

30-150 amp, +24 VDC Vortex[®] Power System with 30 amp PCUs

Key Features

- **Single Point Adjustment (on MCA)**—parameters set once for simplified installation and system adjustments
- **MCA Module**—full system monitoring and control
- **Plug'n'Play**—no system shutdown
- **Optional Temperature Compensation**—maximizes battery life
- **Front to Back Ventilation**—reduces critical rack space needed for revenue producing equipment
- **Power Factor Corrected**—0.99 at 50% load at 120 VAC input
- **Wide AC Input Range (96-264 volts)**—no straps or taps to change

Description

Built on the heritage of the Lorain[®] brand name, the Vortex Mini Series (VMS) power system is available in two versions and is ideal for small wireless applications. The VMS120, 19" (48.26cm) wide, has a meter-control-alarm (MCA) module and has up to four positions for 30-amp plug-in power conversion units (PCUs). The VMS150 fits 23" (58.42cm) applications and consists of an MCA module and up to five positions for PCUs. These systems provide smooth, regulated +24 VDC power from a nominal input voltage range of 120-240 VAC, single phase source. The system can be used without batteries or provided with shelf/rack mounted batteries. Temperature compensation is an available option.

Application

The VMS120 and VMS150 power systems are designed primarily for PCS and micro-cell wireless applications where a small +24 VDC power plant is necessary. Vortex Mini Series power systems are environmentally hardened to withstand hostile environments and are rated for operation in temperature ranges from -40° C to +65° C (-40° F to +149° F).

Additional Information

For additional specification, engineering and installation information, contact a customer service representative and request instruction manual number 581130000 for the 19" (48.26cm) power shelf and number 581130001 for the 23" (58.42cm) power shelf.



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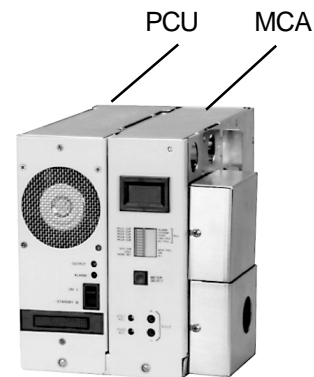
The System

Power Shelf

The rack-mounted power shelf is available in 120 and 150 amp configurations. In addition to housing the MCA, the VMS120 accepts up to four 30 amp PCUs in a standard 19" (48.26cm) cabinet and the VMS150 accepts up to five 30 amp PCUs in a standard 23" (58.42cm) shelf.

MCA Module

The meter-control-alarm (MCA) module contains a digital meter that monitors system output voltage, high voltage shutdown set-point, system output current and individual PCU output current. The MCA module provides local indicators and the ability to transmit alarms. All unit adjustments are made from one location on the MCA module when the system is installed. Set-up specifications are then communicated to all of the PCU modules. If the communication link between the MCA and the PCU modules fails, the PCU modules default to a programmed output voltage.



Temperature Compensation Module

The +24 VDC VMS is available with an optional temperature compensation module which when installed in the battery compartment automatically adjusts output voltage as ambient temperatures in the battery compartment increase or decrease. While all battery manufacturers recommend that the battery compartment remain at 25° C (77° F), they also suggest decreasing voltage in higher temperatures, likewise, increasing voltage in lower temperature. The temperature compensation module extends the life of the batteries and minimizes the risk of thermal runaway.

Power Conversion Units

The VMS system utilizes the V30F25 compact, modular 30 amp PCU. With the system's plug'n'play feature, the installer needs to set up the system only once. System settings will be automatically communicated to each PCU module. If PCU modules are switched between systems with different voltage parameters, the PCU will assume the setting of the system into which it is installed. As a result, system capacity can be increased with a minimum of time and money. In addition, expansion or module replacement can be made without system shutdown. The V30F25 PCU is cooled by drawing air into the front and forcing it out the back. This method of cooling allows the PCU to mount in a small space (8.75" [22.22cm]) and does not require open space above or below the unit. A PCU features a thermal current limit circuit. This system will reduce output when temperatures reach beyond rated limits of +65° C (+149° F). Instead of complete shutdown, the system will proportionally decrease its output until it reaches +85° C (185° F). As ambient temperatures cool, the system will recover automatically without requiring a site visit.

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Power Conversion Unit Specifications

Design Technology: High frequency switch-mode

Input

Voltage: 96-264 VAC

Frequency: 50/60 Hz (47-63)

Protection: If the AC input voltage decreases or increases beyond a non-adjustable predetermined value, the PCU power conversion circuitry inhibits, disabling PCU output. The PCU will recover automatically when the AC input voltage is re-established within specifications limits 120-240 VAC.

Output

Voltage: Adjustable from 23.0 VDC to 28.0 VDC

Current: 30 to 150 amps

Regulation: Steady state output voltage remains within $\pm 0.5\%$ of any voltage within the range of 23.0 VDC to 28.0 VDC for any load current from no load to full load and for any input voltage and frequency within design parameters.

Filtering: On or off the battery

Voice Band Noise — Less than 30dBnC

Wide Band Noise — Does not exceed 500 mv peak-to-peak, 30 mv rms

Protection

Current Limiting — Output current of each PCU is automatically limited to approximately 105% of full load current.

High Voltage Shutdown —

Selective High Voltage Shutdown: The MCA module continuously monitors the power shelf DC output voltage. If the DC output voltage exceeds a preset adjustable HVSD set point, a signal is sent to all monitored PCUs. This signal causes any PCU that is delivering greater than 10% of full load to shut down. The MCA will attempt to re-start the PCU twice. Failing to re-start, the MCA will lock out this PCU.

Status/Alarm Indicators and Metering

Full complement alarming and status indicators such as AC on/standby, fan fail, PCU failure and open sense are displayed on the MCA and locally on each unit.

Environmental

Operating Temperature: -40°C to $+65^{\circ}\text{C}$ (40°F to $+149^{\circ}\text{F}$)

Storage Temperature: -40°C to $+85^{\circ}\text{C}$ (-40°F to $+185^{\circ}\text{F}$)

Humidity: 0% to 95% relative humidity, non-condensing

Altitude: The maximum operating ambient temperature should be derated by $+10^{\circ}\text{C}$ ($+50^{\circ}\text{F}$) at an elevation of 10,000' (3,048m) above sea level. For elevations between 3,000' (914m) and 10,000' (3,048m), derate the maximum operating ambient temperature linearly.

Heat Dissipation: Fan cooled front to rear — 607 BTU/Hr. for each 30 amp module.

EMI/RFI Suppression: Conforms to FCC rules Part 15, Subpart B, Class B.

Audible Noise: 5' (1.52m) from any vertical surface does not exceed 55dBA.

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Power Conversion Unit Specifications (continued)

Physical Characteristics

Mounting: Plug-in installation

Dimensions:

Width: 19" (48.26cm) or 23" (58.42cm)

Height: 8.68" (22.06cm)

Depth: 11.5" (29.2cm)

Weight:

PCU — 11 lbs. (5.1kgs.)

Power Shelf with MCA Module —

19" (48.26cm) – 21 lbs. (9.5kgs)

23" (58.42cm) – 25 lbs. (11.5kgs)

Safety Compliance

UL: UL Recognized (UL 1950)

CSA: CSA 22.2, No. 234-M90



www.marconi.com/power

Marconi Communications

1122 F Street
Lorain, OH 44052
800-800-1280
Fax: 440-246-4876

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