

### XT-Series & AT-Series Alternators

Designed for Recreational Applications

- 170A or 220A in a Small Case Package
- Up to 140A at Idle Speeds
- Patented Smart Ready® Technology (XT-Series Only)
- Dual Fan Cooling, High Airflow Frame
- Ideal for Large Battery Banks
- USCG Title 33, CE, ISO 8846 and SAE J1171 Certified



170A  
XT-Series



220A  
AT-Series

AT-Series and the New XT-Series Alternators from Balmar bring together the latest innovations in alternator design to deliver incredible charging power in a compact, Marine-friendly package.



Advanced  
Braided Stator



Hairpin  
Stator



Traditional  
S-Wound Stator

The New XT-Series 170A Alternator family features a state-of-the-art, braided wire stator design to generate exceptional output in the smallest possible area. The XT-Series produces slightly more power than our previous AT-Series 165A design and operates 5°-10°C cooler. In addition, we've added Balmar's Smart Ready® internal regulator technology to provide an additional level of fault tolerance for cruising boaters. Available XT-Series mounting styles have been expanded to include the "Vortec" 9Si design found on many GM gasoline engines.

The AT-Series 220A Alternator family features a hairpin-wound stator design which uses densely wound square copper wire to generate up to 220A at 3,000 engine rpm. Hairpin-wound stators feature 96 slots - compared to 36 slots in a traditional S-wound stator - allowing the hairpin-wound stator to develop superior electromagnetic energy and efficiency to other traditional stator designs.

XT-Series and AT-Series Alternators may require a Tachometer Signal Stabilizer (Part No. 15-TSS) if your current tachometer is not adjustable. XT-Series and AT-Series Alternators should only be used in Dual Vee or Multi-Groove Serpentine belt configurations. Balmar's growing range of Altmount® Serpentine Pulley Conversion Kits shown on page 11 support all XT- and AT-Series Alternators.

| XT / AT Series Output | Power Take Off | Mounting     | Individual Alternator Part Number <sup>(1)(3)</sup> | Alternator Kit with Max Charge Regulator <sup>(2)</sup> | Altmount® Pulley Kit Required?          |
|-----------------------|----------------|--------------|---|---|---|
| 170 A                 | 5.2 HP         | 1-2" Spindle | XT-SF-170-XX  | XT-SF-170-XX-KIT  | Yes, If DV or Serpentine is Not Present |
|                       |                | 3.15" Saddle | XT-DF-170-XX  | XT-DF-170-XX-KIT <sup>(4)</sup>                         |   |
|                       |                | Vortec       | XT-VT-170-K6  | XT-VT-170-K6-KIT  |   |
| 220 A                 | 6.0 HP         | 1-2" Spindle | AT-SF-200-XX  | AT-SF-200-XX-KIT  |   |
|                       |                | 3.15" Saddle | AT-DF-200-XX  | AT-DF-200-XX-KIT <sup>(4)</sup>                         |   |
|                       |                | 4" Saddle    | AT-DF4-200-XX                                       | AT-DF4-200-XX-KIT                                       |   |

(1) "XX" Pulley Designations: "DV" = 1/2" Dual Vee, "K6" = K6 Serpentine, "J10" = J10 Serpentine.  
 (2) Kit Includes AT-Series Alternator, Max Charge Regulator (MC-614-H) and Temperature Sensors (MC-TS-A, MC-TS-B).  
 (3) The AT-Series Alternator may require a Tachometer Signal Stabilizer (Part No. 15-TSS) if your current tach is not adjustable.  
 (4) All Dual Foot Yanmar Kits include 6-0020 Mounting Kit.

## How to Select the Correct Balmar Charging System for Your Vessel

### Step 1: Determine your Electrical Load

All your device loads and expected duty cycles will clarify your expected daily battery discharge requirements. Add a safety factor.

### Step 2: Identify your Battery Bank Technology and Capacity

How many batteries are in your bank and what is the total storage capacity?  
What type of batteries are employed? (Different technologies require different charging programs)

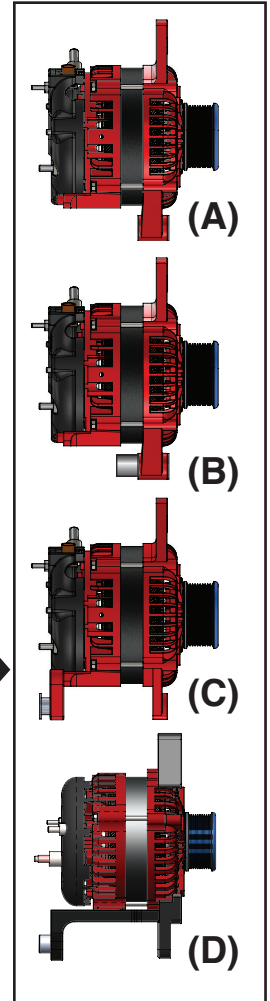
### Step 3: Select your Alternator Output

The correct charging load depends on the battery technology and capacity.  
For example, an AGM battery can accept a 40% charge load, so a 300Ah bank of AGMs can accept 120A of charging from the alternator. Therefore you could utilize a 120A alternator to charge your bank as quickly as possible.

### Step 4: Identify the Alternator Mounting Style Present on your Engine

The most common mounting styles are shown to the right:

|                                    |                  |                        |
|------------------------------------|------------------|------------------------|
| (A) 1" Single Foot (Spindle Mount) | "Motorola Style" | Balmar XT/AT-SF Series |
| (B) 2" Single Foot (Spindle Mount) | "Delco Style"    | Balmar XT/AT-SF Series |
| (C) 3.15" Dual Foot (Saddle Mount) | "Hitachi Style"  | Balmar XT/AT-DF Series |
| (D) 4" Dual Foot (Saddle Mount)    | "J-180 Style"    | Balmar AT-DF4 Series   |



### Step 5: Determine your Belt and Pulley Requirements

An AltMount® belt/pulley conversion kit may be required to handle your alternator Power Take-Off ("PTO") load.

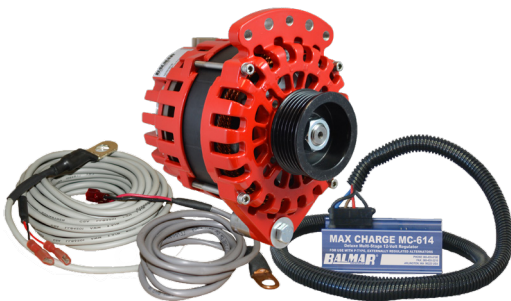
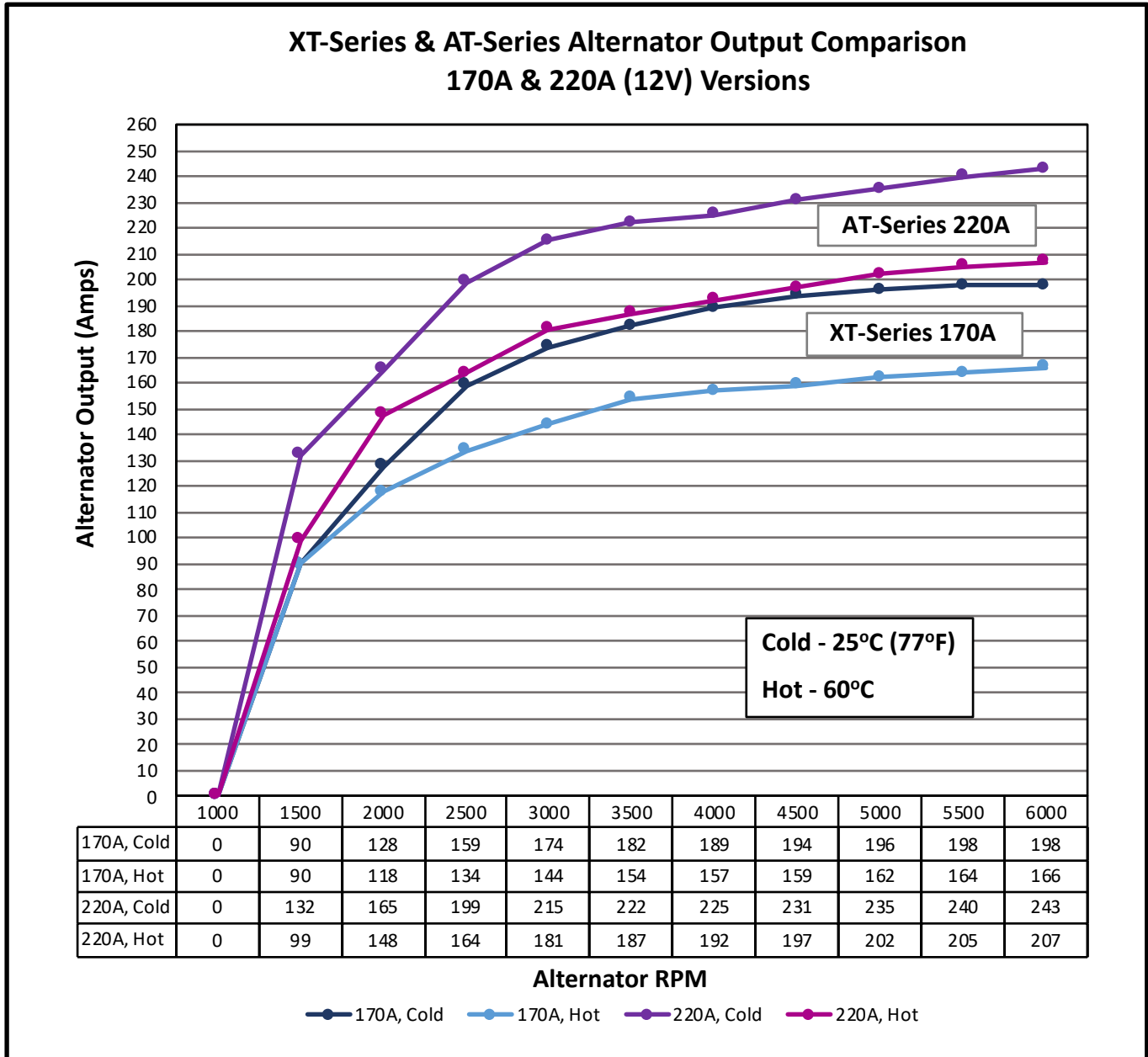
*Detailed toolsets for calculating loads and selecting the appropriate charging system for your vessel are available in the Balmar Catalog or at [www.balmar.net](http://www.balmar.net)*

## AT-Series Alternator Specifications

|   |  |
|---|--|
| <b>Alternator Style:</b> Small Case, Positive Field Excitation (P-Type)   | <b>Mounting Styles:</b> XT-VT Series: Vortec Style<br>XT/AT-SF Series: 1" or 2" Single Foot (Spindle)<br>XT/AT-DF Series: 3.15" Dual Foot (Saddle)<br>AT-DF4 Series: 4" Dual Foot (Saddle) |
| <b>Regulation:</b> External P-Type (MC-614)<br>XT-Series Contains Internal Smart Ready® Voltage Regulator                       |  |
| <b>Cooling:</b> Dual Internal Fans  | <b>Positive Output:</b> Threaded Stud<br>Stud Dimensions: XT/AT: M8 x 1.25   |
| <b>Bearings:</b> Sealed Bearings, Heavy Duty Radial (front & rear)  | <b>Grounding:</b> XT-Series: Case Ground<br>AT-Series: Isolated Ground, Stud Dimensions: M6 x 1.00   |
| <b>Case Construction:</b> Ventilated Cast Aluminum  | <b>AC/Stator Output:</b> 16 Poles<br>Stator Output Wire included in Pigtail Plug   |
| <b>Finish:</b> Red Powder Coat  | <b>Diodes +/-:</b> 6 Positive, 6 Negative; 50A Rated   |
| <b>Tensioning Arm Mount:</b> AT-Series: 0.88" (22mm) Vertical Slot<br>XT-Series: Five Position Crown (3x: M8 x 1.25, 2x: 8mm)   | <b>Internal Voltage Regulation (XT-Series Only):</b><br>14.1 Volts (12V systems)   |
| <b>Mounting Foot Bore:</b> XT/AT-DF & AT-DF4-Series: 10mm (3/8")<br>XT/AT-SF-Series 1 inch: 1/2", SF-Series 2 inch: 10mm (3/8") | <b>Low RPM Cut-In:</b> XT: 1,000 rpm, AT: 1,320 rpm<br><b>Max Alternator RPM:</b> XT/AT 12,000 rpm   |
| <b>Ignition Protection Ratings:</b> USCG Title 33, SAE J1187, CE, ISO 8846  | <b>Normal Operating Temperature:</b> 180 °F / 82° C<br><b>Max Operating Temperature:</b> 225° F / 108° C   |

**Alternator Output Curves**

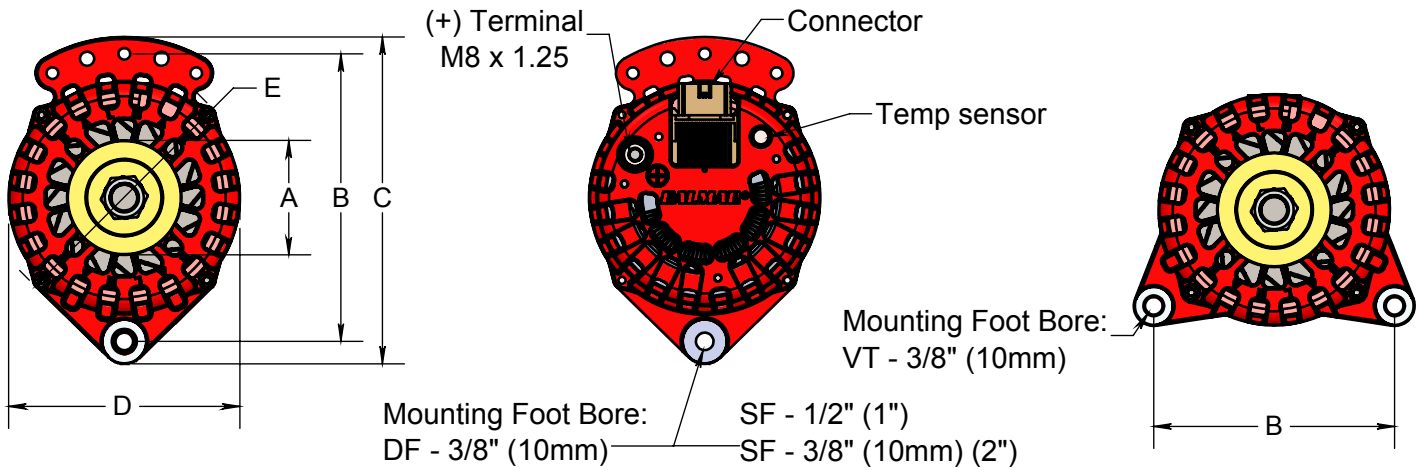
Alternator output is dependent on a number of factors: battery condition and capacity, wire size, engine horsepower and engine RPM, battery temperature and alternator temperature. Of these factors, alternator speed and temperatures are the most important. The following graph describes alternator output based on two temperature levels (ambient (26° C) and hot (90° C)). Test voltages are set at 13.5V.



Balmar XT-Series and AT-Series Alternators and Charging Kits provide maximum charging power in a small case package suitable for installation in most small-to-medium sized diesel engines and most GM-based 4.3L to 8.1L gasoline engines.

*Utilize the Balmar product configurator at [www.balmar.net](http://www.balmar.net) to locate a solution for your engine.*

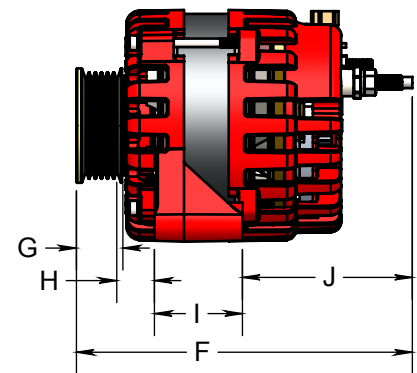
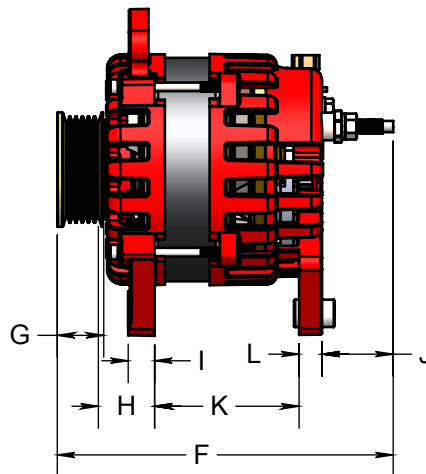
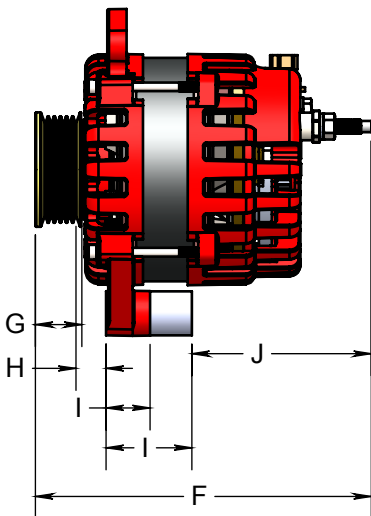
**XT-170-Series Dimensions**



XT-SF-170-XX

XT-DF-170-XX

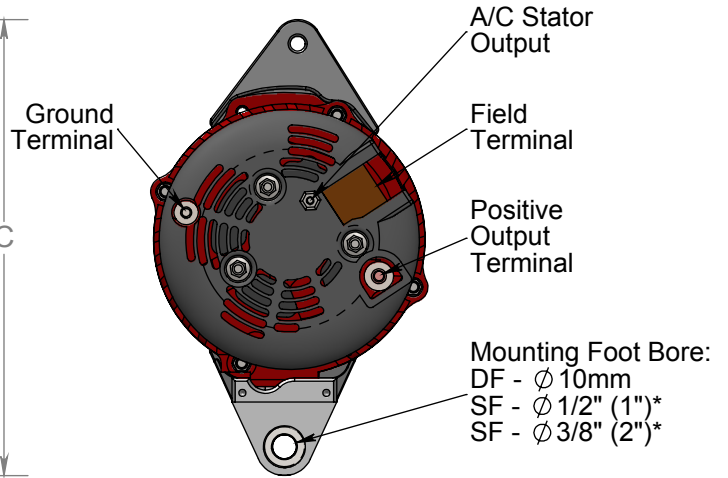
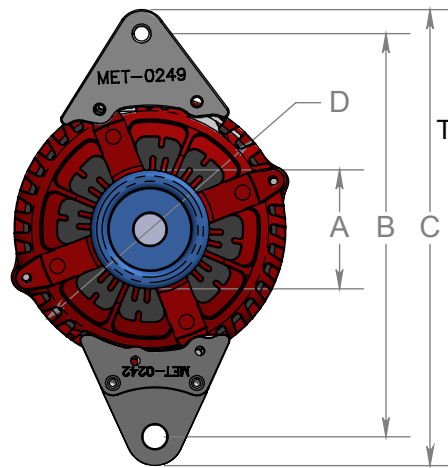
XT-VT-170-K6



| ITEM | DESCRIPTION                  | IN.  | mm  |
|------|------------------------------|------|-----|
| A    | Dual Vee (DV) Pulley Dia.    | 2.71 | 68  |
|      | K6 (serpentine) Pulley Dia.  | 2.42 | 61  |
|      | J10 (Serpentine) Pulley Dia. | 2.28 | 57  |
| B    | Mounting Hole (VT)           | 5.47 | 138 |
|      | Mounting Hole (SF)           | 6.53 | 165 |
| C    | Overall Height               | 7.43 | 188 |
| D    | Case Diameter                | 5.26 | 134 |
| E    | Mounting Ear to Mounting Ear | 5.70 | 144 |
| F    | Overall Length w/ DV Pulley  | 8.00 | 203 |
|      | Overall Length w/ K6 Pulley  | 7.63 | 193 |
|      | Overall Length w/ J10 Pulley | 7.86 | 199 |
| G    | DV Pulley Width              | 1.53 | 38  |
|      | K6 Pulley Width              | 1.18 | 29  |
|      | J10 Pulley Width             | 1.40 | 35  |

| ITEM | DESCRIPTION                   | IN.  | mm  |
|------|-------------------------------|------|-----|
| H    | First Groove to Mounting (SF) | 0.68 | 17  |
|      | First Groove to Mounting (DF) | 1.28 | 32  |
|      | First Groove to Mounting (VT) | 0.85 | 21  |
| I    | Foot Thickness (SF) 1"        | 1.00 | 25  |
|      | Foot Thickness (SF) 2"        | 1.95 | 49  |
|      | Foot Thickness (DF)           | 0.60 | 15  |
|      | Foot Thickness (VT)           | 2.00 | 50  |
| J    | Foot to (+) Terminal (SF) 1"  | 5.03 | 127 |
|      | Foot to (+) Terminal (SF) 2"  | 4.08 | 103 |
|      | Foot to (+) Terminal (DF)     | 1.61 | 40  |
|      | Foot to (+) Terminal (VT)     | 3.86 | 98  |
| K    | DF Saddle Width (MIN)         | 2.88 | 73  |
|      | DF Saddle Width (MAX)         | 3.28 | 83  |
|      | DF Saddle Width               | 3.15 | 80  |
| L    | Rear Foot Thickness           | 0.52 | 13  |

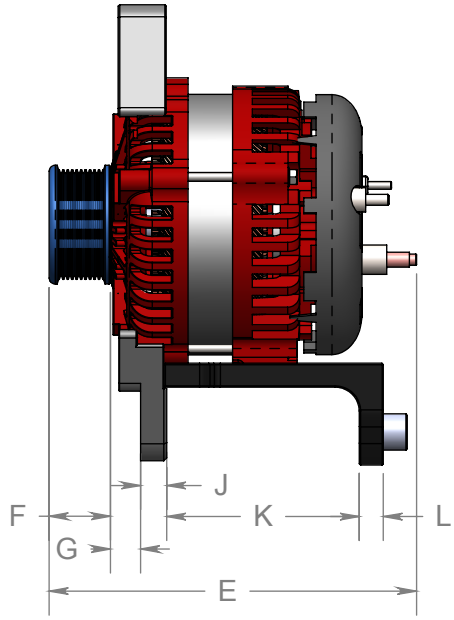
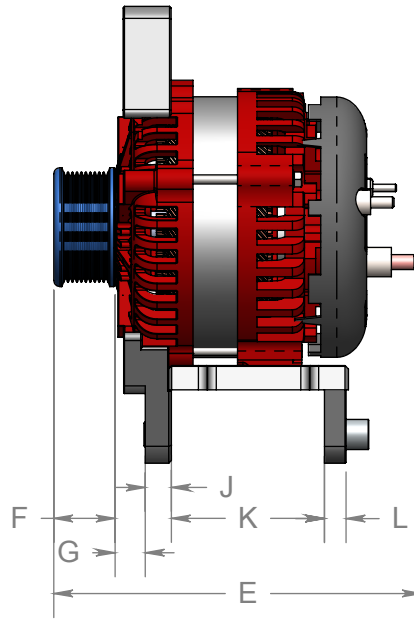
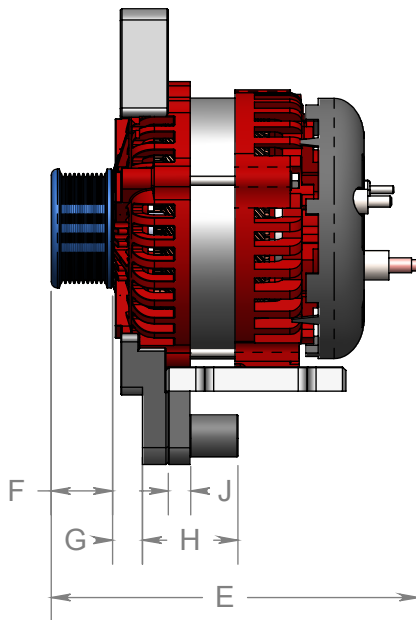
**AT-200-Series Dimensions**



**AT-SF-200-XX**

**AT-DF-200-XX**

**AT-DF4-200-XX**



| ITEM | DESCRIPTION                   | IN.  | mm  |
|------|-------------------------------|------|-----|
| A    | Dual Vee (DV) Pulley Dia.     | 3.20 | 81  |
|      | K6 (Serpentine) Pulley Dia.   | 3.00 | 76  |
|      | J10 (Serpentine) Pulley Dia.  | 2.47 | 62  |
| B    | Mounting Hole-to-Hole         | 8.40 | 213 |
| C    | Over-all Height               | 9.50 | 241 |
| D    | Case Diameter                 | 5.66 | 148 |
| E    | Over-all Length w/ DV Pulley  | 6.70 | 170 |
|      | Over-all Length w/ K6 Pulley  | 6.40 | 163 |
|      | Over-all Length w/ J10 Pulley | 6.35 | 161 |
| F    | DV Pulley Width               | 1.49 | 38  |
|      | K6 Pulley Width               | 1.18 | 30  |
|      | J10 Pulley Width              | 1.14 | 29  |

| ITEM | DESCRIPTION                    | IN.  | mm  |
|------|--------------------------------|------|-----|
| G    | Case Front to Foot Front       | .60  | 15  |
| H    | Foot Thickness (w/o spacer)    | 1.00 | 25  |
|      | Foot Thickness (w/ spacer)     | 2.00 | 51  |
| I    | Foot to Stator Output          | 3.44 | 87  |
| J    | Foot Thickness                 | .50  | 13  |
| K    | DF Saddle Width                | 3.18 | 81  |
|      | DF4 Saddle Width               | 4.00 | 102 |
| L    | Rear Foot Thickness            | .50  | 13  |
| M    | DF Rear Foot to Stator Output  | 1.25 | 32  |
|      | DF4 Rear Foot to Stator Output | .375 | 10  |

Dimensions are approximate and for reference only. Contact Balmar Technical Support if further details are required.