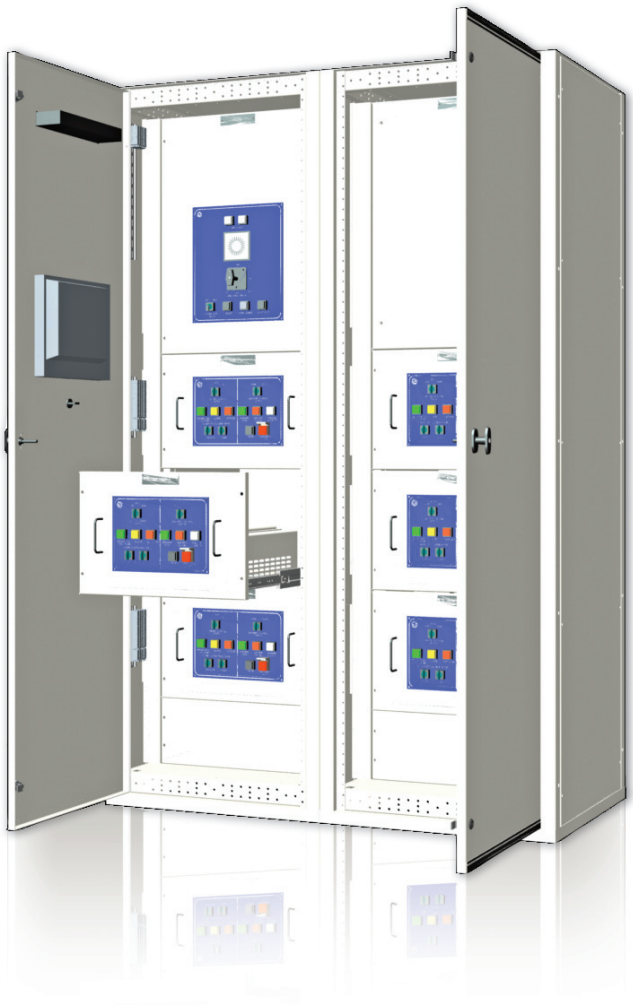
GE Zenith ZDEC 2020

Modular Paralleling Switchgear

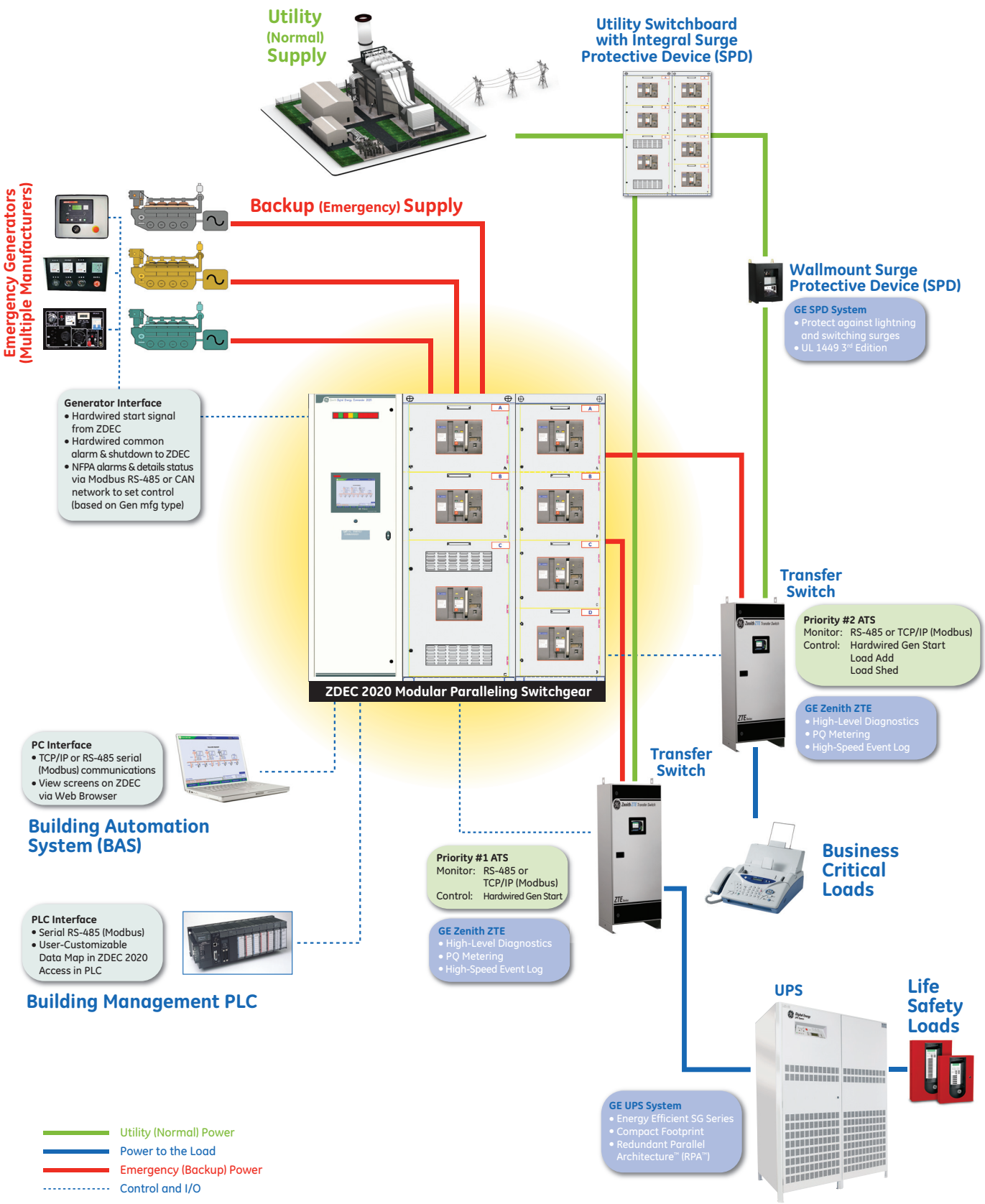


Digital Energy
Power Quality

Healthcare and Critical Facilities Demand Generator Paralleling Systems that are...

- **Flexible** design compatible with multiple brands of generator sets and power section configurations
- **Safe:** Separately-mounted low voltage controls from the power section
- **Modular** construction, user-scaleable to changing facility needs
- **Ease of operation:** Traditional-style annunciation and manual paralleling

ZDEC 2020: An Integral Component



Flexible...Safe...Modular...Easy to Operate

Flexible

- Compatible with multiple brands, sizes and types of generator sets
- One ZDEC 2020 system communicates with multiple generator manufacturers without parts changes or hardware re-configuration to ZDEC controls
- Parallel generators with different kW ratings
- Full flexibility in the choice of breaker manufacturer, LV/MV, traditional or arc-resistant construction

Safe

- Place the power section in restricted electrical room or safe distance from operators to reduce PPE and arc flash hazards
- The maximum voltage present on any terminal is 120V
- All terminals are “finger-safe”
- Control section can be placed in a location accessible and convenient for operators
- UL 891, UL 1558 Ratings

Field Modular and Scalable

- Master/System Controls are pre-configured for up to (6) generators and (32) transfer switches or breakers
- Rack-in/rack-out generator controls that are hot-pluggable*
- Master controls automatically recognize an added generator and permits simple touchscreen generator setup*

Ease of Operation

- Integrated manual hardwired controls for each generator
- Hardwired sync scope with LEDs for manual paralleling
- Large status LEDs located on the front door show the generator and system status at a distance, which are not compromised by touchscreen “screen saver” modes

Installing the Hot-Pluggable Generator Control Drawer Module

* Patent pending

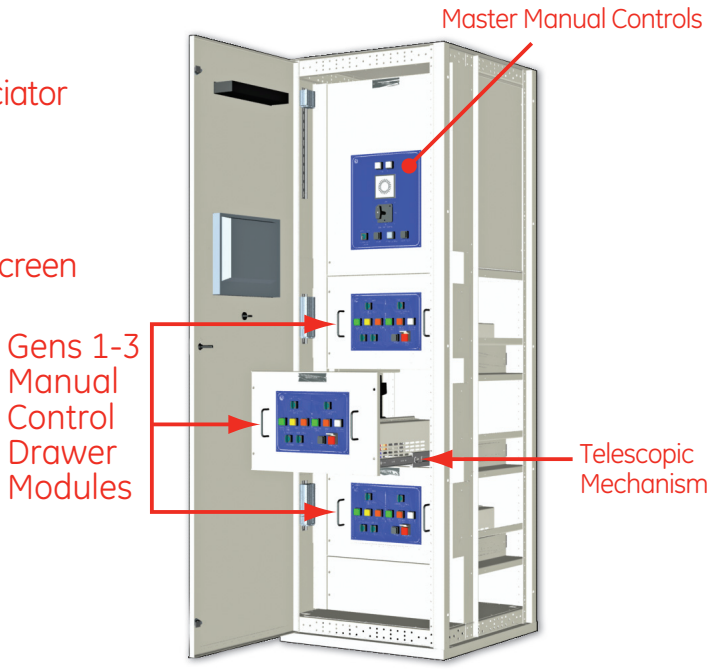
ZDEC Controls

Modular, Hardwired Backup and Color Touchscreen

Control Section Layout

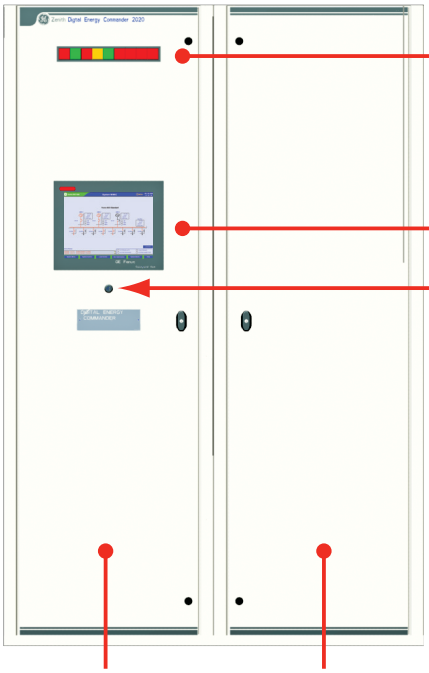
Up to 3 Generators

Front View with Doors Closed

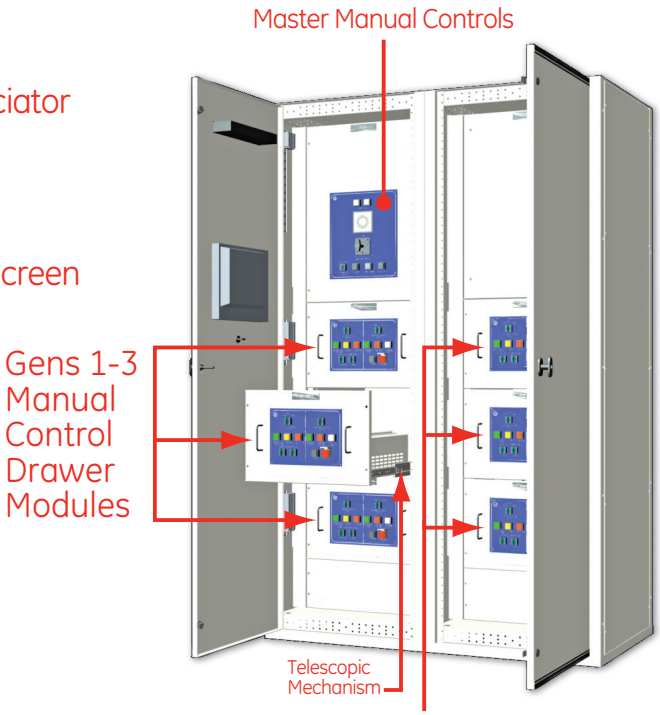


Isometric View with Doors Open

Up to 6 Generators



Front View with Doors Closed



Gens 4-6 Manual Control Drawer Modules

Isometric View with Doors Open

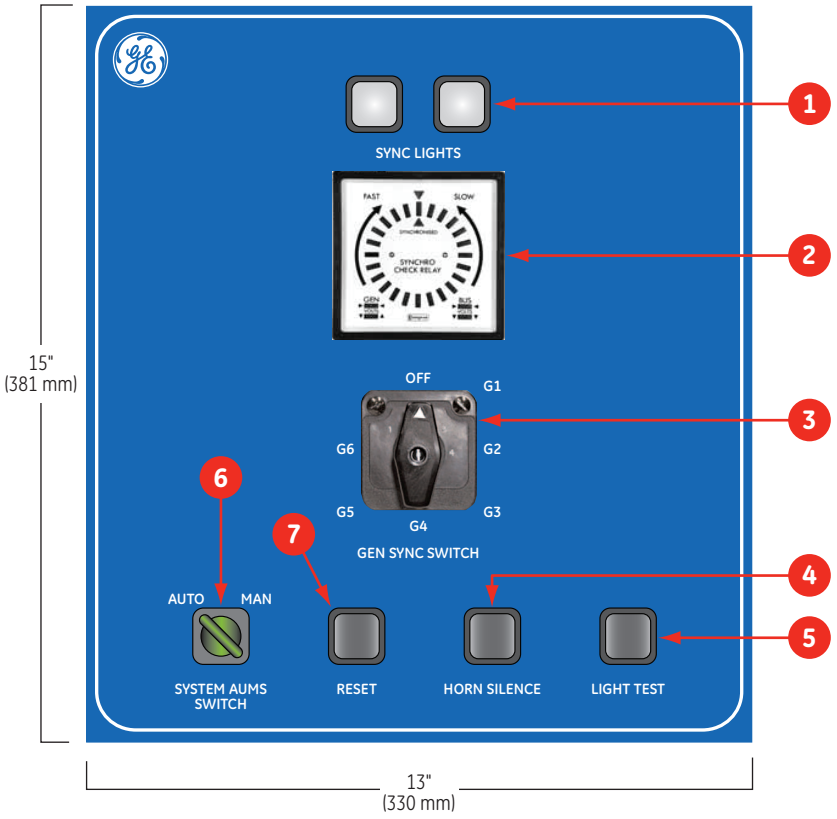
Hardwired Controls

LED Annunciator

System Not in Auto	Any Engine Start Signal Received	Summary Shutdown	Summary Alarm	Non-Emer Mode Activated	Any Engine Comms. Failure	Any Engine Control Fuse Blown	Control Power Fuse Blown	Auxiliary Power Failure

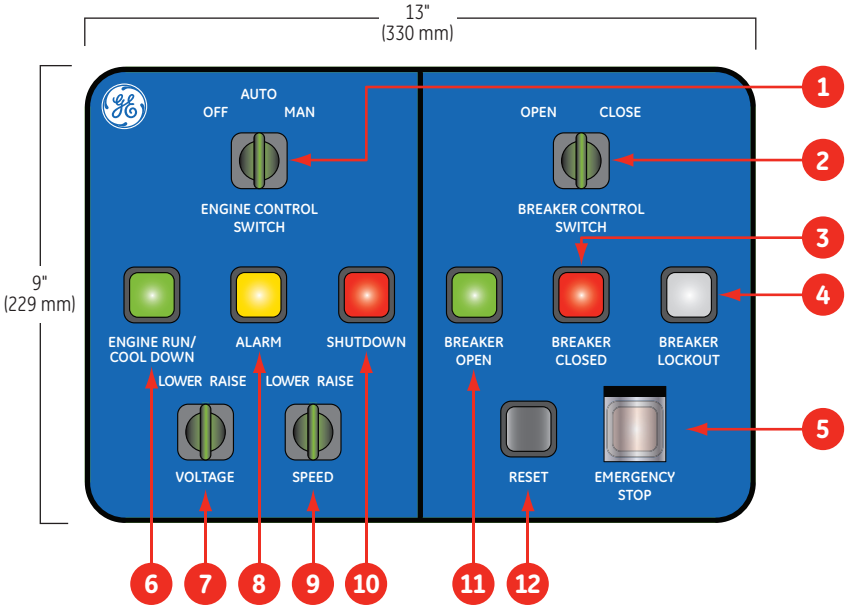
Master Control

1. Sync Lights: White Backlit LED
2. Synchroscope for Manual Generator Synchronization: Red LED Display
3. Generator Selector Switch for Manual Synchronization
4. LED Momentary Pushbutton to Silence the Horn
5. Light Test Pushbutton to Test all the LEDs on the Panel(s)
6. Auto-Man Switch for System
7. Master Reset Pushbutton to Acknowledge System Alarms/Shutdowns



Generator Controls (Typ.)

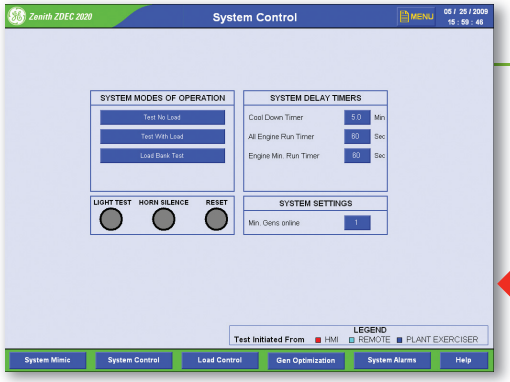
1. Engine Control Switch (OFF-AUTO-MAN)
2. Breaker Control Switch: Manual Spring Return Selector Switch
3. Breaker Closed Status: Red Backlit LED
4. Breaker Lockout Status: White Backlit LED
5. Emergency Stop Pushbutton (Safety Cover)
6. Engine Run/Cool Down: Green Backlit LED
7. Manual Voltage Raise/Lower Spring Return Selector Switch
8. Engine Summary Alarm: Yellow Backlit LED
9. Manual Speed Raise/Lower Spring Return Selector Switch
10. Engine Shutdown Alarm: Red Backlit LED
11. Breaker Open Status: Green Backlit LED
12. Generator Reset Pushbutton



Advanced Control System (ACS)

Configuration

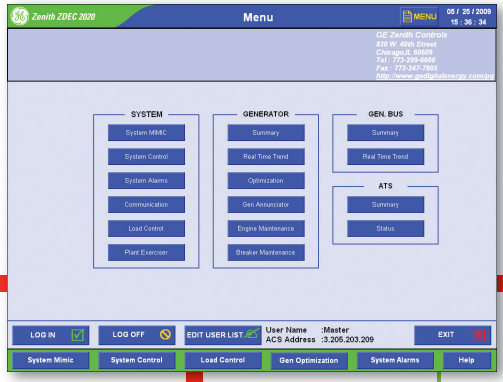
Main Navigation



System Control Screen

Selection of Test Modes (online, offline, load bank)

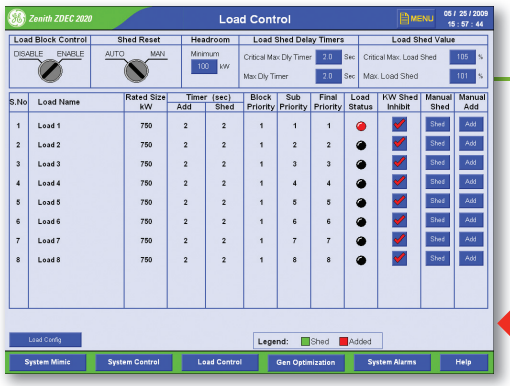
Settings for engine cool-down, minimum run timers, and minimum number of generators online



Menu Screen

Embedded login/ password protection

Single-button navigation to all sub-screens

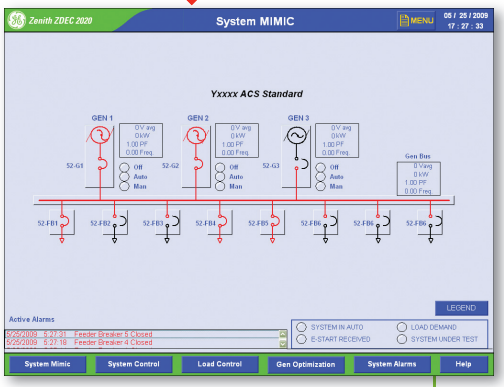


Load Control Screen

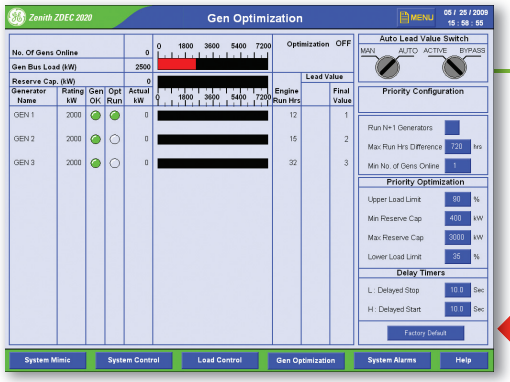
Set load priorities based on generator bus load levels

Manual shed and add individual loads

Reset and re-add any shed loads



Mimic Screen



Generator Optimization Screen

Real-time values of reserve capacity (online kW - system kW demand)

Set time delays and threshold parameters to control the automatic starting/stopping of generator sets in response to system kW demand

Plant Exerciser Screen

Generator system exerciser/setup is simple and intuitive

User selection of start/ stop times and test mode (test with load, test no load)

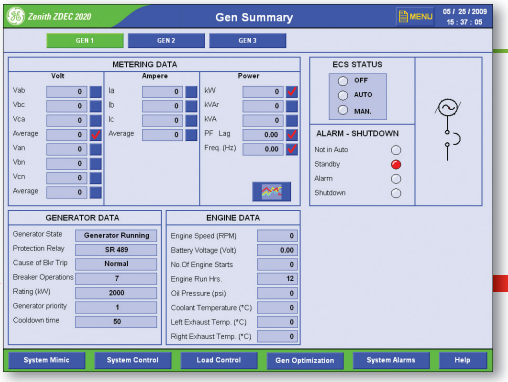
Simple checkbox to inhibit exercising on any given day - without re-programming of parameters

View system mode (standby/off, test, emergency) and gen status (running, off, cooldown) on one screen

Summary metering details for both generators and generator bus

Monitoring

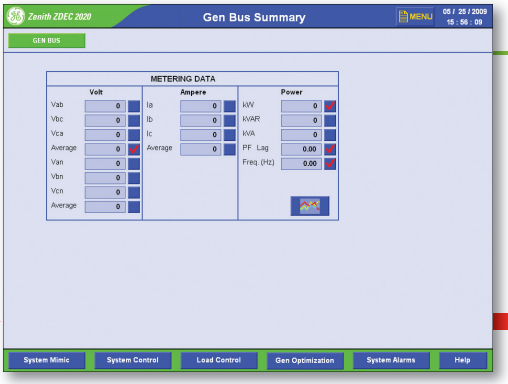
Trending



Generator Summary Screen

Electrical metered data (A, V, kW, etc), generator data (Mode, RPM, Coolant temp) and generator breaker data (open, closed, tripped) all on one screen

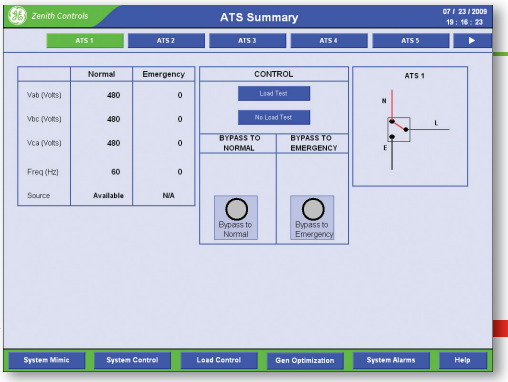
Easy selection of parameters for trending



Generator Bus Summary Screen

Metered data for the combined output of all generator sets on the bus (V, Amps, kW, pF, etc)

Checkbox selection of parameters to include in trending reports



ATS Summary Screen

Monitor all ATS's from one single location

View source phase voltages and Hz

ATS position (Normal or Emergency)

Active load tests

Bypass time delays

System Alarm Screen

Time/date stamped list of all system alarms, shutdowns and events

Ability to view by device or complete list for all devices

Horn silence and alarm reset capability

Records of operator name on all acknowledged alarms

Generator Bus Trend Screen

Save as BMP file

Easy selection of parameters to trend and sampling rate

Focused sampling example:

Generator bus status from outage to all loads online

Wide sampling example:

Generator bus loading across multi-hour outages

Controls Specifications Checklist

Advanced Control System (ACS) Touchscreen Operator Interface

- ☑ 15" TFT Color Touchscreen, 1024 x 768 pixel, 64MB flash memory, built-in Web server, Microsoft CE operating system
- ☐ Optional 17" TFT Color Touchscreen
- ☑ Main Menu screen for quick navigation to sub-screens and functions
- ☑ System Mimic / One-line screen
- ☑ System Control Screen – AUTO/MANUAL Switch, LOCAL/REMOTE, Light test, horn silence, alarm reset, Test with Load, Test no Load, engine cooldown timer, all engine run timer (prior to optimization system enable), and engine minimum run timer
- ☑ System Alarm Screen with acknowledge and reset pushbuttons
- ☑ Load Control Screen with user adjustable load name, add/shed time delays, kW shed enable/ inhibit, and manual shed/add pushbuttons
- ☑ 7-day programmable Plant Exerciser Screen, with user-adjustable start/end times and test mode
- ☑ Generator Summary Screen with:
  - AC metering for each generator (V, A, kW, KVAR, kVA, pF, Hz)
  - Engine data (RPM, battery volts, number engine starts, active engine fault code, oil pressure, coolant temperature, left and right bank exhaust temperature)
  - Generator Data (rating, optimization priority, number running hours and breaker operations, elapsed run time)
  - OFF/AUTO/MANUAL Engine Control Switch
  - CB OPEN/CLOSE pushbutton
  - CB Lockout Reset Pushbutton
  - Engine and PLC Communication Status
  - Generator Status (Not in Auto, Standby/Auto, Alarm, Shutdown)
- ☑ Generator Optimization Screen with:
  - Number of generators online
  - Generator bus load and reserve capacity (kW)
  - Load on each generator (kW)
  - Priority optimization setpoints for upper and lower kW limits, minimum and maximum reserve capacity, maximum set-set running hour difference, minimum number generators online
- ☑ Real Time Trending Screen with trending of generator or bus metered values, with screen capture capability and saving to flash memory in .bmp file format.
- ☑ 3-Level Password security on all user adjustments and entries

Advanced Control System (ACS) Touchscreen Operator Interface

Legend:

☑ Standard ☐ Optional

Controls Specifications Checklist

Engine-Generator Paralleling Controls

- ☑ Automatic Paralleling for up to (6) engine-generator sets. Size, brand and type of your choice.
- ☑ Engine start, synchronization, kW & kVAR load sharing, soft loading/unloading, stop and cooldown
- ☑ Direct data communication to set-mounted control panel for collection and display of detailed generator status (RPM, oil pressure, coolant temperature, etc).
- ☑ 1% accuracy AC metering for each generator and totalized bus (combined generator set output): Volts (L-L, L-N, Avg), Amps (A, B, C, Avg), kW, kVAR, kVA, pF, Hz
- ☑ NFPA 110 Engine/Generator Status, Pre-Alarm and Shutdown fault annunciation with alarm horn and silence pushbutton
- ☑ Generator protection: 27/59 under/over voltage, 81 o/u over/under frequency, 15 auto synchronizer, 32 reverse power, 40 loss of excitation, 25 sync check
- ☑ 3-Position hardwired Engine Control Switch for each generator (OFF/AUTO/MANUAL)
- ☑ Hardwired voltage raise/lower, speed raise/lower and CB open/close pushbuttons and alarm reset pushbutton for each generator set
- ☑ Generator Status LED's for Generator Running, Summary Alarm and Summary Shutdown
- ☑ Breaker status LED's for CB open, CB closed and CB trip/lockout

Load Control (Transfer Switch or Motorized CB) Interface

- ☑ Systems with 2-3 generators: 8 independent load shed/add levels, with up to (2) devices (ATS or CB) per level (up to 16 devices)
- ☑ Systems with 4-6 generators: 24 independent load shed/add levels, with up to (2) devices (ATS or CB) per level (up to 48 devices)
- ☑ Dedicated, hardwired control relays and contacts for Add and Shed control of each transfer switch, independent of monitoring network
- ☐ Optional network connection to GE Zenith Automatic Transfer Switches for display of voltages, time delays and detailed transfer switch status

Legend:

☑ Standard ☐ Optional

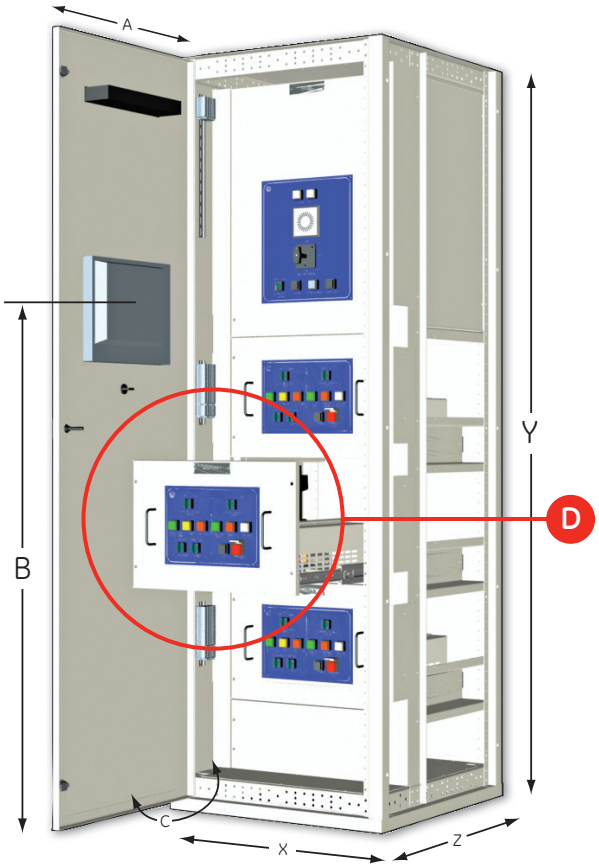
Master/System Operator Controls

- ☑ Hardwired System AUTO-MANUAL Select switch
- ☑ 85 dBA alarm horn, with Silence and Alarm reset pushbuttons
- ☑ 6-Position hardwired Generator Sync Select Switch (Off, G1 to G6)
- ☑ Hardwired Synchroscope and Sync Lamps
- ☑ System Status LED's for: System not in Auto, System start signal (any ATS), Summary Shutdown, Summary Alarm, Non Emergency Mode Active, Communications Fault, Control Fuse Blown, Control Power Failure, Auxiliary Power failure)
- ☑ Power from 24VDC engine cranking batteries with best DC source selector and DC-DC converter for brownout protection during engine cranking
- ☑ Serial (RS-485) port for connectivity to Building Management System (BMS) via non-proprietary Modbus RTU protocol
- ☐ Optional Ethernet TCP/IP port for connectivity to Building Management System (BMS) via non-proprietary Modbus protocol

Racking in the Hot-Pluggable Generator Control Drawer Module

ZDEC 2020 Control Dimensions

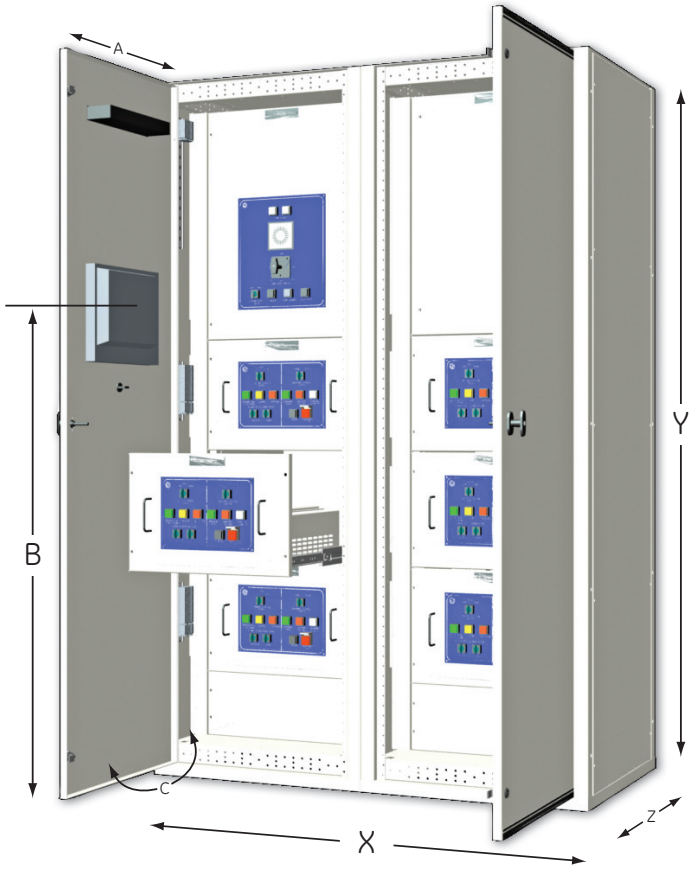
Typical 3-Generator Control System



A	24.8" (630 mm)	**X**	30" (762 mm)
B	60.1" (1527 mm)	**Y**	91.5" (2324 mm)
C	110° max	**Z**	40" (1016 mm)

Weight = 900 lbs (409 kg)

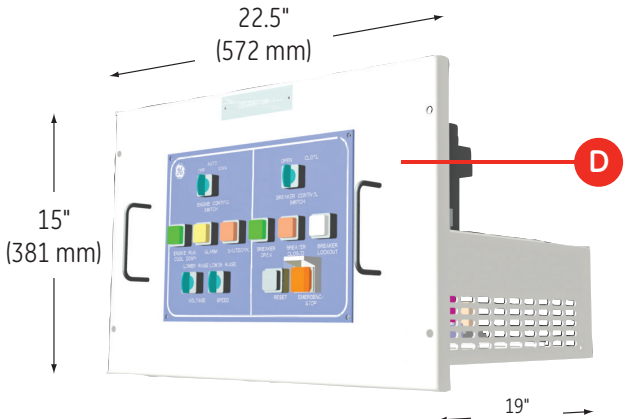
Typical 6-Generator Control System



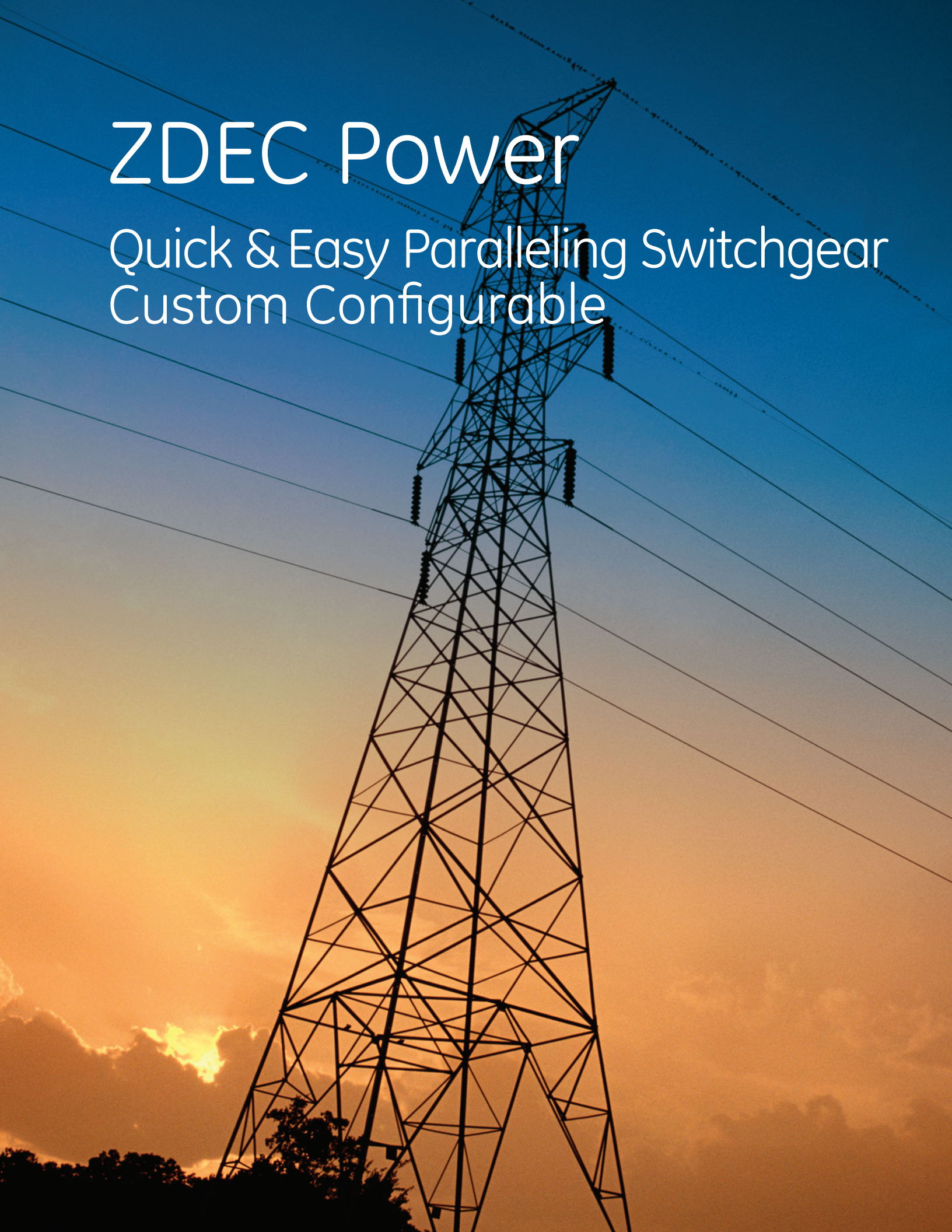
A	24.8" (630 mm)	**X**	60" (1524 mm)
B	60.1" (1527 mm)	**Y**	91.5" (2324 mm)
C	110° max	**Z**	30" (762 mm)

Weight = 1800 lbs (818 kg)

Hot-Pluggable Generator Control Drawer Module (Typ.)



Weight = 35 lbs (16 kg)

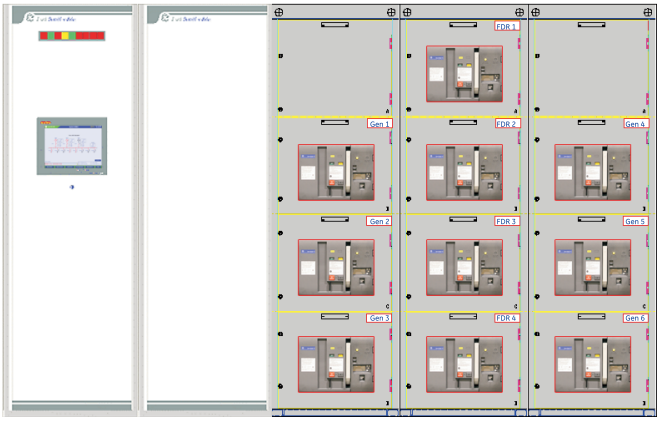


ZDEC Power

Quick & Easy Paralleling Switchgear
Custom Configurable

Power Section Layout

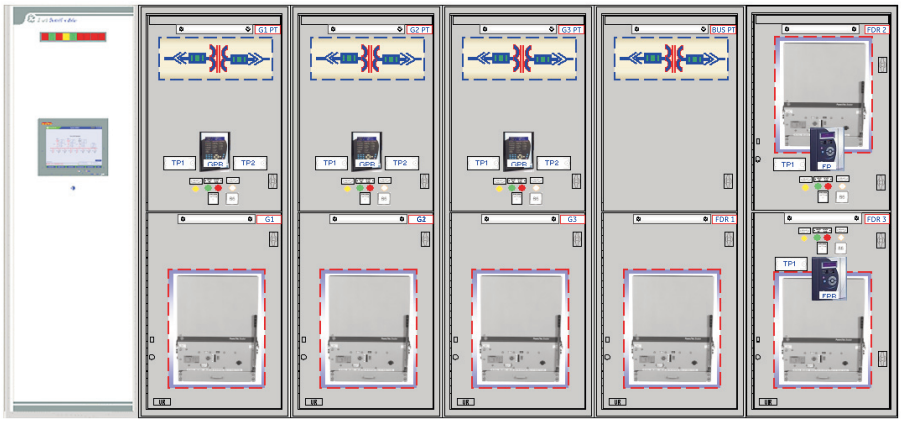
Low Voltage - 480/600V Class



Dimensions per stack	91.5" H x 36" W x 70" D (< = 6000 Amp)
	91.5" H x 36" W x 80" D (8000/10000/12000 Amp)
Weight per stack	2550 lbs.
kAIC	100, 200
Main Bus	4000, 6000, 8000
Rating	UL 891, 1558
Breaker Rating	800-5000A (UL 1558) 6000A (UL 891)

c UL us LISTED

Medium Voltage - 5-15kV



Dimensions per stack	95.1" H x 36" W x 92" D
Weight per stack	4100 lbs.
MVA/kA	350/250 (5kV) 750/500 (15kV)
Silver Plated Bus	
Main Bus	1200, 2000A

NOTE: Typical layouts shown above. Please contact your GE representative for site specific configurations.

Power Components and Specifications

Low Voltage

Low Voltage Breakers

- ☑ UL 1558 listed and labeled, up to 600VAC, 50/60Hz, 1000A inch² construction
- ☑ UL 1066 listed Power Circuit Breakers, drawout-mounted, electrically operated, 100k AIC, with LSI Trip units, 800A to 6000A Frame ratings. Generator breakers include ground fault alarm.
- ☑ Copper Bus, up to 8000A continuous cross bus rating, 3-Phase, 4-wire, 100% neutral, ¼" x 2 ¼" copper ground bus, 100k AIC bracing
- ☑ Mechanical lugs for incoming and outgoing conductors, top or bottom cable entry, interconnect plugs across shipping splits

c UL us LISTED

Medium Voltage

Medium Voltage Breaker

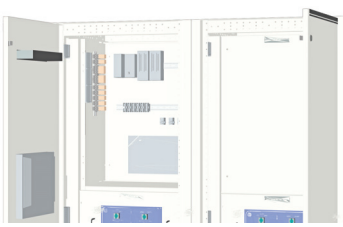
Protective Relays

- ☑ Up to 15kV, 50/60Hz
- ☑ Circuit Breakers, 1200A Frame, 250-350 MVA (5kV class) or 500-750 MVA (15kV class)
- ☑ Silver plated main bus, with NEMA 2 hole lug pattern
- ☑ Drawout PT assemblies (Gens, Bus)

PT

Common Components

Generator Controls (Typ.)



Master Controls

- ☑ "Finger-Safe" customer interface terminals
- ☑ Pre-wired interconnection plugs

Contact Us

We protect and connect the world's **critical** equipment to ensure **safe, reliable** power

Assembled in the USA

imagination at work

GE Digital Energy – Power Quality
830 W 40th Street, Chicago, IL 60609 USA
800 637 1738 **www.gepowerquality.com**