Energy Station SM™

APPLICATION

The Powersmiths Energy Station SM™ PDU (Power Distribution Unit) is optimized for applications demanding the highest levels of power distribution density and reliability in the smallest overall footprint. The unit boasts high levels of configurability, efficiency, live maintainability with service safety, and diagnostic monitoring. It is suitable for applications feeding busways, RPPs (Remote Power Panels) or for feeding server racks directly.

DESCRIPTION

The Powersmiths Energy Station SM™ is a highly configurable UL Listed modular PDU platform specifically engineered to provide leading performance and configurability in a compact footprint while embedding the next level of innovative, safe maintainability as well as industry leading efficiency.

The modularity includes extensive distribution breaker configurations with plug-in or rack-in options, advanced monitoring of main, subfeed and branch circuits, application-specific transformer characteristics, communications, maintainability features, and dual feed inputs.

Front-only access dramatically reduces the installed system footprint by not requiring side or rear clearances for installation or service, allowing units to be installed side-by-side and back-to-back with a conduit pull-box, simplifying installation.

The enhanced safety is achieved by extensive compartmentalization of breakers, front-accessible monitoring and controls, SPD (Surge Protection Device), and user connections, all serving to isolate the service technician from the high energy, main power compartment.

Preventative maintenance is also enhanced with IR (Infrared) viewing grills over compartmentalized breakers, and optional Rotatable IR Port™ for the power compartment.

BENEFITS

Our modular configurable approach enables tailoring to individual project requirements on a UL Listed platform, with the cost and delivery advantages associated with a standard product.

The true front-only access of the units minimizes the installed footprint while leveraging the safer service and maintainability features.

The Powersmiths transformer facilitates system compatibility with the highest levels of operational efficiency, with substantially lower losses and heat load, as well as managed inrush and kAIC levels.

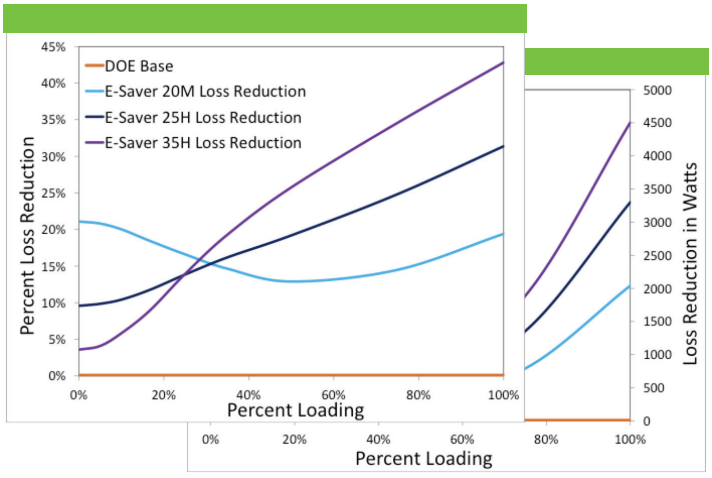
By providing a Web-server instead of a more typical gateway, the user has browser access to the unit over the network. Trend logs can be configured to record the load test performance during commissioning, without requiring hookup of temporary external data acquisition loggers, reducing associated commissioning costs.

THE POWERSMITHS TRANSFORMER

The transformer in the PDU plays an important role in the electrical systems of high power density datacenters: efficiency and load optimization, overload capacity, a seperately derived source with electrical noise attenuation, impedance, fault level, Arc flash, inrush, and harmonic mitigation (where required). To this end, Powersmiths has developed a best practice called OPAL™ that delivers the optimized transformer characteristics for the application. Transformer winding options include copper, aluminum or hybrid copper/aluminum and full capacity multi-voltage outputs.

Efficiency should not be overlooked when selecting a PDU, as it has significant impact on the operating cost of a PDU, from direct energy losses to energy wasted from associated cooling in a 24/7 data center environment. With its lower losses, the Powersmiths transformer provides an attractive price/performance benefit and results in an improved PUE, a lower environmental impact, and in the case of a net zero facility, a reduction in the required renewable energy offset.

Percentage & Watt Loss Reduction Curves:
OPAL 600kVA Series Transformer vs. Typical DOE[1] Transformer with 150°C Rise



[1]U.S. Department of Energy, 10 CFR Part 431, [Docket No. EERE-2010-BT-STD-0048] Energy Conservation Program: Energy Conservation Standards for Distribution Transformers; Final Rule, April 18, 2013

SUBFEEDS

- Individual compartmentalization allows for safe connection and maintenance while the PDU is powered (I-Line excepted)
- Types include: fixed-mount, plug-in, rack-in
- Wiring through conduit pull-box provides generous landing area and bending radius, with isolation from live terminals
- Each compartment has IR viewing grills on the dead front behind a hinged cover
- Square-D I-Line Panelboard to 1200A (no grills or compartments)

MONITORING

The advanced Cyberhawk™ revenue grade meter comes standard with many advanced features, including simultaneous full input and output monitoring providing the unique ability to measure real-time losses and efficiency, along with extensive power quality data, individual transformer coil and ambient temperatures, plus a comprehensive event log and waveform and harmonic display.

Connectivity options include Modbus TCP and BACnet/IP (SMART™ Sensor Protocol). The user interacts with the unit via the color touch screen display and remotely via dynamic Web pages.

The integrated trend log function can be used for system start-up and commissioning during load tests, avoiding the cost and complexity of external data acquisition equipment.

SERVICE ORGANIZATION

Powersmiths provides start-up and commissioning support services and nationwide, 24/7 service support.

SPECIFICATIONS & OPTIONS

*Indicates Available Options

ELECTRICAL:

Power Ratings:
- 50 to 1350 kVA*

Input:
- Voltages: 208V, 415V, 480V or 600V... (3-wire + GND)
- Frequency: 60Hz; 50Hz*
- Dual Feed*

Main Breakers(s):
- 80% Rated; 100% Rated*
- 35kAIC; up to 100kAIC*
- Kirk-key Interlock*

Output:
- Voltages: 208/120V, 415/240V or 480/277V...
- Multi-voltages to 3; (full capacity on any to max. rating)
- 200% Neutral
- Grounding: ISO (Isolated) Ground (field selected)

Transformer:
- OPAL™ Series, Dry-type, Convection Cooled
- Temperature Rise: 80°C, 105°C, 115°C, 130°C (per requirement)
- Aluminum, Copper, Hybrid (Cu/Al) (per requirement)
- Efficiency: > DOE 2016[1]
- Operational Losses: up to 50% reduction
- K-Ratings: K4, K7, K9, K13, K20... (per requirement)
- Impedance: ≥ 4%; up to 7%*
- Inrush: < 7 x FLA (@ 1 ½% source Impedance); at < 4 or 5 x FLA*
- Dual Electrostatic Shields
- Temperature Sensors on each Coil (linear, monitoring required)

SPECIFICATIONS & OPTIONS (Continued)

DISTRIBUTION:

Subfeeds:*
- Individual Compartmentalized, Fixed Mounted to 2,000A
- Square-D, ABB or per Specification
- Plug-in or Rack-in; Touch Resistant Base (ABB)
- I-Line 1200A with MB (Square-D) (note: not live serviceable, no IR Grills)

Panelboards:*
- 225/400/600A with MB; 208/120V, Type NQ (Square-D)
- 250/400/600A with MB; up to 600/347V, Type NF (Square-D)
- 400/800A with MB; up to 600V. Type ARTU (ABB)
- I-Line 1200A with MB to 600V (Square-D)

Expansion Cabinets:*
- Field Installable (per requirement)

MONITORING (Revenue Grade):

Main:
- Full Simultaneous Input/Output(s)
- Voltage, Current, Power, PQ , Energy, Waveforms, Harmonics....
- Real-time Losses and Efficiency
- Individual Transformer Coil Temperatures + Ambient
- Comprehensive Date/Time Stamped Event Logs
- Ethernet: Modbus TCP or BACnet/IP (Smart Sensor Profile)
- Color Touch Screen HMI
- Independent Service Port
- Dynamic Web Pages
- User Configurable Trend Logs (also for test logging)
- Four (4) Digital Inputs for MB/SPD status/Bell Alarm; to 8*
- Alerts/Alarms: Visual, Audible and Summary
- Dual Source Power, Multi-output, Ground Current...*

Subfeeds:*
- Voltage/Current/Power/Energy
- Built-in Breaker Metering

Panelboards:*
- Main: Voltage/Current/Power/Energy
- Branch: Current/Power/Energy

EPO: Local/Remote (User overrideable)

SPD: Up to 240kVA/Mode with Service Disconnect

MAINTAINABLITY:

- Compartmentalized Breakers - Facilitates Live Maintainability
- IR Viewing Grills over Breakers
- 360° Rotatable IR Viewing Port
- Front-Only Access (including installation & maintenance)
- Front Accessible Controls
- Dedicated Communication Service Port
- Conduit Pull-box (no live terminals)

PHYSICAL:

- Enclosure: Type 1, Type 3R (Outdoor)*
- Operating Temperature: 0 - 40°C
- Wiring: Braced, Compression Lugs (Breakers/Terminals Excepted)
- Top Vents with Debris Trap (no horizontal top vents)
- Dimensions/Weight: Size & Configuration Dependent
- Floor Stands (per requirement)

CERTIFICATIONS / QUALITY:

- Seismic: OSHPD/IBC S_{DS}=2.5g, Live Test Qualified (config. dependant)
- Manufacturing: ISO 9001, ISO 14001, ISO 17025 (Efficiency Test Lab)
- UL Listed UL/cUL (UL 1062, CSA 22.2 No. 29-15)

As design optimization is continuous, technical data is updated over time. Please check with Powersmiths for latest revision.

Please print responsibly.

POWERSMITHS

POWERSMITHS INTERNATIONAL CORP. 10 Devon Road, Brampton ON, L6T 5B5 Canada

Phone: (905) 791-1493 Toll-free: (800) 747-9627 Fax: (905) 791-8870 Email: info@powersmiths.com

WWW.POWERSMITHS.COM

807-000431-161-A01