AIRCRAFT PARTS CORP.
STARTER-GENERATOR
TECHNICAL MANUAL

ENGINEER’S OF THE INDUSTRY’S FINEST
STARTER-GENERATORS AND GENERATOR CONTROL UNITS
TRUSTED BY PROFESSIONALS, POWERED BY APC

For Reference Only
APC starter-generators offer many solutions for different customers with various needs and requirements. APC's generators can be manufactured with different types of cooling systems, according to the aircraft's interface requirements. Many of our generators are self-cooled with the aid of a fan, with some generators blast-cooled, also with the aid of a fan. Various types of mountings are used which can allow our customers to choose a generator that best suits their particular requirements. Radio noise can often be problematic. APC manufactures generators in which the radio noise is virtually eliminated. Minimizing these unwanted factors in starter-generators is an important goal and commitment of APC. High vibrations can cause many negative effects on generators when in operation. Our starter-generators exhibit radial vibrations of less than .001 inches at maximum, assuring that our products are capable of maximum performance, as well as being of excellent quality.

APC designs and manufactures starter-generators that are far superior in architecture and performance. Our generators are manufactured for high performance while the price to our customers is extremely competitive. Adding to that, worldwide technical support is available for APC's generators, making overhaul and repair accessibility most convenient. At APC our motto is, "The Customer is the Focus of Everything We Do", and every effort is made to place the customer's needs in the forefront. We continuously strive to meet and exceed our customer's expectations. We do this through the most technologically-advanced product designs for superior performing products and practicing lean manufacturing techniques to keep costs down and passing on the savings to our customers. Our customer service staff is number one in the business, and combined with the entire staff at APC, our business goals have been achieved overall in terms of Quality, Price and Delivery. If you haven't already, call us toll-free at 1-877-4APCMFG, (1-877-427-2634), to learn why APC continues to be the most trusted OEM in the industry today.

APC starter-generators are rated from 150 to 400 amperes. The rated power output ranges from 4.5 to 12 kilowatts. Typical speed range for our starter-generators is from 7,000 to 13,000 rpm. Typical starter outputs, rated at 1000 rpm with an input of 20 volts, are valued between 3.8 and 12.5 horsepower.

APC continues to make every effort to prevent product failure, and has been highly successful in this aspect. Our generators contain components such as armatures insulated with the highest standards in place. The armatures and stators are vacuum impregnated with an epoxy-type varnish. The wedge-type insulation manufactured for our generators and steel banding allows for safe over-speed conditions. Shunt coils are 100% wrapped, preventing internal shorts. APC's generators exhibit tolerance to high operating temperatures, surpassing many others. This high temperature capability yields a longer life of the generator. Brush and commutator wear is minimal over time, also leading to a longer life. A reinforced construction of the commutator head eliminates bearing failures. APC's bearings are carefully selected and packed with high temperature grease. Our products are manufactured and tested to very tight tolerances, which allows for less wear and vibration. Our current TBO, (Time between Overhauls) far exceeds the current industry standard. Our overhaul process and procedures are very strict and cost effective, ultimately assuring our customers the best quality results.

Currently our starter-generators are rated from 150 to 400 amperes. The rated power output ranges from 4.5 to 12 kilowatts. Typical speed range for our starter-generators is from 7,000 to 13,000 rpm. Typical starter outputs, rated at 1000 rpm with an input of 20 volts, are valued between 3.8 and 12.5 horsepower.

APC "XL" Series Starter-Generators are known for the highest quality and dependability since 1960.
TYPICAL STARTER-GENERATOR CONFIGURATION

TYPICAL WIRING DIAGRAM

TERMINALS B, C & E: 3/8-24UNF 11 THD
TERMINALS A & D: #10-32UNF 11 THD

COMMUTATOR-END BELL COMPONENTS

TYPICAL COMPONENTS OF AN APC STARTER-GENERATOR:
<table>
<thead>
<tr>
<th>MODEL SERIES</th>
<th>RATED VOLTAGE</th>
<th>RATED OUTPUT</th>
<th>SPEED RANGE</th>
<th>CONTINUOUS LOAD WITHIN SPEED RANGE</th>
<th>TYPICAL STARTER OUTPUT AT 1000 RPM WITH 20 V INPUT</th>
<th>MAXIMUM STARTER VOLTAGE</th>
<th>MAXIMUM OPERATING ALTITUDE</th>
<th>COOLING TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>150SG SERIES</td>
<td>28.5 V DC</td>
<td>4.5 kW</td>
<td>8,100-12,000 RPM</td>
<td>150 AMPS</td>
<td>3.8 HP</td>
<td>28 V DC</td>
<td>25,000 FT</td>
<td>SELF-COOLED WITH FAN</td>
</tr>
<tr>
<td>160SG SERIES</td>
<td>28.5 V DC</td>
<td>4.8 kW</td>
<td>8,100-12,000 RPM</td>
<td>160 AMPS</td>
<td>4.0 HP</td>
<td>28 V DC</td>
<td>25,000 FT</td>
<td>SELF-COOLED WITH FAN</td>
</tr>
<tr>
<td>200SG SERIES</td>
<td>30 V DC</td>
<td>6.0 kW</td>
<td>7,800-12,000 RPM</td>
<td>200 AMPS</td>
<td>5.8 HP</td>
<td>28 V DC</td>
<td>45,000 FT</td>
<td>BLAST COOLED WITH FAN</td>
</tr>
<tr>
<td>200SGL SERIES</td>
<td>28.5 V DC</td>
<td>6.0 kW</td>
<td>7,050-12,000 RPM</td>
<td>200 AMPS</td>
<td>5.8 HP</td>
<td>28 V DC</td>
<td>45,000 FT</td>
<td>BLAST COOLED WITH FAN</td>
</tr>
<tr>
<td>250SG SERIES</td>
<td>30 V DC</td>
<td>7.5 kW</td>
<td>6,900-12,000 RPM</td>
<td>250 AMPS</td>
<td>8.0 HP</td>
<td>28 V DC</td>
<td>55,000 FT</td>
<td>BLAST COOLED WITH FAN</td>
</tr>
<tr>
<td>300SG SERIES</td>
<td>28 V DC</td>
<td>9.0 kW</td>
<td>7,200-12,000 RPM</td>
<td>300 AMPS</td>
<td>9.8 HP</td>
<td>28 V DC</td>
<td>50,000 FT</td>
<td>BLAST COOLED WITH FAN</td>
</tr>
<tr>
<td>300SGL SERIES</td>
<td>28 V DC</td>
<td>9.0 kW</td>
<td>7,700-12,175 RPM</td>
<td>300 AMPS</td>
<td>10.1 HP</td>
<td>28 V DC</td>
<td>50,000 FT</td>
<td>BLAST COOLED WITH FAN</td>
</tr>
<tr>
<td>400SG SERIES</td>
<td>30 V DC</td>
<td>12 kW</td>
<td>7,200-12,000 RPM</td>
<td>400 AMPS</td>
<td>12.5 HP</td>
<td>28 V DC</td>
<td>55,000 FT</td>
<td>BLAST COOLED WITH FAN</td>
</tr>
</tbody>
</table>
The 150 AMP series starter-generators were designed for the starting of turbine engines. This starter-generator is used as an engine-driven source of DC power and are normally rated at 28.5 volts, 150 amperes over a speed range of 8,100 - 12,000 rpm.

Interpole and compensating winding are provided in the negative circuit to prevent field distortion and insure favorable commutation conditions.

**Typical Aircraft Applications:**
- Agusta
- Eurocopter AS350B, AS35N, AS355
- Bell 206A, B, L
- MD Helicopter
- Pilatus Britten-Norman
- U.S. Army: OH-58, OH-58
- U.S. Coast Guard: H65, Dauphine
- Schweizer 300T
- Valmet L-90TP

**Design Features:**
- Super precision bearings are carefully selected and packed with high temperature grease to fit each application.
- Latest high temperature insulating materials used for longer life.
- Wedge type armature construction and steel banding insure safe overload condition.
- Armatures and field coils are vacuum impregnated to insure maximum insulation performance.
- Reinforced construction of commutator head minimizes brush failure, and possibility of bearing failure due to head vibration.
- Dynamic balancing to 5 grain-inches is performed on each armature and fan.
- Cast aluminum axial fan provides more cooling air throughout entire speed range and eliminates blade flattening at high speed.
- Improved drive shaft and damper are designed for longer life.
- Armature conductors are silver brazed to the commutator risers for maximum durability.

**Product Specifications:**
- **Length:** 8.0 inches
- **Maximum overspeed:** 14,000 RPM
- **Diameter:** 5.25 inches
- **Typical starter output at 1000 RPM with 20V input:** 3.8 HP
- **Weight (approximate):** 18 lbs
- **Maximum operating altitude:** 35,000 ft
- **Rated output:** 4.5 kW
- **Maximum static torque:** 550 in-lb.
- **Rated terminal voltage:** 28.5 V DC
- **Overhung moment:** 65 in-lb max.
- **Cooling:** Self-cooled with fan
- **Rated start locked motor torque:** 10 ft.-lb.
- **400 amps 12 V max.**
- **Cont. load within speed range:** 150 amps
- **Max. allowable start current & voltage:** 700 amps 28 V
- **Generator mode speed range:** 8,100-12,000 rpm
- **Equalizing voltage at rated load current:** 1.49 - 1.97 V
- **Minimum speed:**
  - 7,200 RPM
  - 26 V
  - 120 amps
- **Resistance range in series with the shunt field:** 0.5 - 35
- **Minimum speed for regulation:**
  - 8,100 RPM
  - 20 V
  - 150 amps
- **Allowable brush wear:** 0.490 in.
- **Allowable commutator wear:** 0.125 in.
APC 160SG SERIES GENERATORS

The 160 AMP series starter-generators were designed for the starting of turbine engines. This starter-generator is used as an engine-driven source of DC power and are normally rated at 28.5 volts, 160 amperes over a speed range of 8,100 - 12,000 rpm.

Interpole and compensating winding are provided in the negative circuit to prevent field distortion and insure favorable commutation conditions.

TYPICAL AIRCRAFT APPLICATIONS:
AGUSTA: A109C, F, K, POWER
EUROCOPTER: EC-120, EC-130

DESIGN FEATURES:
- Armature conductors are silver brazed to the commutator risers for maximum durability.
- Armature and field coils are vacuum impregnated to insure maximum insulation performance.
- Cast aluminum axial fan provides more cooling air throughout entire speed range and eliminates blade flattening at high speed.
- Dynamic balancing to 5 grain-inches is performed on each armature and fan.
- Improved drive shaft and damper are designed for longer life.
- Latest high temperature insulating materials used for longer life.
- Reinforced construction of commutator head minimizes brush failure, and possibility of bearing failure due to head vibration.
- Super precision bearings are carefully selected and packed with high temperature grease.
- Wedge type armature construction and steel banding insure safe over speed condition.

PRODUCT SPECIFICATIONS:

| Length: | 8.0 INCHES | Maximum Over Speed: | 14,000 RPM |
| Diameter: | 5.25 INCHES | Typical Starter Output | 3.8 HP |
| Weight (Approximate): | 18 LBS | Maximum Operating Altitude | 25,000 FT |
| Rated Output: | 4.8 KW | Maximum Static Torque | 800 IN- LB |
| Rated Terminal Voltage: | 28.5 V DC | Over Haul Moment | 65 IN-LB Max. |
| Cooling: | Self-Cooled With Fan | Rated Start Locked Rotor Torque | 10 FT-LB |
| Cont. Load Within Speed Range: | 160 AMPS | 400 AMPS | 12 V MAX |

Generator Mode Speed Range: 8,100-12,000 RPM

Minimum Speed:
- 7,200 RPM
- 26 V
- 120 AMPS

Minimum Speed for Regulation:
- 8,100 RPM
- 30 V
- 150 AMPS

Maximum Speed for Regulation:
- 13,000 RPM
- 30 V

Resistance Range in Series with the Shunt Field:
- 0.5 - 35

Equalizing Voltage at Rated Load Current:
- 1.49 - 1.97 V

Ratings:
- 700 AMPS
- 28 V

Allowable Brush Wear:
- 0.450 IN.

Allowable Commutator Wear:
- 0.125 IN.
The 200SGL AMP series starter-generators were designed for the starting of turbine engines. This starter-generator is used as an engine-driven source of DC power and are normally rated at 28.5 volts, 200 amperes over a speed range of 7,050 - 12,000 rpm. Interpole and compensating winding are provided in the negative circuit to prevent field distortion and insure favorable commutation conditions.

**TYPICAL AIRCRAFT APPLICATIONS:**
- MD HELICOPTER: 500, 530, 600N
- SKORSKY: 576A, C, C+
- AGUSTA: A119
- BELL: 206L-1, 206L-3, 407, 430
- CESSNA: CARAVAN 208
- U.S. ARMY: OH-58
- EMBRAER: EMB-120
- NEW PIPER: MERIDIAN
- HELICOPTER: SH-4
- GROB: G140
- PILOTUS: BRITEN/NORMAN

**DESIGN FEATURES:**
- Improved drive shaft and damper are designed for longer life.
- Wedge type armature construction and steel banding insure safe over speed condition.
- Dynamic balancing to 5 grain-inches is performed on each armature and fan.
- Super precision bearings are carefully selected and packed with high temperature grease to fit application as needed.
- Armature conductors are silver brazed to the commutator rings for maximum durability.
- Latest high temperature insulating materials used for longer life.
- Cast aluminum axial fan provides more cooling air throughout entire speed range and eliminates blade flattening at high speed.
- Armatures and field coils are vacuum impregnated to insure maximum insulation performance.

**PRODUCT SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>VALUE</th>
</tr>
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<tbody>
<tr>
<td>LENGTH</td>
<td>8.80 INCHES</td>
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<tr>
<td>DIAMETER</td>
<td>5.30 INCHES</td>
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<tr>
<td>WEIGHT (APPROXIMATE)</td>
<td>21.7 LBS</td>
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<tr>
<td>RATED OUTPUT</td>
<td>6.0 kW</td>
</tr>
<tr>
<td>RATED TERMINAL VOLTAGE</td>
<td>28.5 V DC</td>
</tr>
<tr>
<td>COOLING</td>
<td>BLAST-COOLED WITH FAN</td>
</tr>
<tr>
<td>CONT. LOAD WITHIN SPEED RANGE</td>
<td>200 AMPS</td>
</tr>
<tr>
<td>GENERATOR WIDE SPEED RANGE</td>
<td>7,050-12,000 RPM</td>
</tr>
<tr>
<td>MINIMUM SPEED</td>
<td>2,200 RPM</td>
</tr>
<tr>
<td>MINIMUM SPEED FOR REGULATION</td>
<td>7,050 RPM</td>
</tr>
<tr>
<td>MAXIMUM SPEED FOR REGULATION</td>
<td>17,000 RPM</td>
</tr>
<tr>
<td>RATED TERMINAL VOLTAGE</td>
<td>28.5 V</td>
</tr>
<tr>
<td>MAXIMUM STATIC TORQUE</td>
<td>1100 +/- IN- LB.</td>
</tr>
<tr>
<td>RATED START LOCKED ROTOR TORQUE</td>
<td>13 FT.-LB</td>
</tr>
<tr>
<td>RESISTANCE RANGE IN SERIES WITH THE SHUNT FIELD</td>
<td>0.5 - 35</td>
</tr>
<tr>
<td>ALLOWABLE BRUSH WEAR</td>
<td>0.650 IN.</td>
</tr>
<tr>
<td>ALLOWABLE COMMUTAR WEAR</td>
<td>0.125 IN.</td>
</tr>
</tbody>
</table>
APC 200SG SERIES GENERATORS

The 200SG AMP series starter-generators were designed for the starting of turbine engines. This starter-generator is used as an engine-driven source of DC power and are normally rated at 30 volts, 200 amperes over a speed range of 7,800-12,000 rpm. Interpole and compensating winding are provided in the negative circuit to prevent field distortion and insure favorable commutation conditions.

TYPICAL AIRCRAFT APPLICATIONS:

- U.S. AIR FORCES: AH-1J
- HARBIN: Y12
- U.S. NAVY: LH-6
- BELL: 212, 412
- MITSUBISHI: MU-2

DESIGN FEATURES:

- Wedge type armature construction and steel banding insure safe over speed condition.
- Super precision bearings are carefully selected and packed with high temperature grease to fit application as needed.
- Latest high temperature insulating materials used for longer life.
- Improved drive shaft and damper are designed for longer wear.
- Dynamic balancing to 5 grain-inches is performed on each armature and fan.
- Cast aluminum axial fan provides more air throughout entire speed range and eliminates blade flattening at high speed.
- Armature conductors are silver brazed to the commutator risers for maximum durability.
- Armatures and field coils are vacuum impregnated to insure maximum varnish impregnation.

PRODUCT SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>9.90 inches</td>
</tr>
<tr>
<td>Maximum Over Speed</td>
<td>14,000 RPM</td>
</tr>
<tr>
<td>Diameter</td>
<td>5.50 inches</td>
</tr>
<tr>
<td>TYPICAL STARTER OUTPUT AT 1000 RPM WITH 20V INPUT</td>
<td>6.0 kW</td>
</tr>
<tr>
<td>Maximum Static Torque</td>
<td>3,500 IN-LB.</td>
</tr>
<tr>
<td>Maximum Operating Altitude</td>
<td>35,000 FT</td>
</tr>
<tr>
<td>Maximum Terminal Voltage</td>
<td>30 V DC</td>
</tr>
<tr>
<td>Over Hung Moment</td>
<td>135 IN-LB MAX</td>
</tr>
<tr>
<td>Cooling</td>
<td>SELF-COOLED WITH FAN</td>
</tr>
<tr>
<td>RATED START LOCKED ROTOR TORQUE</td>
<td>13 FT-LB</td>
</tr>
<tr>
<td>1000 AMPS</td>
<td>12 V MAX.</td>
</tr>
<tr>
<td>400 AMPS</td>
<td>0.650 IN.</td>
</tr>
<tr>
<td>MAXIMUM ALLOWABLE START CURRENT &amp; VOLTAGE</td>
<td>1000 AMPS</td>
</tr>
<tr>
<td>Generator Mode Speed Range</td>
<td>7,800-12,000 RPM</td>
</tr>
<tr>
<td>Minimum Voltage</td>
<td>1.49 - 1.97 V</td>
</tr>
<tr>
<td>Equalizing Voltage AT RATED LOAD CURRENT</td>
<td>26 V</td>
</tr>
<tr>
<td>Resistance Range in Series WITH THE SHUNT FIELD</td>
<td>0.5 - 35</td>
</tr>
<tr>
<td>Minimum Speed 48 V</td>
<td>6.700 RPM</td>
</tr>
<tr>
<td>26 V 200 AMPS</td>
<td>28.5 V 200 AMPS</td>
</tr>
<tr>
<td>ALLOWABLE BRUSH WEAR</td>
<td>0.650 IN.</td>
</tr>
<tr>
<td>ALLOWABLE COMUTAR WEAR</td>
<td>0.125 IN.</td>
</tr>
<tr>
<td>Minimum Speed 11000 RPM</td>
<td>7,800 RPM</td>
</tr>
<tr>
<td>28.5 V 200 AMPS</td>
<td>0.650 IN.</td>
</tr>
<tr>
<td>Maximum Speed For Regulation</td>
<td>13,000 RPM</td>
</tr>
<tr>
<td>ALLOWABLE COMMUTAR WEAR</td>
<td>0.125 IN.</td>
</tr>
</tbody>
</table>
The 250SG AMP series starter-generators were designed for the starting of turbine engines. This starter-generator is used as an engine-driven source of DC power and are normally rated at 30 volts, 250 amperes over a speed range of 6,900-12,000 rpm. Interpole and compensating winding are provided in the negative circuit to prevent field distortion and insure favorable commutation conditions. TYPICAL AIRCRAFT APPLICATIONS:

- Beech: 90, 100, 200
- Dornier/Hindustan: DO-228
- Piper Cheyenne PA31
- Schaffer: DC-3 Turbine Conv.
- De Havilland: Twin Otter
- Ayres Thrush
- Myasishchev: M-101 Gzhel
- Air Tractor
- Walters A/S
- Raytheon: King Airs

DESIGN FEATURES:

- Armature conductors are silver brazed to the commutator risers for maximum durability.
- Latest high temperature insulating materials used for longer life.
- Armatures and field coils are vacuum impregnated to insure maximum insulation performance.
- Dynamic balancing to 5 grain-inches is performed on each armature and fan.
- Cast aluminum axial fan provides more cooling air throughout entire speed range and eliminates blade flattening at high speed.
- Super precision bearings are carefully selected and packed with high temperature grease to fit application as needed.
- Wedge type armature construction and steel banding insure safe over speed condition.
- Improved drive shaft and damper are designed for longer life.

PRODUCT SPECIFICATIONS:

<table>
<thead>
<tr>
<th>LENGTH</th>
<th>10.55 INCHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM OVERSPEED</td>
<td>14,000 RPM</td>
</tr>
<tr>
<td>DIAMETER (APPROXIMATE)</td>
<td>5.52 INCHES</td>
</tr>
<tr>
<td>WEIGHT (APPROXIMATE)</td>
<td>31.6 LBS</td>
</tr>
<tr>
<td>RATED OUTPUT</td>
<td>7.5 kW</td>
</tr>
<tr>
<td>RATED TERMINAL VOLTAGE</td>
<td>30 V DC</td>
</tr>
<tr>
<td>COOLING</td>
<td>BLAST-COOLED WITH FAN</td>
</tr>
<tr>
<td>CONT. LOAD WITHIN SPEED RANGE</td>
<td>250 AMPS</td>
</tr>
<tr>
<td>GENERATOR MODE SPEED RANGE</td>
<td>6,900-12,000 RPM</td>
</tr>
<tr>
<td>MINIMUM SPEED</td>
<td>6,200 RPM</td>
</tr>
<tr>
<td>MINIMUM SPEED FOR REGULATION</td>
<td>6,200 RPM</td>
</tr>
<tr>
<td>MAXIMUM SPEED FOR REGULATION</td>
<td>13,000 RPM</td>
</tr>
<tr>
<td>ALLOWABLE BRUSH WEAR</td>
<td>0.625 IN.</td>
</tr>
<tr>
<td>ALLOWABLE COMMUTAR WEAR</td>
<td>0.200 IN.</td>
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</table>
APC 300SGL SERIES GENERATORS

The 300SGL AMP series starter-generators were designed for the starting of turbine engines. This starter-generator is used as an engine-driven source of DC power and are normally rated at 28 volts, 300 amperes over a speed range of 7,200-12,000 rpm.

Interpole and compensating winding are provided in the negative circuit to prevent field distortion and insure favorable commutation conditions.

TYPICAL AIRCRAFT APPLICATIONS:
- AERMACCHI: S211 TRAINER
- BEECH: 1900, 1900D
- CESSNA: CITATION 560, ENCORE, EXCEL, CJ1, CJ2, & APU
- AGUSTA: A300
- PIGAVO: LH-1 RE-ENGINE
- BASLER: DC-3 TURBINE CONVERSION
- DEHAVILLAND: DASH 8-100, 200, 300
- FZL: 130
- IBS AE270

DESIGN FEATURES:
- Super precision bearings are carefully selected and packed with high temperature grease to fit application as needed.
- Wedge type armature construction and steel banding insure safe over speed condition.
- Armature conductors are silver brazed to the commutator risers for maximum durability.
- Improved drive shaft and damper are designed for longer life.
- Dynamic balancing to 5 grain-inches is performed on each armature and fan.
- Cast aluminum axial fan provides more cooling air throughout entire speed range and eliminates blade flattening at high speed.
- Latest high temperature insulating materials used for longer life.
- Armatures and field coils are vacuum impregnated to insure maximum insulation performance.

PRODUCT SPECIFICATIONS:
- LENGTH: 12.25 INCHES
- MAXIMUM OVERSPEED: 14,000 RPM
- DIAMETER: 5.52 INCHES
- TYPICAL STARTER OUTPUT AT 1000 RPM WITH 20V INPUT: 9.8 HP
- WEIGHT (APPROXIMATE): 32 LBS
- MAXIMUM OPERATING ALTITUDE: 55,000 FT
- RATED OUTPUT: 9 kW
- MAXIMUM STATIC TORQUE: 1500 IN-LB.
- RATED TERMINAL VOLTAGE: 28 V DC
- OVER HUNG MOMENT: 149 IN-LB MAX.
- COOLING: BLAST-COOLED WITH FAN
- RATED START LOCKED ROTOR TORQUE: 20 FT.-LB
- CONT. LOAD WITHIN SPEED RANGE: 300 AMPS
- MAXIMUM ALLOWABLE START CURRENT & VOLTAGE: 1700 AMPS 28 V
- GENERATOR MODE SPEED RANGE: 7,200-12,000 RPM
- EQUALIZING VOLTAGE AT RATED LOAD CURRENT: 1.49 - 1.97 V
- MINIMUM SPEED: 6,800 RPM
- 28 V
- 280 AMP
- 300 AMP
- RESISTANCE RANGE IN SERIES WITH THE SHUNT FIELD: 0.5 - 35
- MINIMUM SPEED FOR REGULATION: 7,200 RPM
- 30 V
- 300 AMP
- ALLOWABLE BRUSH WEAR: 0.700 IN.
- MAXIMUM SPEED FOR REGULATION: 13,000 RPM
- ALLOWABLE COMMUTAR WEAR: 0.200 IN.
The 300SG AMP series starter-generators were designed for the starting of turbine engines. This starter-generator is used as an engine-driven source of DC power and are normally rated at 28 volts, 300 amperes over a speed range of 7,200-12,000 rpm.

Interpole and compensating winding are provided in the negative circuit to prevent field distortion and insure favorable commutation conditions.

**TYPICAL AIRCRAFT APPLICATIONS:**
- CESSNA: CITATION 650 & APU
- FAIRCHILD: METRO II, III, IV, V
- GENERAL ATOMIC: PREDATOR B
- CASA: 212
- HINDUSTAN: D-228
- JETSTREAM: 31, 32
- MARSH AVIATION: OV10A CONV.

**DESIGN FEATURES:**
- Trailing type brush holders and instant filming altitude treated split brushes provide excellent commutation.
- Armature conductors are silver brazed to the commutator rings for maximum durability.
- Wedge type armature construction and steel banding insure safe over speed condition.
- Latest high temperature insulating materials used for longer life.
- Armatures and field coils are vacuum impregnated to insure maximum insulation performance.
- Dynamic balancing to 5 grain-inches is performed on each armature and fan.
- Super precision bearings are carefully selected and packed with high temperature grease to fit application as needed.
- Torsional vibration dampener is installed to eliminate torsional vibrations.

**PRODUCT SPECIFICATIONS:**

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<thead>
<tr>
<th>SPECIFICATION</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>12.25 inches</td>
</tr>
<tr>
<td>Diameter</td>
<td>5.52 inches</td>
</tr>
<tr>
<td>Maximum Overspeed</td>
<td>14,000 RPM</td>
</tr>
<tr>
<td>Diameter</td>
<td>32 LBS</td>
</tr>
<tr>
<td>Maximum Operating Altitude</td>
<td>35,000 FT</td>
</tr>
<tr>
<td>Rated Output</td>
<td>96 kW</td>
</tr>
<tr>
<td>Maximum Static Torque</td>
<td>1500 IN-LB.</td>
</tr>
<tr>
<td>Rated Terminal Voltage</td>
<td>28 V DC</td>
</tr>
<tr>
<td>Maximum Overhung Moment</td>
<td>149 IN-LB. MAX.</td>
</tr>
<tr>
<td>Cooling</td>
<td>BLAST-COOLED WITH FAN</td>
</tr>
<tr>
<td>Rated Start Locked Rotor Torque</td>
<td>20 FT-LB</td>
</tr>
<tr>
<td>Cont. Load Within Speed Range</td>
<td>300 AMPS</td>
</tr>
<tr>
<td>Maximum Allowable Start Current &amp; Voltage</td>
<td>1700 AMPS</td>
</tr>
<tr>
<td>Generator Mode Speed Range</td>
<td>7,200 - 12,000 RPM</td>
</tr>
<tr>
<td>Equalizing Voltage</td>
<td>28 V</td>
</tr>
<tr>
<td>Minimum Speed</td>
<td>6,800 RPM</td>
</tr>
<tr>
<td>Resistance Range in Series</td>
<td>1.49 - 1.97 V</td>
</tr>
<tr>
<td>Minimum Speed for Regulation</td>
<td>7,200 RPM</td>
</tr>
<tr>
<td>Allowable Brush Wear</td>
<td>0.700 IN.</td>
</tr>
<tr>
<td>Maximum Speed for Regulation</td>
<td>11,000 RPM</td>
</tr>
<tr>
<td>Allowable Commutator Wear</td>
<td>0.200 IN.</td>
</tr>
</tbody>
</table>
The 400SG AMP series starter-generators were designed for the starting of turbine engines. This starter-generator is used as an engine-driven source of DC power and are normally rated at 30 volts, 400 amperes over a speed range of 7,200-12,000 rpm. Interpole and compensating winding are provided in the negative circuit to prevent field distortion and insure favorable commutation conditions.

**Typical Aircraft Installations:**
- SAAB: 340
- RAYTHEON: HAWKER 700, 800, 800XP & APU
- CANADAIR: CL215, 415 WATER-BOMBER
- BOMBARDIER: LEARJET-60 & APU
- NAL: SARAS
- DEHAVILLAND: DASH 8-400 & APU
- EMBRAER: EMB-120
- MARSH AVIATION: S2 TRACKER CONVERSION

**Design Features:**
- Improved drive shaft and damper are designed for longer life.
- Dynamic balancing to 5 grain-inches is performed on each armature and fan.
- Armature conductors are silver brazed to the commutator risers for maximum durability.
- Latest high temperature insulating materials are used for longer life.
- Armatures and field coils are vacuum impregnated to insure maximum insulation performance.
- Super precision bearings are carefully selected and packed with high temperature grease to fit application as needed.
- Wedge type armature construction and steel banding insure safe over speed condition.
- Cast aluminum axial fan provides more cooling air throughout entire speed range and eliminates blade flattening at high speed.

**Product Specifications:**
- Length: 12.90 inches
- Diameter: 6.21 inches
- Weight (Approximate): 37.5 lbs
- Rated Output: 12 kW
- Rated Terminal Voltage: 30 V DC
- Cooling: Blast-Cooled with Fan
- Cont. Load Within Speed Range: 400 Amps
- Generator Mode Speed Range: 7,200-12,000 RPM
- Minimum Speed: 5,800 RPM
- Minimum Speed for Regulation: 7,200 RPM
- Maximum Speed for Regulation: 13,000 RPM
- Maximum Over Speed: 14,000 RPM
- Maximum Operating Altitude: 55,000 ft
- Rated Terminal Voltage: 30 V DC
- Rated Start Locked Rotor Torque: 20 ft-lb
- Maximum Allowable Brush Wear: 0.700 in.
When a generator needs to be overhauled, many steps are taken towards its completion. This process begins with an initial inspection when the generator is received. The generator is checked, inspected, documented and sent to the overhaul dept. It is then broken down, and its parts are serial numbered. This ensures that there is no mixing of parts, and for traceability of our generators. This also allows APC to track and validate information on all of its generators, including their performance and reliability in the field.

Each major component goes through its own overhaul process. These major components are replaced or refurbished to new condition, during the overhaul process. These components include the terminal block and fan, brushes, slips, spring holders, bearings, armatures, stators, commutator/end bells, claw shafts, damper plate, and friction discs, etc. The armature is re-cut and re-balanced, the stator is completely re-stained with new varnish, which is standard in the overhaul process. After all the necessary parts are overhauled, the generator is ready to be re-assembled.

Once the generator overhaul process is complete and it is re-assembled, it is 100% tested. The product must be validated through Acceptance Test Procedures (ATP) and pass the final inspection police strictly adhered to by our Quality Assurance Dept. After the generator is tested, it is carefully packed and prepared for shipping. The generator is now prepared to be sent to the customer.

For more information on Aircraft Parts Corp. or our overhaul process, please contact us toll-free at 1-877-4APCMFG ((1/877-427-2634).
From takeoff to landing, your partner in flight

APC WORLD HEADQUARTERS:
AIRCRAFT PARTS CORP.
160 FIN COURT
FARMINGDALE, N.Y. 11735, U.S.A.
PHONE: 631-249-3053
FAX: 631-293-4131
www.apcmfg.com

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CERTIFICATION #MB1R316K

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