



LAYERZERO POWER SYSTEMS, INC.

The Foundation Layer

Series 70 eRPP

Web-Enabled Remote Power Panel



Product Brochure

Increase Reliability and Safety In Two Ways With eRPP Remote Power Panels

Reliability Increase #1: Finger Safe

The panel board of the eRPP is designed for maximum operator safety with a fully enclosed current-carrying bus. Branch breakers are inserted into IP-20 (finger-safe) wells and bolted into place using non-conducting screws.

Reliability Increase #2: Selective Trip Coordination

The Series 70 eRPP is supplied with circuit breakers that are tested for selective trip coordination up to 35 kAIC at 208V. In the event of a downstream fault, the branch breaker will always trip before the main breaker under fault conditions up to 35,000 AIC.



LayerZero's eRPP Product Features

Reliability

- ✓ **Silver Plated Input Terminals:** Silver Has Excellent Conductivity To Provide Superior Electrical Performance and Reliability
- ✓ **Machined Hardware:** Machined Cap Screws and Engineered Disc Springs Maintain Constant Torque Throughout Product Life
- ✓ **Convection Cooling:** Natural Convection-Cooled Heat Dissipation System is Maintenance-Free
- ✓ **Serialized Critical Board Tracking:** Critical Boards Are Serialized And Cataloged in an Active Database For Traceability
- ✓ **Selective Trip Coordination:** Main Breaker Will Not Trip In The Event of a Downstream Fault.

Safety

- ✓ **InSight™ IR Portholes:** Bolted Connections Can Be IR Scanned With the Dead-Front Doors Closed
- ✓ **Sectionalized Components:** Separations Between Each Section To Maintain Maximum Operator Safety
- ✓ **Polycarbonate Windows:** Allows Circuit Breaker Positions Viewed With The Dead-Front Door Closed
- ✓ **Dead Front Hinged Doors:** Barrier To Provide A Safe Working Area With No Exposed Live Parts
- ✓ **Guided Wireways:** Helps Keep Wires Organized

Connectivity

- ✓ **Ethernet Connectivity:** Secure VPN Router Connects To Network For Advanced Remote Monitoring Capabilities
- ✓ **Modbus/TCP:** Open Connectivity to Existing Monitoring Systems Without Proprietary Limitations
- ✓ **NTP Time Clock Synchronization:** Facilitates Timeline-Based Logging For Post-Event Reconstruction
- ✓ **SNMP Connectivity:** Permits Remote Management Via Simple Network Management Protocol
- ✓ **Bluetooth Connectivity:** Wirelessly Set Up Panels At The Point-Of-Impact

zen DPQM

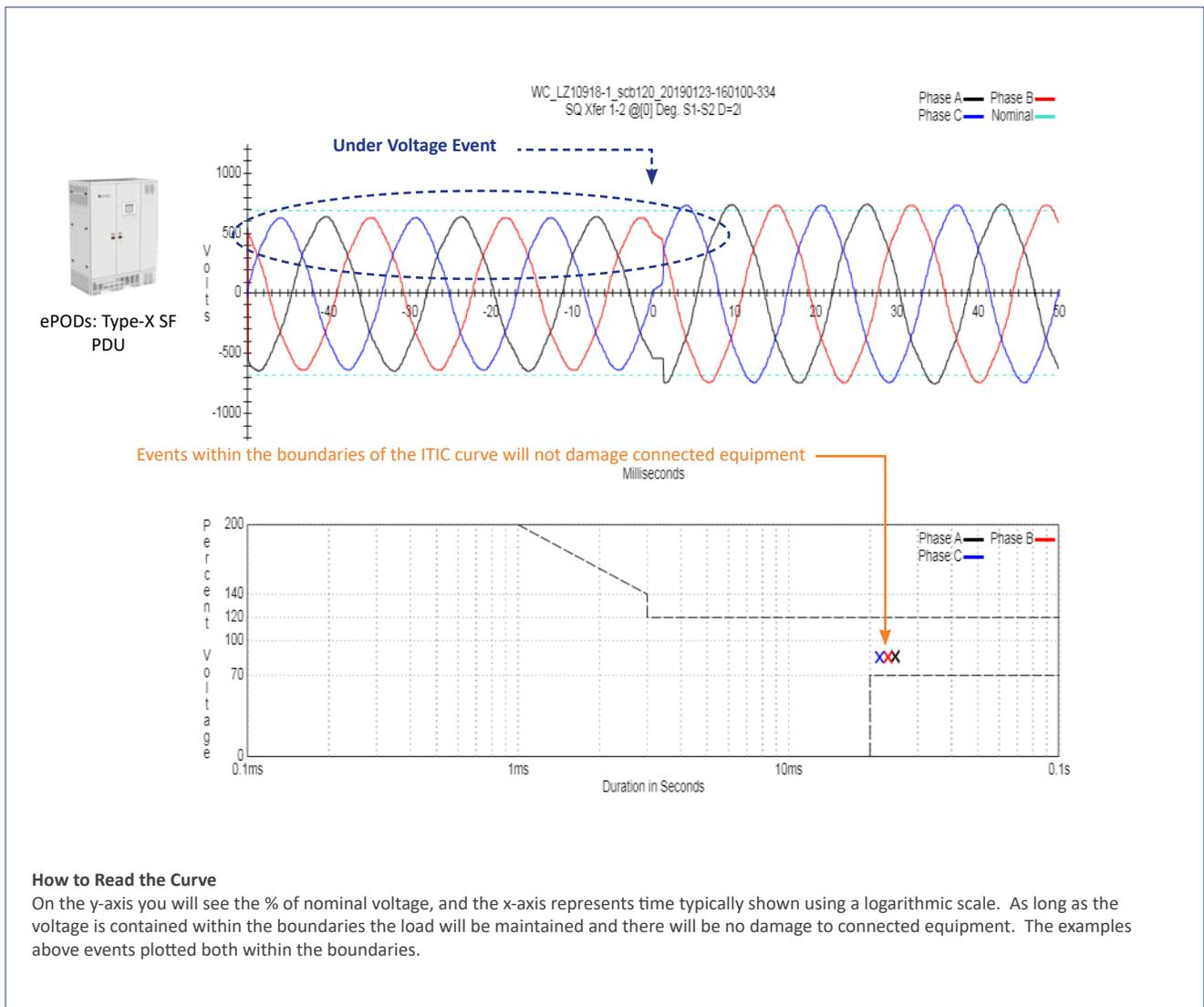
- ✓ **Real-Time Waveform Capture:** Automatically Captures A Picture Of The Power Six-Cycles Before and After Every Event
- ✓ **Optional Local Touch-Screen Interface:** Password-Protected Color Touch-Screen GUI For Local ePODs Setup/Operation
- ✓ **Black-Box Forensics:** eRPP Captures and Records Events To Provide Vital Information In Root-Cause Analysis

All LayerZero products break down power sources into samples for power quality analysis. This data is remotely accessible by connecting to the units via web browser.

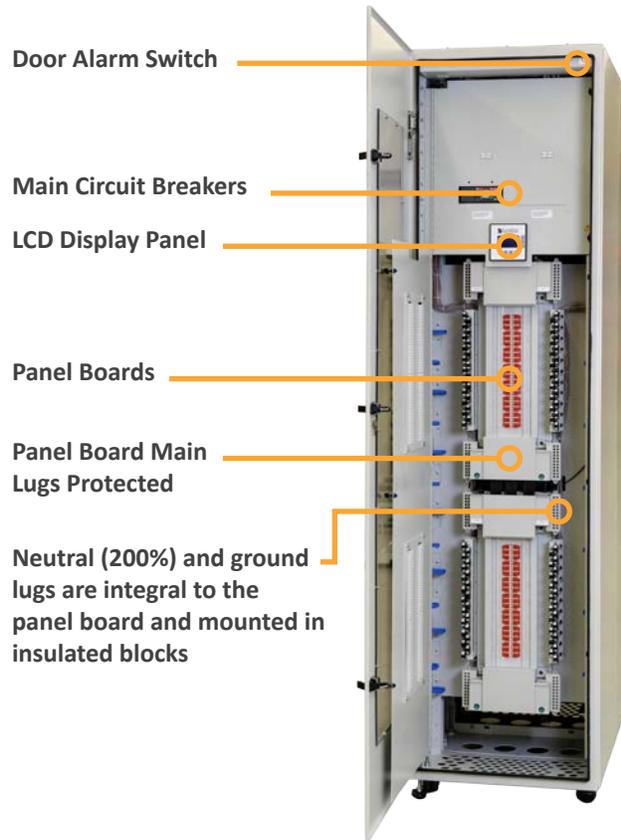
The following “voltage sag” factory test was performed on a LayerZero Series 70 ePODs: Type-X PDU. Each phase is represented by a colored line, plotting the voltage over a period of time.

In the example below, the voltage of all three phases dropped below the user-defined setpoint, which triggered an undervoltage event, an automatic waveform capture, and an ITIC plot of the event.

On LayerZero PDUs and RPPs, waveforms and ITIC plots are generated for every phase, on every circuit, for every event.

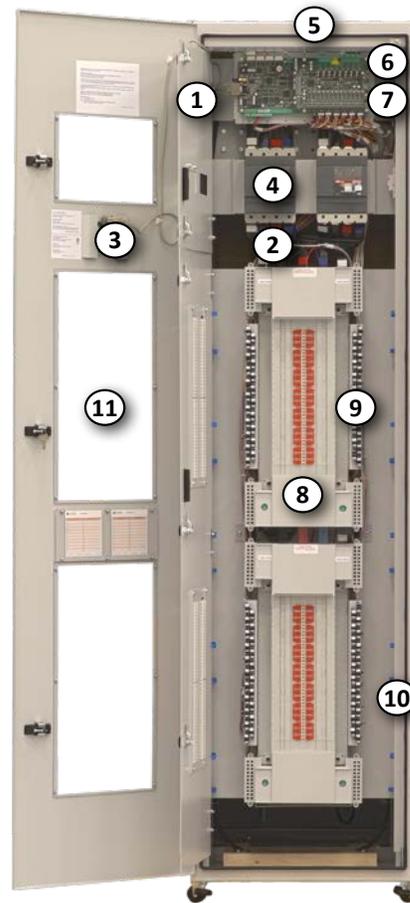


Equipment Layout



Equipment Construction Detail

- 1. Hinged Dead Front Doors
- 2. Silver Plated Terminals (Not Displayed)
- 3. LCD Membrane Display (optional)
- 4. Main Circuit Breakers
- 5. InSight™ IR Portholes (On eRPP Top)
- 6. Zen DPQM Controls
- 7. Bluetooth Connectivity
- 8. SafePanel™ Panel Board
- 9. Zen DPQM CTs
- 10. Guided Wireways
- 11. Polycarbonate Window



LCD Membrane Display

- 12. Membrane Panel Buttons



Reliability Features

Silver Plated Terminals

LayerZero utilizes silver plating on all bus joints to be able to provide the highest performance. Silver has high conductivity and low resistance - which makes for a great contact.



Machined Hardware

Our bolted connections utilize machined cap screws and engineered disc springs. The result is a flat pressure vs deflection profile to ensure that all bolted connections maintain constant torque through the life of the product.

These technologies have been well tested in disparate environments of wide temperature ranges to help ensure that, once connections have been tightened, they stay that way.



No Fans, Dust Filters, or Fan Fuses

Fans and fan sensors are one of the most common components to fail. For maximum uptime, eRPP systems do not contain any fans, dust filters to change, or fan fuses to replace.

The Series 70 eRPP Remote Power Panel utilizes a natural convection-cooled heat dissipation system.



Serialized Circuit Boards

We serialize and track all critical circuit boards and memory cards through our eBOSS portal, which allows customers to reference which components their machines are made from, who tested the components, as well as the ability to view notes generated from testing.

Serialized components offer the ability to drill-down on prospective component failure utilizing predictive modeling techniques, so if part fails, the instance can be cross-referenced with similar parts. This preventative maintenance helps ensure maximum uptime.



Sectionalized Components Help Maximize Operator Safety

Operators are well-protected from exposed connections. There is a physical separation between the main circuit breaker(s) and branch circuit breakers. All connections are optically isolated to minimize risk. Polycarbonate windows are utilized to permit visibility and maximize operator safety.

Energized parts are all insulated, covered, recessed, &/or internally mounted for safer operation of the unit. In addition, sections that isolate machine components are insulated.



Safety Features

Scan Bolted Connections with Dead-Front Doors Closed

Strategically positioned IR-scan portholes to enable safe thermal scanning of all bolted connections with the deadfront closed, without exposing the operator to power circuit voltage.

The IR window swivels upward and unlocks with key-hole access to reveal a mesh, allowing the operator to point-and-shoot thermal cameras to obtain accurate readings. LayerZero provides documentation for proper thermal scanning procedures.



View Status LEDs and Distribution CB Positions With Dead-Front Doors Closed

The Series 70: eRPP is equipped with polycarbonate windows located on the outer door.

Circuit breaker positions can be viewed with the dead-front door closed.

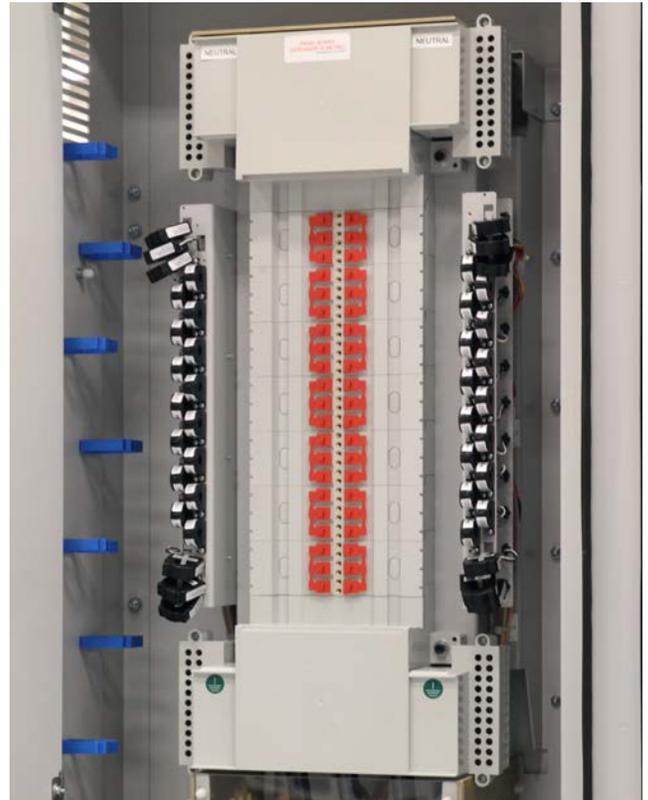


Reliability Features

Selective Trip Coordination

LayerZero Series 70 ePODs: Type-X Power Distribution Units are selective trip coordinated.

Selective Trip Coordination ensures that the main breaker will remain unaffected by the branch circuit breakers in the event of a downstream fault.



The Fault Current Opens the Solenoid Magnet, Causing The Contacts To Part



Unequal Pressure on Each Side of The Arc Causes the Plasma Wave To Rotate Away From The Contacts



The Plasma Wave is Driven into 12 Evenly Spaced Dividers



The Plasma is Rapidly Cooled



Transient Voltage Attempts To Re-Strike The Arc, But The Plasma Is Again Pushed Into The Dividers



When Sufficiently Cool, Charged Particles Recombine And The Fault Current Is Stopped Quickly & Safely

Safety Features

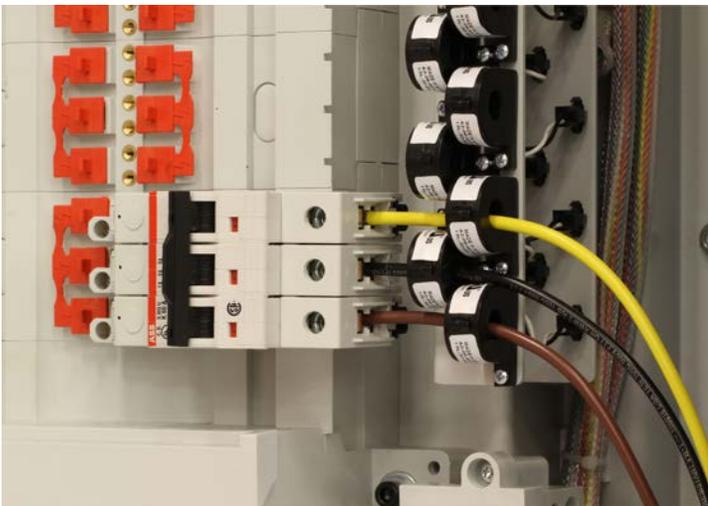
Circuit Breaker Shrouds

LayerZero Series 70 eRPP Remote Power Panel provides optional circuit breaker shrouds, designed to eliminate exposure to live parts.

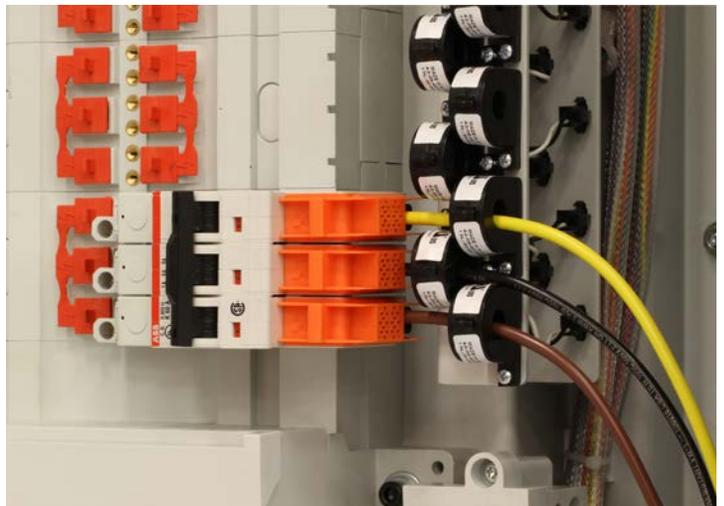


No Exposed Live Parts

LayerZero's patent-pending Circuit Breaker Shrouds cover exposed wiring, maximizing operator safety.



Wiring Without Shrouds Leaves Wiring Exposed



Circuit Breaker Shrouds Maximize Operator Safety

Safety Features

The LayerZero Finger-Safe SafePanel™

The Series 70 eRPP features an IP-20, finger-safe panel board, meaning that the opening will not allow ingress of ½” (12.5mm) diameter probe, for maximum operator safety.

An arc can form as two live conductors are separated – such as the removal of a circuit breaker from a panel board. The SafePanel design ensures that a potential arc would be contained in the connection well so that even if a branch breaker were to be removed, the arc would be contained in the connection well.

Insulated with the components deeply isolated, removal of the breaker is safe and easy.



Isolated, Non-Conducting Brass Screws



The Protective Cover Is Removed



The Breaker Is Inserted Into The Opening



The Breaker Snaps Into The DIN Rail



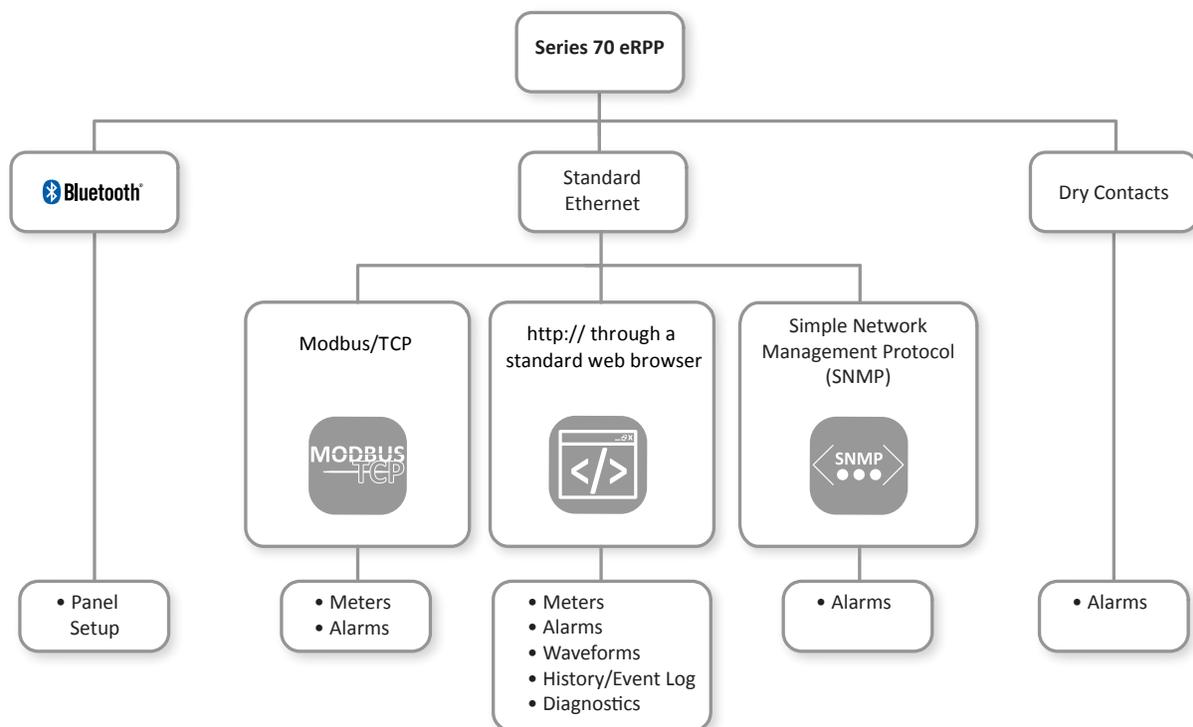
The Breaker Is Secured With An Isolated, Non Conducting Screw

Connectivity Options

Bluetooth Keeps Circuit Level Information Up-To-Date

Coordinate efforts to keep panel board naming conventions accurate and up-to-date with Bluetooth connectivity. In critical facilities, Facilities typically install the physical circuit breakers, while IT workers manage naming of panel designations.

With Bluetooth connectivity, the naming, size, and assignment of circuit breakers can be taken care of at the point-of-impact, bringing together the efforts of facilities and IT for more accurate deployment.



zen DPQM

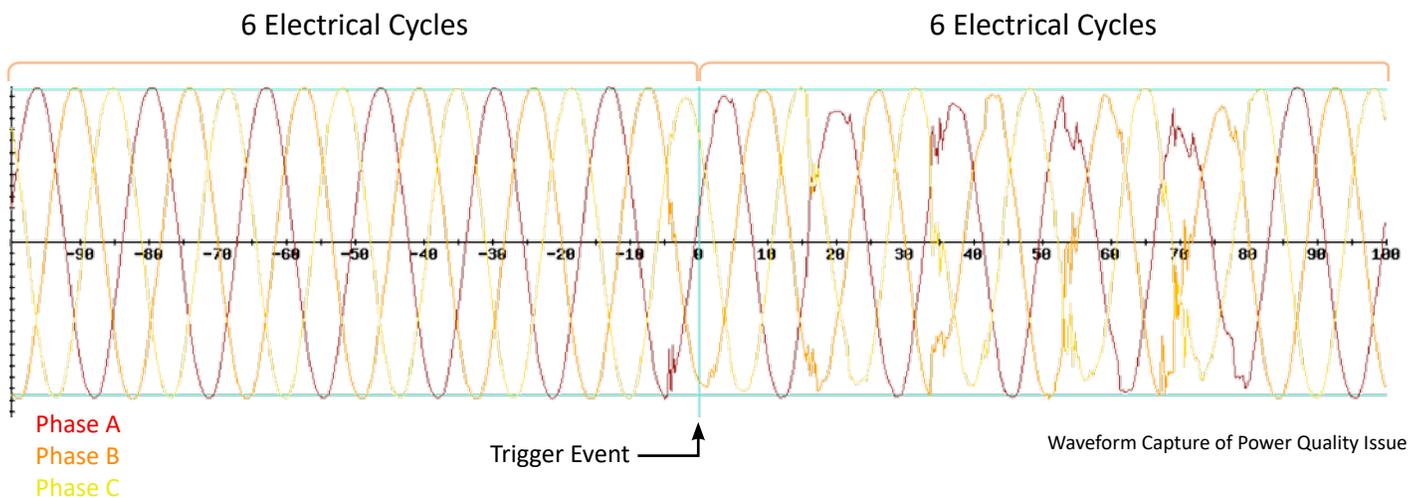
The Series 70 eRPP is equipped with Zen DPQM (Distribution Power Quality Monitoring), an all encompassing monitoring system with local and remote communications options.

From basic monitoring & alarm reporting, to advanced power quality monitoring functionality, Zen DPQM provides a wide-range of options to help you be aware, be vigilant, be proactive in your quest to create a safe, stable and reliable operation.



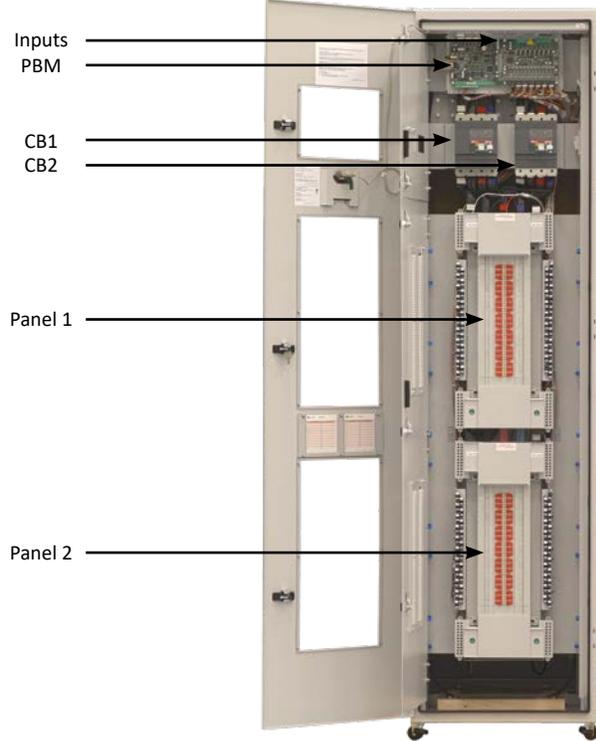
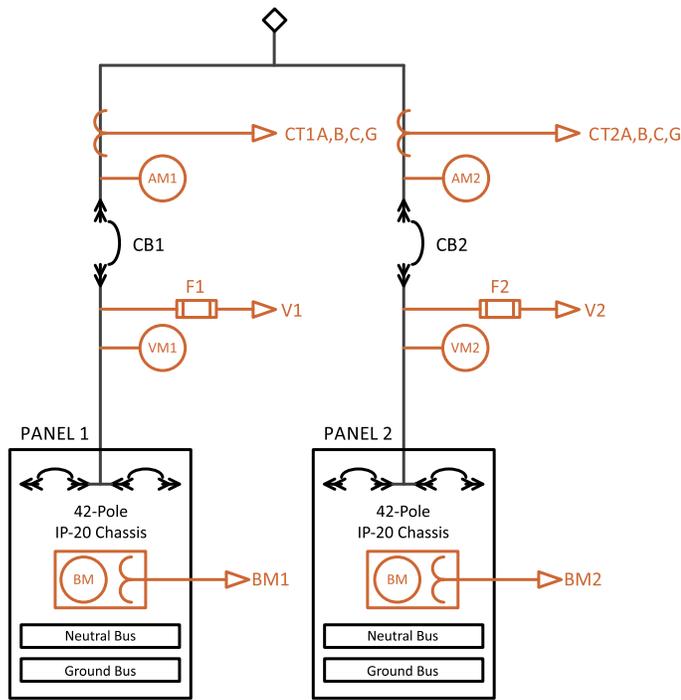
Zen DPQM Provides Answers

Zen DPQM provides timestamped pictures of waveforms before and after events, providing information that enables facilities to go back in time to methodically identify and correct the root causes of events. Zen actively captures power quality information at the STS, PDU, and RPP - permitting thorough post-event analysis.

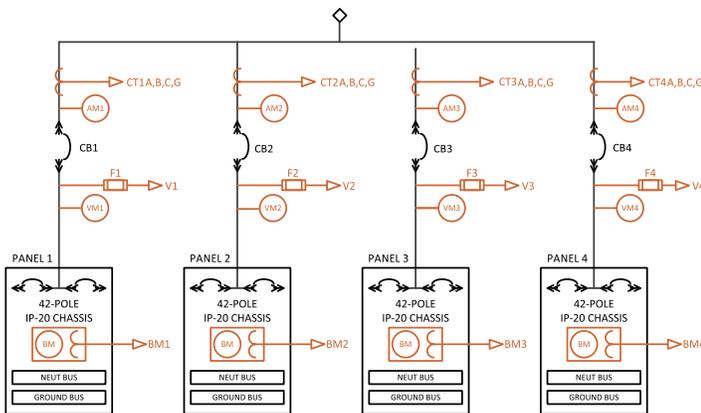




Series 70: eRPP - 1 Input 2 Panel Parallel Configuration

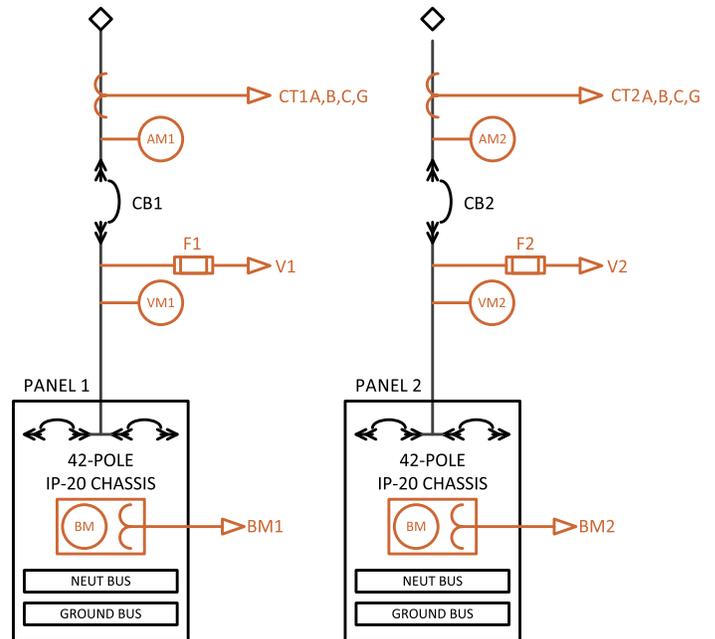


Series 70: eRPP - 1 Input 4 Panel Parallel Configuration



- Current Metering Point
- Voltage Metering Point
- Power Quality Metering Point
- Branch Current Monitoring

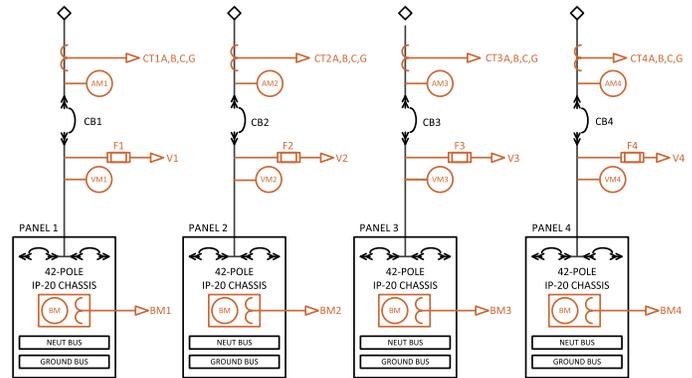
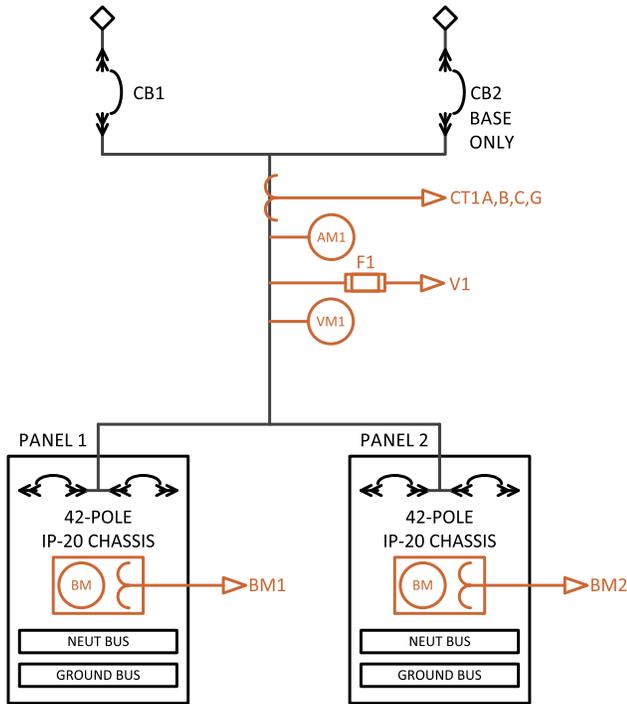
Series 70: eRPP - 1 Input 2 Panel Dedicated Configuration





Series 70: eRPP - 2 Input 2 Panel Feed-Through Configuration

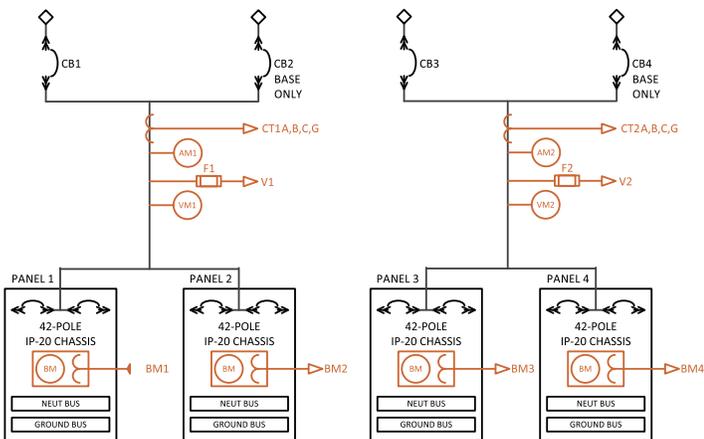
Series 70: eRPP - 4 Input 4 Panel Dedicated Configuration



Series 70: eRPP - 4 Input 4 Panel Feed-Through Configuration

Series 70: eRPP - 2 Input 2 Panel Main-Tie-Main Configuration

Series 70: eRPP - 4 Input 4 Panel Main-Tie-Main Configuration



eRPP MTM One-Lines
Currently Unavailable

Technical Specifications



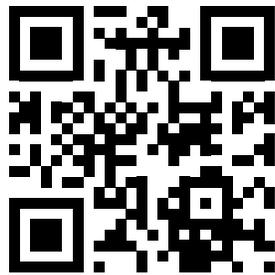
Zen DPQM Parameters		Mains	Subfeeds or Branch Circuits
Voltage Monitor	Volts (L-L) Phase A/B/C (volts RMS)	✓	
	Volts (L-N) Phase A/B/C (volts RMS)	✓	
	Phase Rotation	✓	
Current Monitor	CT Reversed Phase A/B/C/N	✓	✓
	Current Phase A/B/C/N (amperes RMS)	✓	✓
Power Monitor	Frequency (hertz)	✓	
	Real Power (kilowatts)	✓	✓
	Apparent Power (kilovolt-amperes)	✓	✓
	Reactive Power (kilovolt-amperes reactive)	✓	✓
	Power Factor	✓	✓
	Energy (kilowatt-hours)	✓	✓
	Block Demand (kilowatts)	✓	✓
	Block Demand Peak (kilowatts)	✓	✓
	Rolling Demand (kilowatts)	✓	✓
	Rolling Demand Peak (kilowatts)	✓	✓
Power Quality	Percent VTHD (percent)	✓	✓
	Waveform Capture	✓	✓
Alarms	Phase - Under Voltage A/B/C (Alarm)	✓	
	Phase - Over Voltage A/B/C (Alarm)	✓	
	Phase - Low Voltage A/B/C (Warning)	✓	
	Phase - High Voltage A/B/C (Warning)	✓	
	Phase - Over Current A/B/C (Alarm)	✓	✓
	Phase - High Current A/B/C (Warning)	✓	✓
	Under Frequency (Alarm)	✓	
	Over Frequency (Alarm)	✓	
	High VTHD (Warning)	✓	
	Over VTHD (Alarm)	✓	
	Phase Rotation (Alarm)	✓	

All product specifications are subject to change without notice.

Technical Specifications

Mechanical Characteristics				
Dimensions	24"W x 96"H x 24"D (610 mm x 2438 mm x 610 mm)			
Weight	500 lbs (227 kg)			
Enclosure Mounting	Free-Standing			
Frame Construction	Welded Frame			
Electrical Connections	Flexible Laminated Bus, Silver-Plated Solid Busbar			
Color	Textured Powder Coat White (RAL 7035), Blue (RAL 5017), Black, Custom			
Seismic Floor Anchors	Optional			
Seismic Floor Stand	Optional			
Sectionalization	Engineered Composite Insulation, Dead Front Doors			
Circuit Breaker Identification	Labels Viewable Through Polycarbonate Window			
Electrical Characteristics				
Input Voltage	120/208 V, 3-phase, 4-wire + Ground; 208V, 3-phase, 3-wire + Ground; 220/280 V, 3-phase, 4-wire + Ground; 230/400 V, 3-phase, 4-wire + Ground; 240/415 V, 3-phase, 4-wire + Ground; 277/480 V, 3-phase, 4-wire; 480V, 3-phase, 3-wire + Ground			
Number of Output CBs	84-Circuit			
Configuration	1 Input, 2 Panels	2 Inputs, 2 Panels	1 Input, 4 Panels	4 Inputs, 4 Panels
	Parallel (P), Dedicated (D)	Main-Tie-Main (MTM), Feed Through (FT)	Parallel (P)	Dedicated (D), Feed Through (FT), Main-Tie-Main (MTM)
Frequency	50 Hz, 60 Hz			
Poles	3-pole, 4-pole			
Input Feeder Termination	Single, Mechanical; Dual, Mechanical; Two-Hole, Compression			
Neutral Rating	100%, 200%			
Circuit Breaker Mounting Type	Fixed, Plug-In			
Distribution	SafePanel™ Distribution			
Power Quality Monitoring				
Power Quality Monitoring Technology	Zen DPQM™ (Distribution Power Quality Monitoring)			
Waveform Capture	Local Display, Remote Display via Web Browser			
Operational Characteristics				
Cooling	Convection Cooling			
Cable Access	Top/Bottom			
Service Access	Front and Top Only Access			
IR Scan Port Type	InSight™ IR Portholes			
Display Type	3.2" LCD with Membrane, 10.5" Color Touch Screen GUI (Optional)			
Connectivity				
Meters	Local Display, Ethernet, Modbus/TCP, http via Web Browser (Non-Proprietary)			
Alarms	Local Display, Ethernet, Modbus/TCP, http via Web Browser (Non-Proprietary)			
Summary Alarm	Dry Contacts			
Waveforms	Local Display, Ethernet, http via Web Browser (Non-Proprietary)			
History/Event Log	Local Display, Ethernet, http via Web Browser (Non-Proprietary)			
Diagnostics	Local Display, Ethernet, http via Web Browser (Non-Proprietary)			
Time Synchronization	Network Time Protocol (NTP)			
Standards Conformance				
UL	ETL and cETL listed to UL 60950, UL 67			
CSA	CSA C22.2			

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Learn more at www.LayerZero.com



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Rev. 4/19