

Utility Paralleling Switchgear

Low & Medium Voltage

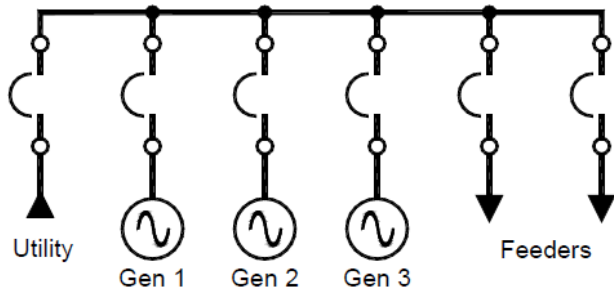


Figure 1: Medium Voltage Multiple Genset Utility Paralleling Lineup

Product Features

- Available in Low Voltage (available as UL891 listed) or Medium Voltage
- Integrated Microprocessor Control
- Completely Automatic Operation
 - Automatic Paralleling
 - kW Soft Loading Control
 - kVAR Control
 - Voltage Matching
- Standard Silver Plated Copper Bus
- Various Modes of Operation Available
 - Base Load Control
 - Import/Export Control
 - Seamless Load transfer
 - Automatic Standby
- Optional SCADA-ready Modbus Communications Port

Product Specifications

Voltage:	208 – 600V, 3 phase, 3 or 4 wire (low voltage) 2400 – 15kV, 3 phase, 3 wire (medium voltage)
Current:	Up to 4000A (low voltage) Up to 3000A (medium voltage)
Enclosure:	NEMA 1 for indoor use NEMA 3R for outdoor use (optional)
Dimensions:	Std. low voltage – 28"W x 80"H x (46" or 54" or 62"D) Std. medium voltage – 36"W x 95"H x 92"D
Metering Type:	True RMS, 3 element
Metering Accuracy:	0.3% - voltage and current 0.6% - power and energy
Metering Options:	PS-P – power sensing (A, V, Hz, kW, PF, kVAR, etc.) 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



Figure 2: Single Generator Low Voltage Utility Paralleling Switchgear (Optional Battery Charger Pictured top Right)



Figure 3: Close-Up Advanced Control Module for Generator Paralleling Control

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.