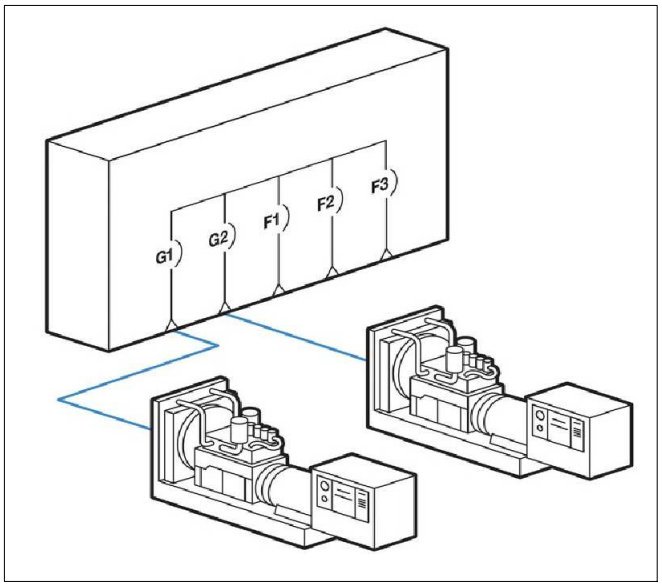
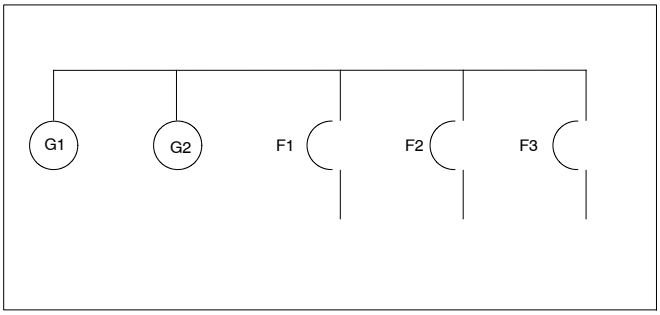
KOHLER®

PD-Series

Prime Power



Typical System



Typical Single Line

General Description

The generators are the primary power source. Usually no utility source is available.

In a typical prime power system, generator power is combined onto the paralleling bus and power is distributed to the loads via the feeder breakers.

Standard Features

- User definable load management
- User definable generator management
- Isochronous real (kW) load sharing
- Isochronous reactive (kVAR) load sharing

User Interface

- Complete system metering, annunciation, settings and control using touchscreen
- Electrical and mechanical metering of the generator set
- Event and alarm logging
- 15 in. touchscreen standard. Optional larger sizes are available.

Communication and Controls

- Status and metering data available via Modbus® TCP/IP
- Optional manual control, front panel metering and status indication is available.

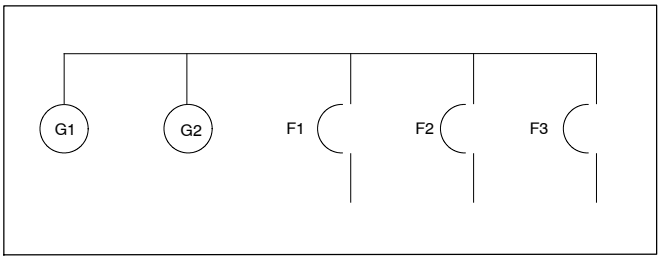
Available UL Listings

- UL891 - Switchboard
- UL1558 - Switchgear
- UL Listed medium voltage

Modbus® is a registered trademark of Schneider Electric.

Typical Sequence of Operation

Single Bus



System Start

When the system is started, all available generators start and lower priority loads are signaled to shed. The first generator to reach rated speed and voltage connects to the generator paralleling bus. The remaining generators synchronize to the paralleling bus. As additional generators connect to the bus, lower priority loads are signaled to add.

Standard Features

Load Management

Each load is assigned a priority level. Load management determines when priority levels are signaled to disconnect (shed) and reconnect (add). When multiple generators are online, load management matches the load to the generator capacity. The system controls feeder breakers or dry contacts for interface to a building management system.

Load Add

Loads can be added based on the following considerations:

- **Generator bus capacity:** Loads are added based on the kW capacity of the bus and a preset kW demand of the load.
- **Number of generators online:** Loads are added based on how many generators are connected to the bus. This is most effective in systems with the same size generators.

Load Shed

A load-shed event can be triggered by:

- **Generator Failure:** Loads are shed based on the number of failed generators.
- **kW overload:** When the load on the generators reaches the overload setpoint, low-priority loads are sequentially shed until the load falls below the overload setpoint or as a block of preset loads.
- **Underfrequency:** Underfrequency is often an indication that the generators are fully loaded and can not supply additional power to the load. When the bus frequency reaches its underfrequency setpoint, preset loads are shed.

Generator Management

Generator management optimizes the number of online generators based on the load's kW demand, starting and stopping generators as required. Generators are sequenced on in order of operator-assigned priority and taken off in reverse priority. Operator-defined setpoints determine the percent load level and time delay at which the generators will be brought on or taken offline.

Control Architecture

Standard

As a standard, every Kohler system is designed to be fully functional in the unlikely event of a touchscreen failure. If the touchscreen fails, the operator, using hardwired switches can:

- Place all automatic controls in Auto.
- Start the generators and initiate the auto synchronization process.

Option 1

This option contains all the features of the standard system and provides the ability to synchronize and parallel (load share) the generators if both the touchscreen and/or the PLC fails.

Option 2

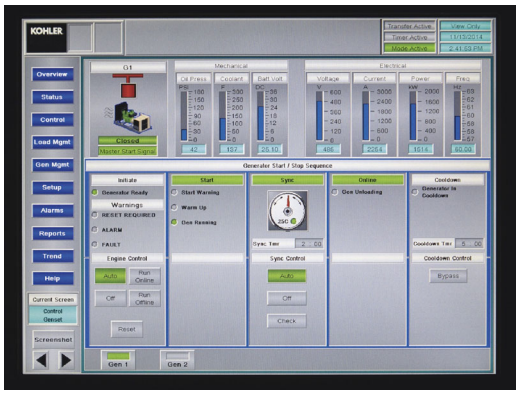
This option contains all the features of Option 1 and provides the ability to manually synchronize the generators using hardwired speed and voltage adjust switches and the ability to parallel (load share) the generators if both the touchscreen and/or the PLC fails.

Operator Interface

With basic knowledge of paralleling switchgear, the operator can navigate the system simply and intuitively without reading a manual. The intuitive interface eliminates fear of operational errors by clearly showing “if this, then that” before a sequence is initiated.

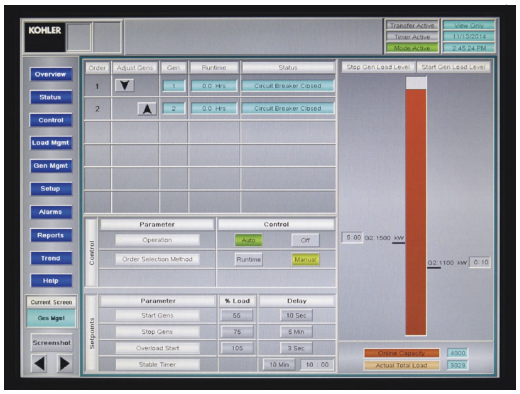
Right Information at the Right Time

By providing pertinent information on each screen, the operator always knows the reaction to an action.



Example of Control: Generator Screen

- Used to monitor and manually control the generator.
- Contains typical controls such as the generator AUTO/OFF/RUN ONLINE/RUN OFFLINE switches and generator synchronizer control switch.
- Shows generator status and metering information.



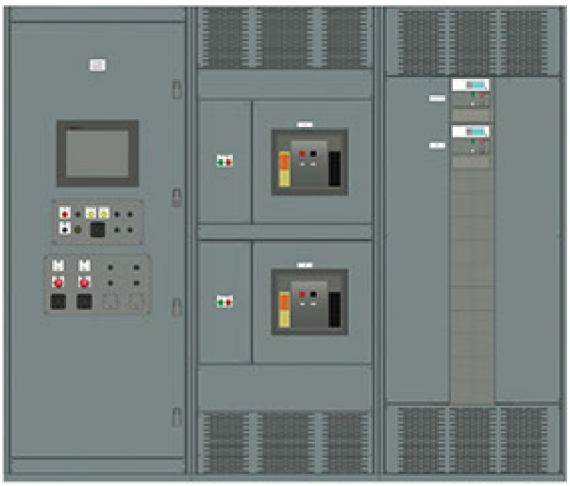
Example of Setup: Generator Management

- Used to monitor and configure generator management mode.
- User sets all parameters associated with generator management and can enable or disable this mode of operation.
- Right side of screen graphically displays settings and current state of the system.

PD-2000 SERIES

The PD-2000 Series is UL 891 listed and allows extreme flexibility in design while providing a strong standard for safety and performance.

- Rear access standard, front access available
- Shallow depth (36-42 in.) available
- UL 489 fixed or drawout breakers
- Molded-case breakers available for distribution
- Bus ratings through 10,000 amps/150 kA withstand
- Complete selection of breaker trip options
- Complete selection of power monitoring options
- NEMA 1, NEMA 3R available

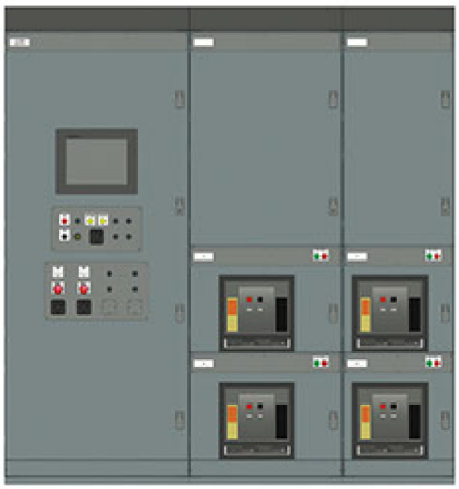


PD-2000 Series

PD-3000 SERIES

Offering the highest standard in bus withstand and breaker ratings, the PD-3000 Series is UL 1558 listed. The series is designed with reliability and serviceability in mind.

- Drawout breakers standard
- UL 1066 drawout breakers
- Complies with ANSI C37.20.1
- Bus ratings through 10,000 amps/200 kA withstand
- Complete selection of breaker trip options
- Complete selection of power monitoring options
- NEMA 1, NEMA 3R available

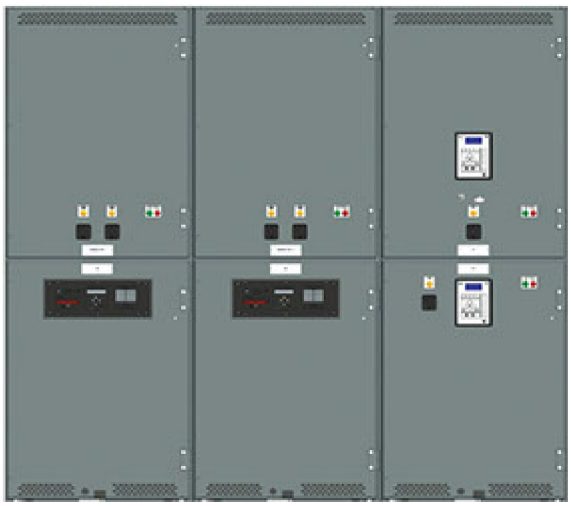


PD-3000 Series

PD-4000 SERIES

Available through 15 kV, the PD-4000 Series provides a complete solution by utilizing the strength of the digital control system combined with utility-grade protective relays.

- UL MV switchgear listing through 15 kV
- Complies with ANSI metal-clad switchgear requirements
- Bus and breaker ratings through 3000 amps
- Complete selection of protective relay options, power monitoring, neutral grounding resistors and control battery systems
- NEMA 1, NEMA 3R shelter aisle available



PD-4000 Series

PD-Series Features

PD-SERIES FEATURES	PD-2000	PD-3000	PD-4000
Low voltage switchboard (UL/cUL 891)	X		
Low voltage switchgear (UL/cUL 1558)		X	
Medium voltage metal-clad switchgear (UL/cUL listed)			X
NEMA 1	X	X	X
NEMA 3R	X	X	X
Short-circuit rating up to 200 kA		X	X
Short-circuit rating up to 150 kA	X		
Bus rating up to 10,000 A	X	X	
Bus rating up to 3000 A			X
Maximum voltage 600 V	X	X	
Maximum voltage 15 kV			X
60 Hz	X	X	X
50 Hz	X	X	X
Parallel up to 32 generators	X	X	X
15” color touch screen (optional touch screen sizes available)	X	X	X
Customizable controls, relays and metering	X	X	X

KOHLER

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