ADVANCED POWER TECHNOLOGIES

# Utility Paralleling Control Module

## UP
## 02 Microgrid, Paralleling, Transfer Control Systems
### Solutions Brochure

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

MADE IN THE USA

ALN: 552 Rev. 01

# Automatic Paralleling Switchgear

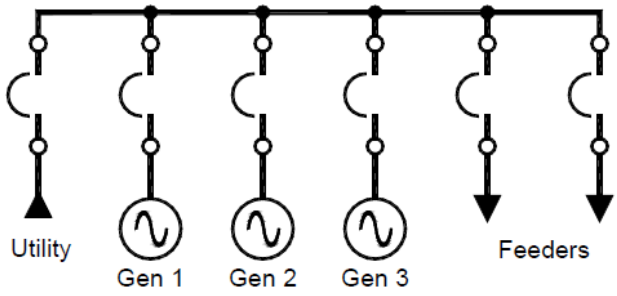


Figure 1: Medium Voltage Multiple Genset Utility Paralleling Lineup

## Automatic Paralleling Switchgear Low & Medium Voltage

### Product Features

- Available in Low Voltage (UL891 Listed) or Medium Voltage
- Integrated Microprocessor Control
- Completely automatic operation
  - Automatic Paralleling
  - kW Soft Loading Control
  - kVAR Control
  - Voltage Matching
- Optional SCADA-ready Modbus Comm. Port for Monitoring and Control
- Standard Silver-Plated Copper Bus
- Various Modes of Operation Available
  - Base Load Control
  - Import/Export Control
  - Seamless Load Transfer
  - Automatic Standby

| Product Specifications | |
|---|---|
| Voltage | 208 – 600V, 3 phase, 3 or 4 wire (LV)<br>2.4-15kV, 3 phase, 3 wire (MV) |
| Current | Up to 4000A UL Listed (LV)<br>Up to 3000A UL Listed (MV) |
| Enclosure | NEMA 1 for indoor use<br>NEMA 3R for outdoor use |
| Dimensions | Standard low voltage – 28” x 80”H x (46” or 54” or 62”D)<br>Std medium voltage – 36”W x 95”H x 92”D |
| Metering Type | Ture RMS, 3 Element |
| Metering Accuracy | 0.3% - voltage and current<br>0.6% - power and energy |
| Metering Options | PS-P – power sensing (A,V, Hz, kW, PF, kVAR, erc.)<br>PS-E – energy sensing (kW-hrs., kVAR-hrs) |
| Generator Protection | Overcurrent (50/51), under/overvoltage, under/over frequency, reverse power, loss of excitation, current balance, ground fault (optional), loss of utility, utility overvoltage (3 phase), utility under voltage (3 phase), utility over/under frequency |
| Options | SCADA-ready Modbus communications port |

# Product Information


Overview of Operation

APT utility paralleling switchgear is intended to provide the necessary controls to relieve a utility grid of part of its burden (kW and kVAR) by displacing it onto a generator set. Once the generator set is paralleled to the utility, it is necessary for the switchgear to be able to control engine load level (kW) and generator excitation level (kVAR). This is accomplished by connecting to the engine speed and generator voltage adjust circuits of the generator set. Several operational modes are available:

1. Base load – This mode soft loads the generator set to a constant load level against utility.

2. Import/export control – This mode seeks to maintain constant utility contribution to a site load. This is accomplished by monitoring utility contribution and trimming generator set load levels up and down as site loads change. Import control means the generator set is contributing less than the total site load requirements and the utility supplies the difference. Export control means the generator set is contributing more than the total site load requirements and the utility is absorbing the difference.

3. Seamless load transfer – This mode softly transfers an entire site load to a generator set and back to the utility source. This is accomplished in a “bumpless” fashion by monitoring the generator and utility contribution to the site’s load while loading the generator set. As the generator set softly ramps up in load, the utility contribution consequently softly ramps down. When the generator set has assumed all the site’s load, a utility circuit breaker is then disconnected. Now the generator is supplying site load isolated from the utility source. When it is time to shutdown the generator set, the generator is first synchronized to the utility across the utility circuit breaker. The loading/unloading sequence is now reversed until all the load is gradually transferred to the utility and the generator set is finally disconnected.

4. Automatic standby – This mode of operation continuously monitors the utility. Should the utility fail, the switchgear automatically initiates a sequence that starts and parallels the generators in standby mode, disconnects the utility feed from the load, and then connects the generator bus to the load. When the utility returns and is diagnosed to be “healthy,” the switchgear softly transfers back to utility power in a closed transition fashion and then shuts down the generators. There is no interruption of power during the return to utility source.

# 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.apt-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 in order 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.