



ADVANCED POWER  
TECHNOLOGIES

# 208V-480V Onboard Paralleled Generator Distribution Switchboard



## GenProtectP-Series Low Voltage Switchboard & Switchgear Solutions Brochure

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



ALN: 572 Rev. 01

# Paralleled Generator Protection



Figure 1: APT GenProtect-P with Multiple Paralleled Generators and Main Bus



Figure 2: 500kW, 480V, 800A Paralleled Generators Disconnect & Output Protection Insulated Case Circuit Breakers and load take-off



Figure 3: On Section of GenProtectP Front View showing Insulated Case Circuit Breaker

## Protection for Multiple Paralleled Generators with Optional Distribution

- ⊙ The most powerful, all in one solution to your paralleled generator power distribution needs
- ⊙ The GenProtectP-Series can be custom configured to accommodate connection of any number of permanent generators with on board paralleling controls
- ⊙ With the option to connect paralleled generator(s) via mechanical main lugs only to one large circuit breaker, or the flexibility in customization to provide a manually operated circuit breaker based disconnect for each generator to a common bus, it makes this the best solution to providing safe, protected power distribution no matter the system protection requirements
- ⊙ Available in NEMA 1 for integration into a generator enclosure or NEMA 3R for centralized outdoor mounting
- ⊙ NEC 2017 requires a method of Energy Reduction Maintenance Mode which adds cost to the overall system for operator safety. This feature is optional when used in conjunction with appropriate engine generator controller settings no matter the circuit breaker size to provide superior protection at an affordable price
- ⊙ Designed to fully support all paralleled generator controllers including
  - CAT EMCP 4.4
  - Cummins Power Command
  - Deep Sea
  - Woodward
  - And more!

# Paralleled Generator Protection



Figure 4: 1.3MW, 480V, 2000A Generator Disconnect & Output Protection Molded Case Circuit Breaker NEMA 1 Enclosure with Window Kit



Figure 5: Remote Engine Control Panel



Figure 6: 2MW, 480V, 3000A Generator Output Protection Insulated Case Circuit Breaker NEMA 1 Enclosure Floor Standing Panel Door Open Side View

## Floor Standing Output & Distribution Protection

- ⊙ Application Voltages:
  - 480V, 600V, 120V/208V (3Ø)
  - 120V/240V (2Ø)
- ⊙ Your Choice of Circuit Breakers:
  - UL® 489 or UL® 1066 Listed
  - Interrupting Rating:
    - 18kA – 200kA @ 480V<sub>AC</sub>
  - Molded Case Circuit Breakers:
    - Available up to 3000A
    - 80% or 100% Rated
    - Fixed Mounted, Drawout, or Plug-In
  - Insulated Case Circuit Breakers:
    - Available from 800A up to 4000A+
    - Manually Operated
    - Electrically Operated with Motor Operator Add-on
    - 100% Rated
    - Fixed or Drawout Mounted
- ⊙ Cable Connections from Generator:
  - (≥1200A) circuit breaker lug terminations
- ⊙ Circuit Breaker Trip Units:
  - Thermal Magnetic
  - Basic Electronic
  - LI – Adjustable long time, instantaneous trip settings
  - LSI – Adjustable long & short time, instantaneous trip settings
  - LSIG – Adjustable long & short time, instantaneous trip settings, with ground fault trip settings
  - LSIA – Ground Fault Indication – Bell Alarm, No Trip
- ⊙ Breaker position Aux Contacts (“a” and “b”)
- ⊙ Shunt Trip
- ⊙ Time Delayed Trip

# Distribution Protection Sections



Figure 7: 1 MW, 480V, 1600A Generator Disconnect & Output Protection Molded Case Circuit Breaker with Front Removable Sheets



Figure 8: Remote Generator Start/Stop & Setpoints Panel

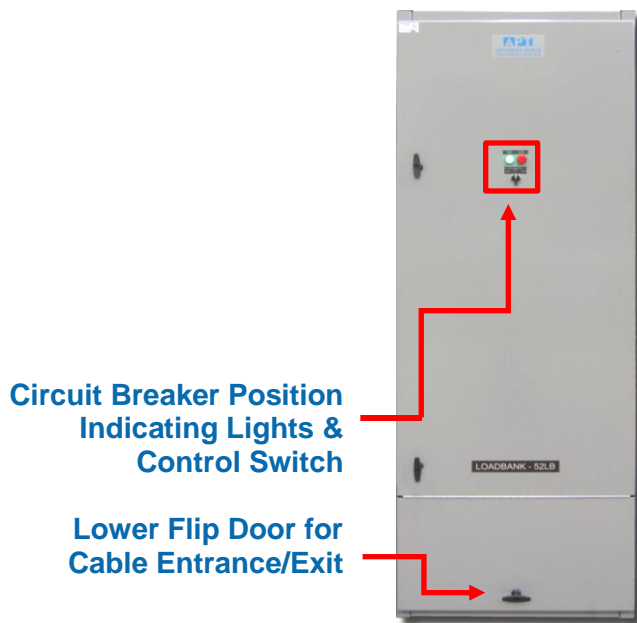


Figure 9: 500kW, 480V, 800A Generator Disconnect & Output Protection Insulated Case Circuit Breaker with Hinged T-hinged Front Door

## Remote Generator Control & Feeder Protection

- ⦿ Installation Location & Enclosure
  - Carbon Steel NEMA 1 Floor Standing
  - ANSI 61 Gray or a variety of customer specified colors
  - Screw Removable Panel or T-latch Front Door allows circuit breaker bus and lug access
  - Your choice of cable entrance/exit locations
- ⦿ Neutral Busbar & Grounding Stud
- ⦿ Optional remote panel includes start and E-stop for control of generator adjustable setpoint parameters with touchscreen HMI to be mounted in a convenient & easy to access location
- ⦿ Each enclosure is manufactured to order based on the dimensions available in the generator house that it will be mounted in
- ⦿ Glastic or Metal Isolation Barriers Between Circuit Breakers Available Upon Request
- ⦿ NEC 695 Compliant Fire Pump Connection
  - Segregation & isolation from generator output/distribution protection circuit breakers
  - Fire pump overcurrent protection connects directly to the generator
- ⦿ Kirk Key Interlocking available to prevent inadvertent paralleling of two sources
- ⦿ Control Power
  - 12/24VDC from Engine starting batteries
  - 120VAC Customer Supplied

## Temporary Generator or Load Bank Connection



Circuit Breaker Position  
Indicating Lights &  
Control Switch

Lower Flip Door for  
Cable Entrance/Exit



Circuit Breaker

Cam-lok Style  
Receptacles

Alternate  
Connections  
(Cover Removed)

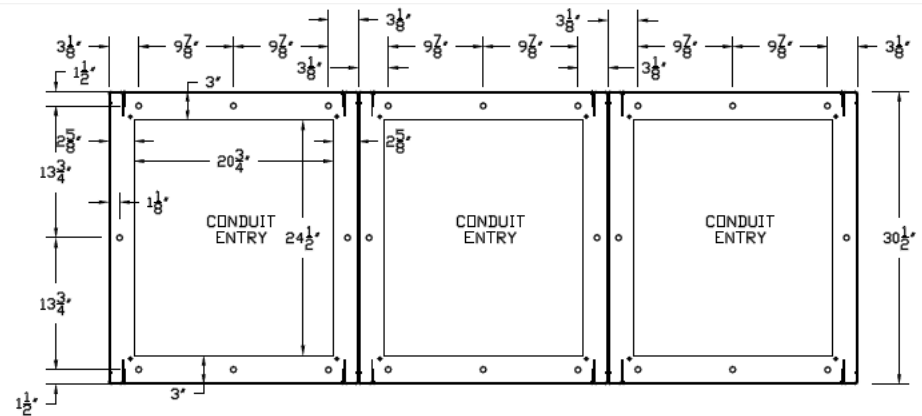
Figure 10: Quick Connect Section

Figure 11: Inside GQC Section

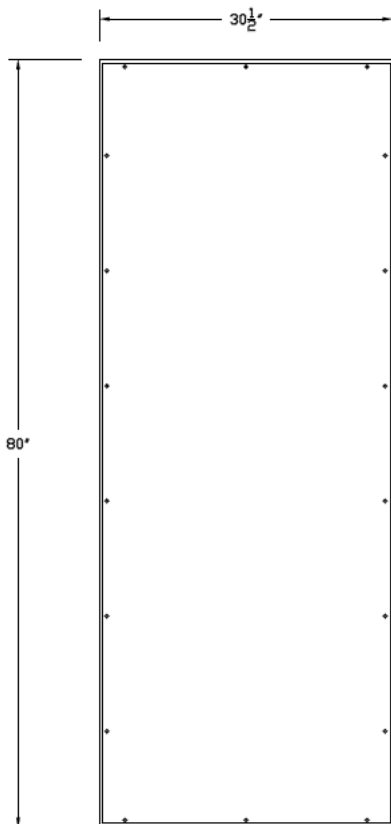
## Integrated Generator / Load Bank Quick Connection

- ⊙ Add the ability to connect load bank your gensets or add temporary power to your distribution system to provide power to your feeders via integrated Generator Quick Connection when permanent generator power is unavailable
- ⊙ Backup your ability to feed loads manually via temporary generator connection.
- ⊙ Per NEC 700.3, temporary generator connection applications require either mechanical or electrical interlocking of the power sources to safely prevent the inadvertent paralleling of the normal & emergency power sources:
  - Service Entrance Rated Manual Transfer Switchboard (two integrated keys)
    - Utility service entrance circuit breaker with mechanical key interlock
    - Temporary generator circuit breaker with mechanical key interlock
  - Temporary Generator Connection Only
    - External service main no temporary generator circuit breaker protection
    - One integrated mechanical key interlock, one ship loose with mechanical key interlock for installation on facility service main
- Multiple generators or feeders circuit breaker sections (multiple mechanical key interlocks, transfer block)
- ⊙ Operation sequence without the interlocking of sources is available for systems that achieve NEC 700.3 source interlocking externally
- ⊙ Loadbank connection only applications
  - Easily connects a temporary loadbank to a facility's permanent generator(s)
  - Utilizes female cam-lok type receptacles
  - Does not require the use of interlocking
  - Circuit breaker and monitoring options available
- ⊙ Integrated Generator & Loadbank Quick Connection
  - Integrates male & female cam-loks into one unit for all your temporary connection needs in one location
  - Dual-purpose termination cabinet allows for safe and clean connection of a portable temporary generator or loadbank for permanent generator load testing

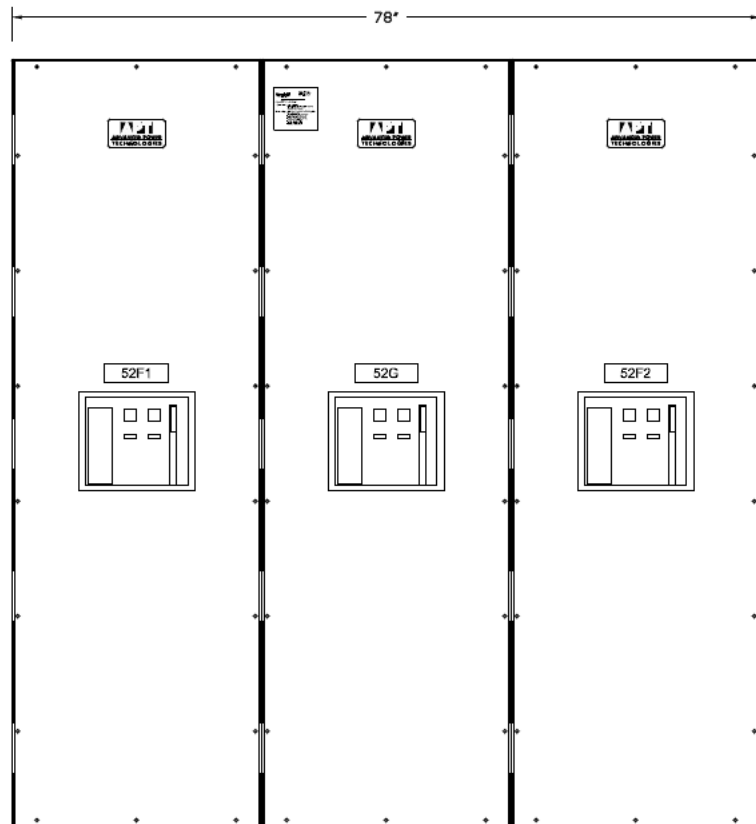
# GenProtectP Standard Enclosure Drawing



PLAN VIEW  
(ANCHORING)



LEFT SIDE VIEW



SECTION 1

SECTION 2

SECTION 3

FRONT VIEW  
EXTERNAL

Figure 12: 800A – 3000A Three (3) Paralleled Generators Output Protection Breaker Standard Depth with Removable Sheets (1S)

# GenProtectL Standard Enclosure Drawing

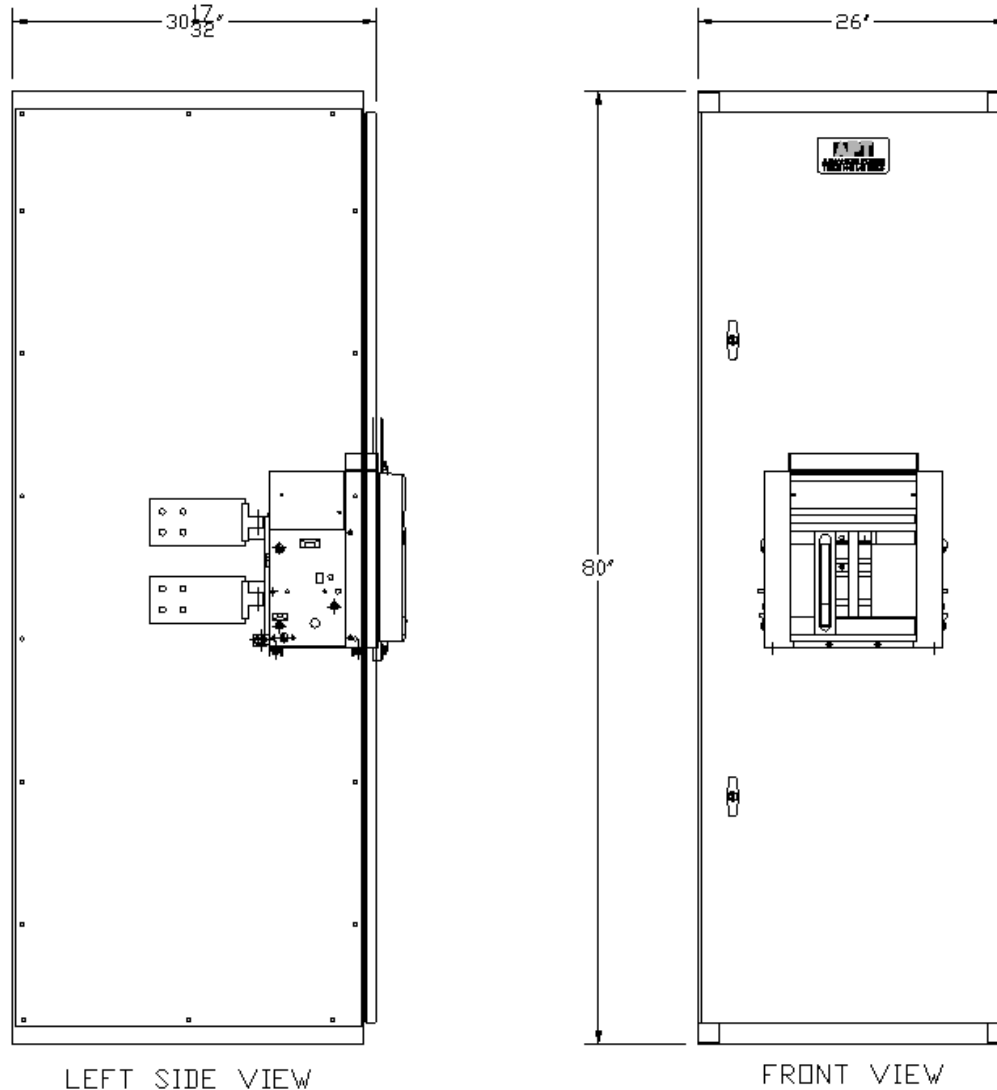


Figure 13: 800A – 3000A Generator Output Protection Breaker Standard Depth



# Extra Depth Enclosure Drawing

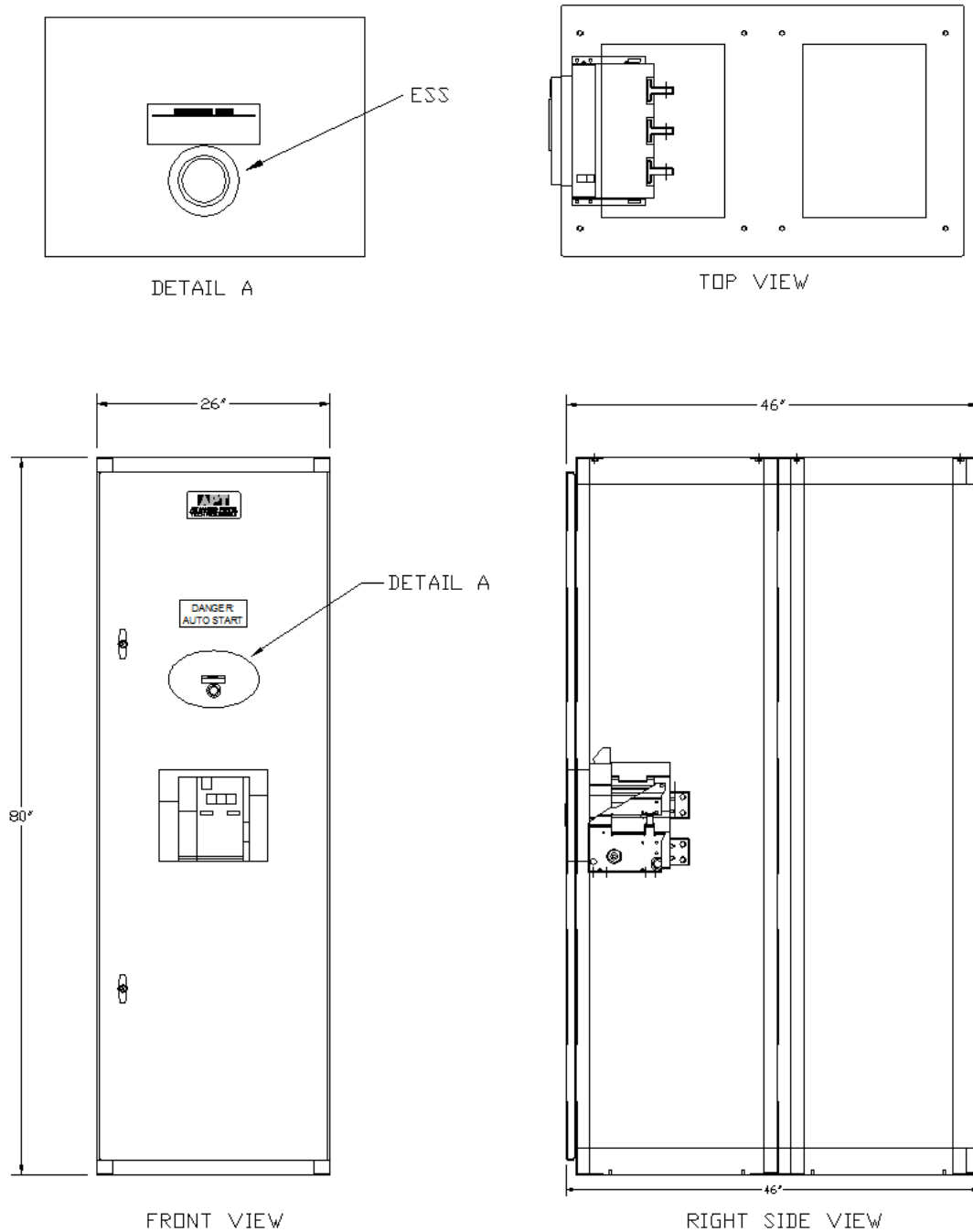
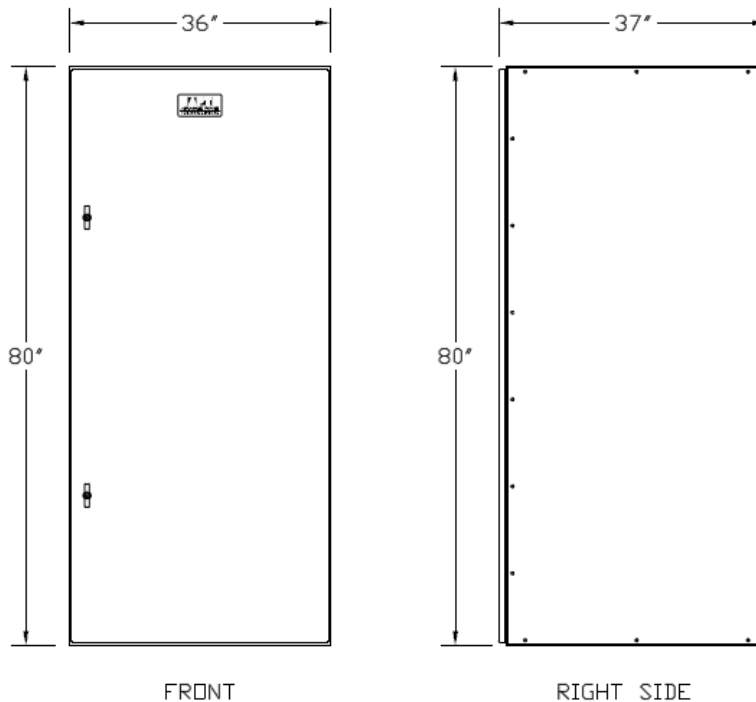
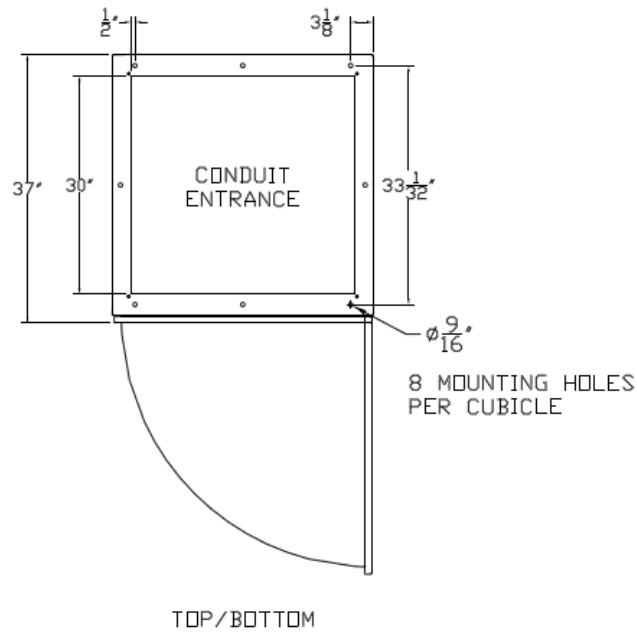


Figure 14: 800A – 3000A Generator Output Protection Breaker with Extra Depth Cabinet



# > 3200A Section Enclosure Drawing



EXTERNAL  
VIEW  
(1D) - NEMA 1 WITH FRONT DOOR

Figure 15: 4000A – 6000A One Generator Output Protection Breaker

# Typical GenProtect Applications

## Power Distribution Only



Figure 16: Single Generator Disconnect & Output Protection

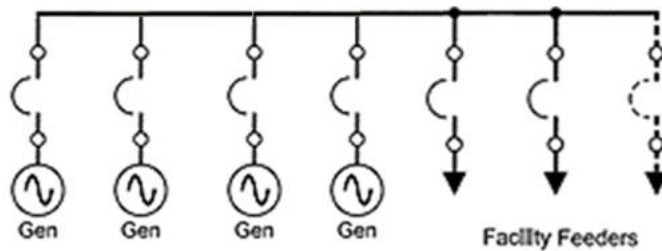


Figure 17: Multiple Paralleled Generator Disconnect & Output Distribution Protection

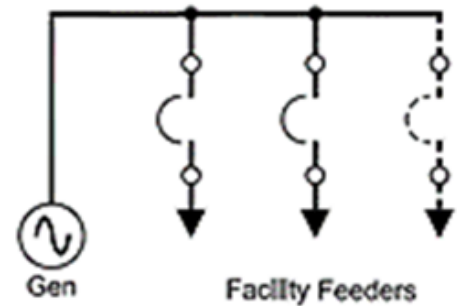


Figure 18: Single Generator Disconnect & Output Protection with Distribution Feeders

## Power Distribution with Fire Pump Protection

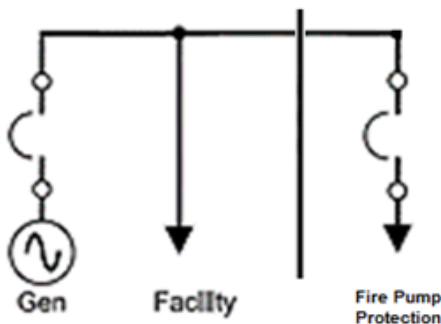


Figure 19: Single Generator Disconnect & Output Protection with Fire Pump Protection



Figure 20: Single Generator Disconnect/Output Protection with Distribution Feeders, & Fire Pump Protection

# 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](http://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.