



ADVANCED POWER
TECHNOLOGIES

Voltage, Frequency Rotary Converter Motor-Generator Systems



RotoVerter Engineered Power Systems Solutions Brochure

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**SAFE SMART SERVICEABLE SWITCHGEAR &
ENGINEERED POWER SYSTEM SOLUTIONS**



ALN: 557 Rev. 03

Sets, Packages, & Systems



Figure 1: M-G Set, No Enclosure



Figure 2: M-G Set, with output circuit breaker in outdoor enclosure



Figure 3: M-G Set, with output circuit breaker and quick connection receptacles in outdoor enclosure



Figure 4: M-G Set, No Enclosure with switchgear control lineup

Product Benefits

APT offers a wide variety of Motor-Generator Sets, Packages, & Systems that can be customized to your application and needs. It is a multi-purpose synchronous motor-synchronous generator set that allows you to use it as a 50/60Hz convertible power supply, and either a variable frequency or voltage power supply. They can be utilized in various applications such as rotary UPS, solving power quality problems, frequency and voltage converters, grid isolation, grid support devices, and micro-grids.

Product Advantages

- ⦿ Complete galvanic isolation between the power source and the load via mechanical coupling. This prevents the most extreme over-voltages and surges on the utility side from damaging loads connected to the generator side of the system.
- ⦿ High available fault current which allows for selective time-overcurrent coordination. This increases the fault tolerance of the system and means that the short circuit in one part of the load may not affect other parts of the

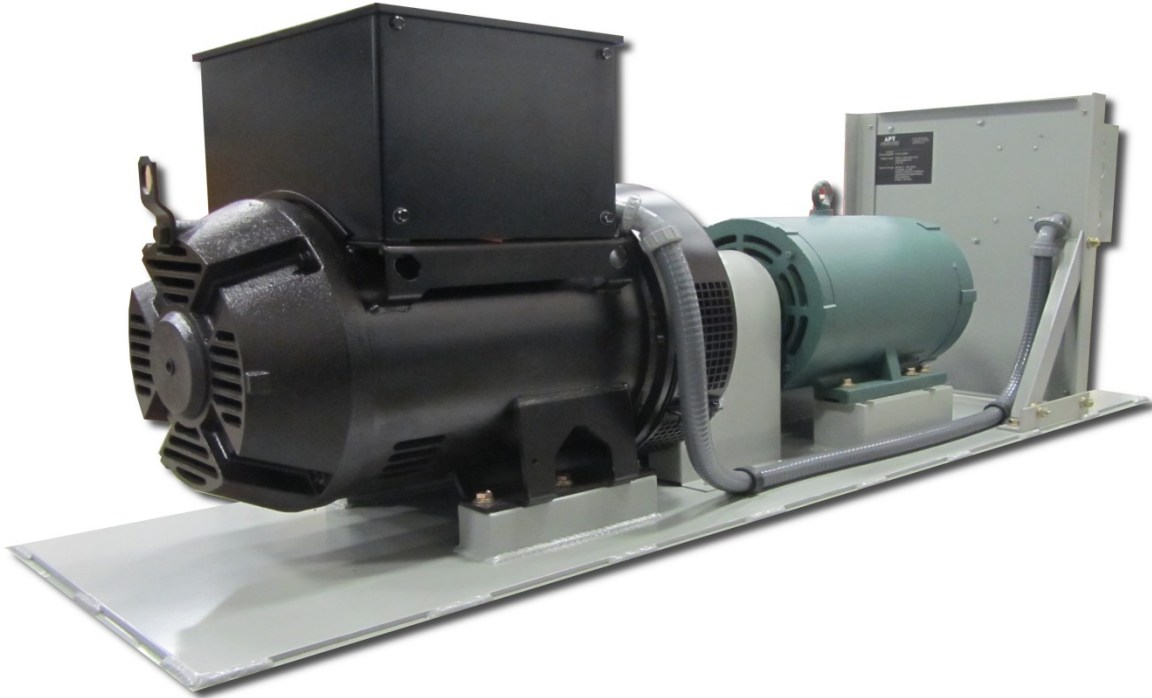
load. This is not achievable when traditional solid state UPS systems are used.

- ⦿ Motor starting capability, which is also not achievable when traditional solid state UPS systems are used.
- ⦿ Ability to operate at wide range of voltages (generally between 120 and 15,000 V) and ability to parallel unlimited number of units to achieve any kW and kVAR output.
- ⦿ Proven industrial and utility grade motor and generator technology and readily available spare parts and motor/generator repair and maintenance facilities.

Product Limitations

- ⦿ Relatively low system efficiency (around 91%).
- ⦿ Recommended bearing maintenance every 2 years.

Types & Applications



Interlocking, Monitoring, and Options

- ⦿ Power Conditioning:
 - Complete galvanic isolation between the power source and the load via mechanical coupling. This prevents the most extreme over-voltages and surges on the utility side from damaging loads connected to the generator side of the system.
 - Ride through upon most single-phase faults and sags and short three phase voltage sags which are milliseconds in duration.
 - High available fault current which allows for selective time-overcurrent coordination. This increases the fault tolerance of the system and means that the short circuit in one part of the load may not affect other parts of the load. This is not achievable when solid state systems are used.
 - Motor starting capability, which is also not achievable when traditional solid-state conditioning systems are used.
 - Ability to operate at wide range of voltages (generally between 120 and 15,000V) and ability to parallel unlimited number of units to achieve any kW and kVAR output.
 - Proven industrial and utility grade motor and generator technology and readily available spare parts and motor/generator repair and maintenance facilities.
- ⦿ Rotary UPS:
 - Motor-Generator based Uninterruptible Power Supply Systems remain a golden standard of the Uninterruptible Power Supplies. When equipment failure due to the power surges, sudden voltage fluctuations or unplanned power losses is not an option, Motor-Generator based Uninterruptible Power Supply Systems are the answer.
- ⦿ Frequency Converters:
 - 50/60 Hz frequency converters
 - 60/50 Hz frequency converters
 - DC to 60 Hz or 50 Hz three phase converters
 - Variable frequency power source
 - Variable voltage power source
- ⦿ Frequency/Voltage Stabilizer
 - When a renewable power source can produce power with unstable frequency and voltage, APT Motor-Generator system can convert this “unstable” power into the utility grade power source with stable voltage and frequency.
- ⦿ For more information about **Grid Isolation**, **Grid Support**, and **Micro-grid applications**, please contact [APT](http://www.appt.com).

About Advanced Power Technologies



Advanced Power Technologies (APT) is on the cutting edge of the latest engineered power system smart technologies, as it relates to microgrid & storage management, renewable & conventional energy source deployment, demand peak shaving, and facility back-up and co-generation power systems. Located in the central United States and headquartered in Lafayette, Indiana with solutions development engineers around the country, APT provides domestic and international products and services to industry leading companies from around the world. APT engineers have decades of power system experience from working with some of the largest companies in industry. Over the last two decades, we have produced successful solutions for hundreds of large-scale electric power projects involving utility/generator paralleling, transfer, peak shaving, and distribution. We pride ourselves in providing electrical power systems that are engineered and custom built, utilizing state-of-the-art technologies to fit our customer's exact needs. The core of our business is low & medium voltage engineered power systems for a wide range of indoor & outdoor applications, such as:

- ⊙ Utility(ies) and Generator(s) Paralleling/Transfer/Peak Shaving/Distribution Switchgear
- ⊙ Microgrids, Microgrid Master Control Panels, SCADA systems
- ⊙ Containerized Battery Energy Storage Systems (BESS)
- ⊙ Photovoltaic (PV) Solar Power Collection/Distribution & Renewable Energy Storage Systems
- ⊙ Low & High Resistance Grounding Systems, Grounding Systems for Photovoltaic Effective Grounding
- ⊙ High Efficiency Combined Heat and Power Switchgear & Control Systems (CHP, Co-generation)
- ⊙ Outdoor Walk-In Electrical Houses (E-Houses) & Skid-Mounted Switchgear
- ⊙ Motor Control Centers & Motor Control Switchgear
- ⊙ Automatic & Manual Load Transfer Switchgear
- ⊙ Bypass/Isolation & Power Distribution Circuit Breaker Switchboards
- ⊙ Generator/Loadbank Quick Connection Switchgear, Switchboards, & Tap Boxes
- ⊙ Industrial Control Panels

Please see our product webpages on www.appt-power.com for product brochures and relevant information. Actual products may look different from images shown on the website and in brochures, based on actual specifications. APT cares and understands that each power system is different. We will evaluate various solutions to develop the best solution for a site. APT focuses on our ability to a combine several traditional pieces of equipment/functionality into as little of a footprint possible. This saves on space, the cost of equipment, cost of installation, and accomplishes the most optimal/state-of-the-art design your facilities. APT's desires to foster and grow a culture of continued open communication with each customer. Let APT be your source to provide fully engineered power system equipment solutions for the full customer facility on time, on or under budget, and in the smallest footprint possible. We are always available to assist customers and engineers representing customers in the development of complex power solutions for all facility types.