LayerZero
Power Systems, Inc.

The Foundation Layer

Series 70 eRDP-FS

Web Enabled Remote Distribution Panel

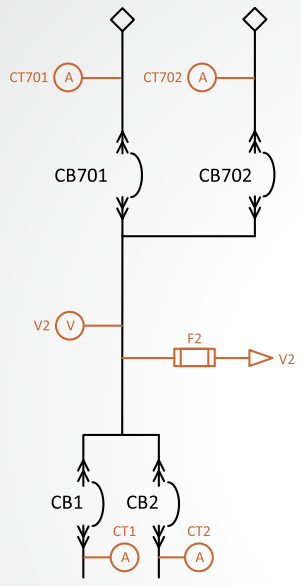
Product Brochure

The LayerZero eRDP-FS Remote Distribution Panel Maximizes Power Reliability

eRDP-FS Is Inspired by NFPA-70E

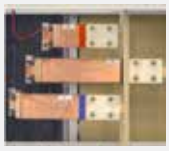
The Series 70 eRDP-FS is a Remote Distribution Panel for critical industries. It features an NFPA 70E friendly design, open layout, and the IP-20 rated Finger-Safe SafePanel, to help protect operators and ensure safe operation. With an emphasis on reliability, safety, connectivity, and power quality monitoring, the Series 70 eRDP-FS provides high-reliability power.

The Series 70 eRDP-FS is designed to be easy to work with, featuring front access for circuit breakers, and side access for input connections.



One Line Diagram

Reliability



Silver Plated Terminals:
Silver Has Excellent Conductivity To Provide Superior Electrical Performance and Reliability

Convection Cooling:
Natural Convection-Cooled Heat Dissipation System is Maintenance-Free

Machined Hardware:
Machined Cap Screws and Engineered Disc Springs Maintain Constant Torque Throughout Product Life

Selective Trip Coordination:
Main Breaker Will Not Trip In The Event of a Downstream Fault.

Serialized Critical Board Tracking:
Critical Boards Are Serialized And Cataloged in an Active Database For Traceability

Safety

INSIGHT IR® Cameras:
Built-in Infrared Cameras to Continuously Scan Bolted Connections For Irregular Rises In Temperature

Sectionalized Components:
Separations Between Each Section To Maintain Maximum Operator Safety

Polycarbonate Windows:
Allows Critical Board LEDs To Be Viewed With The Dead-Front Door Closed

Guided Wireways:
Helps Keep Wires Organized

Dead Front Hinged Doors:
Barrier To Provide A Safe Working Area With No Exposed Live Parts

SafePanel® Distribution:
IP-20 Rated Finger-Safe Panel Board with No Exposure to Exposed Live Parts

Connectivity

Ethernet Connectivity:
Secure VPN Router Connects To Network For Advanced Remote Monitoring Capabilities

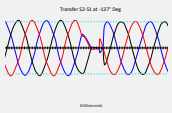
Modbus/TCP:
Open Connectivity to Existing Monitoring Systems Without Proprietary Limitations

NTP Time Clock Synchronization:
Facilitates Timeline-Based Logging For Post-Event Reconstruction

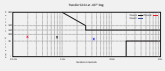
SNMP Connectivity:
Permits Remote Management Via Simple Network Management Protocol

Dry Contacts:
Access Alarms Data with Dry Contacts Connections

Power Quality Monitoring



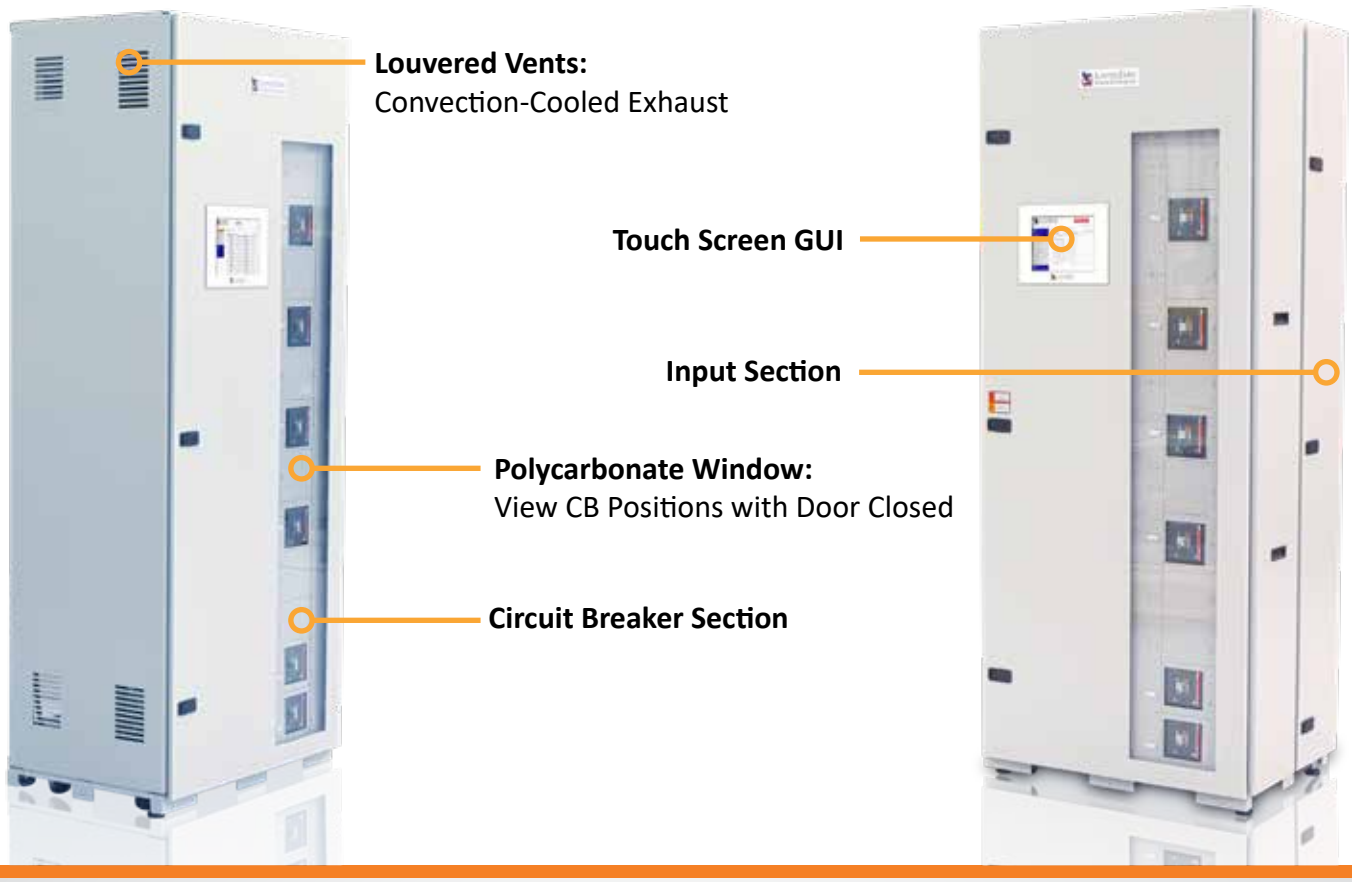
Real-Time Waveform Capture:
Automatically Captures A Picture Of The Power Six-Cycles Before and After Every Event

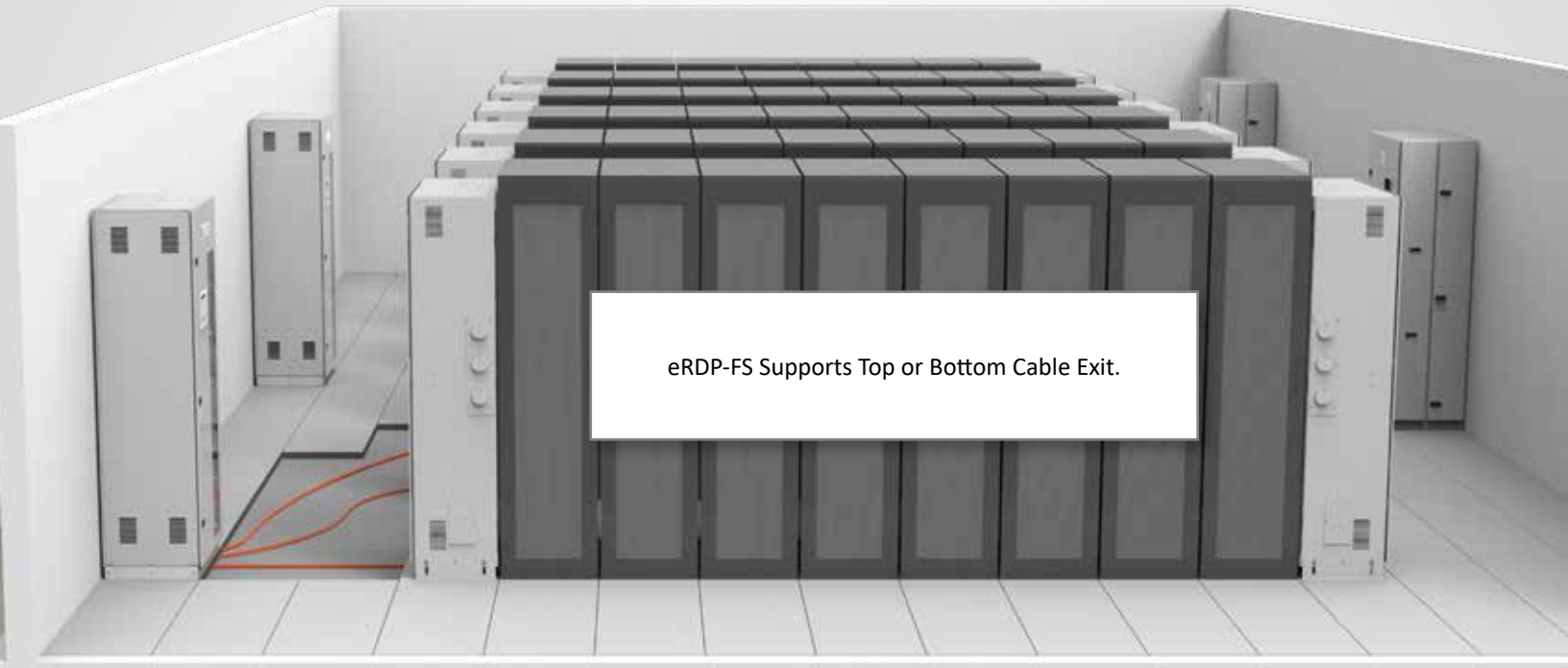


ITIC Plotting:
Generate ITIC Plots To Determine if Connected Equipment Was Affected by Power Quality Events

Optional Local Touch-Screen Interface:
Password-Protected Color Touch-Screen GUI For Local STS Setup/ Operation/Administration

Equipment Layout





Equipment Construction Detail

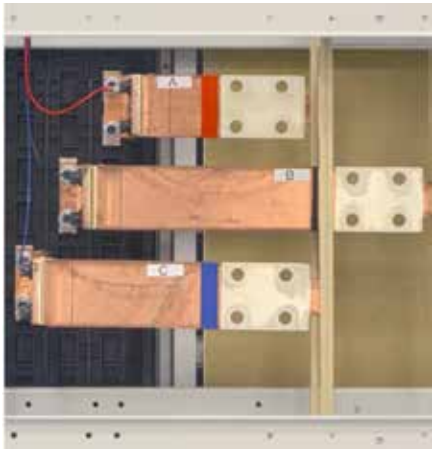
1. Hinged Dead Front Doors
2. Silver Plated Terminals
3. LayerZero DPQM Local Display
4. LayerZero DPQM Controls
5. Bluetooth Connectivity
6. Polycarbonate Window
7. INSIGHT IR®Portholes
8. Convection Cooled Exhaust
9. SafePanel™ Distribution
10. Subfeed Circuit Breakers
11. T-Handle for CB Removal
12. CTs for LayerZero DPQM

13. Alarm & Bypass Indicator
14. PBM Status Indicator
15. Logged In User
16. Navigation Menu

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.



Silver-Plated Customer Connections

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.

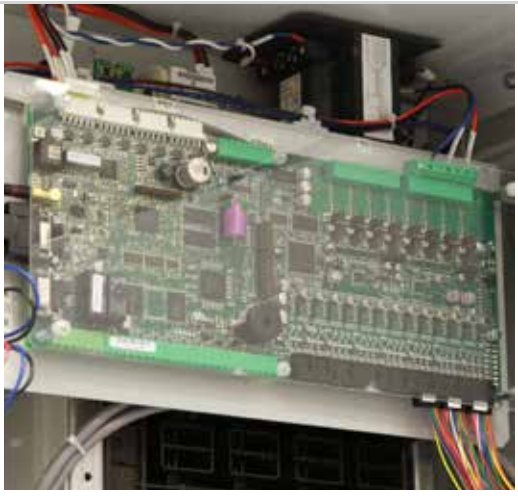
These technologies have been well tested in disparate environments of wide temperature ranges to help ensure that, once connections have been tightened, they stay that way.

Machined Cap Screws and Engineered Disc Springs
Utilized in LayerZero Power Systems Products

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.



Serialized “Panel Board Monitor” (PBM) in an eRDP

Safety Features

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.

After installation, there is no need to open the eRDP-FS main circuit breaker inner cabinet.

Sectionalized Components to Maximize Safety

Scan Bolted Connections with Dead-Front Doors Closed

The left inner dead-front doors contain 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.

INSIGHT IR® Portholes on the eRDP

Polycarbonate Windows

The Series 70: eRDP-FS is equipped with polycarbonate windows located on the outer doors. Circuit breaker positions can be viewed with the dead-front doors closed.

In addition, a hinged polycarbonate window on the input terminals increases safety by eliminating exposure to live bus.

Polycarbonate Windows allow Circuit Breaker Positions to be Viewed with the Outer Doors Closed for Main and Branch Circuit Breakers

Safety Features

The LayerZero SafePanel™

The Series 70 eRDP-FS 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.

Finger-Safe SafePanel® Subfeed Panel Board

eRDP-FS 1200 A Circuit Breaker Installation Process

The Breaker Is Inserted Into The SafePanel

The Handle Is Unlocked

Screws Help Secure The Breaker

For Maximum Safety, The SafePanel Has Recessed Bus Work and Finger Safe Lattice.

Power Quality Monitoring

LZ DPQM

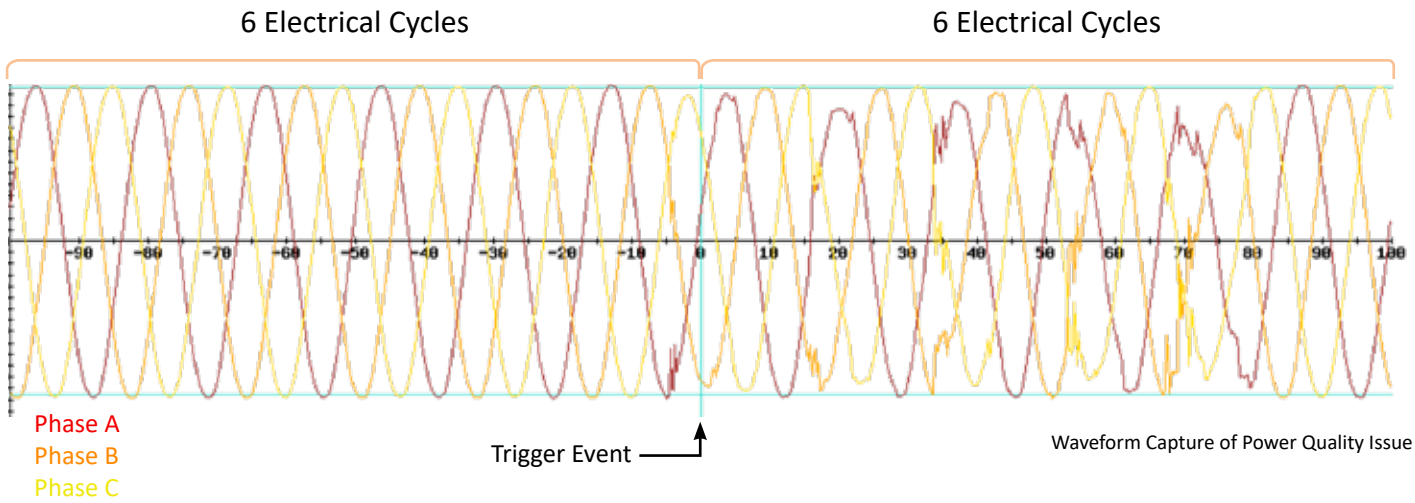
The Series 70 eRDP-FS is equipped with LayerZero DPQM (Distribution Power Quality Monitoring), an all encompassing monitoring system with local and remote communications options.

From basic monitoring & alarm reporting, to advanced power quality monitoring functionality, LayerZero 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.

A color touch screen GUI is optional

LayerZero DPQM Provides Answers

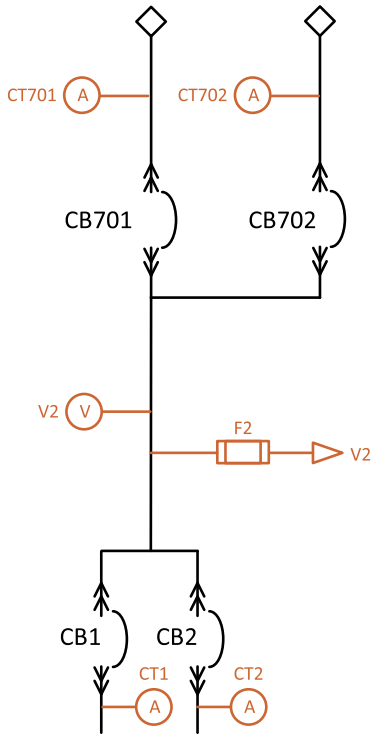
LayerZero DPQM provides timestamped pictures of waveforms before and after events, providing information that enables facilities to go back in time to methodically identify and correct the root causes of events. LayerZero actively captures power quality information at the STS, PDU, and RPP - permitting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



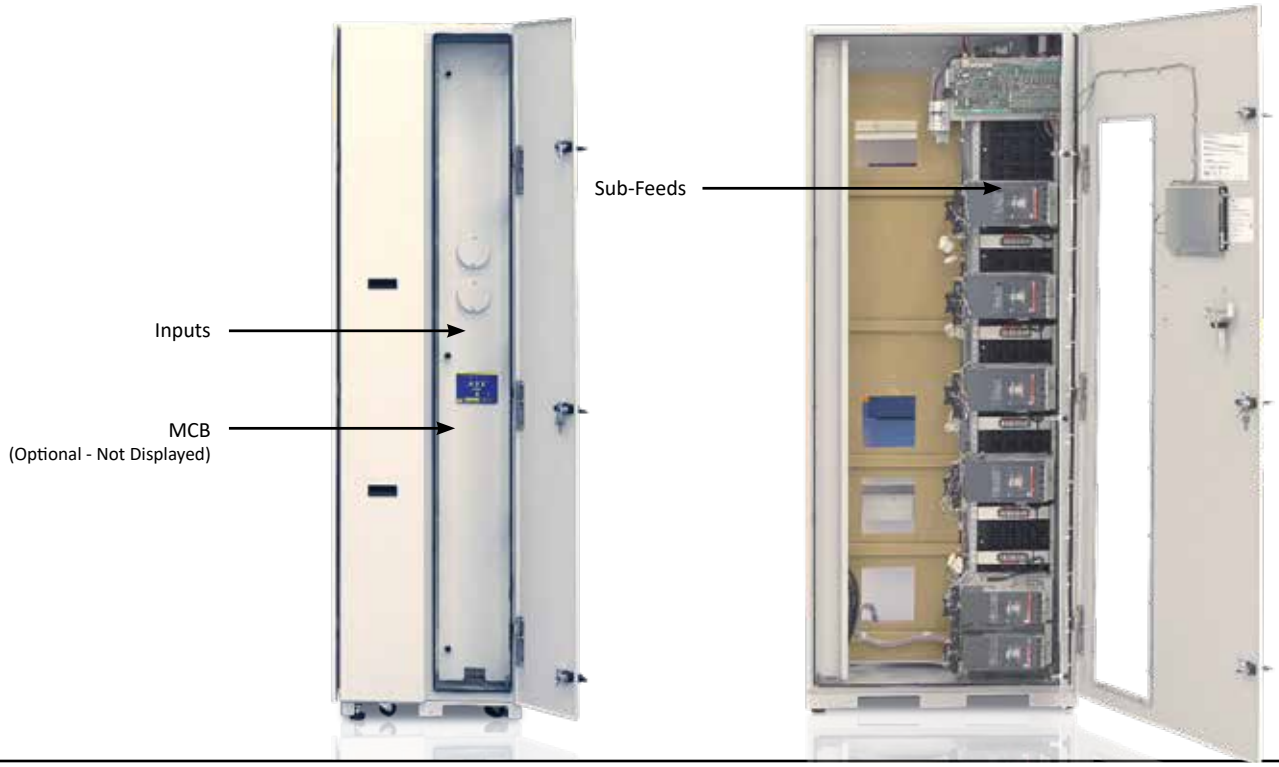
Waveform Capture of Power Quality Issue

Power Quality Monitoring

LZ DPQM



A Current Metering Point
V Voltage Metering Point
PQ Power Quality Metering Point
BM Branch Current Monitoring



Technical Specifications

LZ DPQM

LayerZero 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.

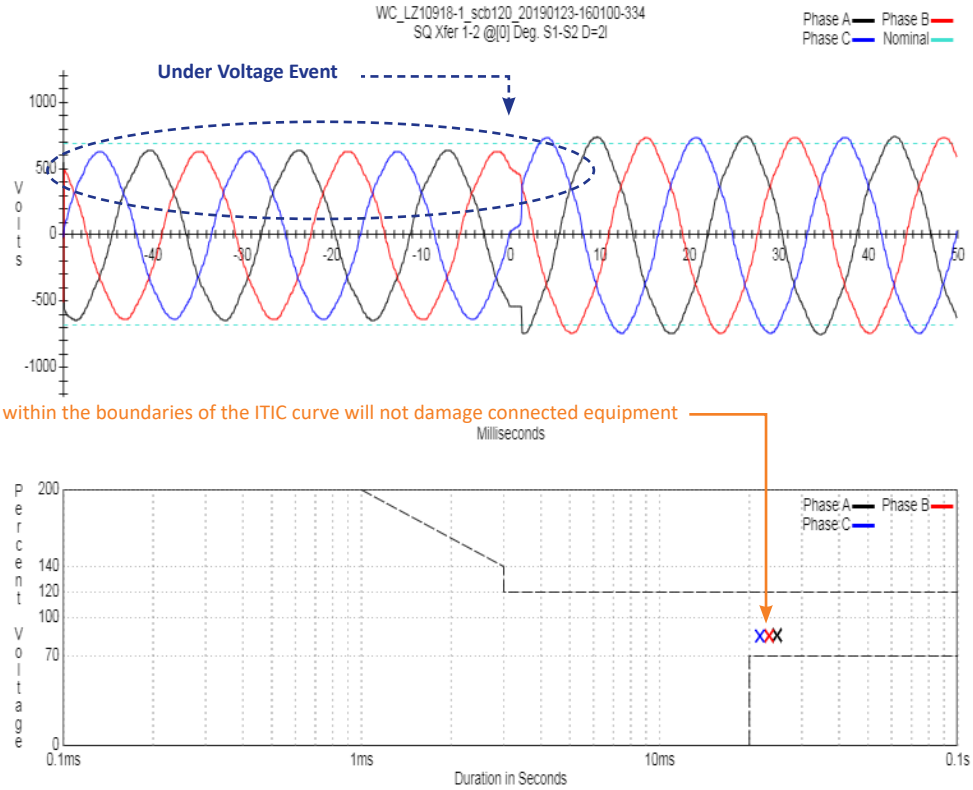
All LayerZero products break down power sources into samples for power quality analysis. This data is remotely accessible by connecting to the units via web browser.

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.

ePODs: Type-X SF PDU



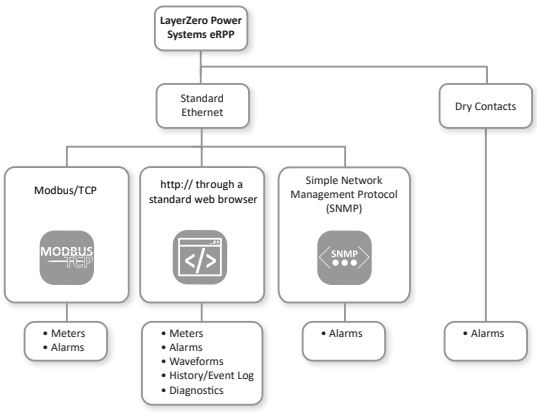
How to Read the Curve

On the y-axis you will see the % of nominal voltage, and the x-axis represents time typically shown using a logarithmic scale. As long as the voltage is contained within the boundaries the load will be maintained and there will be no damage to connected equipment. The examples above events plotted both within the boundaries.

Technical Specifications

eRDP Models with System Withstand Ratings	
120/208V, 3-Phase, 4-Wire + Ground	100 kA
220/380V, 3-Phase, 4-Wire + Ground	65 kA
230/400V, 3-Phase, 4-Wire + Ground	
240/415V, 3-Phase, 4-Wire + Ground	
277/480V, 3-Phase, 4-Wire + Ground	
480V, 3-Phase, 3-Wire + Ground	
575V, 3-Phase, 3-Wire + Ground	42 kA
600V, 3-Phase, 3-Wire + Ground	

Mechanical Characteristics	
Dimensions	36”W x 88”H x 24”D (610 mm x 2235 mm x 914 mm)
Weight	510 lbs (231 kg)
Enclosure Mounting	Wall-Mounted
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	120/208V, 3-Phase, 4-Wire + Ground; 220/380V, 3-Phase, 4-Wire + Ground; 230/400V, 3-Phase, 4-Wire + Ground; 240/415V, 3-Phase, 4-Wire + Ground; 277/480V, 3-Phase, 4-Wire + Ground; 480V, 3-Phase, 3-Wire + Ground; 575V, 3-Phase, 3-Wire + Ground; 600V, 3-Phase, 3-Wire + Ground
Withstand	100 kA
Configuration	Parallel (P), Shared Parallel (SP), Dedicated (D), Feed Through (FT)
Frequency	50 Hz, 60 Hz
Poles	3-pole, 4-pole
Neutral Rating	100%, 200%
Circuit Breaker Type	Electronic Trip, Molded Case Switch, Thermal Magnetic Trip
Distribution	SafePanel™ Distribution
Power Quality Monitoring	
Power Quality Monitoring Technology	LayerZero DPQM (Distribution Power Quality Monitoring)
Waveform Capture	Local Display, Remote Display via Web Browser



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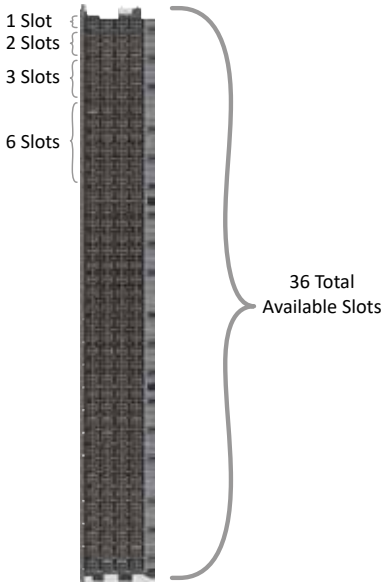
Technical Specifications

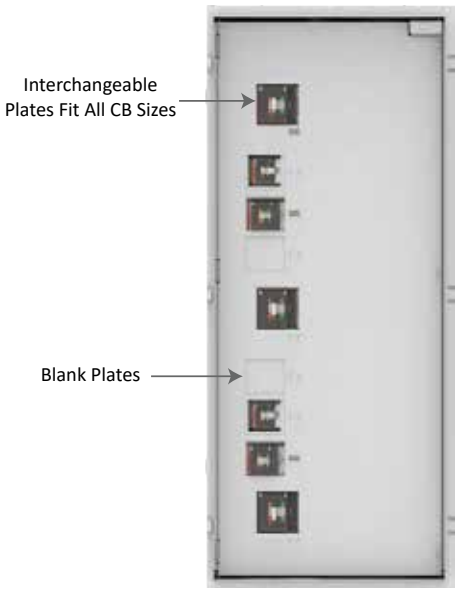
Operational Characteristics	
Cooling	Convection Cooling
Cable Access	Top/Bottom
Service Access	Front and Side Access
IR Scan Port Type	INSIGHT IR®Portholes
Display Type	3.2” LCD with Membrane, 10.5” Color Touch Screen GUI (Optional)
Connectivity	
Meters	Local Display, Ethernet, Modbus/TCP, http via Web 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

Number of Output Circuit Breakers	
Number of Available SafePanel™ Slots	36
CB Rating	Number of Slots Required
100 AF	2
250 AF	3
400 AF	3
400 AF 100%	6
800 AF	6

SafePanel™ Panel Board



Universal Dead Front



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Learn more at www.LayerZero.com

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