bi-directional cooling fan
- Constructed at Balmar in the USA

OFFSHORE REPAIR KITS ARE AVAILABLE FOR MOST BALMAR ALTERNATORS. SEE PAGE 11 OR VISIT WWW.BALMAR.NET FOR DETAILS.

LARGE CASE ALTERNATORS

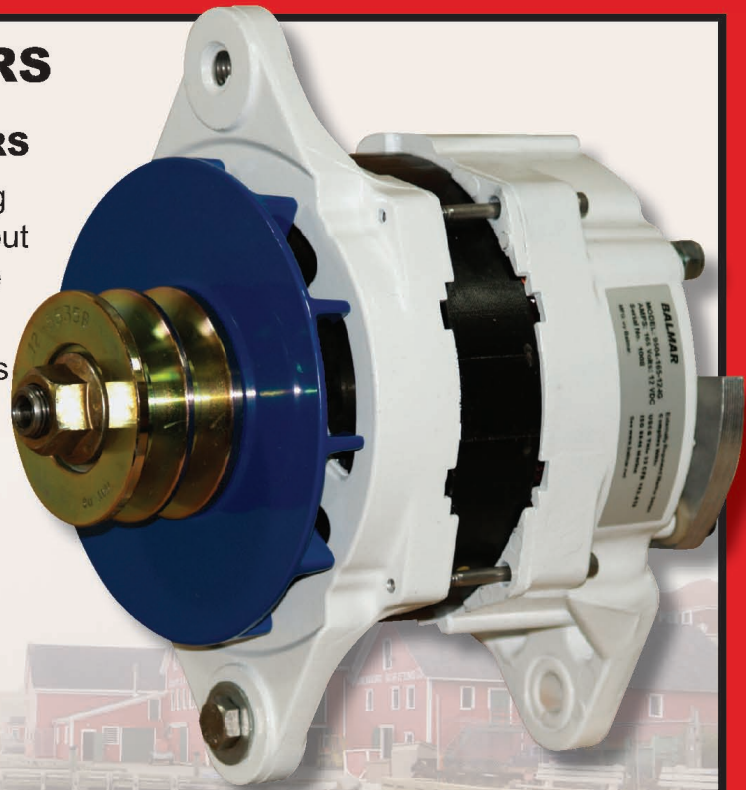
95-SERIES

MID-DUTY, LARGE FRAME ALTERNATORS

With a pedigree that's based in highly demanding military service, the 95-Series alternator stands out as a powerfully capable source of charging in the marine environment.

Despite its generous output curves, the 95-Series alternator is surprisingly compact, allowing it to be used in applications where similarly rated alternators would be impossible to install.

The 95-Series alternator features an isolated ground for sure continuity to system negative. A four-inch J-180 saddle is compatible with a wide number of original position engine mounts, and can be easily designed to work as a second-position mount. Outputs range from 165 amps to 210 amps at 12 volts, and 140 amps at 24 volts. Isolated ground termination. Meets USCG Title 33 standards. One-year limited warranty.



- Constructed at Balmar in Arlington, WA
- Extra heavy-duty windings, diodes & brushes
- Corrosion-resistant powdercoated finish
- Bi-directional cooling fan
- Precision cast aluminum frame

Model #	Mounting Style	Output Amps/Volts	Minimum Belt Width
9504-12-165-IG	Dual Foot (J180)	165A, 12V	1/2" Dual
9504-12-210-IG	Dual Foot (J180)	210A, 12V	1/2" Dual
9504-24-140-IG	Dual Foot (J180)	140A, 24V	1/2" Dual

PAGE 11 - 95-SERIES ALTERNATORS - WWW.BALMAR.NET - PHONE: 360-435-6100



OFFSHORE REPAIR KITS

Recommended for cruisers who stray from the beaten path, our Offshore Parts Kits ensure that you'll have high-quality replacements, should your alternator require repair. Kits vary by alternator model, but all provide the most commonly needed components; brushes, bearings, diodes, or complete rectifier assemblies.

INSTALLATION HARDWARE KITS

Pre-matched hardware kits for various Yanmar engines can save a ton of time and frustration. 6CX and 6LP kits include required pulleys.

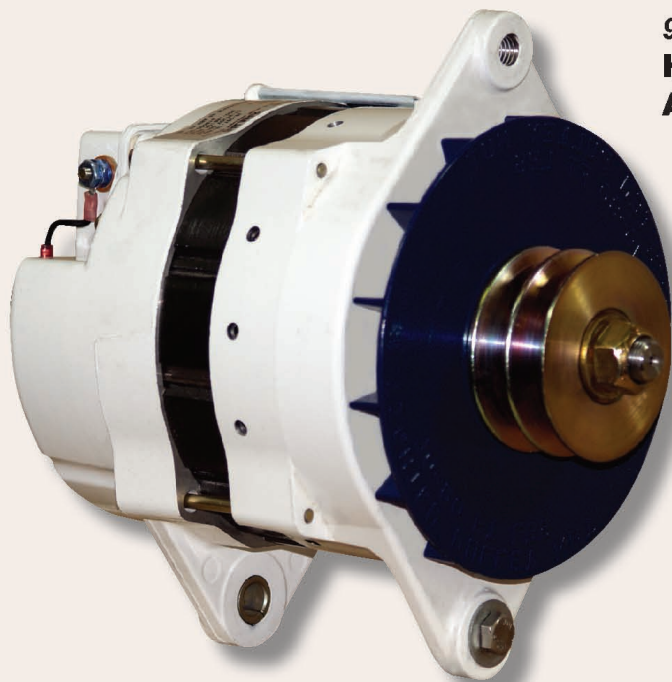
Model #	For Engine Model
6-0020	GM, JH,
6-0030	6CX
6-0040	6LP

Offshore Repair Kits		
Model	For Alternator Series	Includes
7060	6-Series -12 V	Bearings, brushes, regulator/rectifier assemblies.
7060-24	6-Series - 24 V	
7090	9-Series	Bearings, brushes, positive/negative diodes. <i>Note: 7090 Kit includes additional diodes for dual output models which may not be required for single output models.</i>
7094	94-Series	
7095	95-Series	
7097	97-Series	Call Balmar Customer Service for specific parts requirements.
70-AT-165	AT-Series - 165A	Bearings, brushes, rectifier assembly.
70-AT-200	AT-Series - 200A	Bearings, brushes, rectifier assembly.

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EXTRA LARGE CASE ALTERNATORS

97-SERIES HEAVY DUTY, EXTRA-LARGE FRAME ALTERNATORS



Built expressly for the added demands of large, multi-battery banks, inverter loads and other substantial electrical demands, extra-large case 97-Series brushless alternators provide the size, cooling and impressive output across the range of engine rpm required to perform in league with a small genset. Brushless 97-Series alternators deliver unexcelled electrical efficiency and a level of safety that meets U.S. Coast Guard Title 33, SAE J1171 standards for ignition protection. Isolated ground termination. Corrosion-resistant powdercoating. Bi-directional cooling fan. Maximum alternator rpm: 7,000.

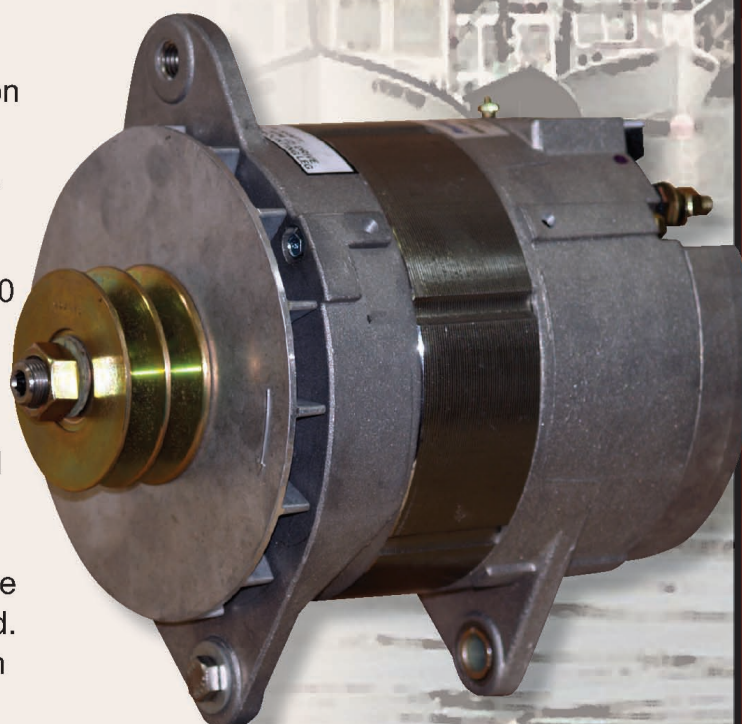
Model #	Mounting Style	Output Amps/Volts	Minimum Belt Width
9704-12-160-BL-IG	J-180 Dual Foot	160A, 12V	1/2" Dual
9704-24-140-BL-IG	J-180 Dual-Foot	140A, 24V	1/2" Dual

- Highly-efficient brushless design
- Designed for extended-duty operation
- Corrosion-resistant powdercoat finish
- Bi-directional cooling fan
- Made in the USA

97EHD-SERIES HEAVY DUTY, EXTRA-LARGE FRAME ALTERNATORS

Perfect as a dedicated alternator for extensive house battery loads, or as a primary alternator on large J-180 mount applications like Caterpillar, Cummins, MTU and John Deere diesel engines, extra heavy duty 97EHD alternators provide exceptional output across the board with ratings in excess of 250 amps at 12 volts and nearly 200 amps at 24 volts.

Housed in a non-powdercoated 6.5" diameter frame, 97EHD alternators are an excellent solution for sustained high output is an essential charging characteristic. Alternators are case ground, and feature bi-directional fan cooling. Positive and negative rectifier assemblies feature high amperage diodes. Dual vee belt is standard. All models require external regulation. Maximum alternator rpm: 7,000.



Model #	Mounting Style	Output Amps/Volts	Minimum Belt Width
97EHD-185-12	J-180 Dual Foot	185A, 12V	1/2" Dual
97EHD-265-12	J-180 Dual Foot	264A, 12V	1/2" Dual
97EHD-190-24	J-180 Dual Foot	190A, 24V	1/2" Dual

- For extra heavy duty electrical demands
- Designed for extended-duty operation
- Natural cast aluminum case
- Bi-directional cooling fan
- Made in the USA

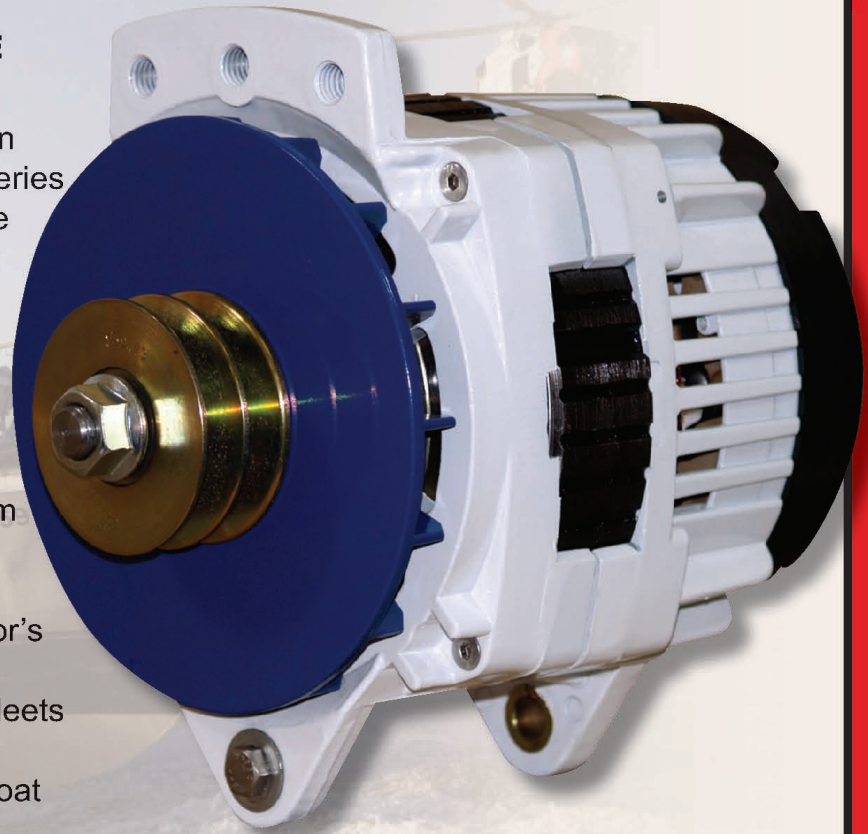
EXTRA LARGE CASE ALTERNATORS

98-SERIES

MAXIMUM DUTY, EXTRA-LARGE FRAME ALTERNATORS

With the ability to deliver performance in league with auxiliary gensets, the 98-Series alternator offers the capacity to produce nearly 5kW of DC output to make short work of big battery charging.

Available in 310A/12V and 220A/24V models, the 98-Series alternator combines a robust brushless design with dual inside/outside cooling fans to produce awesome power with maximum efficiency. High amperage diode, oversized bearings, dedicated isolated grounding add to this powerful alternator's impressive output and dependability. Requires external voltage regulation. Meets USCG Title 33, and SAE J1171 ignition protection standards. Durable powdercoat finish. One year limited warranty.

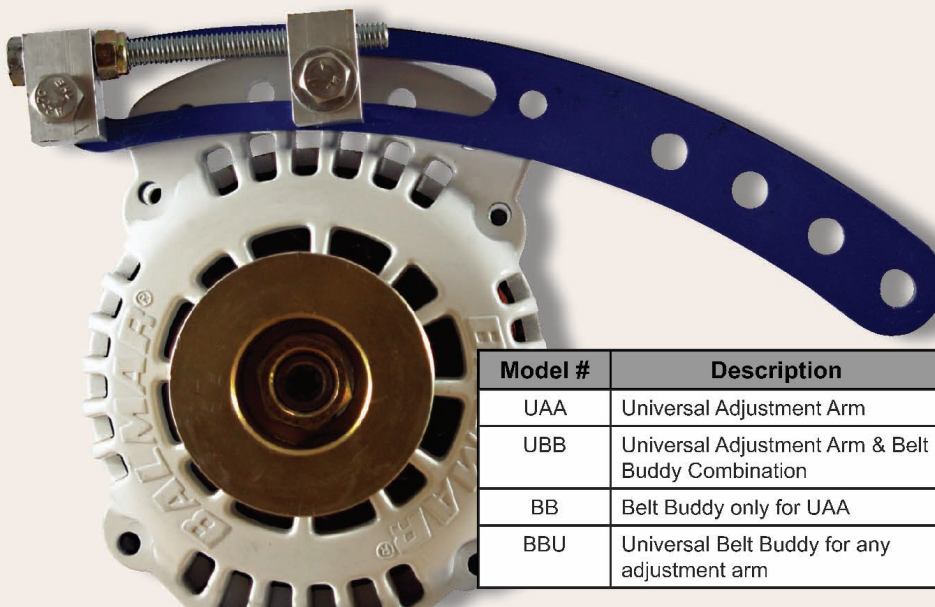


Model #	Mounting Style	Output Amps/Volts	Minimum Belt Width
98-12-310-IG-BL	J-180 Saddle	310A, 12V	1/2" Dual
98-24-220-IG-BL	J-180 Saddle	220A, 24V	1/2" Dual

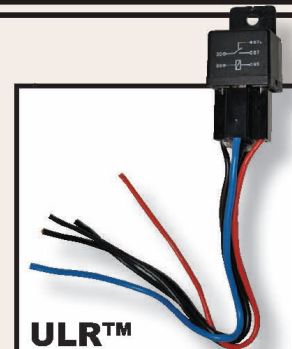
- Maximum Alternator RPM: 7,000.
- Powdercoated Cast Aluminum Case
- Bi-Directional Cooling Fans
- As Used On USCG 43' Motor Lifeboat

UNIVERSAL ADJUSTMENT ARM / BELT BUDDY

Many installers rely on the Universal Adjustment Arm (UAA) for alternator installations. Precision cut and powdercoated for protection from rust and corrosion, the UAA can be purchased alone, or with our new Belt Buddy belt tensioner device. UAA measures 11" x 1" x 1/4".



Model #	Description
UAA	Universal Adjustment Arm
UBB	Universal Adjustment Arm & Belt Buddy Combination
BB	Belt Buddy only for UAA
BBU	Universal Belt Buddy for any adjustment arm



ULR™ UNIVERSAL LAMP RELAY

Uses stator output to provide a signal to support your panel's lamp drive.

Use to complete other circuits to 30A whenever the alternator is in operation. Includes relay and wiring harness.

CHARGING SYSTEM PACKAGES

Charging system packages make it easier than ever to ensure that your alternator and regulator will match your engine with the least amount of installation headaches.

Note that any alternator/regulator packages featuring alternator output ratings in excess of 100 amps will require either dual-vee drive pulleys or multi-groove pulleys to ensure optimal output and limited belt wear. See pages 4 & 5 for information about new AltMount® Serpentine Pulley Kits.



AT-SERIES ALTERNATOR/REGULATOR PACKAGES

New AT-Series alternators, combined with the proven charge control of the MC-614 voltage regulator, provide the ideal charging solution for bigger house batteries and newer high-acceptance battery technologies. Packages include 165-amp or 200-amp AT-Series alternator, Max Charge MC-614 voltage regulator, alternator temperature sensor, battery temperature sensor. **VUP** Package can be used in 2" single-foot applications. **YP** Package includes a conversion bracket for use in 3.15" ID saddle-style mounts. AT Packages must be installed in dual belt, or serpentine belt systems.

6-SERIES ALTERNATOR/REGULATOR PACKAGES

Balmar's 6-Series alternators and multi-stage voltage regulators deliver faster, safer charging for batteries ranging from standard flooded to AGM technologies. Choose ARS-5 or Max Charge regulators to meet your preferred level of performance.

YP models fit engines using a 3.15" I.D. saddle mount. VUP models fit most engines using 1" or 2" single foot mounts. Kits include alternator, voltage regulator, battery and alternator temperature sensors and wiring harness. YP kits include mounting hardware.

Includes ARS-5 Regulator	Includes MC-614 Regulator	Includes MC-624 Regulator	Mounting Style	Output Amps/Volts	Minimum Belt Width
60-YP-70-SR-KIT	60-YP-MC-70-SR-KIT	N/A	3.15" Saddle	70A, 12V	Single 3/8"
60-YP-100-SR-KIT	60-YP-MC-100-SR-KIT	N/A	3.15" Saddle	100A, 12V	Single 1/2"
60-YP-120-SR-KIT	60-YP-MC-120-SR-KIT	N/A	3.15" Saddle	120A, 12V	Dual 1/2"
60-YP-150-SR-KIT	60-YP-MC-150-SR-KIT	N/A	3.15" Saddle	150A, 12V	Dual 1/2"
N/A	N/A	60-YP-24-70-SR-KIT	3.15" Saddle	70A, 24V	Dual 1/2"
621-VUP-70-SR-KIT	621-VUP-MC-70-SR-KIT	N/A	1" or 2" Spindle	70A, 12V	Single 3/8"
621-VUP-100-SR-KIT	621-VUP-MC-100-SR-KIT	N/A	1" or 2" Spindle	100A, 12V	Single 1/2"
621-VUP-120-SR-KIT	621-VUP-MC-120-SR-KIT	N/A	1" or 2" Spindle	120A, 12V	Dual 1/2"
621-VUP-150-SR-KIT	621-VUP-MC-150-SR-KIT	N/A	1" or 2" Spindle	150A, 12V	Dual 1/2"
N/A	N/A	621-VUP-24-70-SR-KIT	1" or 2" Spindle	70A, 24V	Dual 1/2"
N/A	AT-DF-MC-165-KIT	N/A	3.15" Saddle	165A, 12V	Dual 1/2"
N/A	AT-DF-MC-200-KIT	N/A	3.15" Saddle	200A, 12V	Dual 1/2"
N/A	AT-SF-MC-165-KIT	N/A	1" or 2" Spindle	165A, 12V	Dual 1/2"
N/A	AT-SF-MC-200-KIT	N/A	2" Spindle	200A, 12V	Dual 1/2"

ALTERNATOR OUTPUT CURVES

Alternator output is dependent on a number of factors; battery condition and capacity, wire size, engine horsepower and engine rpm, battery temperature, and alternator temperature. Of those factors, alternator rotation speed and alternator temperature are the most important.

The following chart breaks down alternator output based on two temperature levels; cold (with an ambient temperature of 26°C, and hot (with an ambient temperature of 90°C). Note that output values are based on alternator RPM, not engine RPM.

ALTERNATOR POWER CURVES BY MODEL												
ALTERNATOR RPM		1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000
ALTERNATOR MODEL	TEMP.											
6-SERIES 12-VOLT 70-AMP MODELS	COLD	0	20	68	73	77	78	77	77	76	77	77
	HOT	0	15	56	63	65	66	65	65	66	66	65
6-SERIES 12-VOLT 100-AMP MODELS	COLD	0	40	83	100	106	110	104	106	108	109	108
	HOT	0	30	70	80	93	93	93	93	94	93	93
6-SERIES 12-VOLT 120-AMP MODELS	COLD	0	21	80	116	121	122	125	125	124	124	125
	HOT	0	20	60	98	105	108	109	110	110	108	109
6-SERIES 12-VOLT 150-AMP MODELS	COLD	0	85	126	145	151	155	154	154	155	156	155
	HOT	0	75	115	125	136	138	137	137	140	138	138
6-SERIES 24-VOLT 70-AMP MODELS	COLD	0	6	36	55	68	71	73	76	76	75	76
	HOT	0	3	25	40	50	53	53	56	54	56	55
AT-SERIES 165-AMP MODEL	COLD	0	60	119	140	145	156	164	167	169	170	172
	HOT	0	59	103	120	130	140	142	149	150	151	153
AT-SERIES 200-AMP MODEL	COLD	0	132	158	198	190	222	228	230	232	235	238
	HOT	0	73	147	168	173	174	179	182	188	193	194
94/94LY-SERIES 12-VOLT, 165-AMP MODEL	COLD	0	20	60	89	112	128	140	151	158	163	168
	HOT	0	10	50	72	89	104	109	122	139	142	148
94/94LY-SERIES 12-VOLT, 210-AMP MODEL	COLD	0	21	78	103	128	147	162	178	191	208	210
	HOT	0	15	68	82	103	120	131	142	161	170	175
94/94LY-SERIES 24-VOLT, 140-AMP MODEL	COLD	0	8	15	38	50	70	77	96	124	131	135
	HOT	0	0	10	30	40	58	65	75	92	105	110
95-SERIES 12-VOLT, 165-AMP MODEL	COLD	0	18	76	103	122	130	135	138	142	150	158
	HOT	0	9	58	80	90	105	115	118	121	122	127
95-SERIES 12-VOLT, 210-AMP MODEL	COLD	0	40	45	100	125	143	155	170	183	190	195
	HOT	0	35	40	80	115	120	135	142	150	158	161
95-SERIES 24-VOLT, 140-AMP MODEL	COLD	0	7	14	38	55	65	85	100	113	120	133
	HOT	0	5	12	35	50	60	78	95	100	105	110
97-SERIES 12-VOLT, 160-AMP MODEL	COLD	0	22	80	120	140	153	160	162	163	162	160
	HOT	0	18	115	100	120	140	145	148	145	148	148
97-SERIES 24-VOLT, 140-AMP MODEL	COLD	0	22	80	120	135	136	138	140	142	142	145
	HOT	0	18	62	100	115	123	123	123	128	131	138
97EHD-SERIES 12-VOLT, 185-AMP MODEL	COLD	0	100	141	159	165	174	179	183	186	186	184
	HOT	0	83	132	144	150	163	166	170	172	170	171
97EHD-SERIES 12-VOLT, 265-AMP MODEL	COLD	0	50	150	210	225	245	252	255	260	268	270
	HOT	0	30	120	182	186	194	204	212	218	221	221
97EHD-SERIES 24-VOLT, 190-AMP MODEL	COLD	0	40	100	148	168	180	188	193	198	199	198
	HOT	0	22	92	125	145	157	166	170	171	178	178
98-SERIES 12-VOLT, 310-AMP MODEL	COLD	0	36	150	235	262	278	290	295	315	322	320
	HOT	0	30	140	190	215	228	245	250	250	251	252
98-SERIES 24-VOLT, 220-AMP MODEL	COLD	0	36	100	145	167	180	190	195	205	210	220
	HOT	0	34	92	138	156	166	172	178	186	190	192

BALMAR VOLTAGE REGULATION

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

Smart, multi-stage Balmar voltage regulation provides a dynamic method for monitoring battery condition, and applying the correct level of alternator control to ensure that your batteries are charged quickly and safely.

Using advanced, microprocessor-controlled technology, Balmar multi-stage voltage regulators are engineered to precisely control alternator output to provide the optimal charging voltage based on battery type to bring batteries to a full charge. The process is simple, yet exceedingly effective.

During engine operation, the Balmar voltage regulator goes through the following stages to ensure proper battery charging:

- Step 1: Start Delay** - After engine start up, 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 alternator load is applied.
- Step 2: Soft Ramp** - The regulator slowly increases field excitation of the alternator to reduce belt stress.
- Step 3: Bulk Charging** - The regulator increases field output to the maximum safe level, allowing alternator to reach maximum amperage output based on the target limits of the battery type being charged. Target voltage ranges from 14.1 to 14.6 depending on battery program selected (24-volt bulk charging voltages range from 28.2 to 29.2 volts). Bulk time is factory set at 18 minutes, and is fully adjustable in advanced programming mode.
- Step 4: Calculated Bulk** - At the end of the set bulk time period, the regulator calculates the state of charging based on the alternator’s 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.
- Step 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.



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BALMAR VOLTAGE REGULATION

- Step 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 target voltage, and the percentage of field output required to maintain that voltage. This stage will maintain absorption charging voltage until all criteria are met, at which point, the regulator will ramp down to float voltage.
- Step 7: Float Voltage** - Typically a 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.
- Step 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 maintain 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 as indicated by steps 9, 10 and 11.

MULTI-STAGE REGULATOR FEATURES

USER-SELECTABLE PRESET BATTERY PROGRAMS

Every battery is different, so Balmar provides multiple charge profiles to ensure optimal charging. Simply select the battery program that matches your battery technology. Preset programs include profiles for standard and deep cycle flooded, gel, AGM, and spiral wound AGM (Optima) batteries. Max Charge regulators also provide a program for voltage sensitive halogen lighting systems.

ADVANCED PROGRAMMING MODES

Battery needs can change, as can their manufacturer's charging recommendations. That's why Balmar multi-stage voltage regulators feature a broad range of advanced regulator adjustments. By accessing the advanced programming function, the user can increase or decrease charging times and voltages in all stages of charge, increase or decrease start delay and temperature compensation limits, adjust temperature compensation slopes, and modify set points for alternator over-temperature response. It all adds up to the most user control possible.

BELT LOAD MANAGEMENT

Accidents do happen – and occasionally, a boater will install an alternator on an engine that's just too high an output for the system's drive belt. 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 Belt Load Manager. Adjustable in roughly four-percent steps, the Belt Load Manager widens the regulator's field pulse bandwidth, reducing load on the drive belt. The Belt Load Manager can also be used to protect the alternator in applications where battery capacity exceeds ideal charging ratios.

ALTERNATOR AND BATTERY TEMPERATURE SENSING

As battery technologies change, and battery capacities grow, the ability to monitor and respond to changes in alternator and battery temperature becomes more essential. With optional alternator and battery temperature sensors installed, Balmar multi-stage voltage 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, ARS-5 and Max Charge regulators will automatically discontinue charging to avoid dangerous thermal runaway conditions.

Like batteries, alternators have optimal operating temperatures, and by sensing temperature at the alternator, Balmar regulators can make automatic adjustments to field output to ensure that the alternator maintains a safe working temperature. And all of this happens without any need for operator intervention.



Optional Temperature Sensors

BALMAR MULTI-STAGE REGULATORS

MAX CHARGE MC-614 VOLTAGE REGULATOR

Balmar's premium MC-614 multi-stage voltage regulator delivers an impressive list of features, and dependable, robust performance that's unrivaled in the industry.

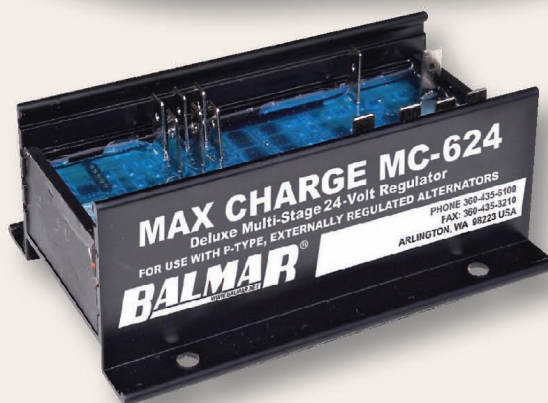
The MC-614 regulator is engineered to provide up to 15 amps of continuous field current, making it the perfect choice for twin-engine applications where large battery banks highlight the need for both alternators to work together to maximize charging output. When used in conjunction with Balmar's Centerfielder II charge balancer, the MC-614 can easily control two alternators on two engines at one time (two MC-614 regulators are required).



MAX CHARGE MC-624 REGULATOR

The 24-volt MC-624 provides all of the functionality of the MC-614 in a regulator that's engineered for 24-volt charging systems. Like the MC-614, the MC-624 regulator features a new, faster processor and updated circuitry to ensure optimal performance and dependability.

The MC-624 regulator is recommended in twin-engine, 24-volt systems using the Centerfielder II. As with all Balmar multi-stage voltage regulators, the MC-624 is designed for use with P-type alternators.



- Selectable preset programs for Gel, AGM, Deep-Cycle Flooded, Standard Flooded, Spiral Wound (Optima) Batteries
- Special program for systems with voltage sensitive halogen lighting
- Universal default program that's safe for most marine battery technologies
- 15A maximum field current output able to drive two alternators at once (recommended for twin engine applications with Centerfielder II – see page 20)
- Alternator and battery temperature sensing with optional sensor cables (see page 20) provides added charging efficiency and system safety.
- A bright LED alphanumeric display and easy to navigate programming mode make the Max Charge regulator as simple as it is intelligent.
- Scrolling program modes are controlled by an easy-to-use reed switch and magnetic programming tool.
- Exclusive Belt Load Manager function allows user to adjust maximum regulator field output

MULTI-STAGE REGULATOR SPECIFICATIONS

Model	Volts	Bat. Temp. Sense	Alt. Temp. Sense	Wiring Harness	Preset Bat. Progs.	Dual Alts.	Belt Wear Control	Adv. Prog. Mode	Dimensions
MC-614	12	YES (2)	YES	NO	7	YES	YES	YES	4.8"x3.2"x1.5"
MC-614-H	12	YES (2)	YES	YES	7	YES	YES	YES	4.8"x3.2"x1.5"
MC-624	24	YES (2)	YES	NO	7	YES	YES	YES	4.8"x3.2"x1.5"
MC-624-H	24	YES (2)	YES	YES	7	YES	YES	YES	4.8"x3.2"x1.5"

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BALMAR MULTI-STAGE REGULATORS

MAX CHARGE MC-612-DUAL REGULATOR

As more boaters opt to install a second alternator on their propulsion engine, Balmar introduces the MC-612-DUAL, the first regulator that's made specifically to control two alternators on a single engine.

The MC-612-DUAL-H features twin 54" wiring harnesses and the ability to sense temperature at two alternators (regulator is programmable to toggle between dual battery or dual-alternator temperature sensing). Like other Max Charge models, the MC-612-DUAL features seven selectable battery programs, along with a wealth of advanced programmability, so it's tailor-made for just about any boating application.



ARS-5 ADVANCED REGULATOR

The ideal choice for the budget-minded boater, the ARS-5 regulator is designed for use with a single 12-volt alternator, yet it provides five selectable battery programs, a belt load manager, and a range of advanced programming functions.

Like all the Max Charge regulators, the ARS-5 regulator features an easy-to-read, 3-digit display, and convenient magnetic reed switch for programming adjustments. Temperature sensing circuits for two batteries and alternator. For use with a single P-type 12-volt alternator. 1 year limited warranty.



- Selectable preset programs for Gel, AGM, Deep-Cycle Flooded, Spiral Wound (Optima) Batteries
- Universal default program that's safe for most marine battery technologies
- ARS-5 offers 9-amp maximum field output. For use in single alternator applications only.
- Alternator and battery temperature sensing provides added efficiency and system safety.
- Bright LED alphanumeric display and easy to navigate programming mode
- Scrolling program modes are controlled by an easy-to-use reed switch and magnetic programming tool, included with the regulator.
- Belt Load Manager allows user to reduce maximum regulator field output in five percent increments to ensure that belts are protected from undue wear.
- Short or long display modes allow the user the ability to see the minimum or maximum operational data while the regulator is active.

MULTI-STAGE REGULATOR FEATURES & SPECIFICATIONS

Model	Volts	Bat. Temp. Sense	Alt. Temp. Sense	Wiring Harness	Preset Bat. Progs.	Dual Alts.	Belt Wear Control	Adv.Prog. Mode	Dimensions
MC-612-DUAL	12	YES (2)	YES (2)	NO	7	YES	YES	YES	4.8"x3.2"x1.5"
MC-612-DUAL-H	12	YES (2)	YES (2)	YES (2)	7	YES	YES	YES	4.8"x3.2"x1.5"
ARS-5	12	YES (1)	YES	NO	5	NO	YES	YES	4.1"x3.2"x1.5"
ARS-5-H	12	YES (1)	YES	YES	5	NO	YES	YES	4.1"x3.2"x1.5"

NOTES: Optional MC-TS-A and MC-TS-B temperature sensors are required to enable advanced regulator temperature sensing functions. DO NOT attempt to use the ARS-5 to control dual alternators. Balmar voltage regulators are designed for use with P-type alternators only. Install regulators in well ventilated location with ambient temperature <110°F. See www.balmar.net for additional information on voltage regulators.

BALANCED TWIN-ENGINE CHARGING

CENTERFIELDER II

The Centerfielder balances twin-engine charging systems by monitoring port and starboard voltage regulators.

When both alternators and voltage regulators are working, the Centerfielder II automatically splits field output from the dominant regulator to both alternators, making it possible to charge a single house battery bank with the combined output of both alternators. The Centerfielder II works in both 12-volt and 24-volt applications, and includes detailed wiring instructions along with larger gauge wire replacements for port and starboard regulator power wires. Use only with Max Charge MC-612, MC-614, or MC-624 voltage regulators. Do not install in systems utilizing internally regulated alternators. 1 year limited warranty.



- Balances charging in twin engine applications
- Isolates alternators and regulators when only one engine is running
- Provides field current from a single regulator to both port and starboard alternators when both engines are in operation
- Eliminates alternator “chatter” by unifying power output to a single battery bank
- For use with Max Charge regulators only
- Includes upgraded regulator power wires and fusing for port and starboard voltage regulator wiring harnesses

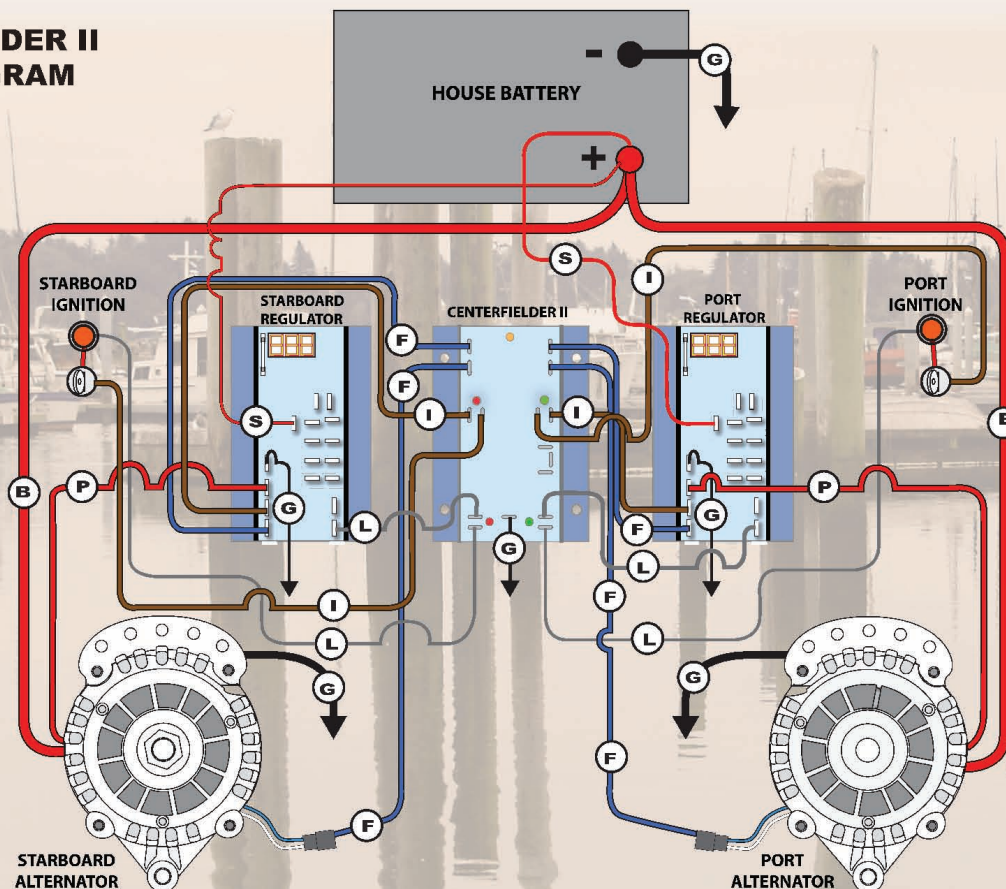
Model	Volts	Use With	Fusing	Wiring Included
CFII-12/24	12 or 24	MC-612, MC-614, MC-624	Included 15A ATC	Fused 12 Ga. Power Wires (2)

TYPICAL CENTERFIELDER II SYSTEM WIRING DIAGRAM

Useful in applications like multihulls and powerboats with twin propulsion motors, the Centerfielder II acts like a referee, ensuring that both port and starboard charging systems work together, rather than compete, to keep a large house battery efficiently charged.

The Centerfielder II is designed to work specifically with MC-614 and MC-624 voltage regulators.

1. **GROUND (G)**
2. **POWER (P)**
3. **FIELD (F)**
4. **IGNITION (I)**
5. **SENSE (S)**
6. **LAMP (L)**
7. **BATTERY+ (B)**



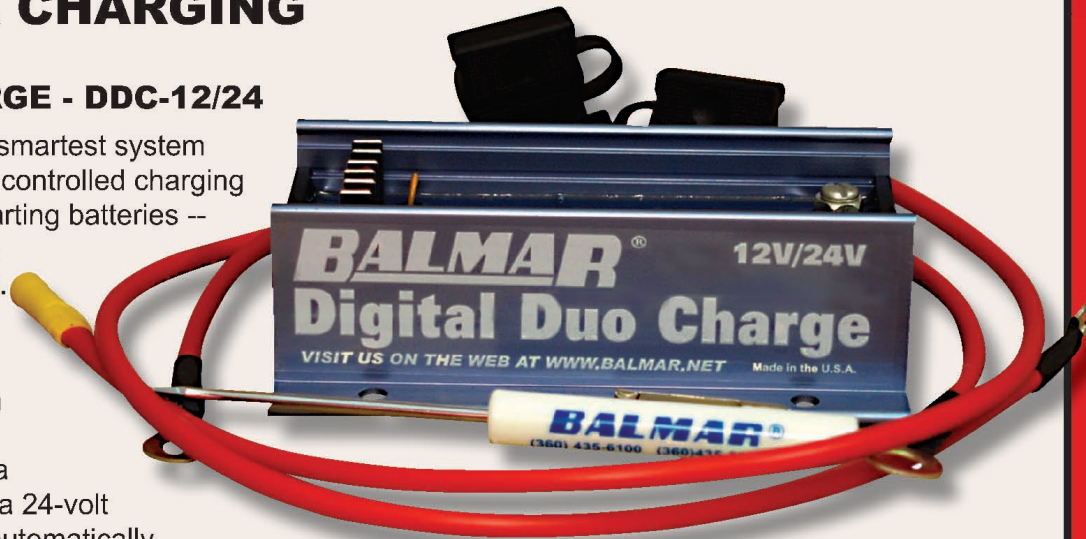
MULTI-BANK CHARGING

DIGITAL DUO CHARGE - DDC-12/24

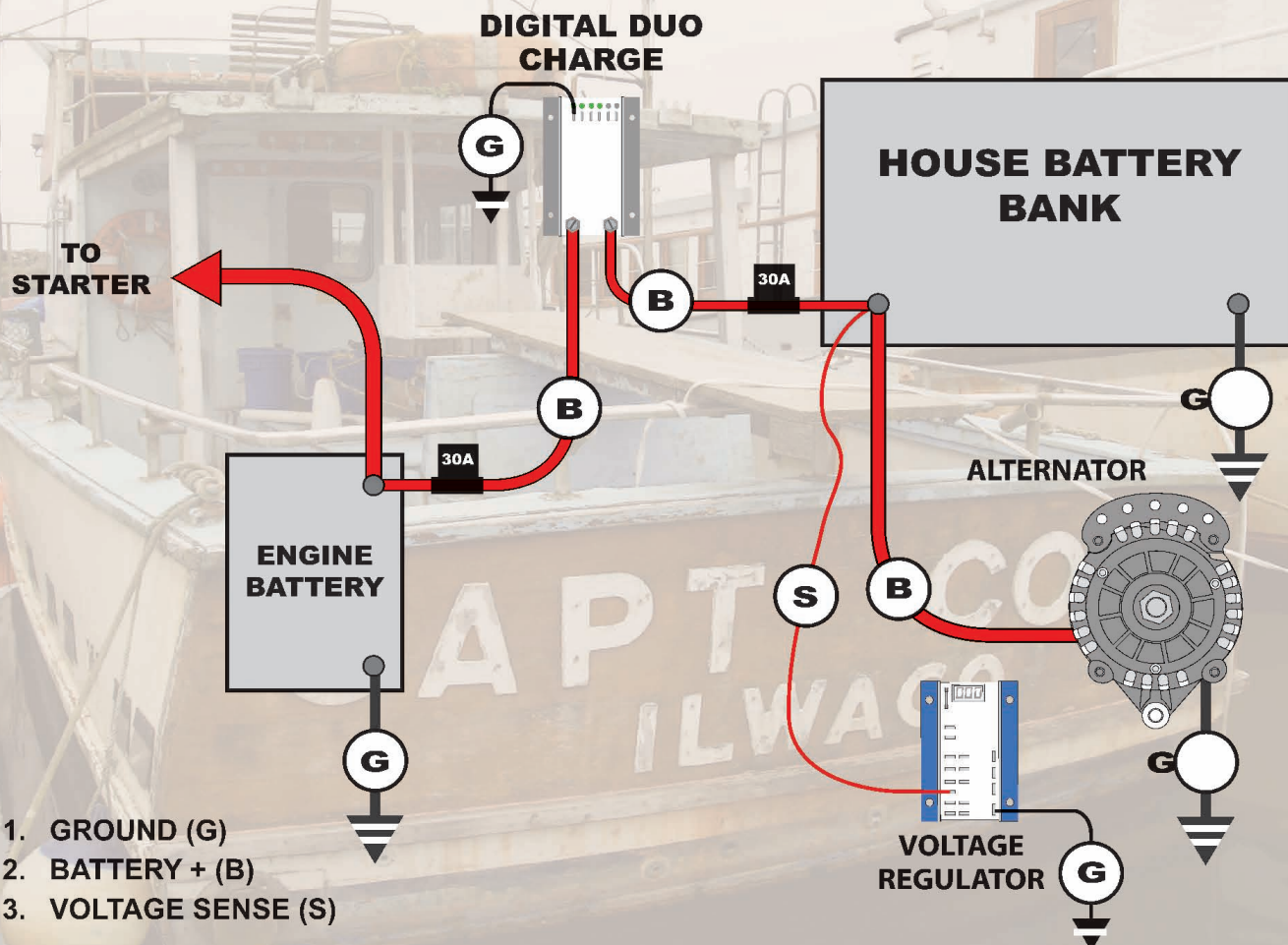
The DDC-12/24 offers the smartest system yet for current and voltage controlled charging between the house and starting batteries -- eliminating the need for an isolator or battery switches.

During charging, the Duo Charge monitors voltage at the house battery. When voltage exceeds the set minimum (typically 13V in a 12-volt system and 26V in a 24-volt system), the Duo Charge automatically engages, providing up to 30 amps to the starting battery. When no charge source is present, the Duo Charge separates the batteries, so the starting battery won't be accidentally discharged.

Optional solenoid control enables higher charging output when required (solenoid is not included). Includes input/output wiring. Preset programs for gel, AGM, standard flooded and deep cycle flooded batteries allow mixing of house and start battery technologies. *Battery temperature sensing requires optional MC-TS-B sensor cable. 1 year limited warranty.



Model	Max. Amps	SystemVolts	Program Presets	Bat. Temp.	Dimensions
DDC-12/24	30	12 or 24	Four (Gel, AGM, Std. Fld., FDC)	YES*	4.8"x3.2"x1.5"



SINGLE-STAGE REGULATORS / ACCESSORIES

SINGLE STAGE VOLTAGE REGULATORS

For vessels with nominal battery loads and in applications where charging times are too short to benefit from the intelligence of smart, multi-stage voltage regulation — a single-stage regulator may be satisfactory. BRS-2T regulators provide adjustable voltage control. ERS regulators are fixed at 14.1 volts.

BRS-2T SINGLE STAGE REGULATORS

Available in 12-volt and 24-volt models, BRS-2T voltage regulators offer the ability to adjust target voltage to meet the needs of various battery types. Models with 54" wiring harness are indicated with "H" suffix. 1 year limited warranty.



ERS-KIT SINGLE STAGE REGULATOR

This non-adjustable, 14.1-volt regulator is ideal as an inexpensive stand alone, or as a compact back up for the toolbox or spares locker. Kit includes assorted connectors to adapt to most alternator installations. 1 year limited warranty.

Model	Volts	Display	Wiring Harness	Voltage Adjustment	Dimensions
BRS-2T-12	12	YES (color LED)	NO	YES (13.5-14.5V)	4.8"x3.2"x1.5"
BRS-2T-12-H	12	YES (color LED)	YES (54" long)	YES (13.5-14.5V)	4.8"x3.2"x1.5"
BRS-2T-24	24	YES (color LED)	NO	YES (27.5-28.5V)	4.6"x3.0"x.75"
BRS-2T-24-H	24	YES (color LED)	YES (54" long)	YES (27.5-28.5V)	4.6"x3.0"x.75"
ERS-KIT	12	NO	PIGTAIL (w/connector kit)	NO (Fixed 14.1V)	2.3"x1.3"x.70"



TEMPERATURE SENSORS

Alternator and battery temperature sensors are for use with 12-volt and 24-volt Max Charge and ARS-5 voltage regulators. MC-TS-B can also be used with Digital Duo Charge.

Temperature Sensor Cables		
Model	For	Length
MC-TS-A	Alternator	54"
MC-TS-B	Battery	240"



SPIKE PROTECTORS

TSP-12 and TSP-24 transient spike protectors add system safety by ensuring an exit to ground, should an AC or DC spike invade the vessel's charging system.

Fused diodes are designed to fail before alternator diodes are likely to be damaged.











Transient Spike Protectors		
Model	For	Fuse
TSP-12	12-Volt	10A
TSP-24	24-Volt	10A



REPLACEMENT 54" REGULATOR WIRING HARNESSES

Model	Fits	Volts
1010	6-Series, 9-Series	12
1011	94-Series	12
1012	6-Series, 9-Series	24
1013	94-Series	24
1014	7-Series, 97-Series, 98-Series	12
1016	97-Series, 98-Series	24

Alternator Dimensions By Series

		REAR TO CENTER OF INSIDE SHEAVE	OVERALL LENGTH OF ALTERNATOR <120A	OVERALL LENGTH OF ALTERNATOR >110A	OVERALL ALTERNATOR HEIGHT	BOLT-TO-BOLT, TENSIONER/ MOUNTING FOOT	CASE DIAMETER	FRONT FOOT WIDTH (Front-To-Back)	SADDLE WIDTH (Inside Dimension)	REAR FOOT WIDTH (Front-To-Back - With Bushing)	FRONT FOOT TO CENTER OF INSIDE SHEAVE	STANDARD PULLEY DIAMETER	MOUNTING FOOT BORE	TENSIONING ARM BOLT DIAMETER/THREAD COUNT	STATOR POLES
	60 SERIES	6.25" 158.8mm	6.6" 167.6mm	7.0" 177.8mm	7.3" 185.4mm	6.5" 165.1mm	5.7" 144.8mm	.55" 13.97mm	3.15" 80mm	.75" 19.1mm	1.0" 25.4mm	2.7" 68.6mm	10mm*	M8 x 1.25	12
	621 SERIES	6.25" 158.8mm	6.6" 167.6mm	7.0" 177.8mm	7.3" 185.4mm	6.5" 165.1mm	5.7" 144.8mm	1 1/2" 25.4mm 50.8mm	N/A	N/A	1.0" 25.4mm	2.7" 68.6mm	.387".5" 9.65mm 12.7mm	M8 x 1.25	12
	604 SERIES	6.25" 158.8mm	6.6" 167.6mm	7.0" 177.8mm	7.3" 185.4mm	6.5" 165.1mm	5.7" 144.8mm	.55" 13.97mm	4.0" 101.6mm	.75" 158.8mm	1.0" 25.4mm	2.7" 68.6mm	10mm*	M8 x 1.25	12
	AT-165 SERIES	6.25" 158.8mm	6.75" 112.0mm	N/A	8.0" 188mm	6.7" 170.2mm	5.3" 135mm	.55" 13.97mm	3.15" 80mm	.75" 19.1mm	1.7" 43.2mm	2.7" 68.6mm	10mm*	N/A	16
	AT-200 SERIES	7.1" 180.34mm	7.95" 202.0mm	N/A	9.6" 244mm	8.54" 217mm	5.68" 145mm	1 1/2" 25.4mm 50.8mm	N/A	N/A	1.7" 43.2mm	2.7" 68.6mm	.387".5" 9.65mm 12.7mm	5/16"	16
	94 SERIES	6.0" 152.4mm	N/A	7.0" 177.8mm	9.0" 228.6mm	8.0" 203.2mm	6.0" 152.4mm	2" 50.8mm	N/A	N/A	1.0" 25.4mm	2.9" 73.7mm	.50" 12.7mm	M10 x 1.25	12
	95 SERIES	7.0" 177.8mm	N/A	9.0" 158.8mm	9.0" 228.6mm	7.7" 195.6mm	6.25" 158.8mm	.52" 13.2mm	4.0" 101.6mm	.75" 19.1mm	1.0" 25.4mm	2.9" 73.7mm	.50" 12.7mm	6.25" 158.8mm	12
	97 SERIES	9.0" 228.6mm	N/A	10.6" 269.2mm	9.45" 240mm	8.4" 213.4mm	6.5" 165.1mm	.55" 13.97mm	4.0" 101.6mm	.75" 19.1mm	1.0" 25.4mm	2.9" 73.7mm	.50" 12.7mm	1/2" x 13	16
	97 EHD-SERIES	9.25" 235mm	N/A	11" 279.4mm	9.45" 240mm	8.4" 213.4mm	6.5" 165.1mm	.51" 13mm	4.0" 101.6mm	.75" 19.1mm	1.0" 25.4mm	2.9" 73.7mm	.50" 12.7mm	1/2" x 13	12
	98 SERIES	9.2" 233.7mm	N/A	11" 279.4mm	9.6" 243.8mm	8.25" 209.6mm	8.25" 209.6mm	.58" 14.7mm	4.0" 101.6mm	.75" 19.1mm	1.25" 31.8mm	2.9" 73.7mm	.50" 12.7mm	1/2" x 13	14

NOTES:

Alternator dimensions are correct as of publication date. In order to ensure quality, Balmar reserves the right to make changes which may affect alternator dimensions or specification. Visit www.balmar.net for any product updates. Balmar is not liable for any damages or injuries resulting from product installation. See Balmar warranty and ordering instructions on Page 3 of this catalog for more information .

Small case 60-SERIES are equipped standard with 10mm bore spacers and bushings. 8mm bore spacers and bushings are available for those units. Call Balmar Customer Service at 360-435-6100.

621-Series alternators are equipped with a removable bushed 1" spacer for use in 2" installations. 1" mounts feature a .50" bore. 2" mounts feature a .38" bore. Always compare existing alternator & replacement alternator dimensions. Balmar cannot guarantee direct OEM replacement.

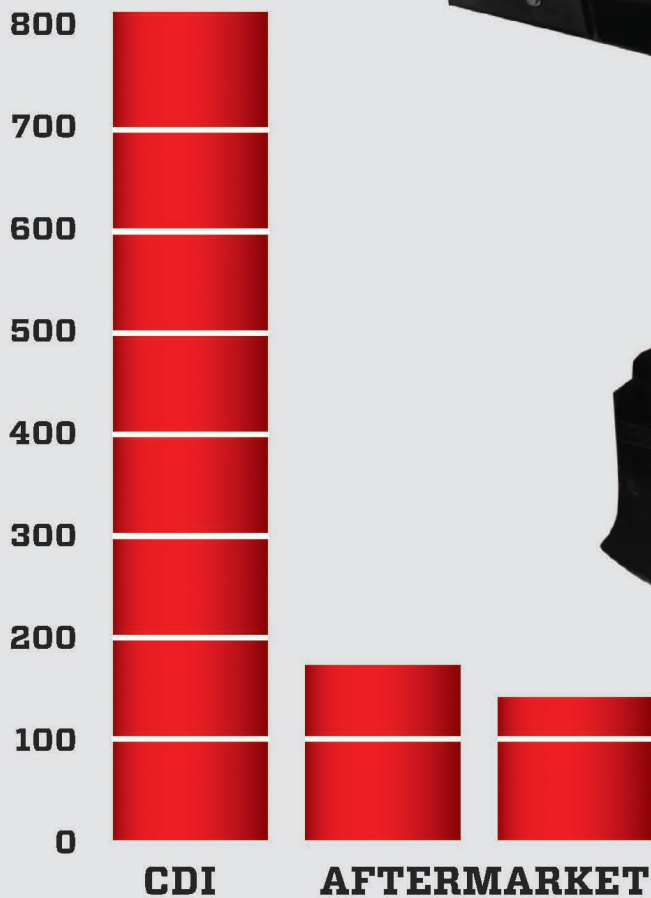
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