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 Power Distribution Unit 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.

## LayerZero's eRDP-FS 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:** eRDP-FS Captures and Records Events To Provide Vital Information In Root-Cause Analysis

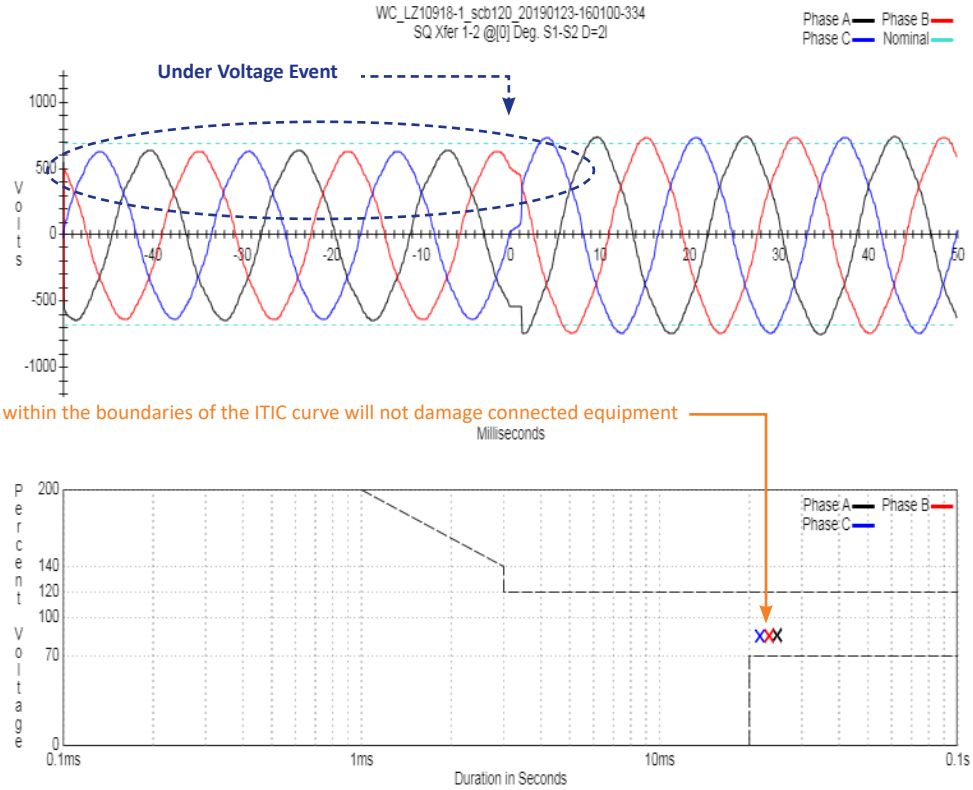
All LayerZero products break down power sources into samples for power quality analysis. This data is remotely accessible by connecting to the units via web browser.

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.

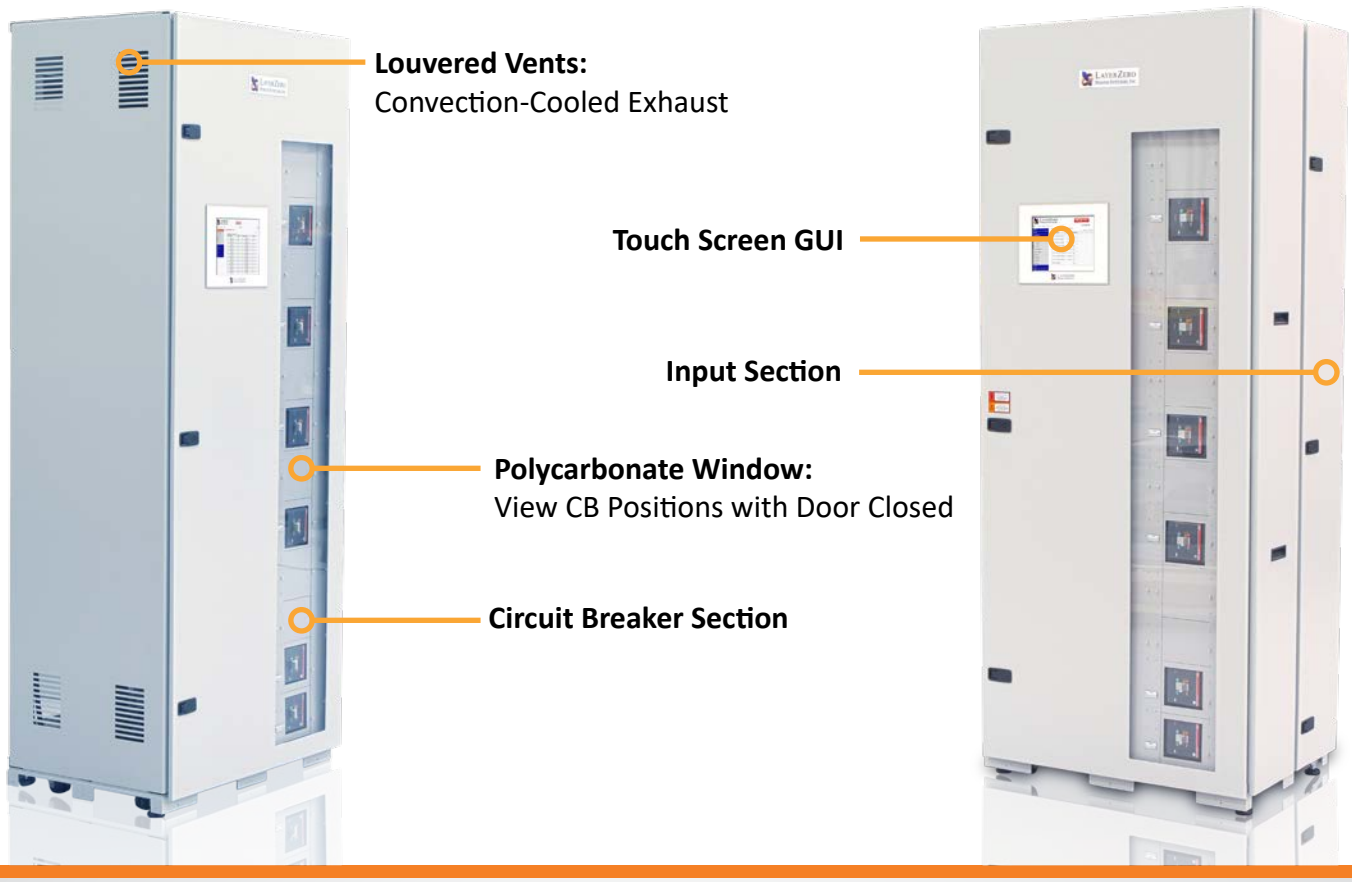
ePODs: Type-X SF PDU

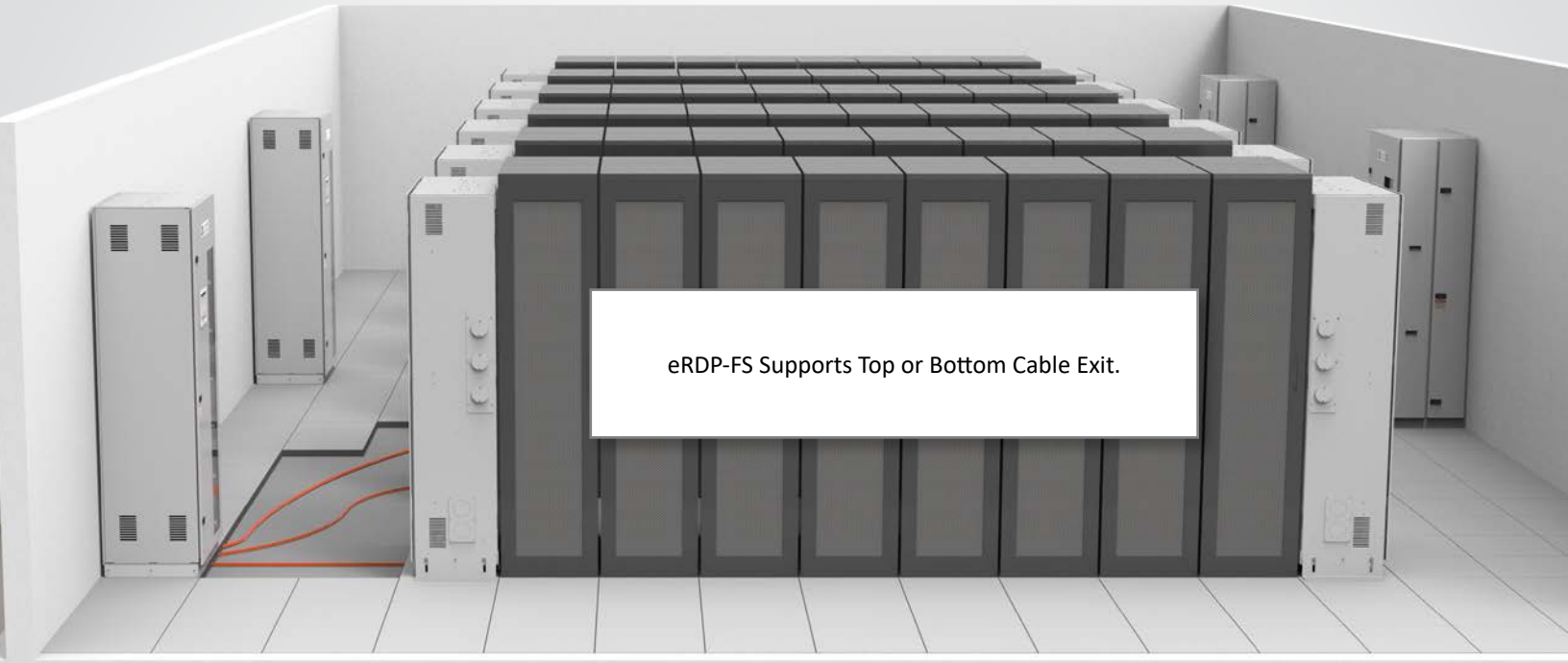



**How to Read the Curve**

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.

## Equipment Layout



## Equipment Construction Detail

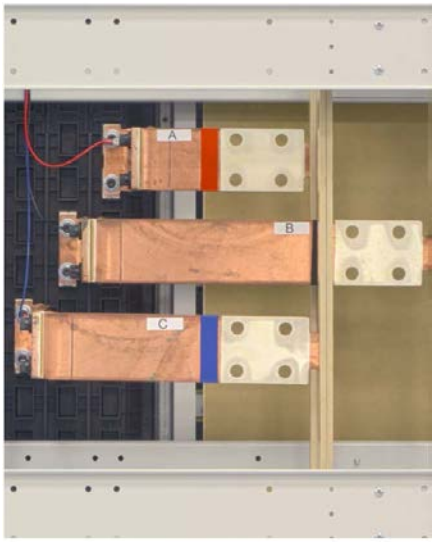
1. Hinged Dead Front Doors
2. Silver Plated Terminals
3. Zen DPQM Local Display
4. Zen DPQM Controls
5. Bluetooth Connectivity
6. Polycarbonate Window
7. InSight™ IR Portholes
8. Convection Cooled Exhaust
9. SafePanel™ Distribution
10. Subfeed Circuit Breakers
11. T-Handle for CB Removal
12. CTs for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




### Machined Hardware

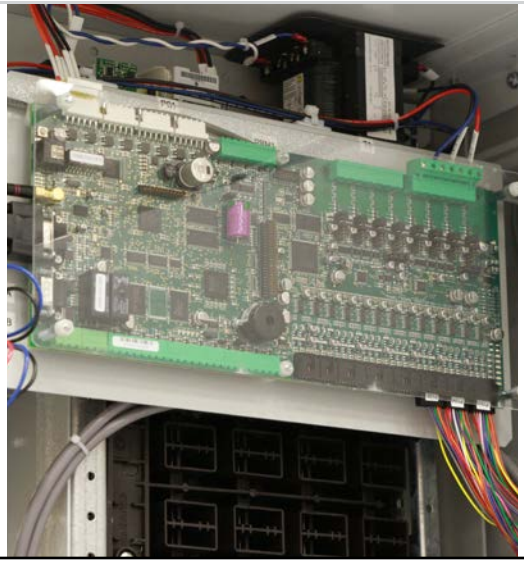
Our bolted connections utilize machined cap screws and engineered disc springs. The result is a flat pressure vs deflection profile to ensure that all bolted connections maintain constant torque through the life of the product.

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.

### 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.



## 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.

### 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.

### 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.

## 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.


## eRDP-FS 1200 A Circuit Breaker Installation Process

The Breaker Is Inserted Into The SafePanel

The Handle Is Unlocked


Screws Help Secure The Breaker

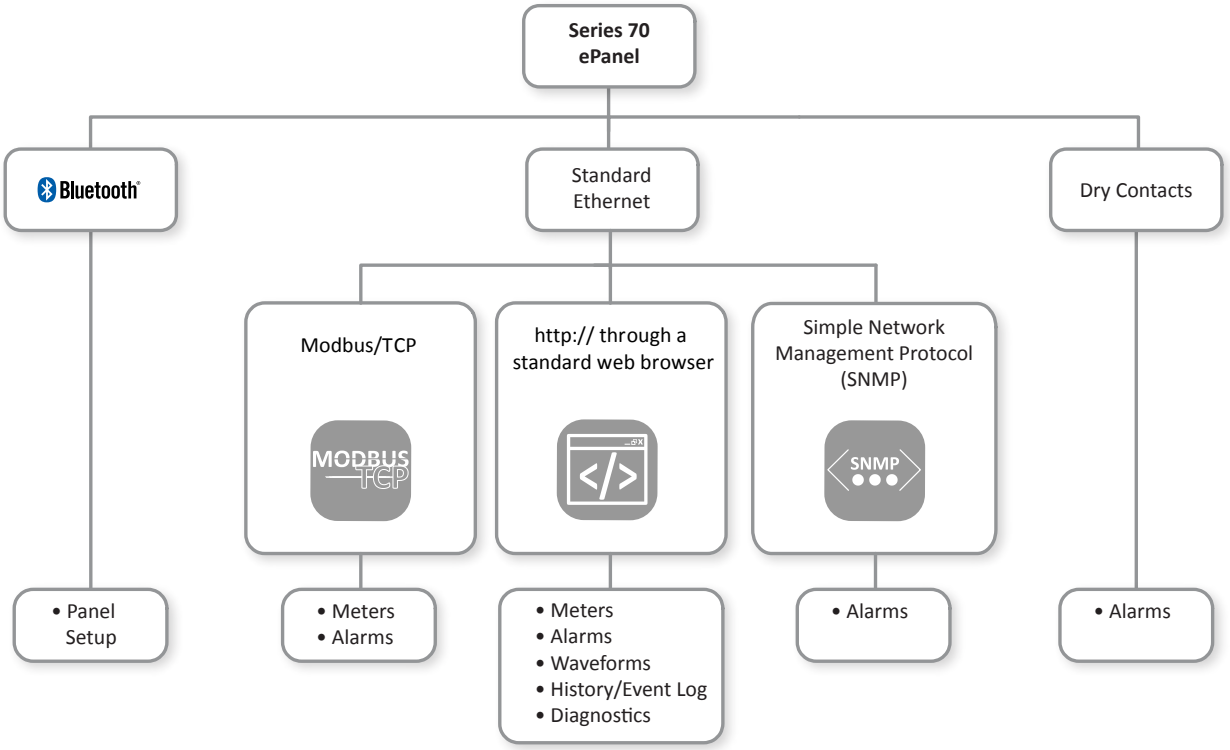
For Maximum Safety, The SafePanel Has Recessed Bus Work and Finger Safe Lattice.

## Connectivity Options

### Bluetooth Keeps Panel Board Names 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 of circuit breakers can be taken care of at the point-of-impact, bringing together the efforts of facilities and IT for more accurate panel names.



## Power Quality Monitoring

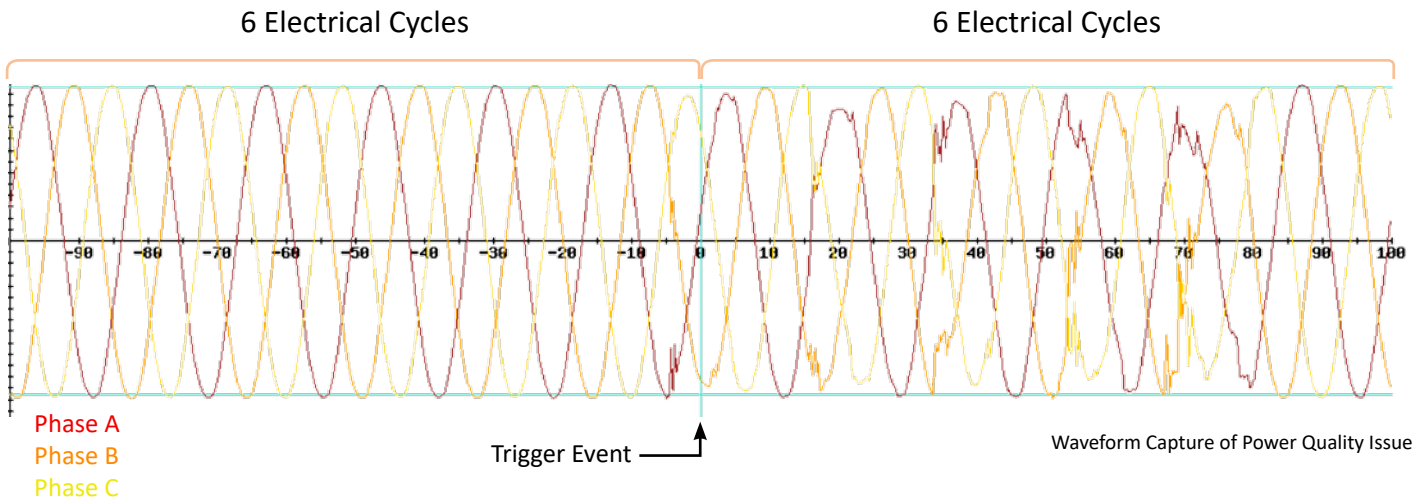
# zen DPQM


The Series 70 eRDP-FS 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.

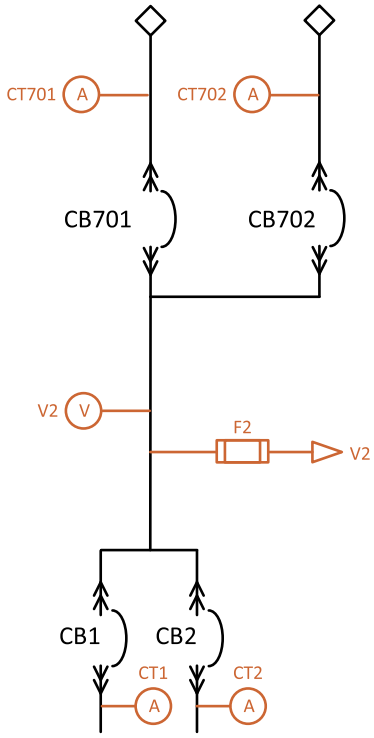
### Zen DPQM Provides Answers

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.

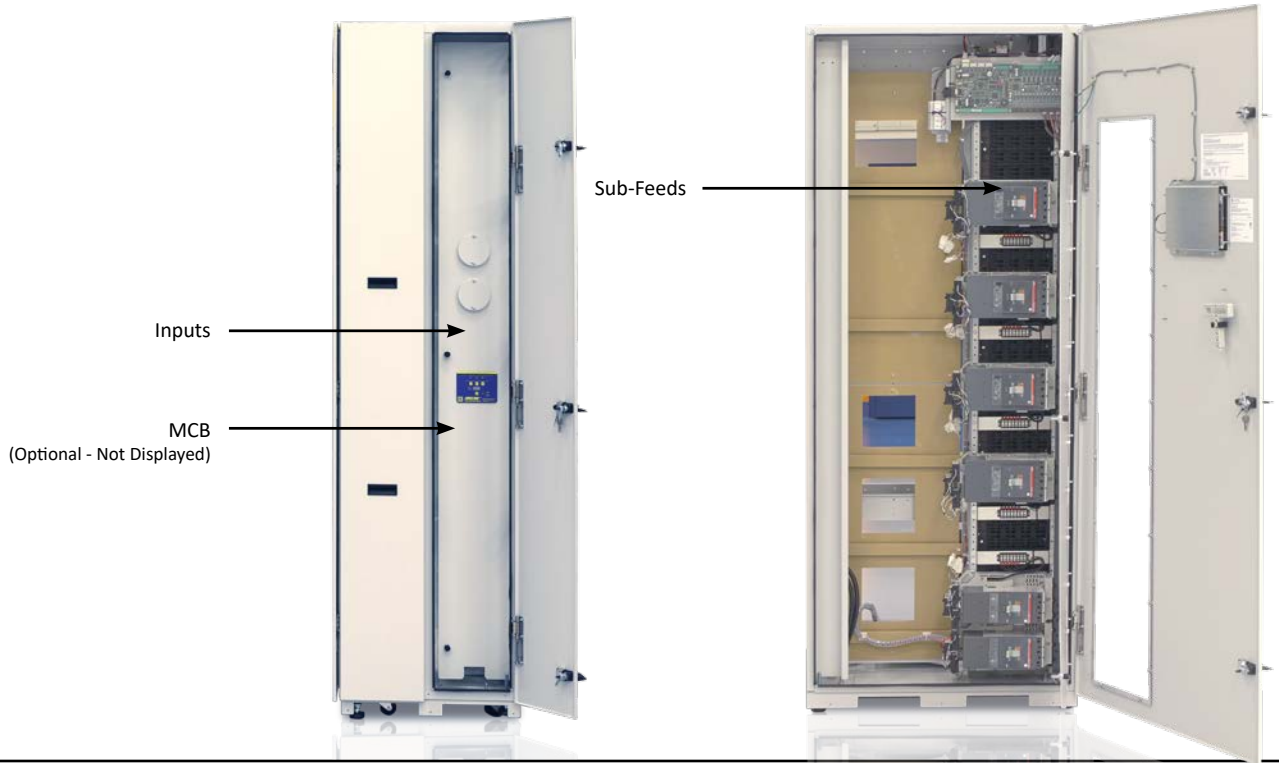


## Power Quality Monitoring

zen DPQM




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



## Technical Specifications

zen DPQM

| 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

| 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 | Zen DPQM™ (Distribution Power Quality Monitoring) |
| Waveform Capture | Local Display, Remote Display via Web Browser |

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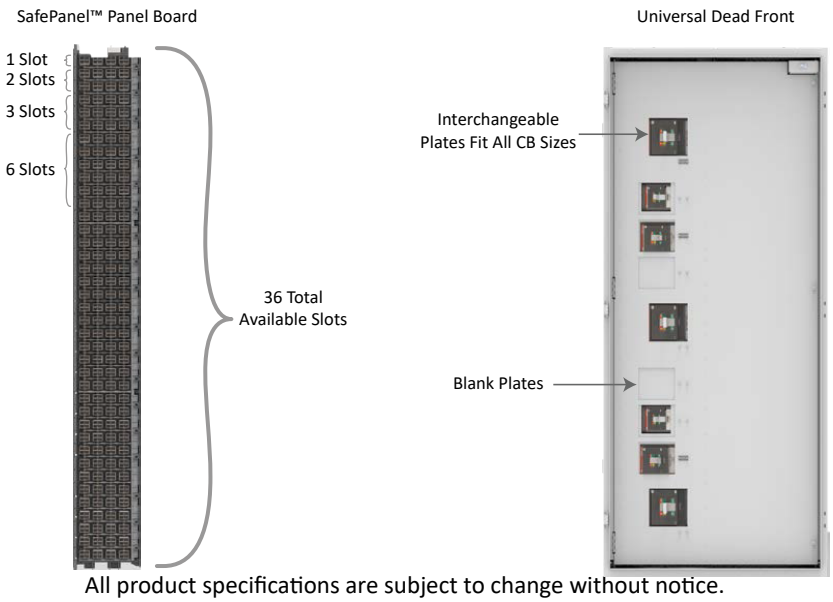
## Technical Specifications

| 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 |

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Learn more at www.LayerZero.com

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