



**23" (58 cm) Wide Shelf**



**19" (48 cm) Wide Shelf**

The *TwinPack Plus*<sup>®</sup>-CE DC Power System is now available with the CE Mark for European Conformity. *TwinPack Plus*<sup>®</sup> is offered in a choice of 23" (58 cm) wide or 19" (48 cm) wide mounting shelves. The 23" (58 cm) wide shelf will accept a maximum of four modular plug-in rectifiers; the 19" (48 cm) wide shelf will accept a maximum of three. The shelves accept individual AC feeds for each rectifier. The four-across shelf measures 10.5" (27 cm) H x 23" (58 cm) W x 24" (61 cm) D. It weighs 49 lbs. (22.7 kg.). The three-across shelf is 10.5" (27 cm) H x 19" (48 cm) W x 24" (61 cm) D, and weighs 45 lbs. (20.45 kg.).

Seven rectifier modules are offered. High output (3000 watt) rectifiers accept AC inputs ranging from 176 to 264 VAC, 45 to 65 Hz, single phase and include the following outputs: -48 VDC/50 amps, +24 VDC/100 amps, and -24 VDC/100 amps. Lower output (1500 watt) rectifiers accept AC inputs ranging from 85 to 264 VAC and include the following outputs: -48 VDC/25 amps, +24 VDC/50 amps, -24 VDC/50 amps, and +12 VDC/100 amps. All rectifiers will operate and produce full output in an environment of -40°C to +65°C. See page 4 for specific model and part numbers.

Each rectifier is connectorized to plug into a backplane panel. Rectifier modules can be added or replaced in the field while the plant is fully operational (HOT SWAP). Rectifiers are connected in a forced load sharing mode. Shelves can be stacked on top of each other in standard 23" (58 cm) or 19" (48 cm) wide rack frames. No heat deflectors are required between shelves. P/N 0000880283, 7/16" (11mm) Nut Driver, is used for final installation of rectifier module(s) (order separately).

Redundant rectifiers are offered on an N+1 basis. Should one rectifier fail, the remaining rectifiers will remain fully operational. Forced paralleling (current sharing) is included with each rectifier module.

#### Rectifier Dimensions & Weight

- Modular design - 10" (25 cm) high x 5" (13 cm) wide x 15" (38 cm) deep.
- 24 lbs. (10.90 kg.) net weight.

#### Regulating

- Module: UL Recognized and CSA Certified. All rectifier modules bear the UL Recognition (UL 1950) mark for the USA and Canada and the CE mark for European Conformity.
- System (includes the mounting shelf): UL Listed (UL 1950) and CSA Certified and bears the UL Listing mark for the USA and Canada and the CE mark for European Conformity. Certain mounting shelves are recognized under UL1950 and bear the UR mark for the US and Canada.

#### Operating Environment.

- The operating ambient temperature range is -40°C (-40°F) to +65°C (+149°F). It will operate fully at all altitudes with the

operating ambient temperature range being derated by 2°C for each 1,000 feet of increased elevation above 5,000 feet. The operating environment relative humidity range is 0% to 95% non-condensing.

#### Cooling

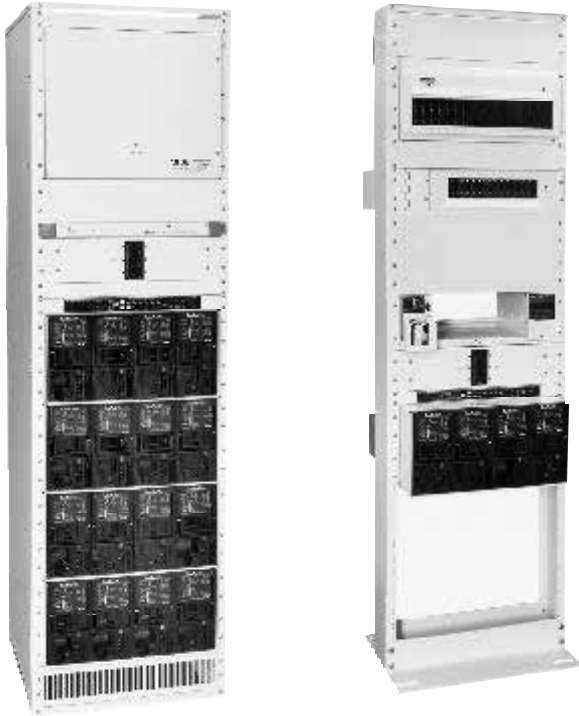
- Each rectifier includes an integral fan for horizontal (front to back) fan cooling. A red fan fail LED is provided. If the fan fails, the rectifier fail alarm and LED will activate. Fan is field replaceable.

#### EMC

- The system (shelf and rectifier module) meets FCC Part 15, Subpart B, Class A. Also complies with the Generic Standard EN50081-1 (1992). The system complies with IEC-1000-3-2 conducted harmonic currents 0 to 2 kHz. Also complies with EN55022, Class A: EMC conducted 0.15 mHz - 30 mHz. EN55022 Class A: EMC radiated 0.03 - 16 Ghz.

## **TwinPack Plus®**

### **-48 VDC/800A Power System.**



**TwinPack Plus®  
+24/-48 VDC Power System.**

#### **Audible/Acoustic Noise**

- Each rectifier has a maximum audible noise of less than 54 dBA when measured 3 feet from the equipment, while operating at no load, partial load, or full load.

#### **Specification Compliance**

- Rectifier and shelf comply with the seismic requirements of Telcordia Technologies GR-63-CORE (Zone 4).
- Complies with applicable portions of Telcordia Technologies GR-947.

#### **Immunity**

The rectifier and mounting shelf system meets the Telcordia Technologies immunity criteria stated in GR-1089-CORE, Issue 1, Nov. 1994, "Electromagnetic Compatibility and Electrical Safety Generic Criteria for Network Telecommunication Equipment". The system also complies with the Generic Standard EN50082-2 (1994).

IEC1000-4-2: ESD Level 4; 8kv contact, 15kv air discharges.

IEC1000-4-3: RF field immunity: Level 3; 10v/m.

IEC1000-4-4: Electrical fast transient/burst immunity: Level 4;  
ac input: 4kv, 2.5khz  
dc output: 4kv, 2.5khz  
control lines: 2kv, 5khz

IEC1000-4-5: Surge immunity test 1.2/50µs (voltage) 8/20µs (current): Level 4;

ac input (line to line): 2kVpk 1.2/50 (8/20)µs

ac input (line to gnd): 4kVpk 1.2/50 (8/20)µs

dc output (line to line): 2kVpk 1.2/50 (8/20)µs

dc output (line to gnd): 4kVpk 1.2/50 (8/20)µs

control signals (line to gnd): 0.5kVpk 1.2/50 (8/20)µs  
ANSI/IEEE C62.41-1991. *Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.* IEEE Location B3/C1 both combination waveform (1.2/50µs - 8/20µs) at 6.0 kV, 3.0 kA and ring waveform (0.5µs - 100 kHz) at 6.0 kV, 0.5 kA.

#### **Input Voltage Range (Single Phase)**

- 3000 Watt Modules: 176 to 264 VAC, 45 - 65 Hz.
- 1500 Watt Modules: 85 to 264 VAC, 45 - 65 Hz.

#### **Output Voltage Range**

- Output voltage range is 47 to 56 VDC (float) and 51 to 60 VDC (equalize) -48 VDC rectifiers; 22 to 28 VDC (float) and 24 to 30 VDC (equalize) ±24 VDC rectifiers; and 11 to 14 VDC (float) and 12 to 15 V DC (equalize) +12 VDC rectifiers.

#### **Output Current**

- 3000 Watt Modules 50A (-48 VDC); 100A (±24 VDC).
- 1500 Watt Modules 25A (-48 VDC); 50A (±24 VDC); 100A (+12 VDC).
- Output current limit is set at 105% of rated current. The rectifier will protect itself from an output short circuit by limiting the output current to 105%. Once the short circuit is removed, the rectifier will automatically resume normal operation.

#### **Efficiency**

- >90% Efficiency at 100% load (24 VDC and 48 VDC models).

#### **Power Factor**

- Advanced power factor correction design using MOSFETS and 75 kHz switching.
- .98 Power factor minimum from 50% load to 100% load.
- .995 Power factor at full load and nominal input.

#### **Harmonic Distortion**

- <5% Total harmonic current distortion (50% to 100% load), 3000 watt models.
- <9% Total harmonic current distortion (50% to 100% load), 1500 watt models.
- Meets IEC-1000-3-2 (limits for harmonic current).

#### **Voltage Regulation**

- ±0.5% voltage regulation from no load to full load and under all line and environmental conditions.

#### **Noise**

- Filtered output (measurements taken with resistive load - no battery). All units are less than the values stated below:
  - 26 dBm-c measured on a 3A noise set or equal.
  - 19 mV RMS between 0 and 10 MHz;
  - 5 mV RMS between 0 and 100 kHz.
  - 200 mV peak-to-peak from 0 to 100 MHz.
  - 100 mV peak-to-peak from 0 to 20 MHz.

#### **UL Listing**

- UL Listed input (AC) fuses and output (DC) breaker included in each rectifier.