<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC Power Systems</td>
<td>2 - 19</td>
</tr>
<tr>
<td>2</td>
<td>Power Plants</td>
<td>20 - 21</td>
</tr>
<tr>
<td>3</td>
<td>Rectifiers/Power Supplies</td>
<td>22 - 32</td>
</tr>
<tr>
<td>4</td>
<td>DC Converters</td>
<td>33 - 39</td>
</tr>
<tr>
<td>5</td>
<td>Inverters</td>
<td>40 - 46</td>
</tr>
<tr>
<td>6</td>
<td>Batteries</td>
<td>47 - 49</td>
</tr>
<tr>
<td>7</td>
<td>Battery Chargers</td>
<td>50 - 56</td>
</tr>
<tr>
<td>8</td>
<td>DC Power Distribution</td>
<td>57 - 63</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Power Monitoring &amp; Control</td>
<td>64 - 69</td>
</tr>
<tr>
<td>10</td>
<td>Low Voltage Disconnects</td>
<td>70 - 72</td>
</tr>
<tr>
<td>11</td>
<td>DC UPS &amp; Power Control</td>
<td>73 - 81</td>
</tr>
<tr>
<td>12</td>
<td>Rack Mount Accessories</td>
<td>82 - 86</td>
</tr>
<tr>
<td>13</td>
<td>Communication Accessories</td>
<td>87 - 90</td>
</tr>
<tr>
<td>14</td>
<td>Installation Accessories</td>
<td>91 - 94</td>
</tr>
<tr>
<td>15</td>
<td>Index</td>
<td>95 - 96</td>
</tr>
</tbody>
</table>

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2911 W. Garry Ave, Santa Ana, CA 92704
Phone: 714-751-0488 • Fax: 714-957-1621
E-Mail: sales@newmarpower.com
Powering The Network Solutions

**AC-DC**
Voltage/Power Range: 120-240 VAC Input 12, 24, 48, or 110 VDC Output 150 Watts - 14 kW
Components: Rectifiers, Battery Chargers, Power Modules, Power Supplies, Power Management, Rack Mount, Wall Mount, Desktop
Systems: Hot Swap Rectifiers Shelves with Distribution and Monitoring
Power Plants: Rack Mount Systems with Batteries

**DC-DC**
Voltage/Power Range: 12, 24, 48, 72, 110 VDC Input 12, 24, 48 VDC Output
Configurations: Isolated/Non-Isolated, Step-Up, Step-Down, Stabilizers, Battery Charger, Rack Mount, Mobile, Wall Mount, Desktop

**DC-AC**
Voltage/Power Range: 12, 24, or 48 VDC Input 120/240 VAC
Output 1000 - 5000 Watts
Configurations: Rack Mount, Wall Mount, Mobile

**DC Power Distribution**
Voltage/Power Range: 12, 24, or 48 VDC Input 200 - 900 Amp VDC
Output Configurations: Rack Mount

**DC UPS**
Voltage/Power Range: 12.24 VDC Input / Output 5-20 amps
Configurations: Mobile Mount

**Battery Chargers**
Voltage/Power Range: 120/240 VAC Input, 12,24,110 VDC Output
Configurations: Wall Mount, Mobile Mount

**Monitoring/Control**
Remote and Local Monitoring, DC Voltage, AC Voltage, Alarms, Batteries, Security, Cameras
Remote Control of DC and AC Equipment

---

**Microwave Backbone**
**SCADA**
**Utility Telecom**
**Smart Grid**
**WIFI**
**Transportation**
**Dispatch**
**911 Call Center**
**Wireless PBX**
**Repeaters**
**Cellular**
**Data Centers**
**Public Safety**
**Trunking Systems**
**Security**
**Wireless ISP**
**Microwave Backhaul**
**Broadband**
**Positive Train Control**
**Private Networks**
**Oil and Gas**
**LAN**
**Specialty Vehicles**
**Meter Reading**
**Base Stations**
**DC UPS**
**Solar**
**Mesh Radio Networks**
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC Power Systems</td>
<td>2 - 19</td>
</tr>
<tr>
<td>2</td>
<td>Power Plants</td>
<td>20 - 21</td>
</tr>
<tr>
<td>3</td>
<td>Rectifiers/Power Supplies</td>
<td>22 - 32</td>
</tr>
<tr>
<td>4</td>
<td>DC Converters</td>
<td>33 - 39</td>
</tr>
<tr>
<td>5</td>
<td>Inverters</td>
<td>40 - 46</td>
</tr>
<tr>
<td>6</td>
<td>Batteries</td>
<td>47 - 49</td>
</tr>
<tr>
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<td>50 - 56</td>
</tr>
<tr>
<td>8</td>
<td>DC Power Distribution</td>
<td>57 - 63</td>
</tr>
<tr>
<td>9</td>
<td>Power Monitoring &amp; Control</td>
<td>64 - 69</td>
</tr>
<tr>
<td>10</td>
<td>Low Voltage Disconnects</td>
<td>70 - 72</td>
</tr>
<tr>
<td>11</td>
<td>DC UPS &amp; Power Control</td>
<td>73 - 81</td>
</tr>
<tr>
<td>12</td>
<td>Rack Mount Accessories</td>
<td>82 - 86</td>
</tr>
<tr>
<td>13</td>
<td>Communication Accessories</td>
<td>87 - 90</td>
</tr>
<tr>
<td>14</td>
<td>Installation Accessories</td>
<td>91 - 94</td>
</tr>
<tr>
<td>15</td>
<td>Index</td>
<td>95 - 96</td>
</tr>
</tbody>
</table>
AC-DC

Voltage/Power Range: 120/240 VAC Input
12, 24, 48, or 110 VDC Output
150 Watts - 14 kW

Components: Rectifiers, Battery Chargers, Power Modules, Power Supplies, Rack Mount, Wall Mount

Systems: Hot Swap Rectifiers Shelves with Distribution and Monitoring

Integrated Assemblies: Rack Mount Systems with batteries

Rack Mount Hot Swap Rectifiers

Unity
Input: 115/230 VAC
Output: 24 or 48 VDC,
150 - 450 Watts
Page 10

Sentinel
Input: 115/230 VAC
Output: 48 VDC,
600 - 1800 Watts
Page 4

Centurion II
Input: 115/230 VAC
Output: 24 or 48 VDC,
1 kW - 6 kW
Page 6

Commander
Input: 115/230 VAC
Output: 48 VDC,
6kW - 14kW
Page 8

Guardian
Input: 115/230 VAC
Output: 110 VDC,
3 kW - 6 kW
Page 10

Gladiator
Input: 115/230 VAC
Output: 110 VDC,
3 kW - 12 kW
Page 10
DC Power Systems

Section 1: DC Power Systems

Modular Power System

PM System
Input: 115/230 VAC
Output: 12, 24, or 48 VDC,
560 - 2200 Watts
Page 13, 24

Self Contained Power System

Integrated Power System with Internal Batteries
Input: 115/230 VAC
Output: 12, 24, or 48V,
500 Watts
Page 14

Power Plants

RPS System
Input: 115/230 VAC
Output: 12, 24, or 48VDC,
500 - 3,000W
Page 12

Wall Mount System

Site Power System
Input: 115/230 VAC
Output: 12, 24, or 48V,
250 - 500 Watts
Page 16
Incredible Functionality in a 1 RU DC Power System, 600 to 1800 Watts

- 19", 1U rackmount shelf with integrated power distribution and SNMP digital controller
- 90-250 VAC input, power factor corrected, no derating at 120V input
- 3 power bays accept 600 watt modular rectifiers, -48V
- 33 amp, 1800 watt total output capacity
- Output temperature compensated for precise battery charging
- 4 DC circuit breaker distribution capacity, with tripped breaker alarm
- Master disconnect breaker for two battery banks, with tripped breaker alarm
- Controller with digital display of system parameters with TCP/IP interface and SNMP monitoring and logging
- Alarm contacts monitor system functions
- Low voltage disconnect built-in
- Easily configures to meet site power requirements

Complete system design and assembly to your application parameters: Rectifier configuration, distribution circuit breaker installation, and programming of alarms and monitors. Installation in a relay rack with batteries and wiring also available.

<table>
<thead>
<tr>
<th>Watts Per Rectifier</th>
<th># of Rectifiers Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>11A (600W)</td>
</tr>
<tr>
<td></td>
<td>22A (1200W)</td>
</tr>
<tr>
<td></td>
<td>33A (1800W)</td>
</tr>
</tbody>
</table>
Sentinel Power System

Specifications

AC Input
Nominal: 115 or 230V
Voltage Range: 90-300V
Frequency Range: 45-65 Hz
Power Factor: >0.99
Efficiency: >92% (from 50% output power)

DC Output
Voltage: -48 volt
Output Ratings: Constant power output from 54V to 58V
Nominal Voltage: 48V
Rated Voltage: 58V

Power:
Rated maximum System Output Power: 1800W @ 54V
Individual Rectifier Power: (48 volt) 600 watt
Amperage @155 or 230 vac in 4.2

DC Distribution:
Load: 4 breaker position capacity, available amperages (specify) 6A, 10A, 20A,
Battery: 30A, with tripped breaker alarm 2 x 30A battery circuit breakers.
Breaker Fail Detection: Electronic fail detection on both load and battery. Breakers
Low Voltage Battery Disconnect: 80A battery LVD installed standard, with disconnect alarm

Monitoring & Control:
Monitors all power system conditions including DC voltage, rectifier current, battery current, battery temperature, and distribution failure. Visual notification of alarm conditions by LED’s and a 4 line x 16 character alpha numeric display mounted on the front panel, with remote notification being enabled by relay contacts, RS232 or TCP/IP (using SNMP). It has a built-in web based configurator allowing setup of system parameters using a web browser and utilizes a USB communications port which allows for local monitoring of system operations as well as easy downloading of configuration files for multiple site installations.

General System

Protection:
Current Limit: Adjustable to 50-100% of maximum rated current.
Over Temperature: Automatic current reduction, backup shutdown protection.
Polarity Reversal: Output fuse with crowbar diode
Over Voltage: Adjustable limit.
Input Voltage: Auto shutdown, auto restart when correct voltage restored.
Input Inrush: <2x maximum input current.
Input Fuses: In phase and neutral.

Technical Characteristics:
Noise: Ripple <100Hz: <1mV rms unweighted
Voice band 100Hz-5KHz: <2mV rms psophometric
Wide band 5kHz-1MHz: <5mV rms unweighted
Peak to Peak 0-20MHz: <50mV peak to peak
Isolation: Input to Output: 4000V DC.
Input to Chassis: 3500V DC (VDR to chassis removed)
Output to Chassis: 2100V DC
Regulation: Line = ±0.1%, Load = ±0.5%
(no load to full load)

Mechanical
Shelf: Dimensions 19” W x 1.75” H x 10.2” D
Weight: 19.84 Lbs. (excluding rectifier modules)
Rectifiers: Dimensions 2.2” W x 1.7” W x 9.25” D
Weight: 1.7 Lbs
Cooling: Forced cooled.

Environmental
Ambient Temperature: Range: -20° to +70° C,
Derating above 50° C
Range: -20° C to +70° C (maximum output power is derated above +50° C)
Storage: -20° C to +70° C
Humidity: 0-98% RH (non-condensing)
Altitude: <8,202 ft., De-rate max. ambient temperature by 4° C per 3,280 ft. above sea level.

Compliances
Safety: EN60950
Electrostatic Discharge: CISPR24
Radiated Radio Freq: CISPR22
AC Harmonics: EN61000-3-2
AC Flicker & Fluctuation: EN61000-3-3
Other: CE & RoHS compliant
Centurion II Power System

Incredible Functionality, Flexibility, and Scalability in a 2 RU DC Power System, 1.0 to 6.0 Kw

- 19", 2U rackmount shelf with integrated power distribution
- 90-250 VAC input, Power Factor Corrected
- 3 power bays accept 1000 or 2000 watt modular rectifiers
- 111 amp, 6000 watt total max. output capacity, (74 Amp, 4000 Watt, N+1) @ -48 or 24 VDC
- Output temperature compensated for precise battery charging
- 16 DC circuit breaker distribution capacity, with tripped breaker alarm
- Master disconnect breakers for two battery banks, with tripped breaker alarm
- Controller with digital display of system parameters with TCP/IP interface and SNMP monitoring/ logging
- Alarm contacts monitor major system functions
- Low voltage disconnect built in
- Easily configures to meet site power requirements

Complete system design and assembly to your application parameters: Rectifier configuration, distribution circuit breaker installation, and programming of alarms and monitors. Installation in a relay rack with batteries and wiring also available.

<table>
<thead>
<tr>
<th>System Power Configurations @ 48V* (220 VAC Input)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watts Per Rectifier</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>2000</td>
</tr>
<tr>
<td>1000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System Power Configurations @ 24V†</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000†</td>
</tr>
<tr>
<td>37A (2000W)</td>
</tr>
</tbody>
</table>

* @ 120 VAC: Derate 2 kW rectifiers 41%; 1 kW rectifiers 33%
Centurion II Power System

Specifications

AC Input
Nominal: 230V
Voltage Range: 90-300V (derate @ 115 input)
Frequency: Range: 45-65 Hz
Power Factor: >0.99
Efficiency: >94% (from 30-95% output power)

DC Output
Voltage
-48 volt	+24 volt
Constant power	Constant power
Output Ratings:
48V to 58V	24V to 29V
Nominal Voltage:
48V	24V
Rated Voltage:
58V	29V

Power:
Rated maximum System Output Power:
6000W @ -48V, 3000 watts @ 24 volts
Individual Rectifier Power: (24 and 48 volt)

<table>
<thead>
<tr>
<th>Power:</th>
<th>1000 watt</th>
<th>2000 watt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amperage @ 230 vac in</td>
<td>18</td>
<td>37</td>
</tr>
<tr>
<td>Amperage @ 115 vac in</td>
<td>12</td>
<td>21</td>
</tr>
</tbody>
</table>
† Model C2R-2000 is rated for 1,000W or 37 amps at 24 volts

DC Distribution:
Load: 16 breaker position capacity, available amperages 6A, 10A, 15A, 20A, 30A, with alarm
Battery: 2 x 100A battery circuit breakers.
Breaker Fail Detection: Electronic fail detection on both load and battery breakers
Low Voltage Battery Disconnect: 125A battery LVD installed standard, with disconnect alarm

Monitoring & Control:
Monitors all power system conditions including DC voltage, rectifier current, battery current, battery temperature, and distribution failure. Visual notification of alarm conditions by LED's and a 4 line x 16 character alpha numeric display mounted on the front panel, with remote notification being enabled by relay contacts, RS232 or TCP/IP (using SNMP). It has a built-in web based configurator allowing setup of system parameters using a web browser and utilizes a USB communications port which allows for local monitoring of system operations as well as easy downloading of configuration files for multiple site installations.

General System

Protection:
Current Limit: Adjustable to 50-100% of maximum rated current.
Over Temperature: Automatic current reduction, backup shutdown protection.
Polarity Reversal: Output fuse with crowbar diode
Over Voltage: Adjustable limit.
Input Voltage: Auto shutdown, auto restart when correct voltage restored.
Input Inrush: <2x maximum input current.
Input Fuses: In phase and neutral.

Technical Characteristics:
Noise: Ripple <100Hz: <1mV rms unweighted
Voice band 100Hz-5KHz: <1mV rms pesophometric
Wide band 5kHz-1MHz: <5mV rms unweighted
Peak to Peak 0-20MHz: <100mV peak to peak
Isolation: Input to Output: 4000V DC.
Input to Chassis: 3500V DC
(VDR to chassis removed)
Output to Chassis: 2100V DC
Regulation: Line = ±0.1%, Load = ±0.5%
(no load to full load)

Mechanical
Shelf: Dimensions 19” W x 3.5” H x 15.35” D
Weight: 19.84 Lbs. (excluding rectifier modules)
Rectifiers: Dimensions 4.25” W x 2.75” W x 11.1” D
Weight: 3.15 Lbs
Cooling: Forced cooled.

Compliances
Safety: EN60950
Electrostatic Discharge: CISPR24
Radiated Radio Freq: CISPR22
AC Harmonics: EN61000-3-2
AC Flicker & Fluctuation: EN61000-3-3
Other: CE & RoHS compliant
Commander Power System

System Power Configurations @ 48V* (220 VAC Input)

<table>
<thead>
<tr>
<th>Rectifier Watts</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>37A 4000W</td>
<td>74A 4000W</td>
<td>111A 6000W</td>
<td>148A 8000W</td>
<td>185A 10000W</td>
<td>222A 12000W</td>
<td>259A 14000W</td>
</tr>
</tbody>
</table>

* @ 120 VAC: Derate 2 kW rectifiers 41%; 1 kW rectifiers 33%

Incredible Functionality, Flexibility, and Scalability in a 5 RU DC Power System, 1.0 to 14.0 Kw

- 19", 5U rackmount shelf with integrated power distribution
- 90-250 VAC input, Power Factor Corrected
- 7 power bays accept 1000 or 2000 watt modular rectifiers
- 259 amp, 14,000 watt total max. output capacity, (222 Amp, 2,000 Watt, N+1) @ -54 VDC
- Output temperature compensated for precise battery charging
- 18 DC circuit breaker distribution capacity, with tripped breaker alarm
- Distribution breaker rating up to 63 amps
- Master disconnect breakers for four battery banks, with tripped breaker alarm
- Controller with digital display of system parameters with TCP/IP interface and SNMP monitoring/logging
- Alarm contacts monitor major system functions
- Low voltage disconnect built in
- Easily configures to meet site power requirements

Complete system design and integration by Newmar to your application parameters: Rectifier configuration, distribution circuit breakers installation, and configuration of alarms and monitors. Assembly in a relay rack with batteries and wiring also available. Let us submit a proposal on your next project.
Commander Power System

Specifications

AC Input
- Nominal: 230V
- Voltage Range: 90-300V (derate @ 115 input)
- Wiring Options: 1) Single 208-240VAC, 3 phase, 4 wire WYE ('Y' input or 2) 3 x separate 208-240VAC, 2 wire inputs
- Frequency Range: 45-65 Hz
- Power Factor: >0.99
- Efficiency: >94% (from 30-95% output power)

DC Output
- Voltage: -48 volt
- Output Ratings: Constant power output from 54V to 58V
- Nominal Voltage: 48V
- Rated Voltage: 58V

Power
- Rated maximum System Output Power: 14,000W @ -48V
- Individual Rectifier Power: (48 volt) 2000 watt
- Amperage @ 230 VAC in: 37
- Amperage @ 115 VAC in: 21

DC Distribution:
- Battery: 4 x 100A battery circuit breakers.
- Breaker Fail Detection: Electronic fail detection on both load and battery breakers
- Low Voltage Battery Disconnect: 300A battery LVD installed standard, with disconnect alarm

Monitoring & Control:
- Monitors all power system conditions including DC voltage, rectifier current, battery current, battery temperature, and distribution failure. Visual notification of alarm conditions by LED's and a 4 line x 16 character alpha numeric display mounted on the front panel, with remote notification being enabled by relay contacts, RS232 or TCP/IP (using SNMP). It has a built-in web based configurator allowing setup of system parameters using a web browser and utilizes a USB communications port which allows for local monitoring of system operations as well as easy downloading of configuration files for multiple site installations.

General System

Protection:
- Current Limit: Adjustable to 50-100% of maximum rated current.
- Over Temperature: Automatic current reduction, backup shutdown protection.
- Polarity Reversal: Output fuse with crowbar diode
- Over Voltage: Adjustable limit.
- Input Voltage: Auto shutdown, auto restart when correct voltage restored.
- Input Inrush: <2x maximum input current.
- Input Fuses: In phase and neutral.

Technical Characteristics:
- Noise: Ripple <100Hz: <1mV rms unweighted
- Voice band 100Hz-5KHz: <1mV rms psophometric
- Wide band 5kHz-1MHz: <5mV rms unweighted
- Peak to Peak 0-20MHz: <100mV peak to peak
- Isolation: Input to Output: 4000V DC.
- Input to Chassis: 3500V DC (VDR to chassis removed)
- Output to Chassis: 2100V DC
- Regulation: Line = ±0.1%, Load = ±0.5% (no load to full load)

Mechanical
- Shelf: Dimensions: 19” W x 8.75” H x 15.35” D
- Weight: 35.15 Lbs. (excluding rectifier modules)
- Rectifiers: Dimensions: 4.25” W x 2.75” W x 11.1” D
- Weight: 3.15 Lbs
- Cooling: Forced cooled.

Environmental
- Ambient Temperature: Nominal: 25+/–5º C
- Range: -10º C to +70º C (maximum output power is derated above +50º C)
- Humidity: 5-95% RH (non-condensing)
- Altitude: <8,202 ft. De-rate max. ambient temperature by 4º C per 3,280 ft. above sea level.

Compliances
- Safety: EN60950
- Electrostatic Discharge: CISPR24
- Radiated Radio Freq: CISPR22
- AC Harmonics: EN61000-3-2
- AC Flicker & Fluctuation: EN61000-3-3
- Other: CE & RoHS compliant
The Unity Rectifier System comprises a low profile 1.75” (1 RU) shelf which accommodates up to three 150 watt, -48 or +24 volt hot-swap rectifiers, plus an optional GMT fuse distribution panel. The system is scalable/adaptable for N, N+1 or N+2 configurations. Form C status contacts enable remote alarms for the rectifiers and fuse distribution circuits. Front panel OK/FAIL LED’s allow monitoring status of each rectifier individually. An optional monitor panel with LVD and battery disconnect breaker provides system status and control.

Features
- 150 watt rectifier units - 48 or 24 volt, slide and lock into the Unity Shelf
- Shelf accommodates up to three rectifiers - 450 watts total - plus an optional five-position GMT fuse panel
- Scalable/adaptable hot swap configuration: N, N+1, N+2
- Front panel status indicators, output voltage test points and adjustment potentiometers
- Individual or summary rectifier alarm contacts; Form C
- Summary fuse panel alarm contacts; Form C
- 115/230 VAC shelf/rectifier input
- Optional GMT fuse panel: Five positions, easy rear panel wiring to loads, fuse access at front
- Optional voltage monitor and LVD panel

Unity Rectifier System

<table>
<thead>
<tr>
<th>Shelf</th>
<th>Input</th>
<th>Capacity</th>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>URS</td>
<td>115/230 VAC Nom.</td>
<td>3 Unity Rectifiers (-48 or +24 V), 1 GMT fuse panel</td>
<td>19/23” Rackmount, 1 RU</td>
<td>6.7 lbs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rectifier</th>
<th>Input Amps @ Full Load 115/230V</th>
<th>Output Voltage</th>
<th>Output Amps Cont.</th>
<th>Watts</th>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>UR48-3</td>
<td>2.2/1.1</td>
<td>-54.4 VDC, adjustable 42-56 VDC</td>
<td>3</td>
<td>150</td>
<td>1 RU</td>
<td>1.9 lbs.</td>
</tr>
<tr>
<td>UR24-6</td>
<td>2.2/1.1</td>
<td>+27.2 VDC, adjustable 21-28 VDC</td>
<td>6</td>
<td>150</td>
<td>1 RU</td>
<td>1.9 lbs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GMT Panel</th>
<th>Nominal Input/Output</th>
<th>Total Fuse Fuse Capacity</th>
<th>Total Current Capacity</th>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>UFP-5</td>
<td>-48 or +24 VDC</td>
<td>5</td>
<td>20A</td>
<td>1 RU</td>
<td>1 lbs.</td>
</tr>
</tbody>
</table>

**Optional System Component**

**Unity Low Voltage Disconnect & Monitor**

Digital battery monitor and alarm panel with Low Voltage Disconnect integrates with the Unity rack mount shelf into a highly functional power system. Built-in features include: LVD, digital monitor of voltage and amperage, battery disconnect breaker and alarm contacts. The digital display monitors bus voltage, battery voltage, system output current and low voltage connect/disconnect set points. See model ULM-100, page 71 for complete specs.
Unity Rectifier System

Unity Rectifiers
Models: UR48-3, UR24-6

Input Voltage/Frequency/PF: 85-264 VAC* / 47-63 Hz. / .96-.98

Input Amperage: 2.2 amps @ 115V, 1.1 amps @ 230V

Output Voltage/Amperage*:
UR48-3: -54.4 VDC, adjustable 42-56 VDC, 3 amps continuous
UR24-6: +27.2 VDC, adjustable 21-28 VDC, 6 amps continuous

100 % output power available from 105 to 264 VAC; Derate output linearly from 100 % @ 105 VAC to 80 % @ 85 VAC

Efficiency: 83 % per rectifier

Regulation/Ripple: +/-2 % / UR24-6: 150 mV, UR48-3: 230 mV

Protection: Over-voltage, current limiting, over-temp, forced air cooling

Alarms/Indicators: Output failure contacts; Form C

Front panel LED indications: "DC OK/DC FAIL" Front panel voltage test points and adjustment

Operating Temperature: -10°C to +60°C; 100 % load to +50°C; Derate linearly to 80 % load @ 60°C

Design Standards: EN55022 Class B, EN61000-4-2.3.4.5.6.8.11, EN61000-3-2.3, UL 1950
Approvals: UL Recognized 60950

Unity Rectifier Shelf
Model: URS

Input: 115/230 VAC nominal

Capacity: Up to Three Unity Rectifiers, -48 or +24 volt and one GMT Fuse Panel (UFP-5)

Mounting: 19" or 23" rack; center or flush mount

Unity Fuse Distribution Panel
Model: UFP-5

Voltage: -48 VDC or +24 VDC nominal (selectable by jumper)

Current: 20 amps max. total

Capacity: Five GMT fuses, 10 amps max. per individual fuse

Available Amperages: 1, 3, 5, 7.5, 10, 15 Amps

Alarms/Indicators: Output failure summary alarm contacts; Form C Front panel blown fuse summary LED indicator

Unity Shelf Rear Panel Diagram

Unity Low Voltage Disconnect & Monitor Rear Panel Diagram (see Model ULM-100 page 71)
RPS Power Systems

RPS Rack Power Systems feature
PM Series rectifiers and PFM Controller.

Our engineering team offers comprehensive system integration services, including consultation, configuration, manufacturing, assembly, test, and delivery of fully integrated and functional power plants. We provide rapid delivery of complete systems, precisely tailored to meet your site requirements. See opposite page for basic menu of components offered in configuring your system.

Project Consultation
The process begins with a comprehensive analysis of your project’s power requirements, offering comprehensive solutions based on all relevant factors, including:

- Load requirements and tolerances
- Site AC power considerations
- Hot swap and hot standby configuration
- Co-location compatibility
- Fault tolerance/redundancy
- Back-up battery run time calculations
- Power distribution requirements
- Remote monitoring and alarming

Engineering and Configuration
A comprehensive project proposal with a detailed diagram of the proposed custom power system is submitted to you for approval.

Rack Assembly
All necessary components are installed and wired in racks or cabinets according to the particular site requirements. These components are typically manufactured and stocked by NEWMAR, thus assuring high reliability and short lead times for system delivery.

Testing
Each rack component undergoes rigorous “burn-in” testing individually, then the assembled rack system is again fully tested under simulated site load and function conditions to ensure maximum reliability.

Documentation
Custom user manuals are provided with each system, consisting of detailed operation and troubleshooting instructions for each system component, complete schematic diagrams.

Shipment
Each rack system is rigidly secured to a custom-built shipping skid and air ride trucked directly to your installation site.

Aftersale Support
A duplicate system file, including detailed photo of the assembled power plant, is maintained at the factory in order to provide ongoing technical support of the system, as needed.

Contact Jeff Wright at jeffw@newmarpower.com to discuss your requirements.
RPS Power System Components

Select from the following components to configure your system.

<table>
<thead>
<tr>
<th>Power Modules</th>
<th>12 Volt</th>
<th>24 Volt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity Installed</td>
<td>Total Amps</td>
</tr>
<tr>
<td>PM-12-40</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>72</td>
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<tr>
<td></td>
<td>5</td>
<td>180</td>
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<td></td>
<td>6</td>
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<td>80</td>
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<td>5</td>
<td>180</td>
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<tr>
<td></td>
<td>6</td>
<td>216</td>
</tr>
</tbody>
</table>

| Power Module | See page 24 for specifications |

48 Volt

<table>
<thead>
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<th>Power Modules</th>
<th>12 Volt</th>
<th>24 Volt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td></td>
<td>5</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td>PM-24-50</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>135</td>
</tr>
</tbody>
</table>

| Power Module | See page 26 for specifications |

Power Function Manager - PFM-400

Provided Functions:
- Low Voltage Disconnect
- Metering
- Rectifiers and Battery Tie Points
- Distribution circuit breakers

Options

Additional Distribution Panel:
- DST-10A
- DST-20A
- DST-FB

Batteries & Accessories
- Front Terminals Batteries - page 49
- Battery Disconnect Panels - page 83
- Battery Trays - page 84

Remote Monitoring
- Site Power Monitor
- Site Monitor and Control

Power Distribution
See page 58, 60 for specifications

Remote Monitoring
See page 65 for specifications

Newport Beach, CA USA
www.newmartelecom.com  • 800-854-3906
The Integrated Power System (IPS) is a unique multifunction power supply which incorporates built-in battery back-up and numerous power accessories within a single 2RU (3.5”) chassis, thus eliminating time-consuming system integration, component sourcing and installation, while saving precious rack space—ideal for any low-to-medium power application requiring AC fault tolerant operation.

A precision regulated power supply/charger, back-up battery, low voltage battery disconnect, output metering, LED status and Form C alarm contacts are all pre-wired and calibrated within the unit for plug-and-play operation. Plug-in terminals are provided for easy wiring of an additional parallel rectifier input, or external batteries for increased back-up capacity.

The batteries are always in-line with the load, thus there is no interruption from relays or transfer switches in the event of AC loss. Batteries are recharged when AC is restored. A manual battery disconnect switch allows internal or external battery service or replacement while the system is running. Models available for -48, +24 and +12 volt applications.

**Features**

- Precision regulated power supply simultaneously maintains batteries at peak charge and supplies system load
- Built-in, sealed, maintenance free, lead acid batteries instantly power load during AC failure—no switch-over delay. 3-5 year average life. Terminals provided for additional external batteries for increased back-up capacity
- Terminals provided for easy addition of parallel rectifier. (48V and 24V models only)
- Low voltage battery disconnect, automatic or manual setting
- Numerous front panel monitors—L.E.D. status indicators and digital ammeter/voltmeter
- Form C summary failure alarm contacts; loss of internal rectifier output, loss of external rectifier output, LVBD contactor open. AC input failure alarm contacts optional
- Numerous protection features—AC input breaker, internal battery breaker, auto thermal shutdown/recovery, current-limiting, short-circuit and over-voltage protection
- 19” rack, 6” forward rackmount brackets provided

<table>
<thead>
<tr>
<th>Model</th>
<th>Input Amps @ Full Load 115 / 230</th>
<th>VDC</th>
<th>Output Adjustment Range</th>
<th>Amps Continuous</th>
<th>Supplemental Input Port*</th>
<th>Internal Battery Capacity</th>
<th>Ground Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPS 48-11</td>
<td>11 / 5.5</td>
<td>54.4</td>
<td>40-60 VDC</td>
<td>11</td>
<td>40 Amps</td>
<td>5 A-H</td>
<td>Positive</td>
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<td>IPS 24-22</td>
<td>11 / 5.5</td>
<td>27.2</td>
<td>20-30 VDC</td>
<td>22</td>
<td>40 Amps</td>
<td>10 A-H</td>
<td>Negative</td>
</tr>
<tr>
<td>IPS 12-40</td>
<td>11 / 5.5</td>
<td>13.6</td>
<td>10-15 VDC</td>
<td>40</td>
<td>N/A</td>
<td>20 A-H</td>
<td>Negative</td>
</tr>
</tbody>
</table>
Integrated Power Systems

Specifications

AC Input

Input Range (switch selectable):
115V = 92-130 VAC
230V = 184-260 VAC

Frequency: 47-63 Hz

DC Output

Voltage/Amperage: See model matrix
Maximum Load with External Rectifier and Battery Inputs: 40A
Regulation: Line: ± 1 %, Load: ± 2 %
Ripple: ± 1 %

Power Scaling via Back Panel Quick Connects

External Rectifier Input: 24V, 48V only; 560 or 1,000 watt (see PM Series page 6)
External Battery Bank: 12V/24V/48V

Environmental

Temperature Rating: -10° to + 60° C; Derate linearly from 100% load @ 50° C to 75% @ 60° C

Mechanical

Chassis: Aluminum
Rack Size: 19” or 23”, 2 RU (3.5”)
Cooling: Forced Air
Dimensions: 3.5”H x 17”W x 18”D

Protection

- Current Limit, Short Circuit
- Over Voltage
- Auto Thermal Shutdown/Recovery
- Input Fuse and Circuit Breaker
- Circuit Breaker For Internal Battery
- Low Voltage Battery Disconnect (Adjustable)

Internal Batteries

Type: 12 Volt, 5 A-H Sealed Lead-Acid Maintenance-Free
Amp-Hour Capacity: See Matrix below

Weight: 4 Lbs. each; 4 Batteries per Unit

Approvals: UL Recognized, DOT and IATA approved for shipment by air

Indicators and Alarms

System “Nominal” indicator lights:
- AC OK
- External Rectifier ON/OK
- Internal Rectifier On/OK
- Battery Contactor Closed System
- “Warning” indicator lights:
  - Check System
  - Battery Disconnect
  - Form C Alarm Contacts:
    - Summary Failure
    - AC Input Failure (Optional)

Options

AC Input Fail Contacts:
Specify 115 or 230 VAC
Rectifier/Battery Input Cable Assembly: (Model CA-24)
Rear Support Bracket for Flush Mounting Models: RSB-19
Distribution Panel Models: DST-10 (UL), DST-20A (UL)
Unit Supplied Without Batteries

Internal Battery

Constant Current Performance (Amps) to 1.75 VPC

<table>
<thead>
<tr>
<th>Model</th>
<th>5 Min.</th>
<th>15 Min.</th>
<th>30 Min.</th>
<th>1 Hr.</th>
<th>2 Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPS 48-11</td>
<td>15.0</td>
<td>8.0</td>
<td>5.0</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>IPS 24-22</td>
<td>30.0</td>
<td>16.0</td>
<td>10.0</td>
<td>6.0</td>
<td>4.0</td>
</tr>
<tr>
<td>IPS 12-40</td>
<td>40.0</td>
<td>32.0</td>
<td>20.0</td>
<td>12.0</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Form C: AC Input Failure Alarm (Optional)
Form C: Summary Alarm Output Contacts
Power Supply/Battery Charger Module
19” Rack Mount Ears Provided
Battery On-Line/Off-Line Control Circuit Breaker Front Panel
Output Voltage Adjust Front Panel

Top View with Cover Off

System Output Quick Connect
External Battery Quick Connect
External Rectifier Quick Connect
Internal Battery Bank
Low Voltage Disconnect Circuit
System Status/Digital Battery Condition Meter (V&A) Front Panel
Manual Battery Disconnect Switch - Front Panel
System Status LED’s - Front Panel

NEWMAR
Newport Beach, CA USA  www.newmartelemcom.com  • 800-854-3906
The Site Power System (SPS) series provides a complete DC power solution that integrates quickly with batteries, loads, and monitors. Available in 12, 24 and -48 volt, 300 and 475 watt configurations, the compact assembly contains: power supply with temperature compensated, automatic boost/float battery charge cycle; low voltage disconnect; and programmable alarm contacts. High operating temperature rating with convection cooling make the unit ideal for remote site shelters, railroad wayside bungalows, and pole mount enclosure applications, as well as private network base stations and microwave sites.

Features
- Well regulated noise free output - no interference with sensitive electronic loads
- Separate Battery Charger output with remote temperature compensation sensor
- Automatic Boost voltage output after AC power failure quickly recovers battery
- Low voltage disconnect protects batteries from over discharge
- Output current indicator LEDs
- Wide temperature operating range (-40 to +70° C), convection cooled, meets AREMA standards
- Alarm contacts interface with remote monitor systems

<table>
<thead>
<tr>
<th>Models</th>
<th>Voltage Range</th>
<th>Voltage Adjustment Range</th>
<th>Output Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPS 12-20</td>
<td>13.6V</td>
<td>11-15V</td>
<td>20</td>
</tr>
<tr>
<td>SPS 12-35*</td>
<td>13.6V</td>
<td>11-15V</td>
<td>35</td>
</tr>
<tr>
<td>SPS 24-10</td>
<td>27.2V</td>
<td>22-30V</td>
<td>10</td>
</tr>
<tr>
<td>SPS 24-20*</td>
<td>27.2V</td>
<td>22-30V</td>
<td>20</td>
</tr>
<tr>
<td>SPS 48-6</td>
<td>54V</td>
<td>44-60V</td>
<td>6</td>
</tr>
<tr>
<td>SPS 24-12*</td>
<td>54V</td>
<td>44-60V</td>
<td>12</td>
</tr>
</tbody>
</table>

* New models, contact factory for availability

Specifications: SPS Series

AC Input
- Nominal: 110/220V, 50/60Hz
- Voltage Range: 100-275V AC (full power output), 85-100V AC (reduced power output)
- Frequency Range: 45-66Hz
- Power Factor/Efficiency: >0.99 (full load)/87%
- Input Fuses: Fuses in phase & neutral
- Maximum Input Current: 300W Models: 4A
  475W Models: 6A

Protection
- Input Voltage: Automatic shutdown, restarts automatically when correct voltage restored.
- Input Rush: <2x maximum input current.

Mechanical
- Size: 12.25" W x 5.75" H x 2.45" D, (311mm x 146mm x 62mm)
- Weight: 3.4 Lbs./1.5 Kg.
Specifications cont.

Protection

Redundancy/Scalability: Ok to wire in parallel, active load sharing

Temperature Compensation: Output voltage slope adjustable 0.1 to 0.2%/°C, 3' cable with battery lug sensor provided

Safeguards: Reverts to default voltage if sensor wire becomes short or open. High voltage limit under extreme low temperature conditions

Regulation Line/Load: ±0.1%/-0.5% (no load to full load)

Hold-up Time: >15ms for 20% output voltage drop.

Start-up Time: Walk-in delay 2 seconds (depends on AC input voltage)

Protection

Current Limit: Adjustable to 50-100% of maximum rated current

Over Temp: Automatic current turndown, backup shutdown protection

Polarity Reversal: Output fuse with crowbar diode

Over Voltage: Adjustable limit

Noise: (under nominal conditions)

Ripple: <100Hz: <5mV rms

Voice Band 100Hz to 5KHz: <1mV rms psophometric

Wide Band 5KHz to 1 MHz: <5mV rms

Peak to Peak 0 to 20MHz: <50mV p-p

Isolation

Input to Output: 4,200V DC

Input to Chassis: 3,500V DC (VDR to chassis removed.)

Output to Chassis: 2,100V DC

Environmental

Cooling: Convection cooled

Range: -40° to +70°C operating range, -10° to +60° @ 100% load rating, derate to 20% load below -10° C and above +60° C

Humidity: 5-95% RH (non-condensing)

Altitude: <7500m de-rate maximum ambient temperature by +4° C per 3000m above sea level

Mechanical

Case: Painted Aluminum

Mounting: Wall or enclosure back plane, vertical orientation

Dimensions: 12.25” W x 6.40” H x 2.45” D; (311mm x 163mm x 62mm)

Weight: 3.4 lbs.; 1.5 kg

Connections:

AC: IEC 320 universal connection, 3 foot power cord provided, NEMA 5-15

Output to Load & Batteries: 4 way lumberg macromodule, screw style

Temperature Sensor: 2 way lumberg macromodule, (pre-installed on 6 foot cable)

Monitor Connection: RJ45

Standard Features

Output Current Indicator: Ten segment red LED “dot” display

Auto Float/Boost: Rectifier enters boost mode at power up. When battery current reduces to float threshold limit (adjustable from 0.1A to 40% MRC), unit reverts to float voltage. When in boost but out of current limit, rectifier automatically switches to float after four hours. If battery current exceeds float threshold when rectifier in float mode, it automatically switches to boost mode.

Alarm and Indicator Controls:

Positive V out, Load share signal (in/out), External shutdown, Open collector ‘off normal’ alarm (OSVD, over temp. limit), LVD synchronisation signal (in/out) Temperature compensation input signal, Open collector rectifier fail (via 4k7 resistor), Open collector mains fail, Negative V out.

Low Voltage Disconnect:

<table>
<thead>
<tr>
<th>Voltage Disconnect</th>
<th>SPS 12-XX</th>
<th>SPS 24-XX</th>
<th>SPS 48-XX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Adjustment Range</td>
<td>10-12V</td>
<td>19-24V</td>
<td>39-48V</td>
</tr>
</tbody>
</table>

Internal Alarm Card: 4x N.O or N.C (selectable) relay contacts with single common for rectifier fail, off normal, float low, float high. 1x VF changeover relay contact for mains fail. Relay contacts rated at 100V DC 1A. Connections via “mini combicon” connector accepts 16 AWG (1.5mm diameter) wire.

LED Indicators:

Green - AC on. (primary converter operating) Green - Temperature probe connected and within normal limits.

Red - Rectifier ‘failed’.

Green - Rectifier in ‘float’ mode.

Yellow - Rectifier in ‘boost’ mode.

Yellow - Rectifier in ‘current’ limit.

Red - Rectifier ‘off normal’.

Internal Adjustments:

Float voltage, Boost voltage, Over voltage shut down, Current limit, Temperature compensation slope, Auto boost to float threshold limit, Load disconnect voltage, Load disconnect hysteresis voltage

Design Standards

EN60950,

Electrostatic Discharge: CISPR24,

Radiated Radio Frequency: CISPR22, AC

Harmonics: EN61000-3-2, AC

Flicker and Fluctuation:

EN61000-3-3, CE MTBF

358,540 Hours, calculated to Telcordia Standards

* New models, contact factory for availability.
The Guardian is a high voltage industrial power system with power output to 6.0 kW (50 amps) @ 120 VDC and is an ideal battery charging solution for utility protection and control equipment.

Featuring high frequency switch mode rectifier modules, intelligent network capable controllers, load and battery distribution breakers and, AC input isolation and surge suppression, all in a compact 2U, 19” rack mountable power shelf.

Features
- Fully featured industrial rectifiers
- Network monitoring available
- Earth leakage detection
- Built-in AC surge suppression
- Battery and load breakers
- Hot swappable rectifiers provide N+1 redundancy
- Easily customized and configured to suit site requirements
- Modular 19” design for ease of installation

Specifications

**Electrical**
- **AC Input:** Single phase, 90 - 300 VAC, 45 - 66 Hz.
- **Power Factor:** 0.99 (full load)
- **DC Output:** 120V
- **Rated Voltage:** 80 - 155V
- **Rated System Output Power:** 6.0kW max. @ 121.5 VDC (50A)
- **DC Distribution:**
  - **Load:** 1x 63A, 2 pole load breakers
  - **Battery:** 1x 125A, 2 pole battery breaker
- **Breaker Trip Detection:** Auxiliary alarms on both load and battery breakers

**Monitoring and Control**

Various monitoring options are available via the supervisory modules. Standard features include full temperature compensation, automated and manual battery testing/equalization and three voltage-free relay alarm outputs.

**Mechanical**
- **Dimensions:** 19” W x 3.5” (2U) W x 16.3” D
- **Weight:** 16.5 Lbs. (excluding rectifier modules)

Preliminary product announcement, contact factory or see website for more information.
The Gladiator high voltage industrial power system with power output of up to 12.0 kW (100 amps) @ 120 VDC is an ideal battery charging solution for utility protection and control equipment.

Featuring high frequency switch mode rectifier modules, intelligent network capable controllers, load and battery distribution breakers, and AC input isolation and surge suppression, all in a compact 5U, 19” rack mountable power shelf.

**Features**
- Fully featured industrial rectifiers
- Network monitoring available
- Earth leakage detection
- Built-in AC surge suppression
- Battery and load breakers
- Hot swappable rectifiers provide N+1 redundancy
- Easily customized and configured to suit site requirements
- Modular 19” design for ease of installation

<table>
<thead>
<tr>
<th>Watts Per Rectifier</th>
<th># of Rectifiers Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td>1</td>
</tr>
<tr>
<td>25A (3000W)</td>
<td>2</td>
</tr>
<tr>
<td>50A (6000W)</td>
<td>3</td>
</tr>
<tr>
<td>75A (9000W)</td>
<td>4</td>
</tr>
<tr>
<td>100A (12000W)</td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

**Electrical**
- **AC Input:** Three phase or single phase 90 - 300 VAC, 45 - 63 Hz.
- **Max. Input Current:** 76A
- **Protection:**
  - **Input Voltage:** Auto Shutdown, auto restart when correct voltage restored
  - **Input Inrush:** 2x maximum input current
- **DC Output:**
  - **Nominal Voltage:** 120V
  - **Voltage Range:** 80 - 155V
  - **Maximum Current:** 100A (25A per module)
- **DC Distribution:**
  - **Load:** 3 x 63A, 2 pole load breakers
  - **Battery:** 1 x 125A, 2 pole battery breaker

**Monitoring and Control**
- **Interface Display:** 4 line x 16 character multi-lingual, alpha-numeric
- **Controls:** 3x push buttons for parameter setting or viewing on front panel
- **Communications:**
  - **Serial:** 1x USB port on front panel for local PC interface
  - **Relay:** 3x alarm and control relays
  - **TCP/IP:** Ethernet interface for communication using SNMP protocol

**Mechanical**
- **Dimensions:** 19” W x 8.75” (5U) W x 12.6” D
- **Weight:** 20 Lbs. without rectifiers

**Preliminary product announcement, contact factory or see website for more information.**
NEWMAR manufactures a broad range of high quality power products for communication applications and has earned a reputation for producing high reliability DC components and systems for powering the wireless network.

Our engineering team offers comprehensive system integration services, including consultation, configuration, manufacturing, assembly, test, and delivery of fully integrated and functional power plants. We provide rapid delivery of complete systems, precisely tailored to meet your site requirements. See opposite page for basic menu of components offered in configuring your system.

**Project Consultation**
The process begins with a comprehensive analysis of your project’s power requirements, offering comprehensive solutions based on all relevant factors, including:

- Load requirements and tolerances
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- Remote monitoring and alarming

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A comprehensive project proposal with a detailed diagram of the proposed custom power system is submitted to you for approval.

**Rack Assembly**
All necessary components are installed and wired in racks or cabinets according to the particular site requirements. These components are typically manufactured and stocked by NEWMAR, thus assuring high reliability and short lead times for system delivery.

**Testing**
Each rack component undergoes rigorous “burn-in” testing individually, then the assembled rack system is again fully tested under simulated site load and function conditions to ensure maximum reliability.

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Custom user manuals are provided with each system, consisting of detailed operation and troubleshooting instructions for each system component, complete schematic diagrams.

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Each rack system is rigidly secured to a custom-built shipping skid and air ride trucked directly to your installation site.

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A duplicate system file, including detailed photo of the assembled power plant, is maintained at the factory in order to provide ongoing technical support of the system, as needed.

Contact Jeff Wright at jeffw@newmarpower.com to discuss your requirements.
Components

Power Plants

- Modular Rectifiers
  Page 24

- Hot Swap Rectifiers
  Pages 4 - 11

- Site Power Monitor
  Page 66

- Power Management System
  Pages 26, 71

- Distribution Panels
  Pages 58 - 61

- DC-DC Converters
  Page 34

- DC-AC Inverters
  Page 42

- Fuse Panel
  Page 62

- Battery Tray
  Page 84

- Batteries
  Page 48
AC-DC
Voltage/Power
120/240 VAC Input
12, 24, 48 VDC Output
150-1000 Watts

Components:
Rectifiers
Battery Chargers
Power Modules
Power Management
Power Supplies

Configurations:
Rack Mount
Wall Mount
Desktop
Rectifiers - Power Supplies

Rack Mount Rectifiers and Management Components

- **Power Module**
  Input: 120/230 VAC
  Output: 12, 24 or 48 VDC, 560 - 2200 Watts
  Page 24

- **PFM-400**
  Input: 12, 24 or 48 VDC
  Total Current Capacity: 400A
  Page 26

- **Integrated Power System with Internal Batteries**
  Input: 115/230 VAC
  Output: 12, 24 or 48 VDC, 11 - 40 Amps with Internal Battery
  Page 28

Mobile, Wall Mount, and Desktop Power Supplies

- **Heavy Duty Power Series**
  Input: 115/230 VAC
  Output: 12 or 24 VDC, 5 - 35 Amps
  Page 30

- **Power-Pac Series**
  Input: 115/230 VAC
  Output: 12 VDC, 5 Amps
  Battery Back-up: 7 - 14 A/H
  Page 32

- **USAR Series**
  Input: 115/230 VAC
  Output: 24 or 48 VDC
  3 - 6 Amps, 150 Watts
  Page 32

- **Site Power System**
  Input: 115/230 VAC
  Output: 12, 24, or 48 VDC, 250 - 500 Watts
  Page 16
These versatile Rectifier Modules function as either power supplies or battery chargers for 12, 24 or 48 volt systems; positive, negative or floating ground. They may be employed singly or in combination, enabling the installer to scale the system anywhere from 500 to 10,000 watts per rack. Units may be paralleled for N + 1 redundancy and alarm contacts allow local or remote monitoring. An optional DC quick connect wiring kit allows easy replacement of modules without system shutdown.

Power Modules may be used separately as a power source, or they may be integrated with the Power Function Manager (see RPS System page 12 to greatly expand the system capability with other functions such as digital output monitoring, powering multiple loads via circuit breaker distribution and low voltage battery disconnect.

**Features**

- 12, 24 or 48 volts output; pos., neg. or floating ground
- 115 or 230 VAC, 50-60 Hz input 560 & 1000 watt models
- 230 VAC only 2200 watt model
- 560, 1000 or 2200 watts per module (approx.)
- Built-in oring diode for parallel or N + 1 configuration
- Power supply or battery charger operation (DC UPS system)
- Optional battery charging circuit: three-step charging, gel/lead-acid switch, and temperature compensation
- Form C alarm contacts
- 19" or 23", 2 RU, flush or 6" forward rackmount

<table>
<thead>
<tr>
<th>Model</th>
<th>Input Amps @ Full Load 115/230V</th>
<th>Output VDC V Out</th>
<th>Output VDC V2</th>
<th>Amps Cont.+</th>
<th>Watts</th>
<th>Weight Lbs</th>
<th>Kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM-12-40A</td>
<td>8.5/4.3</td>
<td>13.6</td>
<td>14.3</td>
<td>40</td>
<td>560</td>
<td>12.2</td>
<td>5.5</td>
</tr>
<tr>
<td>PM-12-80</td>
<td>16/8</td>
<td>13.6</td>
<td>—</td>
<td>80</td>
<td>1000</td>
<td>15.2</td>
<td>6.9</td>
</tr>
<tr>
<td>PM-24-20</td>
<td>8.5/4.3</td>
<td>27.2</td>
<td>27.9</td>
<td>20</td>
<td>560</td>
<td>12.2</td>
<td>5.5</td>
</tr>
<tr>
<td>PM-24-40</td>
<td>16/8</td>
<td>27.2</td>
<td>—</td>
<td>40</td>
<td>1000</td>
<td>15.2</td>
<td>6.9</td>
</tr>
<tr>
<td>PM-48-10</td>
<td>8.5/4.3</td>
<td>54.4</td>
<td>55.1</td>
<td>10</td>
<td>560</td>
<td>12.2</td>
<td>5.5</td>
</tr>
<tr>
<td>PM-48-20</td>
<td>16/8</td>
<td>54.4</td>
<td>—</td>
<td>20</td>
<td>1000</td>
<td>14.0</td>
<td>6.4</td>
</tr>
<tr>
<td>PM-48-50</td>
<td>*/22</td>
<td>54.4</td>
<td>—</td>
<td>50</td>
<td>2200</td>
<td>34</td>
<td>15</td>
</tr>
</tbody>
</table>

*VDC (V out) Measured at output terminal with oring diode
* 230 VAC input only
VDC (V2) Measured at direct output terminal
+ For parallel configuration/load sharing derate output 10%
Power Modules

**Performance Specifications**

**Input:**
- 85 - 135/170-270 VAC (selectable), 47 - 63 Hz., 560 watt models
- 90 - 265 VAC, 1000 watt models
- 207 - 253 VAC, 2200 watt model

**Power Factor:**
- 0.7, 560W & 2200W models
- 0.98, 1000W models

**Regulation:**
- ± 1% at direct output (V2);
- ± 2% through "oring" diode (V out)

**Ripple:**
- 1% (Typical)

**Efficiency:**
- 80-85% @ full load

**Front panel Output Voltage Adjustment**

**Pot Range:**
- ±10%

**Altitude Range:**
- Full output to 5,000 feet. Derate output current 4% per 1,000 feet to 10,000 feet max.

**Temperature Rating**

**560 watt models:**
- -40° C to +60° C;
- Derate linearly from 100% load @ 50° C to 75% @ 60° C

**1000 watt models:**
- -20° C to +70° C;
- Derate linearly from 100% load @ 50° C to 50% @ 70° C

**2200 watt model:**
- 0 - 50° C

**Mechanical/General**

- Powder coated aluminum front panel and cover
- Vinyl laminated base and cover
- 19" Rackmount brackets provided
- Wallmount via optional brackets
- AC Input wiring:
  - 560 watt units: IEC AC entry, 6' IEC cord with NEMA 5-15 plug provided
  - 1000 watt units: IEC entry, 6' IEC power cord with NEMA 20 plug provided
  - 2200 watt unit: Hardwire junction box, no power cord provided
- 1/4"-20 Output stud (560 watt models)
- Output bus bar (1,000 & 2200 watt models) with 1/4" - 20 bolts
- Output "OK" L.E.D.
- Multi color LED: Green = Ok, Red = Fail (1000W models only)
- Loss-of-output alarm contacts- Form C, plus loss of AC alarm contacts Form C (1000 & 2200 watt units only)
- Front panel voltage test points

**Options**

- Three stage charger function with gel/lead-acid selector Model: CFB (560 & 1000 watts only)
- Temperature compensation (for battery charging). All models.
- DC Quick Connect Wiring Kit:
  - 560 watt models: QCK-3 (for 2-3 unit PM system) & QCK-6 (for 4-6 unit PM system)
  - 1000 watt models: QCK-3A (for 2-3 unit PM system) & QCK-6A (for 4-6 unit PM system)
  - 2200 watt model: CCK-4
- "Universal" mounting bracket; Model: UMB-PM (500 & 1KW models only)
- Metering, alarms, LVD and distribution breakers (PFM-400 or ULM-100 module options)

**Protection**

- Output fuse for reverse polarity
- Current limit
- Input circuit breaker
- Automatic high temp. output power reduction (560W & 2200W models)
- Forced air cooling with filter provided (560W models only)

**Design Standards**

- UL 1950 / EN 60950 (Safety)
- EN 50082 (Immunity)
- EN 55014 (Conducted)

---

**Case Size – All Models**

<table>
<thead>
<tr>
<th><strong>Inches</strong></th>
<th><strong>W</strong></th>
<th><strong>D</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>17</td>
<td>20.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Centimeters</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>13.5</td>
</tr>
<tr>
<td>43.2</td>
</tr>
<tr>
<td>52.1</td>
</tr>
</tbody>
</table>

*“19” mounting brackets provided*
The Power Function Manager (PFM-400) is a system integrating component which converts ordinary power supplies (or Power Modules, shown on page 24) into a fully integrated and multifunctional power system. The unit provides for control, monitoring, paralleling and protection of 12, 24 or 48 VDC, positive negative or floating ground power sources.

The PFM has a heavy duty (400 amp) parallel tie point bus, digital output voltage and amperage monitoring, system and battery status lights, load distribution circuits, low voltage battery disconnect and summary alarm contacts, all combined in a compact, rackmount housing which serves as a master DC power management and distribution center. A high amp rackmount ground/return bus is provided.

The PFM may be used for integration, control, monitoring and protection of numerous different types of power sources, such as AC-DC rectifiers, regulated power supplies or DC-DC converters.

### Features/Benefits

- Provides parallel tie point for DC power modules; simplifies wiring
- 12, 24 or 48 VDC input/output; can be used with virtually any DC system
- Use with positive, negative or floating ground; no need to stock multiple units to meet different site requirements
- Digital meter displays system voltage or current via selector switch, providing easy on-site monitoring of battery and power module output
- Status lights indicate system and battery connect/disconnect status, assisting technicians in system troubleshooting
- Summary alarm contacts (form C) allow remote indication of system status in the event of extended AC power loss
- Manual battery disconnect switch allows service/replacement of batteries without system shutdown
- High current output bus for wiring main system load or for feeding an external distribution panel
- 800 amp ground bus provided
- Up to five isolated distribution circuit breaker capacity with “TRIP” alarm contacts; easy front panel plug-in installation. Breakers sold separately
- Low voltage battery disconnect protects batteries in the event of extended AC power loss
- 19” or 23” rack mount, flush or 6” forward mounting

### Rectifiers/Power Supplies

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Input/Output VDC</th>
<th>Circuit Breaker Capacity</th>
<th>Digital Meter Display</th>
<th>Weight (lbs./kg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFM-400</td>
<td>12, 24, or 48 pos. or neg. ground</td>
<td>5</td>
<td>Volts or Amps</td>
<td>20/9.1</td>
</tr>
</tbody>
</table>
Specifications

Overall Performance
- Maximum Total Current Capacity: 400 amps (max. 6 power supply/modules)
- Digital meter accuracy: 1.6% +/- one digit
- Circuit breaker voltage rating: 80 VDC
(see Options for available amperages)

Protection
- Low voltage battery disconnect

Indicators/Alarms
- System output “OK” L.E.D. indicator
- “BATTERY ONLINE” L.E.D. indicator
- LVBD “OPEN” L.E.D. indicator
- Form C summary alarm contacts: power module failure, LVBD activation, tripped load breaker

Low Voltage Battery Disconnect Specifications
Factory set actuation voltages:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Connect</th>
<th>Disconnect</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 VDC</td>
<td>12.4</td>
<td>10.4</td>
</tr>
<tr>
<td>24 VDC</td>
<td>24.8</td>
<td>20.0</td>
</tr>
<tr>
<td>48 VDC</td>
<td>50.0</td>
<td>40.0</td>
</tr>
</tbody>
</table>

- Min/Max Connect/Disconnect Voltages, user adjustable ± 15%
- Max continuous current: 400 amps

Mechanical/General
- Heavy duty plated copper bus bar
- Anodized aluminum front/side panels
- 19”, 2 RU, flush or 6” forward rackmount

Temperature Rating
-40° C to +60° C

Circuit Breakers
- Plug-in mid-trip circuit breakers with auxiliary contacts that activate “CHECK SYSTEM” indicator and summary alarm contacts. Available Amperages: 5, 10, 15, 20, 30, 40, 50, 75, 100 (specify model PBA-5, PBA-10, etc.) when ordering

Options
- Quick connect DC wiring harness for use with Newmar 1 KW Power Modules; QCK-3, CCK-4 (page 86)
- Rear rack covers (page 86)
- Power Modules (page 24)
- Additional Distribution: Model DST-10 (UL) or DST-20A(UL) (page 58)

Rear Panel View

Chassis Ground
Return/Ground
Status Contacts
Hot Power Module Input
Hot Switched Outputs
Summary Alarm Contacts
Hot Unswitched Output
Hot Battery Input/Output

Low Voltage Battery Disconnect Specifications
Factory set actuation voltages:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Connect</th>
<th>Disconnect</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 VDC</td>
<td>12.4</td>
<td>10.4</td>
</tr>
<tr>
<td>24 VDC</td>
<td>24.8</td>
<td>20.0</td>
</tr>
<tr>
<td>48 VDC</td>
<td>50.0</td>
<td>40.0</td>
</tr>
</tbody>
</table>

- Min/Max Connect/Disconnect Voltages, user adjustable ± 15%
- Max continuous current: 400 amps
The Integrated Power System (IPS) is a unique multifunction power supply which incorporates built-in battery back-up and numerous power accessories within a single 2RU (3.5") chassis, thus eliminating time-consuming system integration, component sourcing and installation, while saving precious rack space—ideal for any low-to-medium power application requiring AC fault tolerant operation.

A precision regulated power supply/charger, back-up battery, low voltage battery disconnect, output metering, LED status and Form C alarm contacts are all pre-wired and calibrated within the unit for plug-and-play operation. Plug-in terminals are provided for easy wiring of an additional parallel rectifier input, or external batteries for increased back-up capacity.

The batteries are always in-line with the load, thus there is no interruption from relays or transfer switches in the event of AC loss. Batteries are recharged when AC is restored. A manual battery disconnect switch allows internal or external battery service or replacement while the system is running. Models available for -48, +24 and +12 volt applications.

### Features
- Precision regulated power supply simultaneously maintains batteries at peak charge and supplies system load.
- Built-in batteries instantly power load during AC failure—no switch-over delay. 3-5 year average life. Terminals provided for additional external batteries for increased back-up capacity.
- Terminals provided for easy addition of parallel rectifier. (48V and 24V models only)
- Automatic low voltage and manual battery disconnect.
- Numerous front panel monitors—L.E.D. status indicators and digital ammeter/voltmeter.
- Form C summary failure alarm contacts; loss of internal rectifier output, loss of external rectifier output, LVBD contactor open. AC input failure alarm contacts optional.
- Numerous protection features—AC input breaker, internal battery breaker, auto thermal shutdown/recovery, current-limiting, short-circuit and over-voltage protection.
- 19" or 23", 6" forward rackmount brackets provided

### Rectifiers/Power Supplies

<table>
<thead>
<tr>
<th>Model</th>
<th>Input Amps @ Full Load</th>
<th>Output Adjustment Range</th>
<th>Amps Continuous</th>
<th>Supplemental Input Port*</th>
<th>Internal Battery Capacity</th>
<th>Ground Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPS 48-11</td>
<td>11 / 5.5</td>
<td>54.4</td>
<td>11</td>
<td>40 Amps</td>
<td>5 A-H</td>
<td>Positive</td>
</tr>
<tr>
<td>IPS 24-22</td>
<td>11 / 5.5</td>
<td>27.2</td>
<td>22</td>
<td>40 Amps</td>
<td>10 A-H</td>
<td>Negative</td>
</tr>
<tr>
<td>IPS 12-40</td>
<td>11 / 5.5</td>
<td>13.6</td>
<td>40</td>
<td>N/A</td>
<td>20 A-H</td>
<td>Negative</td>
</tr>
</tbody>
</table>
Integrated Power Systems

Specifications

**AC Input**
Input Range (switch selectable):
- 115V = 92-130 VAC
- 230V = 184-260 VAC
Frequency: 47-63 Hz

**DC Output**
Voltage/Ampereage: See Matrix on page 28
Maximum Load with External Rectifier and Battery Inputs: 40A
Regulation: Line: ± 1 %, Load: ± 2 %
Ripple: ± 1 %

**Power Scaling via Back Panel Quick Connects**
External Rectifier Input: 24V, 48V only; 560 or 1,000 watt (see PM Series page 6)
External Battery Bank: 12V/24V/48V

**Environmental**
Temperature Rating: -10° to + 60° C; Derate linearly from 100% load @ 50° C to 75% @ 60° C

**Mechanical**
Chassis: Aluminum
Rack Size: 19" or 23", 2 RU (3.5")
Cooling: Forced Air
Dimensions: 3.5'H x 17"W x 18"D
Weight: 33 Lbs. (with batteries)
17 Lbs. (without batteries)

**Protection**
- Current Limit, Short Circuit
- Over Voltage
- Auto Thermal Shutdown/Recovery
- Input Fuse and Circuit Breaker
- Circuit Breaker For Internal Battery
- Low Voltage Battery Disconnect (Adjustable)

**Internal Batteries**
Type: 12 Volt, 5 A-H Sealed Lead-Acid Maintenance-Free
Amp-Hour Capacity:
- See Matrix below
Weight: 4 Lbs. each; 4 Batteries per Unit

**Approvals**: UL Recognized, DOT and IATA approved for shipment by air

**Indicators and Alarms**
System "Nominal" indicator lights:
- AC OK
- External Rectifier ON/OK* (except IPS-12-40)
- Internal Rectifier ON/OK
- Battery Contactor Closed
System "Warning" indicator lights:
- Check System
- Battery Disconnected
Form C Alarm Contacts:
- Summary Failure
- AC Input Failure (Optional)

**Options**
AC Input Fail Contacts:
Specify 115 or 230 VAC
Rectifier/Battery Input Cable Assembly:
Model CA-24
Rear Support Bracket for Flush Mounting:
Model RSB-19
Distribution Panel:
Models DST-10 (UL) & DST-20A (UL)
Unit Supplied Without Batteries

**Top View with Cover Off**

**Internal Battery**
Constant Current Performance (Amps) to 1.75 VPC

<table>
<thead>
<tr>
<th>Model</th>
<th>5 Min.</th>
<th>15 Min.</th>
<th>30 Min.</th>
<th>1 Hr.</th>
<th>2 Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPS 48-11</td>
<td>15.0</td>
<td>8.0</td>
<td>5.0</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>IPS 24-22</td>
<td>30.0</td>
<td>16.0</td>
<td>10.0</td>
<td>6.0</td>
<td>4.0</td>
</tr>
<tr>
<td>IPS 12-40</td>
<td>40.0</td>
<td>32.0</td>
<td>20.0</td>
<td>12.0</td>
<td>8.0</td>
</tr>
</tbody>
</table>
Power Supplies - Heavy Duty Series

These super-rugged DC supplies are ideal for powering 12 and 24 volt communication equipment in base stations, remote sites and mobile communication applications where reliability is essential. The proven linear circuit design provides pure noise free output and long service life.

Features

- Excellent Regulation and Ripple Spec: Output voltage maintained within 1% under all rated line and load conditions
- Polyurethane conformal coated PC board and corrosion resistant heavy duty aluminum case with integral shock mounts assures survival in hostile environments
- Heat generated by semi-conductors is extracted and dissipated by large heat sink fins for cool operation
- Protection: overvoltage, current limit; (set @ 105% of intermittent rating), thermal overload and input/output fusing
- Thermally activated cooling fan on “CD” units

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Input/VAC</th>
<th>Output Amperage</th>
<th>Case Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 Volt Output</td>
<td>Intermittent</td>
<td>Continuous</td>
<td>Lbs. Kg.</td>
</tr>
<tr>
<td>115-12-8</td>
<td>115/230</td>
<td>8</td>
<td>5</td>
<td>P-2</td>
</tr>
<tr>
<td>115-12-20A</td>
<td>115/230</td>
<td>20</td>
<td>8</td>
<td>P-3</td>
</tr>
<tr>
<td>115-12-35CD</td>
<td>115/230</td>
<td>35</td>
<td>35</td>
<td>P-5</td>
</tr>
<tr>
<td>24 Volt Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>115-24-10</td>
<td>115/230</td>
<td>10</td>
<td>4</td>
<td>P-3</td>
</tr>
<tr>
<td>115-24-18CD</td>
<td>115/230</td>
<td>18</td>
<td>18</td>
<td>P-5</td>
</tr>
<tr>
<td>115-24-35CD</td>
<td>115/230</td>
<td>35</td>
<td>35</td>
<td>P-6</td>
</tr>
</tbody>
</table>
Power Supplies - Heavy Duty Series

Specifications

Input Range
105-125/210-250 VAC (selectable), 50-60 Hz; Derate to 50% output below 110 and 220 VAC

Operating Temperature

Standard Units
0-50°C, Derate Linearly From 100% @ 40°C To 50% @ 50°C Thermal shutdown @ 85°C Case temperature

C.D. Units
0-65°C, Derate Linearly From 100% @ 50°C To 50% @ 65°C Thermal shutdown @ 85°C Case temperature

Duty Cycle

Intermittent: 20 minutes max on time, 20% duty
Continuous: 24 Hours/Day 100% Duty

Options

- Modify for use as a Battery Charger
- Output voltage adjust (see Output Voltage for range)
- Transfer relay for back-up battery in event of power failure (ERC option)

Output Voltage

12 V Models:
13.6 VDC (Internally adjustable 12.6-14.5 VDC)
Ripple: 40mV P-P (@ 110-125 / 220-250 VAC input)

24 V Models:
24.5 VDC (Internally adjustable 21-27.5 VDC)
Ripple: 70mV P-P (@ 110-125 / 220-250 VAC input)

Regulation All Models:
1% Line and Load (@ 110-125 / 220-250 VAC input)

Back in 1974, Newmar began producing the Heavy Duty Power Supply Series, the first model designated 115-12-6A. The unit pictured, serial number 133, came off the tug boat “Hercules” in Galveston and was in service for 15 years powering a VHF radio. When returned to Newmar as part of our Reliability Certification Program, it worked perfectly and there were no records or indications that the unit had ever been repaired.

Rectifiers/Power Supplies

Inches   Centimeters
<table>
<thead>
<tr>
<th>Model</th>
<th>H</th>
<th>W</th>
<th>D</th>
<th>H</th>
<th>W</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-2</td>
<td>6.0</td>
<td>4.6</td>
<td>8.5</td>
<td>15.2</td>
<td>11.7</td>
<td>21.6</td>
</tr>
<tr>
<td>P-3</td>
<td>5.7</td>
<td>4.8</td>
<td>16.3</td>
<td>14.5</td>
<td>12.2</td>
<td>41.4</td>
</tr>
<tr>
<td>P-5</td>
<td>6.5</td>
<td>9.5</td>
<td>14.0</td>
<td>16.5</td>
<td>24.1</td>
<td>35.6</td>
</tr>
<tr>
<td>P-6</td>
<td>6.5</td>
<td>13.0</td>
<td>18.75</td>
<td>16.5</td>
<td>33.0</td>
<td>47.6</td>
</tr>
</tbody>
</table>
Power-Pac - 12 Volt

This 12 volt, 10 amp power supply features built-in back-up batteries which are charged during normal operation and then continue to power radios when AC power is lost. Choose 7 or 14 amp-hour battery capacity.

- Highly regulated, low ripple output for noise-free radio operation
- Battery automatically comes on-line if AC fails
- Low battery alarm and disconnect
- Terminals for wiring external battery bank for greater reserve capacity

Specifications
Input: 115/230 VAC, 50-60 Hz.; Output: 13.6 VDC @ 10A int., 5A cont.

Operating On Battery
<table>
<thead>
<tr>
<th>Battery Capacity</th>
<th>Dimensions (H x W x D) Inches</th>
<th>Weight Lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Amps for 40 min.</td>
<td>5.3 x 9.0 x 10.5</td>
<td>18</td>
</tr>
<tr>
<td>10 Amps for 20 min.</td>
<td>5.3 x 9.0 x 10.5</td>
<td>18</td>
</tr>
<tr>
<td>15 Amps for 10 min.</td>
<td>5.3 x 9.0 x 10.5</td>
<td>18</td>
</tr>
<tr>
<td>20 Amps for 5 min.</td>
<td>5.3 x 9.0 x 10.5</td>
<td>18</td>
</tr>
</tbody>
</table>

Unity Stand Alone Rectifier - 24 & 48 Volt

For applications that do not require rack-mounting or redundancy, the Unity is available as a stand-alone rectifier. A versatile flange permits a myriad of mounting options, such as on the side of rack rails, inside cabinets, on walls or under shelves, maximizing use of restricted spaces.

A 6' power cord and a rear-mounted terminal block for easy wiring. Performance specifications are identical to single Unity Rectifiers detailed on page 10.

Rectifiers/Power Supplies

Emergency Relay/Charger - E.R.C. 12 & 24 Volt

Allows emergency battery tie-in to a radio system normally operated by a power supply. The radio connects through the ERC to the power supply and the E.R.C. maintains the back-up battery via a trickle charge.

When AC power fails a relay automatically connects the radio to the back-up battery, restoring the system within one second. When AC power is restored the radio is automatically reconnected to the power supply and the trickle charge resumes to the battery.

Specifications
Relay Switch Over Time: 1 sec.
Trickle Charge: 1.5 amp

<table>
<thead>
<tr>
<th>Model</th>
<th>Input</th>
<th>Output Voltage (Adjustable)</th>
<th>Amp Cont. Output</th>
<th>Dimensions (H x W x D) Inches</th>
<th>Weight Lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC 12-15</td>
<td>115/230 VAC, 50-60Hz</td>
<td>54.4 VDC (42-56)</td>
<td>3</td>
<td>2.25 x 2.875 x 4</td>
<td>1 .5</td>
</tr>
<tr>
<td>ERC 24-15</td>
<td>115/230 VAC, 50-60Hz</td>
<td>+27.2 VDC (21-28)</td>
<td>6</td>
<td>1.75 x 6.3 x 12.8</td>
<td>2.8</td>
</tr>
</tbody>
</table>

* Built to order
DC-DC Converters

**DC-DC**

Voltage/Power Range: 12, 24, 48, 72, 110 VDC Input, 12 or 24 VDC Output, 3 - 50 Amps

Configurations: Isolated/Non-Isolated, Step-Up, Step-Down, Stabilizers, Battery Charger, Rack Mount, Mobile, Wall Mount, Desktop

---

**Rack Mount**

**Rackmount DC Converter**

- **Input:** 24 or 48 VDC
- **Output:** 12, 24, or 48 VDC, 15 - 30 Amps

Page 34

---

**Mobile Mount**

**Standard Series**

- **Input:** 24 or 48 VDC, Negative Ground
- **Output:** 12 or 24 VDC, 3 - 50 Amps

Page 36

**Isolated & Spike Protected Series**

- **Input:** 24, 36, 48, 72 or 110 VDC, Positive or Negative Ground
- **Output:** 12 or 24 VDC, 6 - 35 Amps

Page 38

---

**Voltage Stabilizers, Mobile Mount**

**Stabilizer Series**

- **Input:** 12 or 24
- **Positive or Negative Ground**

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>35</td>
</tr>
</tbody>
</table>

Page 78

---

**Isolated Series**

- **Input:** 12, 24 or 48 VDC, Positive or Negative Ground
- **Output:** 12 or 24 VDC, 3 - 35 Amps

Page 39
Communication sites require isolated DC Converters to provide excellent voltage regulation, low noise, and high efficiency voltage conversion. Reliability is vital under continuous duty operation and high ambient temperatures.

These units accept a wide input range at 24 or 48 VDC nominal, positive or negative ground, and produce pure 12, 24, or 48 volt power. The solid state circuitry is conservatively designed and semiconductors are selected and tested to withstand 200% of normal operating power.

Output voltage is maintained within 1% for all line and load conditions and the output is well filtered, allowing use with sensitive transceivers and telecom equipment.

**Features**

- 48, 24 volt inputs; 12, 24 and 48 volt outputs; positive, negative or floating ground
- Input/Output-chassis isolation – 250 VDC
- 400 watt output
- Rated for continuous duty at full load
- Excellent regulation under all line/load conditions
- Low ripple provides noise free output
- High efficiency – 87% typical
- High temperature rating to +50°C with forced air cooling
- Easily adapts to both 19” and 23” racks, flush or 6” forward mount
- Output volt and ammeter
- Output voltage adjustment on front panel
- Input/output circuit breakers
- Low profile – occupies two RU (one RU space above and below recommended for cooling)

<table>
<thead>
<tr>
<th>Model</th>
<th>Input Voltage (VDC)</th>
<th>Max Amps</th>
<th>Output Voltage (VDC)</th>
<th>Output Adjustment Range</th>
<th>Amperage (Continuous)</th>
<th>Weight (Lbs.)</th>
<th>Dimensions (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48-12-30RM</td>
<td>40-60</td>
<td>12</td>
<td>13.6</td>
<td>12.6-14.5</td>
<td>30</td>
<td>10</td>
<td>3.5 19 14</td>
</tr>
<tr>
<td>48-24-15RM</td>
<td>40-60</td>
<td>12</td>
<td>27.2</td>
<td>25.2-29.0</td>
<td>15</td>
<td>10</td>
<td>3.5 19 14</td>
</tr>
<tr>
<td>24-48-8RM</td>
<td>20-30</td>
<td>24</td>
<td>54.4</td>
<td>12.6-14.5</td>
<td>8</td>
<td>10</td>
<td>3.5 19 14</td>
</tr>
</tbody>
</table>
Rackmount DC Converters

Performance
- **Regulation:** 1% line/load
- **Ripple:** +/- 1/2% peak-peak max.
- **Idle Current:** 48V: <100 mA, 24V: 300 mA
- **Efficiency:** 85% typical @ 50% load.
- **Operating Temperature:** -20° to 50° C
- **Isolation:** 250 volts input-output-chassis

Mechanical
- Powder coated aluminum front panel, vinyl coated aluminum case
- Mounting brackets provided for 19" or 23" rackmount, center or front
- Easy access terminal blocks on back of unit, with protective cover
- Front panel switch guard provided
- Output voltage adjustment potentiometer recessed in front panel

Protection
- Input and Output circuit breaker
- Current limited/short circuit proof
- High/low input voltage shutdown
- Fail-safe components guard against output over-voltage condition.
- Automatic high temperature power reduction starting at 65° C heat sink temp.
- Automatic thermal shut down and recovery @ 80° C heat sink temp. (automatic reset @ 55° C heat sink temp.)
- Reverse polarity protection.

Options
- Operation as battery charger and/or parallel redundant operation. (Heat sink mounted oring diode installed in series with the output)
- Output Failure Alarm Contacts; Form C

Rear Panel View

**DC Output Failure Contacts Terminals**

**Input/Output Terminals**
DC-DC Converters - Standard Series

Convert 20-50 VDC input to 12 or 24 VDC negative ground output for powering communication/navigation equipment, on negative ground systems. (see Isolated series, page 39 for positive ground applications.) Ideal for powering voice and data transceivers in mobile applications.

Features

- Excellent Regulation: Output voltage maintained within 1% under all line and load conditions within rating.
- Heat generated by semi-conductors is extracted and dissipated by large heat sink fins that maximize air contact for cool operation and long life of components.
- Polyurethane conformal coating on PC boards and corrosion-resistant anodized aluminum case with heavy duty shock mounts assure survival in hostile environments.
- Numerous converter and load protection circuits: Current limiting; automatic thermal shutdown; short circuit proof; reverse polarity and overvoltage protection.

<table>
<thead>
<tr>
<th>Model</th>
<th>Input voltage</th>
<th>Output voltage</th>
<th>Output Amps</th>
<th>Case Size</th>
<th>Weight (Lbs)</th>
<th>Weight (Kg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intermittent</td>
<td>Continuous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-12-3</td>
<td>17-32</td>
<td>13.6</td>
<td>3</td>
<td>3</td>
<td>C-11</td>
<td>1 .45</td>
</tr>
<tr>
<td>32-12-6</td>
<td>20-50</td>
<td>13.6</td>
<td>6</td>
<td>6</td>
<td>C-10</td>
<td>2.5 1.1</td>
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<tr>
<td>32-24-6</td>
<td>32-50</td>
<td>24.5</td>
<td>6</td>
<td>6</td>
<td>C-10</td>
<td>2.5 1.1</td>
</tr>
<tr>
<td>32-12-10</td>
<td>20-50</td>
<td>13.6</td>
<td>10</td>
<td>10</td>
<td>C-2</td>
<td>4 1.8</td>
</tr>
<tr>
<td>32-24-10</td>
<td>32-50</td>
<td>24.5</td>
<td>10</td>
<td>10</td>
<td>C-2</td>
<td>4 1.8</td>
</tr>
<tr>
<td>32-12-15</td>
<td>20-50</td>
<td>13.6</td>
<td>15</td>
<td>15</td>
<td>C-2</td>
<td>5 2.3</td>
</tr>
<tr>
<td>32-24-15</td>
<td>32-50</td>
<td>24.5</td>
<td>15</td>
<td>15</td>
<td>C-2</td>
<td>5 2.3</td>
</tr>
<tr>
<td>32-12-25</td>
<td>20-50</td>
<td>13.6</td>
<td>25</td>
<td>20</td>
<td>C-3</td>
<td>7.5 3.4</td>
</tr>
<tr>
<td>32-24-25</td>
<td>32-50</td>
<td>24.5</td>
<td>25</td>
<td>20</td>
<td>C-3</td>
<td>7.5 3.4</td>
</tr>
<tr>
<td>32-12-35</td>
<td>20-50</td>
<td>13.6</td>
<td>35</td>
<td>30</td>
<td>C-4</td>
<td>12 5.5</td>
</tr>
<tr>
<td>32-24-35</td>
<td>32-50</td>
<td>24.5</td>
<td>35</td>
<td>30</td>
<td>C-4</td>
<td>12 5.5</td>
</tr>
<tr>
<td>32-12-50</td>
<td>20-50</td>
<td>13.6</td>
<td>50</td>
<td>40</td>
<td>C-5</td>
<td>16 7.3</td>
</tr>
<tr>
<td>32-24-50</td>
<td>32-50</td>
<td>24.5</td>
<td>50</td>
<td>40</td>
<td>C-5</td>
<td>16 7.3</td>
</tr>
</tbody>
</table>
DC-DC Converters - Standard Series

Specifications

**Output:** 13.6 VDC (internally adjustable 12.6-14.5) or 24.5 VDC (or specify)

**Ripple:** 150 mV P-P maximum

**Regulation:** 1% Line/Load

**Duty Cycle Ratings:** Intermittent - 20 minutes max on time, 20% duty, current limit set at approx. 105% of intermittent rating. Continuous - 24 hours, 100% duty 24-12-3: 2 minute max.

**Idle Current:** Less than 100 mA (including power ON light)

**Operating Temp:** 0-50° C. Derate Linearly from 100% @ 40° C to 50% @ 50° C. Thermal shutdown @ 70° C

**Case Temperature (all models except 24-12-3):**

- Model 24-12-3: Full output -25° to +30° C; Derate linearly from 100% @ +30° C to 45% @ +50° C

**Switching Frequency:** 40 Khz

**Efficiency:** 85% - Typical.

**Isolation – Output/Chassis; Input/chassis:** 250 VDC

**Option: Extreme Vibration Mounting Kit**

The Extreme Vibration Mounting Kit is available to protect NEWMAR power converters from the extreme stresses of shock and vibration when mounted on high vibration vehicles.

The kit (pictured here) replaces the standard vibration kit provided with the unit and fits into the unit's mounting flange to act as a "super shock absorber" for electronics in high vibration applications. It is available to fit all NEWMAR units from 2 to 70 lbs. Specify KIT-L for units which weigh 2-15 lbs. and Kit-H for units which weigh 16-70 lbs.

Mechanical

- Anodized aluminum heat sink case
- Front panel terminal block
- Heavy duty mounting flange
- Conformal coated PC board

Options

- Operation as battery charger or parallel redundant operation* – derate to continuous duty rating (contact factory)
- Extreme vibration mounting kit. (Information below) * Except Model: 24-12-3

Case Size

<table>
<thead>
<tr>
<th>Case</th>
<th>Inches</th>
<th>Centimeters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
<td>W</td>
</tr>
<tr>
<td>C-1</td>
<td>2.7</td>
<td>4.5</td>
</tr>
<tr>
<td>C-2</td>
<td>4.5</td>
<td>5.9</td>
</tr>
<tr>
<td>C-3</td>
<td>6.0</td>
<td>4.7</td>
</tr>
<tr>
<td>C-4</td>
<td>6.0</td>
<td>4.7</td>
</tr>
<tr>
<td>C-5</td>
<td>6.2</td>
<td>6.8</td>
</tr>
<tr>
<td>C-10</td>
<td>2.8</td>
<td>4.2</td>
</tr>
<tr>
<td>C-11</td>
<td>3.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Powering the Network
Newport Beach, CA USA
www.newmartelecom.com • 800-854-3906
Isolated and Spike protected series converters offer the benefits of an isolated converter plus protection against line transients and voltage spikes typically caused by large DC motors and switching transients often encountered on fork lifts, locomotives and light rail applications. A transient energy circuit clamps input spikes to a safe level, protecting both the converter and the powered equipment. Rugged case construction and internal components designed for severe vibration applications.

**Features**

- Wide range of input voltage
- Precise output voltage
- Reverse polarity protection
- Input fuse/Output fuse
- Current limiting, short circuit proof output
- Automatic re-setting thermal shutdown
- Input transient protection
- High/low input voltage shutdown

**Specifications**

**Output:** 13.6 VDC (internally adjustable 12.6-14.5) or 24.5 VDC (or specify)

**Ripple:** 150 mV P-P Regulation: +/- 2%

**Duty Cycle Ratings**: Intermittent - 20 minutes, max on time, 20% duty, Continuous - 24 x 0.7

**Operating Temp:** -40°C to +80°C

**Thermal shutdown @ 85°C**

**Efficiency:** 85% - typical.

**DC Isolation:** 1,400 VDC Input/Output, Input/Chassis, Output/Chassis

**ISP Surge Protection**

36 VDC Input:
140 joules (Watt-Seconds)
Peak Current, 2,000 Amps

72 & 110 VDC Input: 100 Joules
(Watt-Seconds) Peak Current, 12,000 Amps

**Options**

- Operation as a battery charger or parallel/redundant operation (contact factory)
- High vibration mounting kit (see page 37)

**Model** | Input voltage | Output voltage | Output Amps | Case Size | Weight
--- | --- | --- | --- | --- | ---
36-12-6ISP† | 18-65 | 13.6 | 6 | C-7 | 5.2.3
36-24-3ISP | 18-65 | 24.5 | 3 | 5 | 2.3
36-12-18ISP | 20-65 | 13.6 | 18 | C-6 | 8.3.6
36-24-9ISP | 20-65 | 24.5 | 9 | 5 | 3.6
36-12-35ISP* | 20-65 | 13.6 | 35 | 20 | C-9 | 12.5.5
72-12-6ISP | 42-90 | 13.6 | 6 | C-7 | 5.2.3
72-24-3ISP | 42-90 | 24.5 | 3 | C-7 | 2.3
72-12-18ISP | 42-90 | 13.6 | 18 | C-6 | 8.3.6
72-24-9ISP | 42-90 | 24.5 | 9 | C-6 | 3.6
110-12-18ISP | 80-140 | 13.6 | 18 | C-6 | 8.3.6
110-24-9ISP | 80-140 | 24.5 | 9 | C-6 | 3.6

† This model EMC and safety CE certified for sales within the European Union.
*Build to order only - 10 unit minimum
DC-DC Converters - Isolated Series

This series provides voltage conversion as well as input/output isolation, allowing use of negative ground electronics on off-highway vehicles which typically employ positive ground battery systems. May also be used as a voltage stabilizer and filter for sensitive equipment.

Features
- Wide range of input voltage
- Precise output voltage regulation
- Reverse polarity protection
- Input fuse/Output fuse
- Total input/output isolation, pos. or neg. ground
- Current limiting, short circuit proof output
- Automatic re-setting thermal shutdown
- High/low input voltage shutdown
- Polyurethane conformal coating on PC board
- Power “ON” light
- Rugged case designed for high vibration applications

Specifications
Output: 13.6 or 24.5 VDC (internally adjustable +/- 7%)
Ripple: 150 mV P-P Regulation: +/- 2% Line/Load Duty Cycle Ratings:
Intermittent - 20 minutes, max on time, 20% duty, Continuous - 24 hours, 100% duty
Operating Temp: 0-50° C; derate linearly from 100% @ 40° C to 50% @ 50° C

Efficiency: 85% - typical.
DC Isolation: Input/Output, Input/Chassis, Output/Chassis): 250 VDC

Options
Operation as battery charger, high vibration mounting kit

<table>
<thead>
<tr>
<th>Model</th>
<th>Input voltage</th>
<th>Output voltage</th>
<th>Output Amps</th>
<th>Case Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-12-12I</td>
<td>10-16**</td>
<td>13.6</td>
<td>12</td>
<td>C-8</td>
<td>6</td>
</tr>
<tr>
<td>12-24-6I</td>
<td>10-16**</td>
<td>24.5</td>
<td>6</td>
<td>C-8</td>
<td>6</td>
</tr>
<tr>
<td>12-12-35I</td>
<td>10-16**</td>
<td>13.6</td>
<td>35</td>
<td>C-9</td>
<td>12</td>
</tr>
<tr>
<td>12-24-18I</td>
<td>10-16**</td>
<td>24.5</td>
<td>18</td>
<td>C-9</td>
<td>12</td>
</tr>
<tr>
<td>48-12-6I</td>
<td>20-56</td>
<td>13.6</td>
<td>6</td>
<td>C-7</td>
<td>7</td>
</tr>
<tr>
<td>48-24-3I</td>
<td>20-56</td>
<td>24.5</td>
<td>3</td>
<td>C-7</td>
<td>7</td>
</tr>
<tr>
<td>48-12-12I</td>
<td>20-56</td>
<td>13.6</td>
<td>12</td>
<td>C-8</td>
<td>6</td>
</tr>
<tr>
<td>48-24-6I</td>
<td>20-56</td>
<td>24.5</td>
<td>6</td>
<td>C-8</td>
<td>6</td>
</tr>
<tr>
<td>48-12-18I</td>
<td>20-56</td>
<td>13.6</td>
<td>18</td>
<td>C-8</td>
<td>8</td>
</tr>
<tr>
<td>48-24-9I</td>
<td>20-56</td>
<td>24.5</td>
<td>9</td>
<td>C-8</td>
<td>8</td>
</tr>
<tr>
<td>48-12-35I</td>
<td>20-56</td>
<td>13.6</td>
<td>35</td>
<td>C-9</td>
<td>12</td>
</tr>
<tr>
<td>48-24-18I</td>
<td>20-56</td>
<td>24.5</td>
<td>18</td>
<td>C-9</td>
<td>12</td>
</tr>
</tbody>
</table>

**11.5 VDC minimum start-up voltage, then operates @ 10-16 VDC from 1 amp minimum to full load
Section 5: Inverter-Chargers

**Rack Mount Inverters**

- **2U Series**
  - Input: 24, 48 or 125 VDC
  - Output: 120 VAC, 800 - 1600 Watts

- **1U Series**
  - Input: 48 VDC
  - Output: 120 VAC, 1000 Watts

- **Mobile Mount**

- **IC Series Inverter-Chargers**
  - Input: 12 or 24 VDC
  - Output: 120 VAC, 1800 - 4800 Watts

- **PS Series Inverters**
  - Input: 12 VDC
  - Output: 120 VAC, 1000 - 2000 Watts

**DC-AC**

- **Voltage/Power Range:**
  - 12, 24, or 48 VDC Input
  - 120/240 VAC Output
  - 1000 - 5000 Watts

- **Configurations:** Rack Mount, Wall Mount, Mobile, Fixed

- **Systems:** UPS, Auxiliary AC Power
Inverters - PS Series

The PS Series inverters produce high efficient, pure sine wave output from 12 volt battery input with high surge power for motor start making it ideal for mobile applications. A power saving mode, with user friendly adjustable set points, conserves batteries when not in use. A remote control/display panel and front panel indicator lights allows for easy analysis and control.

Features

- 1000, 1500, 2000W models
- Pure sine wave 115V output
- 12V input
- High efficiency ~ 90%
- Power saving mode conserves battery when not in use, user adjustable set points
- AC duplex outlet on front panel
- Status indicators lights on front panel:
  - Input voltage
  - Output power level
  - Power Mode
  - Fault status
- Remote control/display included
- Protection:
  - Low input voltage
  - Overload
  - Short circuit
  - Overtemp
- Rugged compact case, ideal for mobile and industrial applications

Remote Panel Included

<table>
<thead>
<tr>
<th>Description</th>
<th>Input</th>
<th>AC Out Continuous</th>
<th>AC Out Surge</th>
<th>Dimensions/Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-1000 PS</td>
<td>12V</td>
<td>1000W @ 115V</td>
<td>2000W</td>
<td>H: 3.46” W: 7.17” D: 15.08” Lbs: 8.8</td>
</tr>
<tr>
<td>12-1500 PS</td>
<td>12V</td>
<td>1500W @ 115V</td>
<td>3000W</td>
<td>H: 3.46” W: 7.52” D: 16.34” Lbs: 10.5</td>
</tr>
<tr>
<td>12-2000 PS</td>
<td>12V</td>
<td>2000W @ 115V</td>
<td>4000W</td>
<td>H: 6.53” W: 8.22” D: 14.5” Lbs: 12.2</td>
</tr>
</tbody>
</table>
These inverters provide seamless back-up power for AC powered communications equipment from the site's 48 or 24 VDC battery system. A fast-acting transfer switch ensures voice and data transmissions remain uninterrupted in the event of a power grid failure or if the site utility power is disconnected for maintenance and upgrade purposes. Built in a 2RU case adaptable for 19” rack installations.

**Features**

- Pure sine wave AC output powers telecom equipment without performance degradation
- Continuous duty rated – full output wattage maintained even during extended power outages
- 1000 VA and 2000 VA models available – easily cascaded for N+1 redundancy, providing maximum reliability required by data centers
- Low EMI and RFI interference characteristics
- User-friendly Status and Diagnostic LCD/LED displays
- Utility bypass function with fast load transfer switch
- Remote Power Management optional via RS-232 port
- Optional SNMP card for remote monitoring
- Numerous circuit and load protections: over-current, over-temp, overload, reverse polarity, high/low battery voltage
- Form C alarm contacts for monitoring AC “Fault” and “DC Abnormal” conditions
- Adapts for 19” racks; occupies only 2 RU (3.5”)
- UL and cUL listed

### Features

<table>
<thead>
<tr>
<th>Model</th>
<th>DC Input Voltage</th>
<th>DC Input Amps</th>
<th>AC Output KVA</th>
<th>AC Output Watts</th>
<th>Weight (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-1000RM</td>
<td>20 - 30</td>
<td>50</td>
<td>1 KVA</td>
<td>800</td>
<td>15.4</td>
</tr>
<tr>
<td>48-1000RM</td>
<td>40 - 60</td>
<td>25</td>
<td>1 KVA</td>
<td>800</td>
<td>15.4</td>
</tr>
<tr>
<td>48-2000RM</td>
<td>40 - 60</td>
<td>50</td>
<td>2 KVA</td>
<td>1600</td>
<td>17.6</td>
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<tr>
<td>48-1000IRM*</td>
<td>40 - 60</td>
<td>25</td>
<td>1 KVA</td>
<td>800</td>
<td>15.4</td>
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<tr>
<td>48-2000IRM*</td>
<td>40 - 60</td>
<td>50</td>
<td>2 KVA</td>
<td>1600</td>
<td>17.6</td>
</tr>
<tr>
<td>125-1000RM</td>
<td>100 - 150</td>
<td>10</td>
<td>1 KVA</td>
<td>800</td>
<td>15.4</td>
</tr>
<tr>
<td>125-2000RM</td>
<td>100 - 150</td>
<td>20</td>
<td>2 KVA</td>
<td>1600</td>
<td>17.6</td>
</tr>
</tbody>
</table>

* I series models use IEC type AC output connector
**Rackmount Inverters**

**Specifications**

**AC Characteristics**

**Voltage:** 100/110/115/120 VAC (selectable using RS-232 port and additional software); Factory set at 115 VAC

**Frequency:** 60 Hz. Standard, 50 Hz. Optional

**Regulation:** +/- 2%

**Wave Form:** Pure Sine

**Outlets Rear Panel:**
- 24-1000RM & 48-1000RM – (4 ea.) NEMA 5-15R
- 48-2000RM – (4 ea.) NEMA 5-20R

**Total Harmonic Distortion:** 6% 120V/100% linear load
- 4% 120V/100% SPS load

**Transfer Time:** <4 ms.

**Displays**

**LED:** Inverter On, Overload, DC Abnormal, Fault

**LCD:** Inverter On, Output Voltage and Frequency, Input Voltage, Load Percentage, DC Voltage, System Model, Internal Environment Temperature, Utility Status, Short Circuit, Over Temperature

**Operating Temperature:** 0° to 45° C

**Cooling:** Forced air, front-to-back

**Humidity:** 0-90% relative humidity

**Acoustic Noise:** 46 dBA @ 1 M

**Alarms**

Form C (Dry Contact) terminals (two sets – "DC ABNORMAL" and "FAULT")

**Communication Interface**

RS-232 port, serial cable included

**Protection Features**

DC Input Fuse and Breaker, AC Input Breaker, Output Breaker, Short Circuit, Overload, Over Temperature, Over/Under Output Voltage, Over/Under Input Voltage, Fan Failure Detection

**Mechanical**

**Dimensions:** 17.4"W x 3.5"H x 11.6"D

**Mounting:** 19' Rack

**Weight:** 24-1000RM & 48-1000RM – 15.4 Lbs.,

**Options**

Remote monitor via RS 232 port. SNMP card required.

---

**RS-232**

**AC Input Terminal**

**Fan**

**DC Input Terminal**

**Optional Card Slot**

**Dry Contact Terminal**

**AC Output Socket**
Rackmount Inverter - 48-1U-1000RM

This inverter provides seamless back-up power for AC powered communications equipment from the site’s 48 VDC battery system. A fast-acting transfer switch ensures voice and data transmissions remain uninterrupted in the event of a power grid failure or if the site utility power is disconnected for maintenance and upgrade purposes. Built in a low profile case for 19” rack installations.

Features

- Pure sine wave AC output powers telecom equipment without performance degradation
- Continuous duty rated – full output wattage maintained even during extended power outages
- 1000 Watts – easily cascaded for N+1 redundancy, providing maximum reliability required by data centers
- Low EMI and RFI interference characteristics
- High efficiency: 88% (Full linear load at 120 VAC Output)
- Two NEMA 5-20R AC receptacles provided
- Utility bypass, with fast load transfer switch, <8mS
- Numerous circuit and load protections: over- temp, overload, reverse polarity, high/low battery voltage, AC input breaker
- Load & temperature controlled cooling fan
- Form C alarm contacts for monitoring Abnormal conditions
- Fan aging, failure, disconnect and blockage alarm
- All diagnostic Operation Controlled by a microprocessor
- User-friendly Status and Diagnostic LCD/LED displays
- Remote Power Management optional via remote control relay RS-232 port
- Standard 19” 1U Rackmount
- UL and cUL listed

See page 42 for 2000W units.

<table>
<thead>
<tr>
<th>Model</th>
<th>DC Input Voltage</th>
<th>DC Input Amps</th>
<th>AC Output Watts</th>
<th>Weight (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48-1U-1000RM</td>
<td>36 - 60</td>
<td>25</td>
<td>1000</td>
<td>12.7</td>
</tr>
</tbody>
</table>
**Rackmount Inverter - 48-1U-1000RM**

**AC Characteristics**
- **Voltage:** 97-123 VAC (select using front panel selection buttons or RS-232 port and additional software); Factory set at 110 VAC
- **Frequency:** 60 Hz. Standard, 47-63 Hz. User selectable
- **Wave Form:** Pure Sine
- **Total Harmonic Distortion:** THD < 2%
- **Transfer Time:**
  - From AC bypass mode: ≤ 20mS
  - From Inverter mode: ≤ 8mS

**Input:**
- **No Load Current:** .75A
- **Over Voltage Protection:** 60 VDC
- **Under Voltage Protection:** 36-44 VDC
- **Voltage Range:** 36-60 VDC
- **Efficiency:** 88% (Full Load)

**Output:**
- **Voltage:** 97-123 VAC
- **Transfer Switch:** 15AMP/120VAC
- **Max Output power (3min):** 1100W
- **Surge power:** 2000W

**Displays**
- **LED:** Inverter (On), AC Grid, Bypass and Alarm
- **LCD:** 2 line LCD w/ Keypad for navigation.
- **Selectable functions:** Input OVP, UVP voltage, UV alarm & Alert settings, Output voltage, Frequency settings, Online, Offline(Haphazard, normal, Exacting) settings
- **Operating Temperature:** 0° to 50° C Full Load,
  -30°-70° C in Storage
- **Cooling:** Forced air, front-to-back On @ Internal > 55°C or load > 30%
- **Humidity:** 0-90% relative humidity

**Visual & Audio Alarms:**
- Form C (Dry Contact) terminals
- Overload / Short Circuit Alarm
- Input UV / OV
- Over Temperature
- Fan Failure (Buzzer alarm)

**Communication Interface**
- RS-232 port, Remote control of inverter (on/off)

**Mechanical**
- **Dimensions:** 16.5”W x 1.713”H x 15.5”D
- **Mounting:** 19” or 23” Rack (Requires 19”-23” adaptors)

**EMC & Safety Standards**
- FCC Class B, UL60950-1, CAN/CSA-C22.2 No.60950-1 & TUV EN60950-1
Inverter-Chargers

These inverter-chargers deliver pure, sinusoidal AC for flawless operation of all appliances and sensitive electronics and contain charger to replenish battery when AC is present.

Features

- Generates “Perfect Wave” 120 VAC for powering highly input-sensitive computers, electronic controllers/processors
- Built-in high output three stage, temperature compensated charger for rapid battery bank replenishment - programmable for gel-cell, lead-acid or AGM battery type with amp-hour capacity selector
- Models available for 12 and 24 volt systems
- Internal charger is activated by an automatic transfer relay when external AC power is available. Optional Battery Integrator permits charging of multiple banks
- Large DC input terminal blocks and front panel GFCI protected outlet receptacles. AC output from the inverter may also be hard-wired
- Operation clearly displayed with front panel status indicators-optional remote panel available
- Numerous safety and circuit protections: short circuit, over load, over-temperature, ground fault protection, output circuit breaker
- Thermally controlled cooling fan prolongs life of components
- Automatic low voltage shutdown circuit prevents damage to batteries due to over-discharge when using inverter function
- Heavy duty powder coated aluminum construction and polyurethane coated internal circuitry—built to last in the harsh industrial environment
- UL listed with full two year warranty

Optional
Remote Control and Indicator Panel
Model: ICR-2
Specify 25 or 50 feet of wire length

<table>
<thead>
<tr>
<th>Case</th>
<th>Inches</th>
<th>Centimeters</th>
<th>Model: 12-1800IC</th>
<th>Model: 12-3000IC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
<td>W</td>
<td>D</td>
<td>H</td>
</tr>
<tr>
<td>I-2</td>
<td>7.5</td>
<td>16</td>
<td>15.5</td>
<td>19.1</td>
</tr>
<tr>
<td>I-3</td>
<td>10</td>
<td>17</td>
<td>16</td>
<td>25.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Inverter Output:</th>
<th>12-1800IC</th>
<th>12-3000IC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Watts (Surge)</td>
<td>4000</td>
<td>6500</td>
</tr>
<tr>
<td></td>
<td>Watts (Cont.)</td>
<td>1,800</td>
<td>3,000</td>
</tr>
<tr>
<td></td>
<td>Wave Type</td>
<td>PS</td>
<td>PS</td>
</tr>
<tr>
<td>Inverter Input:</td>
<td>VDC</td>
<td>11 - 14</td>
<td>11 - 14</td>
</tr>
<tr>
<td></td>
<td>Mca. Amps</td>
<td>180</td>
<td>300</td>
</tr>
<tr>
<td>Charger Input:</td>
<td>Mca. Amps</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Charger Output:</td>
<td>Max Amps @ V</td>
<td>85A@12V</td>
</tr>
<tr>
<td></td>
<td>Case</td>
<td>I-2</td>
<td>I-3</td>
</tr>
<tr>
<td></td>
<td>Weight (Lbs./Kgs)</td>
<td>54/25</td>
<td>75/35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Inverter Output:</th>
<th>24-2200IC</th>
<th>24-4800IC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Watts (Surge)</td>
<td>6,500</td>
<td>14,000</td>
</tr>
<tr>
<td></td>
<td>Watts (Cont.)</td>
<td>2,200</td>
<td>4,800</td>
</tr>
<tr>
<td></td>
<td>Wave Type</td>
<td>PS</td>
<td>PS</td>
</tr>
<tr>
<td>Inverter Input:</td>
<td>VDC</td>
<td>22 - 28</td>
<td>22 - 28</td>
</tr>
<tr>
<td></td>
<td>Mca. Amps</td>
<td>110</td>
<td>240</td>
</tr>
<tr>
<td>Charger Input:</td>
<td>Mca. Amps</td>
<td>15</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Charger Output:</td>
<td>Max Amps @ V</td>
<td>40A@24V</td>
</tr>
<tr>
<td></td>
<td>Case</td>
<td>I-2</td>
<td>I-3</td>
</tr>
<tr>
<td></td>
<td>Weight (Lbs./Kgs)</td>
<td>54/25</td>
<td>75/35</td>
</tr>
</tbody>
</table>
Battery Shelf & Module System

BM Series Battery Module

Installing system back-up batteries or increasing current capacity has never been easier. The BM Series Battery Module, provides the complete solution in one low profile 2RU (3.75") chassis. No need for sourcing and installing battery trays, interconnect cable, terminals, lugs, battery breaker, etc. The BM provides it all in one package – sealed, maintenance – free batteries included – with easy input output plug-in connectors on the chassis rear. Multiple modules may be paralleled for increased capacity.

The system comprises of a rack mount Battery Shelf and one or two 48 VDC Battery Modules. The shelf and modules are sold separately.

The battery modules slide easily into the shelf and are secured in place with a rear retaining pin and a front panel latch. Plug-in connector assemblies provided for quick connection to system load and/or paralleling multiple Battery Modules to meet run time requirements.

Features

- Battery Modules slide easily into shelf and plug quickly into DC power systems; shelf accommodates 2 Modules
- Modules and shelf fit together in low profile design – only 2RU (3.5”)
- Internal batteries are sealed, maintenance-free and are IATA and DOT certified for shipment by air
- Plug-in polarized connector assemblies enable quick, easy, plug-and-play installation and eliminate the danger of reverse polarity connections

Over-Current Protection: Circuit Breaker / Switch

Output Connector Rating: 50 amps maximum

Internal Battery

| Constant Current Performance (Amps) to 1.75 VPC |
|-----------------|----------------|----------------|----------------|----------------|
| Model           | 5 Min. | 15 Min. | 30 Min. | 1 Hr. | 2 Hrs. |
| BM 48-4         | 15.0    | 8.0     | 5.0     | 3.0   | 2.0    |

- Battery Type: Lead-Acid. Sealed, maintenance-free AGM. IATA and DOT certified for shipment by air.
- Typical Battery Life: 3-5 years in standby use

Model | Dimensions (In.) | Weight Lbs.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Module</td>
<td>3.4</td>
<td>7.4</td>
</tr>
<tr>
<td>Battery Shelf</td>
<td>3.5</td>
<td>19</td>
</tr>
</tbody>
</table>

Temperature Rating: -15° to +50° C

Model | Description
|------|----------------|
| BM 48-4, Battery Module | 48 Nominal VDC, 54.4 Float VDC, 4 Amp-Hour, 15 Amp Circuit Breaker Protection
| BMS-19/23 Rackmount Shelf | Accommodates 1 or 2 Battery Modules

NEWMAR

Powering the Network

48 Newport Beach, CA USA
www.newmartelemcom.com • 800-854-3906
Battery Strings

Communication and wireless network power systems typically require back-up power capacity at 8-10 hour rates or more. It’s important that reserve battery systems in stand-by applications are sized properly and utilize high quality cells resulting in a long design life. Many factors must be considered when specifying and selecting the proper batteries for these applications, including peak and average loads, current, run time, ambient temperature, battery chemistry type, energy density, and desired re-charge interval.

Newmar can assist you in specifying your battery strings and supply the proper charging and monitoring system for your application. Once we determine your needs, we can have the batteries delivered directly to your site, as part of a complete rackmount power system, a battery rack, or just the batteries themselves. Please contact us and we’ll do the analysis for you and recommend a cost effective, reliable turnkey system.

For related accessories, see page 84 for a selection of rackmount battery trays and page 83 for battery disconnect panels.
Battery Chargers

Section 7: Battery Chargers

PTM Series
Input: 115/230 VAC
Output: 24 VDC, 67 Amps
Page 51

PT Series
Input: 115 or 115/230 VAC
Output: 12, 24, or 32 VDC,
7 - 95 Amps
Page 52

ABC Series
Input: 115/230 VAC
Output: 12 VDC,
8 - 25 Amps
Page 54

Ni-Cad Series
Page 55

110 VDC Wall Mount Series
Input: 90 - 300 VAC
Output: 110 VDC
25 Amps
Page 56
Battery Chargers - PTM Series

The PTM series applies the “fault-tolerant” concept to 24V battery charging systems, by using multiple independent charger modules within the unit.

It consists of a wall mount case which serves as connection point to AC input and battery bank output, as well as three front-facing power bays, each accommodating a 550 watt charger module which slides and locks in place. If a module fault occurs, a front panel indicator is activated and the system continues operating on the remaining modules.

The modules are easily identified and can be quickly replaced with an on-hand spare or an exchange unit from the factory.

The system features three stage charging for rapid recharge and optional temperature compensation for optimal battery life. See our Phase Three Page for a complete description of the three stage charging process.

General System Specifications

<table>
<thead>
<tr>
<th>System Voltage/Frequency:</th>
<th>24 Volt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage/Frequency:</td>
<td>90-264 VAC, 47-63 Hz, single phase; derate linearly from 100% output @ 105 VAC to 80% output @ 90 VAC</td>
</tr>
<tr>
<td>Power Factor:</td>
<td>.96-.99</td>
</tr>
<tr>
<td>Efficiency:</td>
<td>85% typical</td>
</tr>
<tr>
<td>Nominal Charge/Float Voltages:</td>
<td>Refer to chart on Phase Three Page</td>
</tr>
<tr>
<td>Temperature Compensation (Option):</td>
<td>- 5 mV per cell per °C (typical)</td>
</tr>
<tr>
<td>Temperature Rating:</td>
<td>0-60° C; derate linearly from 100% output @ 50° C to 80% output @ 60° C</td>
</tr>
<tr>
<td>Recommended Battery Type/Capacity:</td>
<td>Gel-Cell, Flooded or Sealed Lead-Acid</td>
</tr>
<tr>
<td>Output Battery Banks:</td>
<td>3</td>
</tr>
<tr>
<td>Module Bays:</td>
<td>3*</td>
</tr>
<tr>
<td>Status Indicators:</td>
<td>Output OK, Low Output Voltage, Check System/Module Fault, Battery Hot/Reduced Output, Total Output Current Bar Graph, Output Voltage Test Points</td>
</tr>
<tr>
<td>Alarm Contacts:</td>
<td>Check System; Output OK/Fail</td>
</tr>
</tbody>
</table>

Case Material: Powder Coated Stainless Steel

Weight: Empty: 16 lbs/7.3 kg. - With three modules installed: 34 lbs/15.5 kg.

*Note: Charge modules are shipped in the same carton as the PTM case and are then placed in position by the installer.

Individual Module Specifications

Models: PTM-24-22 (24 volt)

Protection Features: Input Fuse, Output Fuse, Current Limiting, Over Voltage Protection, Cooling Fan, Automatic Thermal Shutdown/Recovery

Compliances: CE Mark, UL Recognized: E183223, Level 3 Safety: EN60950-1 USA, Canada, Europe EMI Radiated and Conducted: FCC Part 15 Level A; EN55022 Class A

Status Indicators: Output OK (Green)/FAULT (Red)

Weight: 6 lbs.

PTM-24-22: 22.5 amps max in Bulk Phase; 20 amps max in Absorption/Float Phase

Options

Temperature Compensation Sensor: Model TCS-12/24

<table>
<thead>
<tr>
<th>System Model</th>
<th>Modules Installed*</th>
<th>Max Output Amps</th>
<th>Max Input Amps @ 115/230 VAC</th>
<th>Inches</th>
<th>Centimeters</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTMS-24-67</td>
<td>3</td>
<td>67 @ 24 V</td>
<td>9/18</td>
<td>20.9</td>
<td>10.9</td>
<td>8.8</td>
</tr>
</tbody>
</table>
Battery Chargers - Phase Three Series

Phase Three “Smart” battery charging technology is now available in a wide range of power levels, allowing you to select the right size, features and flexibility you require for virtually any application from providing quick recharge of auxiliary batteries in vehicles parked in the station house, to powering continuous loads and maintaining peak charge in large battery systems in remote communication sites as well as industrial generator and marine applications. These chargers interact with batteries to put them through the optimum three stage charge process which provides for fastest recovery and ideal conditioning, maximizing battery performance and extending battery life.

A selector switch adjusts output voltage to adapt for gel-cell/flooded lead-acid/AGM battery types. An optional temperature compensation sensor also adjusts output for ideal voltage based on changes in the batteries’ ambient temperature. All models are housed in a rugged stainless steel case with a durable white powder coat finish, and the internal circuitry is polyurethane coated for maximum corrosion resistance.

Features

- “Smart” circuitry provides three stage charging—bulk, absorption, float.
- Wide model range covers battery system ratings from 14-950 amp-hours
- Gel-Cell/Flooded Lead-acid/AGM battery type switch selects optimum charge/float voltages.
- Multiple isolated output banks; ammeter indicates total output current. (except PT-7)
- Optional sensor adjusts output voltage based on battery temperature (except PT-7)
- Current limiting-prevents damage from overloading
- Charger status clearly displayed with L.E.D. and/or audible indicators or optional remote panel.
- Use as a power supply; can power loads without a battery in line
- Built to last—rugged stainless steel case with a durable white powder coat finish with drip shield and polyurethane coated internal circuitry
- Numerous Safety and EMC Compliances
- Two year parts and labor warranty

Temperature Compensation:
- 5 mV per cell per °C. Sensor supplied with 25’ cable and plug-in connector

Protection (all models):
- Input/Output Fuses, Current Limiting, Thermal Protection, Forced Air Cooling, Drip Shield

Optional Remote Panel, Model RP:
- LED’s indicate charger output stage. Button allows manual reinitialization of three stage charge cycle. Panel dimensions: 3” H x 4.75” W. Except models PT 40U and PT-24-20U
### Specifications

<table>
<thead>
<tr>
<th>Case Size Ref.</th>
<th>Weight: Lbs./Kg</th>
<th>Sensor Model</th>
<th>Remote Panel Model</th>
<th>Equalize Option</th>
<th>Output Indicator Ref.</th>
<th>Compliance Ref.</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>3.2/1.5</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>M-1</td>
<td>CG, CE</td>
<td>10.5 x 5.0 x 2.8</td>
</tr>
<tr>
<td>A-2</td>
<td>4/8</td>
<td>TCS-12/24</td>
<td>N/A</td>
<td>No</td>
<td>M-3</td>
<td>CG, CE</td>
<td>12.5 x 7.7 x 4.3</td>
</tr>
<tr>
<td>A-3</td>
<td>4.3/1.9</td>
<td>TCS-12/24</td>
<td>N/A</td>
<td>No</td>
<td>M-3</td>
<td>CG, CE</td>
<td>13.85 x 9.5 x 4.8*</td>
</tr>
<tr>
<td>A-4</td>
<td>5/2.3</td>
<td>TCS-12/24</td>
<td>N/A</td>
<td>No</td>
<td>M-3</td>
<td>CG, CE</td>
<td>14.8B x 9.6 x 5.6B</td>
</tr>
<tr>
<td>A-5</td>
<td>6/3.2</td>
<td>TCS-12/24</td>
<td>N/A</td>
<td>No</td>
<td>M-3</td>
<td>CG, CE</td>
<td>17.5C x 12 x 7.2C</td>
</tr>
</tbody>
</table>

With Dripshield Installed:
- Add .75" (1.9 cm) to height & 1.35" (3.4 cm) to depth
- For A-1, A-2, A-3, A-4: Add 1.27" (3.2 cm) to height & .5" (1.27 cm) to depth
- For A-5, A-6: Add 2" (5.08 cm) to height & 1" (2.54 cm) to depth

### Temperature Rating References

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Derate linearly from 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-1</td>
<td>-10°C to +45°C</td>
</tr>
<tr>
<td>T-2</td>
<td>-10°C to +60°C</td>
</tr>
<tr>
<td>T-3</td>
<td>-10°C to +60°C</td>
</tr>
<tr>
<td>T-4</td>
<td>-10°C to +60°C</td>
</tr>
<tr>
<td>T-5</td>
<td>-20°C to +60°C</td>
</tr>
<tr>
<td>T-6</td>
<td>-20°C to +50°C</td>
</tr>
<tr>
<td>T-7</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>T-8</td>
<td>-20°C to +70°C</td>
</tr>
</tbody>
</table>

### Compliance References*
See matrix for applicable models

**UL:** UL 1950 (Per DNB report)
**CG:** USCG CFR 183.410 (Ignition protected)
**EN:** EN 60335-1, EN 60335-2-29
**CE:** Carries the CE Mark

* Numerous other Safety and EMC compliances may also apply. Contact factory if further compliance information is required.

### Nominal Output Voltages at Gel/Flooded Switch Settings

(Without Temperature Compensation option installed or at 22.2°C (72°F) with Temperature Compensation option installed.)

<table>
<thead>
<tr>
<th>Setting</th>
<th>12 Volt Models</th>
<th>24 Volt Models</th>
<th>32 Volt Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Charge @ 50% load</td>
<td>Float @ .5 amp load</td>
<td>Charge @ 50% load</td>
</tr>
<tr>
<td>Gel-Cell</td>
<td>14.0 VDC</td>
<td>13.6 VDC</td>
<td>28.0 VDC</td>
</tr>
<tr>
<td>Flooded/AGM</td>
<td>14.2 VDC</td>
<td>13.4 VDC</td>
<td>28.4 VDC</td>
</tr>
</tbody>
</table>
Battery Chargers - ABC Series

These Chargers utilize time tested SCR charging circuitry, individually sensing and regulating each of 2 isolated battery banks, allowing the user to leave the charger operating indefinitely, even under no-load conditions without fear of overcharging. They are ideal for vehicle applications which have an intermittent demand for battery power.

For battery systems which require high continuous output, see our Phase Three Chargers page 47.

These chargers are housed in a rugged, black anodized aluminum, heat-sink case which extracts heat without introducing dust & moisture to the inside of the unit. The reliable ABC charger is employed in hostile environments throughout the world; in mining equipment, emergency service vehicles and rugged off-road applications.

All ABC chargers feature a total output ammeter, on-off power switch, power “on” indicator light, 115/230 VAC input voltage selector switch, factory installed AC power cord with molded plug and shock-resistant rubber mounting grommets. Circuit boards are polyurethane conformal coated for corrosion resistance and all are protected against overheating by an automatically resetting thermal switch.

Features

- Total output ammeter
- Dual independently regulated output banks
- On-off switch and power “on” indicator light
- Vibration absorbing mounting grommets
- Anodized aluminum case
- 115/230 VAC input selector switch
- Auto-reset thermal breaker
- Conformal coating of circuit board

<table>
<thead>
<tr>
<th>Model</th>
<th>Input Volts (all models)</th>
<th>Amps*</th>
<th>Output Volts</th>
<th>Banks</th>
<th>Amps</th>
<th>Inches H</th>
<th>W</th>
<th>D</th>
<th>Centimeters H</th>
<th>W</th>
<th>D</th>
<th>Lbs. Kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC 12-8</td>
<td>105-125 VAC or 210-250 VAC</td>
<td>2/1</td>
<td>12</td>
<td>2</td>
<td>8</td>
<td>6.0</td>
<td>4.2</td>
<td>20.3</td>
<td>15.2</td>
<td>10.6</td>
<td>9</td>
<td>4.1</td>
</tr>
<tr>
<td>ABC 12-25</td>
<td>50-60 Hz.</td>
<td>5/3</td>
<td>12</td>
<td>2</td>
<td>25</td>
<td>11.9</td>
<td>4.7</td>
<td>30.2</td>
<td>11.9</td>
<td>15.8</td>
<td>14</td>
<td>6.4</td>
</tr>
</tbody>
</table>

* @ Full Load
Battery Chargers - Ni-Cad Series

Nickel Cadmium batteries require specialized charging regimens to safely restore their cells to full energy capacity. Critical factors include: proper programming for the number of cells, battery capacity rating, voltage setting, current control, and temperature compensation. This series of chargers provide all these necessary features.

Charging Features
Programmable output - for selecting proper charge regimen of Ni-cad batteries by selecting:
- Number of cells (5/10)
- Constant Current level
- Constant voltage
- Float voltage
- Battery capacity

Digital readout provides system status and simplifies programming:
- Battery voltage
- Output current
- Amp-Hours supplied
- Time until end of charge cycle

Temperature compensated output adjusts voltage based on battery temperature, ensuring safe charging and long battery life

Power
800 Watt output power returns energy to battery quickly, 50 amps to a 10 cell string

Monitors & Alarms
Large front panel indicator lights provide easy visual check of charger status:
- On Charge
- End of charge cycle

Visual and audible two tone alarms alerts to problems:
- High battery temperature
- Over current
- High ambient temperature
- Extreme battery discharge
- Battery disconnected

Design Details
- Micro-processor based circuit provides precise output per installers programmed characteristics
- Rugged industrial circuit and case designed for wall mount applications
- Fan cooled
- High current plug-in output connector
- Easy programming via front panel display and selector switch
- Models for 115 and 230 VAC input
- Size: 11.6” H x 6.3” W x 3.3” D

Preliminary Product announcement, contact factory or view web site for specific model details and availability.
**Battery Charger - 110 VDC Wall Mount**

This high voltage battery charger with a power output of 3.0kW and maximum current of 27A is an ideal battery charging solution for 110 VDC utility protection and control equipment where 19” rack space is unavailable.

Utilizing intelligent controller and modular rectifiers, this stand alone wall mount high voltage battery charger is designed for easy installing directly to a vertical surface or used as a mobile charger. Voltage easily customized and configured to meet specific requirements.

Fan cooled and supplied with a durable easy clean air filter that requires minimal maintenance.

**Features**
- Fully featured industrial grade internal rectifier
- Large visible alpha-numeric status display
- Network monitoring available
- Configurable DC earth leakage detection option
- Wall Mount configuration leaves room for additional equipment in a 19” rack/cabinet
- High amp power connectors for ease of connection
- Hot swapable, internal rectifiers allows replacement under load
- Easily customized and configured - contact Newmar with your specifications

**Specifications**

**AC Input:** 90-300 VAC, single phase with surge protection and 32 amp input breaker

**Frequency Range:** 45-66Hz

**Power Factor:** >0.99 (full load)

**System**

**Output Power:** 110V (80-155V DC)
3000W @ 120V DC, 25A nominal, 27A max

**Monitoring and Control:** Full temperature compensation, automated and manual battery testing/equalization and three voltage-free relay alarm outputs.

**DC Distribution Breakers**
- **Load:** 1x 32A 2 pole
- **Battery:** 1x 32A 2 pole

**Mechanical**
- **Weight:** 24 Lbs.
- **Dimensions** 24.4" H x 14.8" W x 3.15" D

---

*Preliminary product announcement, contact factory or view web site for more information.*
The DST Series are a high density Rackmount Distribution Panels designed to accommodate virtually any 48 VDC, 24 VDC or 12 VDC power distribution requirement. Its flexibility makes it ideal for all telecom site power requirements, large and small.

These distribution panels accommodate up to 10 or 20 circuit breakers (depending on model) within a compact rackmount housing, occupying only 2 RU of rack space. The circuit breakers feature a unique plug-in design which requires only front access for quick, easy installation during initial power system configuration, as well as future system expansion.

**Features**

**Model DST-20A (UL)** features dual isolated 10 circuit A and B buses, each rated at 450 amps, enabling redundant power configuration or different voltages/ground references. A and B inputs can also be paralleled, creating a single 900 amp bus.

**Model DST-10 (UL)** has a single 450 amp bus which accepts up to 10 breakers.

The **plug-in circuit breakers** insert securely into sockets recessed in the front access panel. Breaker alarm contacts provide remote tripped-breaker alarm/indication. A "mid-trip" function of the circuit breaker provides quick visual identification of a failed circuit and distinguishes between an overcurrent trip and intentional shut-off. When tripped, the toggle handle moves to a 90° position, halfway between the "on" and manual "off" position.

**Note:** The DST Panel is shipped without circuit breakers installed, they are easily added at site.

Specify the required amperages when ordering and plug into panel during installation. Available amperages: 5, 10, 15, 20, 25, 30, 40, 50, 75 and 100. Snap-in hole plugs are provided for unoccupied breaker positions and a clear protective cover which prevents accidental shut off of the breakers and also provides for convenient placement of circuit identification labels.

**Input/output wiring is rear access** via bus bars that accept single or double hole lugs. Input/output buses are secured to the load breaker sockets via solid nickel-plated copper bus material.

**Rear protective cover provided:** attaches to back of panel within the 2 RU vertical rack space.

**Mounting brackets are provided** to adapt the panel for 19" racks.

### DC Power Distribution

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Bus</th>
<th>Total Circuit Capacity</th>
<th>Total Current Capacity</th>
<th>H</th>
<th>W</th>
<th>D (Panel)</th>
<th>D (w/ Cover)</th>
<th>Weight* (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DST-10</td>
<td>12/24/48 VDC</td>
<td>Single</td>
<td>10</td>
<td>450 Amps</td>
<td>3.5</td>
<td>19</td>
<td>11</td>
<td>14.4</td>
<td>9</td>
</tr>
<tr>
<td>DST-20A</td>
<td>12/24/48 VDC</td>
<td>Dual</td>
<td>20</td>
<td>900 Amps</td>
<td>3.5</td>
<td>19</td>
<td>11</td>
<td>14.4</td>
<td>12</td>
</tr>
</tbody>
</table>

* Weight with no circuit breakers installed
**Circuit Breaker Distribution Panel**

### Specifications

#### Compliances
- **UL Listed:**
- **1801 First Edition:** Subject Standard for Power Distribution Center for Telecommunications Equipment
- **C22.2 No. 225-M90:** Canadian Standards for Telecommunication Equipment
- **CE Marked**

#### Circuit Breakers - PBA Series
- **UL Recognized**
- **CE Marked**
- **Current Ratings:** 5, 10, 15, 20, 25, 30 40, 50, 75 or 100 amps
- **Breaker rating stamped beside toggle for easy reference**
- **Voltage Rating:** 80 VDC max.
- **Type:** Plug-in with Auxiliary Contacts

#### Mechanical
- **Bus Bars:** Nickel-plated copper; accepts single or double hole lugs
- **Front Panel:** Anodized aluminum
- **Top Cover, Rear Panel:** Vinyl-laminated aluminum

#### Alarm/Indicator
- **Tripped Breaker Contacts via Rear Panel Connector:** Normally Open configuration
- **Note:** Separate contacts for each bus on model DST-20A
- **Model:** RC-DST (Provided)
  - Covers rear, top, sides of bus bars. (DST must be flush mounted to rack face for installation of cover)

#### Options
- **Rear Terminal Cover Assemblies**
  - **Model:** RRC (Optional)
    - Covers rear, top, sides of multiple components in relay rack. Specify 19” or 23”, 3 RU or 7 RU height. (DST may be either center or flush mount to use cover)
- **Return Bus Bar Assembly - Rear Rack Mount**
  - 800 amps; **Model:** BBA-800

---

**Rear Terminal Cover Provided**

**Return Bus Bar - order separately**
- **Model:** BBA-800
  - See page 85

**Rear Panel View**

**Alarms Contacts Socket**

**Optional Rear Rack Cover - 3 or 7 RU**
- See page 86
Combination DC Power Distribution Panel Utilizes Both GMT Fuses and Circuit Breakers.

The DST-FB panel offers a unique combination of circuit protection, utilizing both circuit breakers and GMT fuses in a single, 2 RU rack mount assembly. This provides system integrators a flexible DC power distribution system allowing the installer to assign low power loads to fuses and high power loads, up to 30 amps, to circuit breaker protected circuits. The unit features dual busses, one bus accommodating 8 plug-in circuit breakers and the second holding up to 8 GMT style fuses. Front panel LEDs indicate power available per bus as well as blown fuse and tripped/off circuit breaker occurrence. Tripped condition also activates form C contacts for integrating remote alarm reporting. The panel integrates with 12, 24 or 48 volt systems, any ground reference, making the unit ideal for any power system.

**Features**

- 12, 24, or -48 VDC, Positive or Negative Ground
- Integrates easily with any power system
- Dual Bus (100 amps ea.): Bus A, 8 x GMT fuses; Bus B, 8 x plug-in circuit breaker capacity (fuses and breakers sold separately)
- Easily convert dual bus into single bus with provided jumper (200 amps max., 100A Bus A + 100A Bus B)
- Indicators: Power available LED, blown fuse LED, tripped/off circuit breaker LED
- Form C alarm contacts

**DC Power Distribution**

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Input/Output</th>
<th>Total Circuit Capacity</th>
<th>Dimensions (Inches)</th>
<th>Weight* (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DST-FB</td>
<td>12, 24 or 48 VDC</td>
<td>8 Circuit Breakers, 8 Fuses</td>
<td>900 Amps (dual bus)</td>
<td>3.5 H 19 W 11 D</td>
</tr>
</tbody>
</table>

* Weight with no circuit breakers installed
Circuit Breaker & Fuse Distribution Panel

Specifications

Electrical

Nominal Input: 12, 24 or 48 VDC, Positive or Negative ground

Total Circuit Capacity (16 total): 8 GMT fuses & 8 breakers

Dual Bus:
- Bus rating: 100 Amps each max.
- Bus A: Feeds 8 x GMT fuses, 15 Amps max., fuse rating
- Bus B: Feeds 8 x plug-in circuit breakers, 30 Amps max., breaker rating

Circuit Breaker Values:
- 5, 10, 15, 20, 25 & 30 amp., easy plug-in via panel front (sold separately) DST-FB series

GMT Fuse Values:
- 1, 3, 5, 7.5, 10 & 15 amp, (sold separately)

Indicators & Alarms

- Power Available LED, one per Bus (Green)
- Blown fuse LED (Red)
- Tripped/Off circuit breaker LED (Red)

Alarm Contacts: Form C, one each for Bus A & Bus B, activates on any of the above alarm conditions

Mechanical

Chassis: Vinyl laminated aluminum with powder coated front panel

Rack Size: 19”, 2 RU, flush or center mount

Environmental

Operating Temperature: -40 to +60°C

Rear Panel View

To Individual Loads

Breaker Protected

To Individual Loads

Fuse Protected

From Source B
(100A Max)

From Source A
(100A Max)

Chassis Ground

Isolated Inputs A and B Can Be Combined Using Supplied Shorting Bars

200A Max Combined, 100A Max/Bus
These fuse panels are ideal for DC distribution for low power loads in 24 and 48 volt positive and negative ground network applications and provide enhanced system reliability via a dual input bus which allow configuration with redundant power sources. Each input bus accommodates 10 or 20 GMT fuses (depending on model) in ratings up to 15 amps. Form C alarm contacts provide remote monitoring of input power and blown fuse conditions. Front panel LEDs indicate normal operation, fuse failure mode, as well as a user configured external alarm signal. Their low profile 1.75” (1 RU) occupies minimal space and can be configured for 19 inch rack mounting.

Features

- GMT Fuse holders, 15 amps max.
- Form “C” alarm contacts
- Polarity insensitive panels work with positive and negative ground systems -/+ 24 or -/+ 48 VDC
- Power On and alarm indicator lights
- 1RU (1.75”) in height will configure to 19” or 23” rack mounting

DC Power Distribution

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Input/output</th>
<th>Total Fuse Capacity</th>
<th>Amps per Bus (Dual Bus)</th>
<th>Total Current Capacity</th>
<th>Dimensions (Inches)</th>
<th>Weight (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDP-1010</td>
<td>+/-24 or 48 VDC</td>
<td>20</td>
<td>100</td>
<td>200A</td>
<td>1.75 17 11.5</td>
<td>8</td>
</tr>
<tr>
<td>FDP-2020</td>
<td>+/-24 or 48 VDC</td>
<td>40</td>
<td>100</td>
<td>200A</td>
<td>1.75 17 11.5</td>
<td>8</td>
</tr>
</tbody>
</table>
Specifications

Nominal Input/Output: +/- 24 or +/- 48 VDC

Total Fuse Capacity:
- FDP 1010: 10 GMT fuses per bus
- FDP 2020: 20 GMT fuses per bus

Total Current Capacity:
- FDP 1010: 200 amps (dual 100 amp bus)
- FDP 2020: 200 amps (dual 100 amp bus)

Fuse Holder & Fuse Rating:
- 15 amps max.
- GMT Fuses, available amperages: 1, 3, 5, 7.5, 10, and 15. Other ratings available upon request

Note: Fuses sold separately

Front Panel Details
- LED status indicators:
  - Normal Operation
  - Fuse Alarm
  - External alarm
- Easy accessible fuse blocks
- Spare fuse holder

Operating Temperature
- -20° to +60° C
- -5° to +140° F

Compliances
- NEBS 3 Certified

Mechanical
- Steel case painted flat black with white graphics
- Mounting ears provided for 19” rackmount, flush mount or 6” offset
- 1 RU (1.75”), can be zero clearance mounted directly adjacent to other equipment

Alarms
- Form C alarm contacts for each bus
- External ground input alarm (bay or rack alarms)

Rear Panel Details (see illustration below)
- Input Terminal Block: Two 1/4” studs on 5/8” centers
- Output and Alarm Terminal Blocks:
  - FDP 1010: Barrier Terminal Block; #22 to #10 AWG wire for fork or ring #6 screw
  - FDP 2020: Elevator clamp style terminal block; #26 to #12 AWG wire.
- Cable Management Bar
- Clear Lexan cover protects wiring connections

Rear Panel Views

FDP-1010

FDP-2020
Digital Instruments

These highly versatile digital instruments enable continuous and comprehensive monitoring of fixed site or mobile AC and DC electrical systems. They provide quick easy-to-read and accurate information on all important aspects of electrical system status: voltage, current, power consumed, power available and AC frequency. In addition, abnormal system conditions such as high/low voltage trigger user-adjustable alarms.

All read-outs and programming are controlled via touch pads on the instrument face. LCD displays are easily read, even in bright sunlight. Backlighting is provided for use at night or in low-light installations. Instruments mount in 2 1/8” diameter hole and standard instrument faces are available 2 1/2” square.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE</td>
<td>Displays volts, amps, frequency and wattage of 115/230 VAC systems. High/low volt/frequency alarms. Current transformer included. 2 1/2” square face</td>
</tr>
<tr>
<td>ACE-VAF-100</td>
<td>ACE meter, same as above with 4-1/4” x 4-1/4” square face</td>
</tr>
<tr>
<td>DCE</td>
<td>Displays DC volts, amps, energy used/remaining in battery system; 500 amp shunt included. High/low voltage, low amp-hour alarms. 2 1/2”</td>
</tr>
<tr>
<td>DCE-VAH-110</td>
<td>DCE Meter, same as above with 4-1/4” x 4-1/4” square face</td>
</tr>
<tr>
<td>DCV</td>
<td>Displays DC volts for three battery banks. High/low voltage alarms. 2 1/2” square face</td>
</tr>
</tbody>
</table>

**Electrical System Meter: AC & DC**

An essential tool for any electrical system installer or site maintenance technician, the Electrical System Meter provides extremely accurate data on all major AC and DC electrical functions in a convenient hand-held device with large easy-to-read LCD display.

**Measures and Displays**

- Voltage up to 400 VAC
- AC Current up to 200 Amps
- Frequency at 50-100,000 Hz
- DC Voltage up to 400 VDC
- DC Current up to 200 Amps
- Electrical Continuity

**Features**

- Clamping sensor allows current measurement without disconnecting wiring or shunt installation
- Long easy-grip color coded needle-type test probes
- Operates on two AA batteries (provided)
- Protective carry-case included

**Model:** ESM
Power Monitoring & Control

Site Power System
- Alarms - Major/Minor
- Voltages
- Current
- Temperature
- Low Voltage Disconnect

Rectifier/Battery Charger
- DC Bus Voltage
- Output Current

DC Distribution Panels
- Bus Voltage
- Load Current
- Breaker Trip Alarm

Inverter
- DC Input Voltage
- AC Output Voltage
- Alarms

Remote Activation Examples
- Cycle Power to Reboot
- Generator
- Relay Control
- Data Out
to Internet
- Control
Command
Input from
Desktop

Remote Sense Examples
- Door Open Alarm
- Temperature
- Radio Signal
Strength - RSSI
- DC Amperage
- Battery Voltage
- Data Out
to Internet
- Site Power Monitor - SPM-200
Page 66
- Site Monitor & Control - SMC-300
Page 68

Example of possible sense inputs

Grid AC Voltage
- Battery Voltage: 12/24/48
- Charge/Discharge Current

Ambient Temperature

Door Open Alarm
Site Power Monitor

Web-enable and integrate intelligence to any site’s AC and DC power system for 24/7 monitoring, alarm condition notification, and data logging of vital electrical functions. All programmable, accessible, and managed via the Internet: TCIP or SNMP. View current conditions and log 30 day history of DC and AC power status at remote sites before dispatching personnel.

The Site Power Monitor is designed specifically for monitoring power supplies, rectifiers, batteries, converters, inverters, UPS, distribution panels, and AC power at communication sites, base stations, and outdoor enclosures via Ethernet or Wireless connection. The palm sized unit can be rack, DIN-rail, or wall mounted and is easily adapted to virtually any make of power system via nine sensor input ports which capture and stream critical data via the internet for analysis and logging of site history. Web page based programs are easily user configured for site parameters with up to 50 desired alarm conditions settings and multiple automatic notification options by e-mail, PDA, and mobile phone.

Sites without internet access can use the monitor solely as a data logger that captures and retains 30 days’ data, ready for download to lap top for site history file and analysis of component performance and failure conditions.

**Sensor Data**
- DC Bus/Battery Voltage
- DC System Amperage/ Battery Charge-Discharge Current
- AC Voltage
- Ambient Temperature
- Dry Contacts/Alarms

**Firmware**
- Programmable Alarms
- Data Logging
- Ethernet Camera

**Reporting Via**
- Internet – Software Included
- E-Mail
- Cell Phone

**Optional Accessories**
- Video Cameras
- 12 or 24 volt wall plug power supply
- Multi-site software
- Rackmount Panel
- Sensors
  - Water
  - Door/Window open alarm
  - Fire/Smoke detector
  - Shunts

<table>
<thead>
<tr>
<th>Model</th>
<th>Input</th>
<th>Dimensions (Inches)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPM-200</td>
<td>9 - 60 VDC, neg./pos ground, 250 mA max.</td>
<td>H 3.27 w 4.66 D 2.18</td>
<td>1 Lb.</td>
</tr>
</tbody>
</table>

**Power Monitoring & Control**
Site Power Monitor

Monitor Inputs: 9 Total

**Voltage**
- **DC: 3 Ports:**
  - 2 each: 0-40 VDC
  - 1 each: 36-60 VDC
  - Accuracy: +/- 2%
- **AC: 2 Ports:**
  - 120/240 (90-264A) utility power (L-N or L-L)
  - 120/240 inverter output (floating)
  - Accuracy: +/-2%

**DC Current: 1 Port**
- +/− 100mv, 100 amp differential shunt voltage
- Read battery charge/discharge current, or load current
- Optional Shunt required for monitor package: P/N 575-2000-0
- Accuracy: +/-3%

**Dry Contact Switch Sensors: 3 Ports**
- Possible uses: door open, water leak detection, smoke alarm, component fail, breaker trip, high temperature Sensor
- Located outside case of unit
- Range: -40 to +60° C, -40° to +140° F
- Accuracy: +/-0.5° C

**Reporting**
- Ethernet Port connection: RJ-45, 10/100 auto sense
- HTTP - Web Access, Self-generated Web-page
- SNMP - MIB with Gets, Traps, and Clears
- Alarms - HIGH and LOW trip, 50 max., user-programmable
- Logging - Excel logs created, time stamped, continuous graphing
- SMTP/POP3 - email alerts, POP password
- Data Formats: XML, FDA, WAP (cell phone)
- Optional Console - Multiple Site Monitor with log aggregation and thumbnail camera views
- Remote Firmware upgrades - no need to visit the site.
- Local Data downloading and programming require and RJ-45 cross over cable (not included)

**Environmental**
- Operating Temperature range -20° C to 60° C

**Data Screens**
- Sensors
- Alarm settings (customized web page)
- Data logging
- Camera feeds (4 max.)

**Data logging: Remote Or Download Locally:**
- 30 days + rolling history with 30 second interval refresh
- CSV file compatible

**Images:** Ethernet Camera Enabled

**Alarms**
- 50 user configurable all with separate high/low trip settings
- Notification by Via Internet, e-mail or mobile phone
- User-programmable notification to 5 different e-mails addresses

**Diagnostics/Indicators/Controls**
- Front panel LED's:
  - Input Power ON/OK
  - System OK
  - Flashing Activity Indicator Ethernet port
  - System reset button

**Protections**
- Reverse Polarity
- Input overvoltage
- External 1A slo-blo fuse provided for DC power input

**Mechanical**
- Case: Aluminum, powder coat

**Mounting options:**
- Wall mount
- DIN-rail
- 19 inch rack mount (via optional bracket)

**Input Ports:**
- Compression screw terminal block
- 14-26 AWG wire

**Optional Accessories**
- Video Cameras
- 12 or 24 volt wall plug power supply
- Sensors
Powering the Network

The Site Monitor and Control unit allows you to download real-time data and control devices remotely from your desktop or mobile phone. Remotely activate DC or AC devices, no more driving to a mountain top to cycle power to re-boot a piece of gear, perform a battery discharge test, or start and monitor the output of a generator.

Numerous power sensors options let you configure on-site input to meet particular needs. Monitor DC volts/amps, temperature and alarms. Easy to use web-based reports utilize Linux® operating system to provide real-time status, and logging feature stores data graphically for further analysis and forensics. In addition to the power sensors, the system monitors 5 different alarm channels: such as a door, open, smoke, water, etc. Also monitors transmitter signal strength of radios with RSSI output.

**Features**

- Monitors basic electrical functions: battery voltage, charge/discharge rate
- Monitors critical site environmental conditions: temperature, door open alarms, smoke/fire detectors, including 2 USB ports for cameras and other equipment
- Set alarm notification points: reported by e-mail or cell using SMS text messages, SNMP traps
- Customize data screens per site input configuration
- Customize monitoring programs and upload to SMC control board
- Remotely control two built-in relays that can be wired to AC or DC functions, such as: Start/Stop generator
- Cycle power to re-boot lock-up conditions
- Disconnect batteries or rectifiers for system power test
- Automatically cycle various loads based on site condition parameters you set from desktop, example cycle ventilation fan when ambient temp reaches critical level
- Optional board provides 5 additional controllable relay outputs, connects into USB port

<table>
<thead>
<tr>
<th>Model</th>
<th>Powered By</th>
<th>Power Consumption</th>
<th>Dimensions (Inches)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMC-300</td>
<td>12 - 60 VDC, neg./pos ground</td>
<td>1.2 Watts</td>
<td>4.38 10.25 2.3</td>
<td>3 Lb.</td>
</tr>
</tbody>
</table>
Specifications

Operating Voltage
12 - 60 VDC, pos. or neg ground
Power Consumption
1.2 Watts

Inputs
- 1 Ethernet (10/1000 Mb/s)
- 3 DC inputs configurable to sense combination of:
  - DC Volts: +/- 100
  - DC Amps: 50 - 1000 A
    (one 100A shunt provided)
- 4 General purpose I/O pins (3.3 VDC in or out)
- Onboard Temperature Sensor: -25° to 100° C
- 5 alarm pins for external alarm contacts
- 2 USB 2.0 ports
- 2 control relays, 5 amps DC or AC (240V) controlled, each with manual override button for onsite testing
  - Optional board for 5 additional control relays
- 1 console serial port
- Signal strength for radios equipped with RSSI output

Graphic Functions
- Voltmeter
- Ammeter
- Temperature
- Interval: day, week, month, year

Alarm Alerts
- Email
- SMS messaging

Mechanical
- Compact size: 4.38” H x 10.25” W x 2.3” D
- Mounting: wall, shelf or rack using model BPL-3 rack bracket (3RU)
- End panel wiring ports and fully size removable cover allows easy access to connections
- High impact plastic box with clear cover allows viewing of board mounted status lights
- Operating temp: -30° - +85° C

Options
- USB plug-in board expands relay capacity by 5 additional outputs for remote control of AC/DC equipment onsite, model REB-5

Example of Data Log Screen

![System Load Average](image)

FROM: 2010-07-04 14:09 - TO: 2010-07-11 14:09 - (1 Week)

- 1 Minute Cur: 1.10 Ave: 1.07 Max: 1.33
- 5 Minute Cur: 1.14 Ave: 1.11 Max: 1.35
- 15 Minute Cur: 1.10 Ave: 1.10 Max: 1.31
Section 10: Low Voltage Disconnect

Unity Low Voltage Disconnect & Monitor
- Input: 12, 24, or 48 VDC
- Current Rating: 100 Amps
Page 71

Mobile/Wall Mount

Low Voltage Disconnect
- Input: 12, 24, or 48 VDC
- Current Rating: 30 - 75 Amps
Page 72
Rack Mount LVD & Monitor

This 1RU assembly contains numerous DC control and monitoring features that integrate power and distribution components into a highly functional system. Built in features include: low voltage disconnect, digital monitor of voltage and amperage, battery disconnect breaker, and alarm contacts. The digital display monitors bus voltage, battery voltage, system output current, and low voltage connect/disconnect set points. Alarm contacts actuate on low voltage and battery disconnect conditions. Rear panel bus bars provide ample terminal landings for easy integration with rack mount rectifiers, distribution panels and batteries.

Features

- Digital monitor displays system bus voltage, battery voltage, total rectifier amperage, and connect/disconnect voltage set points, and system ambient temperature
- For use with 12, 24, and -48V systems
- Solid state (FET) low battery voltage disconnect with adjustable set points and manual over ride switch for system maintenance/testing
- with adjustable low battery alarm contact alerting to impending system shutdown
- 100 amp battery disconnect breaker for system protection and easy testing and maintenance
- Form C alarm contacts
- All these functions in a compact 1 RU unit, minimizing system rack space

Specifications

Electrical

- Voltage Range: 8 to 65 vdc
- Grounding: Positive or Negative (polarity insensitive)
- Battery Breaker: 100 Amps with handle guard
- Low Voltage Battery Disconnect: 100 Amp, solid state (FET)
- LVD Set Points and Adjustment Range.

Mechanical

- Chassis: Aluminum, black powder coat
- Terminals: Plated copper. Landings for up to three rectifier inputs, with separate battery bus
- Cooling: Convection

Environmental

- Operating Temperature range: 0 to +60° C

Protection

- Battery: 100 amp circuit breaker
- Reverse Polarity: Polarity insensitive design

Indicators/Adjustments/Alarms

- Meter: Display (via front panel selector switch)
  - DC volts
  - DC Amps
  - LVD thresholds: Connect & Disconnect
  - Ambient Temperature
  - Adjustable brightness
  - Default settings restore feature

VDC | Disconnect | Connect | Adj. Range
---|------------|---------|-----------
12V | 10.4V      | 12.2V   | 10-16V    
24V | 21.0V      | 24.5V   | 20-30V    
48V | 42.0V      | 49.0V   | 40-60V    

Model | Nominal Voltage | Max. Continuous Current | Dimensions (Inches) | Weight (Lbs.)
---|-----------------|-------------------------|---------------------|----------------
ULM-100 | 12, 24 or 48, pos. or neg. ground | 100 Amps | 1.75 | 19 | 11 | 6.25

Powering the Network
Newport Beach, CA USA  www.newmartelecom.com • 800-854-3906 71
Low Voltage Disconnect

Discharging batteries beyond a critical low voltage can damage the batteries as well as sensitive electronic loads, and require a longer recharge interval. A low voltage disconnect prevents this condition. The LVD contains a sense and control circuit housed in a compact, rugged, vinyl-clad aluminum case. It is installed in-line between the battery and the load. The unit continually monitors battery voltage and if it falls below a preset voltage threshold, the load is automatically disconnected. When batteries are recharged past another pre-set voltage the load is reconnected. Connect and disconnect points are user adjustable.

Ideal for mobile or wall mount, see page 71 for rack mount.

<table>
<thead>
<tr>
<th>Model</th>
<th>Input Voltage</th>
<th>Contact Current Rating</th>
<th>Factory Set Actuation Points Disconnect</th>
<th>Factory Set Actuation Points Connect</th>
<th>Adjustment Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVD 12-30</td>
<td>12V (Neg. Ground)</td>
<td>30 Amps</td>
<td>10.4 VDC</td>
<td>12.2 VDC</td>
<td>9 - 15 VDC</td>
</tr>
<tr>
<td>LVD 12-75</td>
<td>12V (Neg. Ground)</td>
<td>75 Amps</td>
<td>10.4 VDC</td>
<td>12.2 VDC</td>
<td>9 - 15 VDC</td>
</tr>
<tr>
<td>LVD 24-50</td>
<td>24V (Neg. Ground)</td>
<td>50 Amps</td>
<td>21.0 VDC</td>
<td>24.5 VDC</td>
<td>18 - 30 VDC</td>
</tr>
<tr>
<td>LVD 48-30</td>
<td>48V (Pos. Ground)</td>
<td>30 Amps</td>
<td>42.0 VDC</td>
<td>49.0 VDC</td>
<td>38 - 60 VDC</td>
</tr>
</tbody>
</table>

For high current model, see Power ULM-100 - opposite page

**Specifications**

**Operating Temperature:** 0-50 °C  
**Mechanical**  
**Case:** Powder coated aluminum  
**Dimensions (Mounted Vertically, All Models):**  
5.25” H x 5.25” W x 3.5” D  
**Weight:** 2 Lb.
The MDP-25, a DC UPS, addresses common problems in mobile computer workstations due to low voltage and loss of power. It protects against system crashes, lengthy reboot sequences, and data corruption caused by voltage dips, drops, and loss. The unit includes a noise filter and voltage spike protection circuit, ensuring clean power. When the primary voltage drops, the internal 9AH battery switches on-line in milliseconds to prevent interruption. The unit also features a three-stage, temperature-compensated charger and provides reserve (isolated) power with specific current limitations. It is designed for installation in emergency and utility vehicles, providing a reliable source for mobile computers, workstations, and electronics. The MDP-25 is ideal for protecting mobile electronics against voltage dips, drops, and loss, and it provides supplemental voltage to maintain mobile electronics operation when the vehicle battery is sensed.
**Mobile DC UPS: MDP-25**

**Specifications**

**Input range:** 10.2V – 15.5V (start-up @ 11.5V)

**Standby Current Draw:** <50mA - operating mode, <30 mA sleep mode

**Output:** 12 VDC

**Maximum Load Current:** 25 amps

**Battery Connect Sequences**

- Internal battery switches online when vehicle battery voltage = 10.0 V ± 1.0 V (Vehicle battery disconnects after 3 seconds if low voltage condition persists)
- Vehicle battery reconnects @ 11.5 V ± 1.0 V
- Internal Battery Low Voltage Disconnect: < 9.6 V

**Temperature rating**

Operating temp: 0 – 50° C

**Mechanical**

- Aluminum case with access door for easy removal of battery
- Heavy duty mounting suitable for commercial vehicle use

**Battery Specification**

- 9 AH, sealed Lead Acid – typical life 5 years, easily replaced via front panel access door.
- Power delivery @ > 10.2 volts @ 25°C
  - 5 amps @ 60 minutes
  - 10 amps @ 20 minutes
  - 25 amps @ 8 minutes
- Voltage Spike Protection: Transient energy capability; 100 Joules, 4,000 amps Max (8 x 20 micro seconds)
- Output Signals for terminals (such as Motorola® 810 work stations and MVX 1000 video systems):
  - When imminent Voltage decay to 11.5 VDC is projected (adjustable set point)
  - On Charge/Discharge
  - Internal Battery Charger
  - Charge Current: 2 amps max., three-stage (Bulk, Absorption, Float)
  - Temperature Compensated

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions (Inches)</th>
<th>Weight (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDP-25</td>
<td>H 5.75 W 6 D 8.5</td>
<td>9.4</td>
</tr>
</tbody>
</table>
Mobile DC UPS: StartGuard

The abrupt DC system voltage drop that accompanies engine starting can cause micro-processor based voice and data transmitters to “dump” programmed memory.

StartGuard solves this problem by providing supplemental voltage to sensitive electronics while the engine is cranked. It contains a sealed rechargeable battery which is switched on-line to electronics when sensing the starter switch or solenoid is engaged. When the engine is running, the StartGuard automatically goes off-line and the internal battery is recharged by the alternator.

Specifications

**Input Voltage**: 13.8 - 14.8 VDC nominal, 15.5 VDC max.

**Relay Activation Input Voltage**: 7-15 VDC

**Output**: 20 amps max.

**Battery**: 12 VDC, sealed rechargeable, 5-7 year life (typical), 5 amp-hour capacity. Certified by DOT and IATA for shipment by air.

**Back-up Capacity (Fully Charged)**: (See matrix)

**Provides Voltage Protection During Engine Start**

<table>
<thead>
<tr>
<th>Model</th>
<th>Input</th>
<th>Back-Up Capacity</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 Minute</td>
<td>2 Minutes</td>
<td>Inches</td>
</tr>
<tr>
<td>NS-12-20</td>
<td>13.8-14.8 VDC Nominal 15.5 VDC Max</td>
<td>20 amps</td>
<td>18 amps</td>
<td>8.25</td>
</tr>
</tbody>
</table>
Mobile communication electronics such as programmable two-way radio and data transceivers, vehicle location systems and other microprocessor-controlled devices require clean and steady DC input power. Their sensitive circuitry is highly vulnerable to voltage drop from engine start, noise and line spikes from alternators and motors, and conducted noise from various other electronic devices. NAV-PAC prevents all of these problems and is in use by thousands of Emergency Vehicles nationwide.

**Features**
- Prevents voltage “drop-out” during engine start
- Absorbs line “spikes”
- Filters out electrical interference
- Provides supplemental voltage/battery back-up for up to 15 min.
- Remote monitor panel provided

**Specifications**

**Output:**
- 12 Volt @ 20 amps max
- 24 Volt @ 15 amps max

**Battery:**
Sealed Rechargeable 5.0 Amp-Hour, 5-7 years typical life, can be replaced. Low-voltage disconnect circuit protects battery from total discharge. Certified by DOT and IATA for shipment by air.

**Noise Filtering:**
Audio through 200 MHZ Voltage Spike Protection: Transient energy capability; 100 Joules, 4,000 amps Max (8 x 20 micro seconds)

**Size (H x W x D):**
- 12V: 5.25” x 6.2” x 7.4” (13.3 X 15.7 X 18.8 cm)
- 24V: 6.0” x 6.75” x 7.5” (15.7 X 17.14 x 19 cm)

**Weight:**
- 12V: 5.9 lbs. (2.7 Kg.)
- 24V: 8 lbs. (3.6 Kg.)

**Panel Dimensions:**
- 3.5” W x 2” H (8.9 x 5.1 cm)

**U.S. PATENT #:** 5172292

---

**Table: Back-Up Power**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nav-Pac-20</td>
<td>Nav-Pac, 12V, 20 Amps</td>
</tr>
<tr>
<td>Nav-Pac SW</td>
<td>Nav-Pac, 12V, 20 Amps with On/Off Switch</td>
</tr>
<tr>
<td>Nav-Pac-24V</td>
<td>Nav-Pac, 24V, 15 Amps</td>
</tr>
</tbody>
</table>

**Now Available in 24 Volt**

---

**Provides Continuous Voltage Protection**
12 & 24 Volt Stabilizing Converters

Feed sensitive electronics with proper voltage regardless of battery condition. These stabilizing converters provide continuous, precisely regulated output over the entire range of a battery’s usable voltage. This prevents subjecting loads to fluctuating input voltage which can cause shutdown, diminish performance and possibly damage sensitive circuitry.

These converters provide total input/output isolation, virtually eliminating conducted line noise and permitting connection of negative ground loads to positive or floating ground systems, or vice versa. They can also be modified for use as battery chargers, allowing maintenance of a battery at a great distance from the charging source, providing reserve power if the main source fails. The rugged anodized aluminum case is ideal for mobile applications.

Application Benefits Include
- Operate electronics at optimal input voltage, even from nearly drained batteries
- Boost voltage to compensate for voltage drops in long wire runs from batteries
- Eliminate voltage drops during momentary high current drain from batteries, as during engine start
- Eliminate voltage fluctuation from charge sources
- Eliminate voltage overshoot due to sudden removal of high current load

Options/Factory Modifications
(contact factory for details)
- Operation as a battery charger
- Parallel/redundant operation
- Non-standard output voltage

See page 19, for additional Isolated Series Converters specifications and mechanical description.

### DC UPS & Power Control

#### DC Power Conditioners

**12 Volt System**

<table>
<thead>
<tr>
<th>Model</th>
<th>Input Voltage</th>
<th>Output Voltage</th>
<th>Output Amps</th>
<th>Case Size (H x W x D)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-12-3I</td>
<td>10-16</td>
<td>13.6</td>
<td>3 intermittent</td>
<td>3.5 x 3.5 x 1.75</td>
<td>1.45</td>
</tr>
<tr>
<td>12-12-6I</td>
<td>10-16</td>
<td>13.6</td>
<td>6 intermittent</td>
<td>3.5 x 3.5 x 1.75</td>
<td>1.45</td>
</tr>
<tr>
<td>12-12-12I</td>
<td>10-16*</td>
<td>13.6</td>
<td>12 continuous</td>
<td>4.25 x 5.9 x 14.0</td>
<td>6.27</td>
</tr>
<tr>
<td>12-12-35I</td>
<td>10-16*</td>
<td>13.6</td>
<td>35 continuous</td>
<td>6.0 x 6.8 x 16.5</td>
<td>12.55</td>
</tr>
<tr>
<td>24-24-3I</td>
<td>20-32</td>
<td>27.2</td>
<td>3 intermittent</td>
<td>6.0 x 6.8 x 16.5</td>
<td>12.55</td>
</tr>
<tr>
<td>24-24-7I</td>
<td>20-32</td>
<td>27.2</td>
<td>7 intermittent</td>
<td>7.0 x 3.5 x 1.75</td>
<td>2.9</td>
</tr>
<tr>
<td>48-24-9I</td>
<td>20-56</td>
<td>24.5</td>
<td>9 continuous</td>
<td>4.25 x 5.9 x 14.0</td>
<td>8.36</td>
</tr>
<tr>
<td>48-24-18I</td>
<td>20-56</td>
<td>24.5</td>
<td>18 continuous</td>
<td>6.0 x 6.8 x 16.5</td>
<td>12.55</td>
</tr>
</tbody>
</table>

*11.5 VDC minimum start-up voltage, then operates at 10-16 VDC from 1 amp minimum to full load

**24 Volt System**

<table>
<thead>
<tr>
<th>Model</th>
<th>Input Voltage</th>
<th>Output Voltage</th>
<th>Output Amps</th>
<th>Case Size (H x W x D)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-24-3I</td>
<td>20-32</td>
<td>27.2</td>
<td>3 intermittent</td>
<td>6.0 x 6.8 x 16.5</td>
<td>12.55</td>
</tr>
<tr>
<td>24-24-7I</td>
<td>20-32</td>
<td>27.2</td>
<td>7 intermittent</td>
<td>7.0 x 3.5 x 1.75</td>
<td>2.9</td>
</tr>
<tr>
<td>48-24-9I</td>
<td>20-56</td>
<td>24.5</td>
<td>9 continuous</td>
<td>4.25 x 5.9 x 14.0</td>
<td>8.36</td>
</tr>
<tr>
<td>48-24-18I</td>
<td>20-56</td>
<td>24.5</td>
<td>18 continuous</td>
<td>6.0 x 6.8 x 16.5</td>
<td>12.55</td>
</tr>
</tbody>
</table>
Noise Filters & Automatic Power Selector

Noise Filters

The interference or electronic "noise" generated by alternators, ignition systems, motors, etc., can render a vehicle’s radio, data receivers or other electronic equipment making them virtually useless. This interference takes the form of popping or static on radios or audio gear and garbled images or "hash" on video displays.

These specialized filters can be used singly or in combination to attenuate conducted line noise, either at the affected equipment or at the noise source. The "PC" models feature inductor and capacitor circuit that filters both the "+" and "−" leads.

Filter Features

- Heavy duty construction
- Operate on 6-48 VDC systems
- Integral mounting flanges for secure installation
- Nickel-plated brass stud connectors on alternator filter (model 150A) accommodate high current cables and terminals
- Color coded wire leads on all other models make in-line installation easy

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>150A</td>
<td>Alternator filter, 150 amps</td>
</tr>
<tr>
<td>PC-10</td>
<td>Affected equipment inductor/capacitor, filters &quot;+&quot; and &quot;−&quot; leads, 10 amps</td>
</tr>
<tr>
<td>PC-25</td>
<td>Affected equipment inductor/capacitor, filters &quot;+&quot; and &quot;−&quot; leads, 25 amps</td>
</tr>
</tbody>
</table>

Automatic Power Selector

The Automatic Power Selector (APS) is a solid state device which enables installation of a seamless, redundant power system for critical electronic loads. It selects the higher voltage of two isolated DC power sources and routes power to the load. Should one source falter or fail, the other will automatically supply the load with no transfer delay, operation continues uninterrupted.

Easy installation, two independent power sources are wired to the APS and routed in a single output to the vital load. Rugged, rust-proof anodized aluminum case.

<table>
<thead>
<tr>
<th>Model</th>
<th>Max Loads</th>
<th>Voltage Rating</th>
<th>Dimensions (Inches)</th>
<th>Weight (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS-70</td>
<td>70 Amps</td>
<td>6-50 VDC, neg. ground</td>
<td>3.25&quot; x 4.5&quot; x 3.1&quot;</td>
<td>2</td>
</tr>
<tr>
<td>APS-160</td>
<td>160 Amps</td>
<td>6-50 VDC, neg. ground</td>
<td>9.0&quot; x 4.5&quot; x 3.1&quot;</td>
<td>5</td>
</tr>
</tbody>
</table>

Critical Loads

Typical Installation
Power Timer

Eliminate dead vehicle batteries caused by power drain from radios and data terminals that must operate while the engine is off. Allows use of accessory loads per programmed time limit while preserving battery for engine start.

Features

- Programmable disconnect time limit, 15 minutes to 8 hours, so that you can match your auxiliary load use to battery capacity, providing maximum run time yet still ensuring adequate reserve for engine start
- Prevents dead batteries due to accessories being left on and forgotten
- Once power off circuit is activated, power to auxiliary circuits is automatically restored when engine started. Optional ignition sense input resets power ‘on’ without having to start engine; no delay in use of equipment
- Low and High Voltage Disconnect
- Simple 3 wire installation: 1) Power in from battery, 2) power out to loads, 3) chassis ground.
- Rugged construction, powder coated case with epoxy potted components with waterproof time-out setting switches. Designed to withstand 80° C and vibration of engine compartment applications, and perform in demanding emergency vehicle applications
- 30 amp rating: can be applied to multiple auxiliary loads/circuits. Multiple devices can be left on during emergency calls without running engine

Timer Circuit Configurations

Range: 15 minutes - 8 hours
Increments:
Minutes: 6, 15, 18, 24, 30, 45
Hours: 1, 1.5, 2, 3, 4, 8
Programming: Dip switches on top of unit

Specifications

Rating: 12 volt nominal, 30 amps, 13 mA standby current
Protection: Low and high voltage disconnect,
Low < 10.5V with 10 second delay
High > 15.0V with 3 second delay
Operating Temperature: -20 to +80° C

Mechanical

Case: Powder coated steel with epoxy potted components
Size: (H x W x D): 1.25" x 4.25" x 2"
Weight: 1Lb.

LED's Indicate Output Status
Present, Ok
Present, On Timer
Disconnected, Timed Out
Disconnected, Low Voltage

Wiring

Input
- + DC (fuse provided)
- - DC
- Ignition sense

Output
- + DC to loads

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions (Inches)</th>
<th>Weight (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMR-30</td>
<td>1.25 x 4.25 x 2</td>
<td>1</td>
</tr>
</tbody>
</table>
Battery Integrators

Charging multiple battery banks without use of diode isolators dictates that the batteries be connected or “integrated” only whenever a charge voltage is present so that they may be charged simultaneously, then disconnected or “isolated” when in use to allow for selective discharge and avoid having the secondary or standby battery drain into the primary battery.

Battery Integrators perform this function automatically, acting as a “smart” switch to connect independent battery banks only when a charging voltage is present. Otherwise, they are isolated, and discharge between banks is prevented.

The Battery Integrator causes no voltage drop in the charging system, while the multiple batteries are charged as a single bank whenever a charging source of approximately 13.2 VDC or 26.4 VDC or greater is present (depending on model).

When the alternator or charger is off or a large load causes the voltage to drop below the disconnect point the unit breaks the common tie between the banks. This allows selective battery discharge and prevents “dumping” of a higher-charged bank into a lower-charged bank. The unit may also be remotely activated to connect other batteries through the key starter or a manual switch to provide an added “boost” from the secondary battery whenever the starter is engaged and the unit senses there is sufficient voltage in that battery to provide an assist.

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI-100</td>
<td>12 VDC, 100 Amps Max.</td>
<td></td>
</tr>
<tr>
<td>BI-200</td>
<td>12 VDC, 200 Amps Max.</td>
<td></td>
</tr>
<tr>
<td>BI-24-100</td>
<td>24 VDC, 100 Amps Max.</td>
<td></td>
</tr>
</tbody>
</table>

Battery Isolators

Heavy duty isolators allow charging multiple batteries automatically from one or two alternators and prevent discharge from one battery bank to another. Each battery is charged according to need without overcharging. Rated for 12-48 volt negative ground systems

<table>
<thead>
<tr>
<th>Model</th>
<th>Alternator Inputs</th>
<th>Battery Bank Outputs</th>
<th>Alternator Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2-70</td>
<td>1</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>1-3-70</td>
<td>1</td>
<td>3</td>
<td>70</td>
</tr>
<tr>
<td>1-2-120</td>
<td>1</td>
<td>2</td>
<td>120</td>
</tr>
<tr>
<td>1-3-120</td>
<td>1</td>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>2-3-70</td>
<td>2</td>
<td>3</td>
<td>70</td>
</tr>
<tr>
<td>2-3-120</td>
<td>2</td>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>1-3-165</td>
<td>1</td>
<td>3</td>
<td>165</td>
</tr>
</tbody>
</table>

NOTE: These battery isolators are not compatible with self exciting alternators. Please consult the manufacturer of your alternator if you are unsure of your configuration.
Section 12: Rack Mount Accessories

Battery Disconnect Panels
Page 83

Battery Trays
Page 84

Bus Bars/ BBA-800 / GB-19
Page 85

Misc – QCK / RRC
Page 86
Battery Disconnect Panels

BDP-1

- Provides over-current protection in high current battery wiring applications
- Provides a convenient means of disconnecting batteries from power plant during servicing
- High current single pole breaker is mounted into 2UR rackmount panel
- Auxiliary contacts (form C) provide tripped breaker signal to power plant monitor
- Adapts for 19” racks
- Voltage Rating: 12, 24 or 48 VDC

<table>
<thead>
<tr>
<th>Model</th>
<th>Battery Strings</th>
<th>Available Amperage</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDP-1</td>
<td>1</td>
<td>50, 75, 100</td>
</tr>
<tr>
<td>BDP-2</td>
<td>2</td>
<td>50, 75, 100</td>
</tr>
</tbody>
</table>

We can supply your battery requirements, see page 49 for battery ordering information.
Battery Trays & Equipment Shelves

**Battery Trays**

- Heavy gauge cold rolled steel trays fit standard 19" racks
- Ideal for holding up to four 100 amp-hour front terminal batteries
- Powder coat finish
- Mounting hardware supplied
- 23" trays also available in various depths. Contact factory and specify requirements.

<table>
<thead>
<tr>
<th>Model</th>
<th>Tray Area</th>
<th>Weight Capacity</th>
<th>Colors</th>
<th>Ship Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT 19” x 19”</td>
<td>17.25’ x 19.04”</td>
<td>350 lbs</td>
<td>Black</td>
<td>12 lbs</td>
</tr>
<tr>
<td>BT 19” x 21”</td>
<td>17.25’ x 22.3”</td>
<td>400 lbs</td>
<td>Black or Gray</td>
<td>17 lbs</td>
</tr>
</tbody>
</table>

**Adjustable Equipment Rack Shelves**

- Fits standard 19” racks
- Adjustable depth for balancing and desired front projection
- 16 gauge cold rolled steel with powder coated finish
- Flanged sides for added strength
- Supports up to 200 lbs.
- Mounting hardware included

<table>
<thead>
<tr>
<th>Model</th>
<th>Shelf Area</th>
<th>Weight Capacity</th>
<th>Colors</th>
<th>Ship Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS 19” x 16” Adjustable</td>
<td>17.56” x 16”</td>
<td>200 lbs</td>
<td>Black or Gray</td>
<td>10 lbs</td>
</tr>
<tr>
<td>RS 19” x 20” Adjustable</td>
<td>17.56” x 20”</td>
<td>200 lbs</td>
<td>Black or Gray</td>
<td>11 lbs</td>
</tr>
</tbody>
</table>

**Ventilated Equipment Rack Shelves**

- Fits standard 19” racks
- Vent holes in tray bottom allow air flow to cool equipment
- 16 gauge cold rolled steel with powder coated finish
- Supports up to 150 lbs
- Mounting hardware included

<table>
<thead>
<tr>
<th>Model</th>
<th>Shelf Area</th>
<th>Weight Capacity</th>
<th>Colors</th>
<th>Ship Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS 19” x 15” Ventilated</td>
<td>17.5” x 14.87”</td>
<td>150 lbs</td>
<td>Black or Gray</td>
<td>10 lbs</td>
</tr>
</tbody>
</table>
Bus Bars

Rack Mount

- 800 amp rated nickel-plated copper bus bar for use as heavy duty DC positive or negative connection point in rack installations
- Mounts to rear of rack; adaptable to 19" or 23" rack widths
- All mounting hardware, including isolated stand-offs and rear rack bracket

BBA-800

- Multiple attachment holes in two sizes provided for single and dual hole lugs:
  - 18 ea. @ .312" x .500"
  - 6 ea. @ .437" round
  - 4 ea. @ .281" round
- Dimensions: 19.5" x 2" x 1/4"
- Projection from rack: 7.5"
- Weight: 4 Lbs.

GB-19

- Copper bus bar for (unplated)
- 100 amp rating
- 14 ea. 1/4" landing points
- Installer must supply insulating stand-offs
- Tie bar provided for connecting to adjacent racks
- Designed for 19" racks
- Dimensions: 19.3” W x 0.75” H x 0.15” D
- Weight: 1 Lb.

Mobile Mount

Ideal as a DC ground tie point or positive bus, these heavy duty, 500 amp rated bus bar assemblies feature 5/16" studs on 1" centers in 1/4” thick copper bar for common connection/distribution of large wire gauges and accommodate 5/16" ring terminals.

- Insulated base (reinforced nylon resin) with clear protective cover
- Ideal power tie point when adding batteries, electronics and accessories to vehicles

<table>
<thead>
<tr>
<th>Model</th>
<th>Qty. of 5/16&quot; Studs</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB-2</td>
<td>2</td>
<td>3-1/16&quot; x 1 1/2&quot;</td>
</tr>
<tr>
<td>BB-2/8</td>
<td>2 plus 8 - #8 screws</td>
<td>6-1/16&quot; x 1-1/2&quot;</td>
</tr>
<tr>
<td>BB-5</td>
<td>5</td>
<td>6-1/16&quot; x 1-1/2&quot;</td>
</tr>
<tr>
<td>BB-8</td>
<td>8</td>
<td>9-1/16&quot; x 1-1/2&quot;</td>
</tr>
</tbody>
</table>
Quick Connect Wiring Kits

- Designed specifically for use with NEWMAR PM Series Power Modules and Power Function Manager (see pages 24-25) in stacked rack configuration.
- Allow for quick installation and removal of rectifiers
- Wiring harness is fitted with “Anderson” quick-connect and ring lug terminals; all wires tie-wrapped into proper position for quick and easy installation.
- Simplifies parallel wiring multiple modules
- Facilitates “hot” change-out of modules without system shutdown

### Models

<table>
<thead>
<tr>
<th>Description</th>
<th>AWG</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>QCK-3</td>
<td>6</td>
<td>3 Lbs.</td>
</tr>
<tr>
<td>QCK-3A*</td>
<td>4</td>
<td>3 Lbs.</td>
</tr>
<tr>
<td>QCK-6</td>
<td>6</td>
<td>4 Lbs.</td>
</tr>
<tr>
<td>QCK-6A*</td>
<td>4</td>
<td>4 Lbs.</td>
</tr>
<tr>
<td>CCK-4</td>
<td>6</td>
<td>6 Lbs.</td>
</tr>
</tbody>
</table>

* PM-12-80 - only use QCK-3A or QCK-6A

Rear Rack Covers

- Clear plastic panels attach to rear of racks to protect service personnel by preventing accidental contact with “live” terminals, etc., from top, sides and rear.
- Holes in rear panels allow for flow-through ventilation of fan-cooled components
- May be installed at 14” or 17” rear depth
- Multiple covers may be stacked to accommodate system height
- All mounting hardware included

### Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Rack Height (1RU = 1.75”)</th>
<th>Rack Width</th>
<th>Weight (Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRC-3-19</td>
<td>3 RU</td>
<td>19’</td>
<td>4</td>
</tr>
<tr>
<td>RRC-7-19</td>
<td>7 RU</td>
<td>19’</td>
<td>5</td>
</tr>
<tr>
<td>RRC-3-23</td>
<td>3 RU</td>
<td>23’</td>
<td>5</td>
</tr>
<tr>
<td>RRC-7-23</td>
<td>7 RU</td>
<td>23’</td>
<td>6</td>
</tr>
</tbody>
</table>
Speakers & Antenna Switches

Indoor/Outdoor Paging Speakers

PA-60/40
Heavy Duty Commercial

Clear, distortion free, waterproof deck horns are ideal for paging and alarm systems. High impact plastic with hook-up wire provided. 8 Ohm. Assembled with stainless steel hardware.

<table>
<thead>
<tr>
<th>Model</th>
<th>Output Nominal / Peak</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-8W</td>
<td>8 watts / 12 watts</td>
<td>1 Lb.</td>
</tr>
<tr>
<td>PA-30/20</td>
<td>30 watts / 20 watts</td>
<td>3 Lbs.</td>
</tr>
<tr>
<td>PA-40/30</td>
<td>40 watts / 30 watts</td>
<td>5 Lbs.</td>
</tr>
<tr>
<td>PA-60/40</td>
<td>60 watts / 40 watts</td>
<td>8 Lbs.</td>
</tr>
</tbody>
</table>

Note: Model PA-60/40 is a commercial grade horn which also features excellent sensitivity as a microphone for use in talk-back systems.

Model: CS-201
Two position switch allows manual selection of one of two antennas with a single radio or one of two radios with a single antenna. Die cast aluminum case.
Power: 1.5 kW peak, 1kW continuous
Impedance: 50 ohm
Connectors: SO-239/UHF
Weight: 1 Lb., .5 Kg.

Antenna/Coax Switches

Model: RCS
Remote controlled, operates on 12 VDC. Single pole, double throw. Permits remote selection of two antennas with a single radio.
Power: 1Kw.
Impedance: 48 ohm
Coil Current: 250 mA
Connectors: SO-239/UHF
Weight: 1 Lb., .5 Kg.

Microphone Clips

Model: Spring Clip
All stainless steel. For securing standard mobile radio microphone.

Note: Model PA-60/40 is a commercial grade horn which also features excellent sensitivity as a microphone for use in talk-back systems.
The Phone-Com intercom system provides direct, wired, point-to-point communication. Voice contact to any phone in the system is as easy as lifting the receiver and pressing the call button. Phone-Com operates on 12 VDC. They are constructed of high-impact plastic and are available in either bright white or traditional black. Wall mounting bracket is provided. Two versions are available:

**PI-2**: Designed for communication between only two points. A single call button sounds a buzzer and illuminates an indicator lamp on the companion phone. Available singly or as a set with 40’ of interconnect wire, fuse, terminal lugs and mounting hardware.

**PI-10**: For multiple station calling capability. Up to 10 phones may be interconnected, and each phone has 10 call buttons. Sold individually - see wiring requirements below.

**Phone-Com Wiring**: Color-coded multi-conductor interconnect wire (22 AWG) is available from NEWMAR at any length desired with 5, 10 or 15 conductors. For PI-2, use 5 conductor wire. For PI-10, add 3 to the total number of stations to determine minimum number of conductors required.

Note: Phones are not waterproof and should be installed in a protected location.

**PI-2**: Two station phone with single call button; sold individually; 2 lbs. (Specify White or Black when ordering)

**PI-2 SET**: Two station phone set, 40’ interconnect wire, fuse, lugs, mounting hardware; 5 lbs. (Specify White or Black when ordering)

**PI-10**: Multi-station phone with 10 call buttons, sold individually; 2 lbs. (Specify White or Black when ordering)

**22 AWG Wire**: 5, 10 or 15 conductor; sold per foot.

**BUZZER**: Optional external buzzer for use in high-noise areas

![2 Station Example Wiring Diagram with Station 2 with Slave](image)
Portable Radio Covers

AQ Series Waterproof Radio Covers

Hand-held radios can be taken anywhere without being damaged by water, dust or sand when the AQ Series waterproof cover is used for protection. Even total immersion will not harm the radio. These covers are certified waterproof to a depth of 33 feet.

The case is made of super-tough, UV resistant PVC, which is engineered with enough flexibility to facilitate easy operation of knobs and keypads. Transparent design allows easy reading of digital displays. Sound is virtually unimpeded and RF transmission is unaffected.

A quick release clip allows easy insertion and removal of the radio and a handy lanyard provides extra security when hands are wet. But if the radio falls into deep water, no problem! Safely inside the AQ case, it will float!

Models

**AQ-10L/R:** For compact hand-held radios. New reversible design accommodates both left and right hand antennas

**AQ-20L/R:** For standard size hand-helds. New reversible design accommodates both left and right hand antennas

Dimension in inches

A = Overall height of radio/phone with antenna extended
B = Height of radio/phone body
C = Combined width and depth of radio/phone

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQ-10L/R</td>
<td>13.3”</td>
<td>6.1”</td>
<td>4.1”</td>
<td>1 Lb.</td>
</tr>
<tr>
<td>AQ-20L/R</td>
<td>15.7”</td>
<td>7.8”</td>
<td>5”</td>
<td>1 Lb.</td>
</tr>
</tbody>
</table>
**Junction Boxes**

**PX Series Junction Boxes**
- Waterproof junction box with terminal strip for electronic connections in areas subject to spray, washdowns, etc.
- Rugged, non-corrosive polypropylene housing
- "Universal" cut-to-fit cable entries, diameter range: .14 - .81"
- Brass compression screw terminals
- Wire gauge: 16 AWG

<table>
<thead>
<tr>
<th>Model</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>PX-1</td>
<td>6 pair</td>
</tr>
<tr>
<td>PX-2</td>
<td>12 pair</td>
</tr>
<tr>
<td>PX-3</td>
<td>18 pair</td>
</tr>
</tbody>
</table>

**BX Series Junction Boxes**
- Splash proof junction box with terminal strip
- Rugged cast aluminum box and cover with enamel finish
- Multiple rubber grommet cable entries
- Brass compression screw terminals

<table>
<thead>
<tr>
<th>Model</th>
<th>Terminals</th>
<th>Wire Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td>BX-1</td>
<td>6 pair</td>
<td>16 AWG</td>
</tr>
<tr>
<td>BX-2</td>
<td>12 pair</td>
<td>16 AWG</td>
</tr>
<tr>
<td>BX-3</td>
<td>22 pair</td>
<td>14 AWG</td>
</tr>
</tbody>
</table>

**EX Series Electrical Enclosures**
These polycarbonate enclosures provide functional and professional protection for wire connectors, terminal blocks, relays, solenoids, fuses, etc. In addition, instruments, switches and panels can be surface mounted to the cover, as there is ample space for rear projection and wiring.

The watertight enclosures have gasketed covers with captured non-corrosive securing screws, and an internal base plate with stand-off mounts for securing components inside the enclosure.

<table>
<thead>
<tr>
<th>Model</th>
<th>Size L x W x D (inches)</th>
<th>Knock-Outs (size cross-reference below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX-373</td>
<td>7.09 x 3.7 x 3.19</td>
<td>14 ea. PG-16</td>
</tr>
<tr>
<td>EX-474</td>
<td>7.09 x 4.33 x 4.37</td>
<td>16 ea. PG-16, 4 ea. PG-21, 2 ea. PG-29</td>
</tr>
<tr>
<td>EX-1074</td>
<td>7.09 x 10.0 x 4.37</td>
<td>24 ea. PG-16, 8 ea. PG-21, 4 ea. PG-29</td>
</tr>
</tbody>
</table>
Terminal Strips & Bus Bars

**Bus Bars**

Ideal as a DC ground tie point or positive bus, these heavy duty, 500 amp rated bus bar assemblies feature 5/16” studs on 1” centers in 1/4” thick copper bar for common connection/distribution of large wire gauges and accommodate 5/16” ring terminals.

- Insulated base (reinforced nylon resin with clear protective cover)
- BBA-800 - rackmount see page 82

**Terminal Strips**

- Use as a common negative/neutral bus for AC or DC systems. Dual terminal strips in 4 or 8 screw positions on 3/4” centers are secured to a high density insulated base. All hardware, bus material and fasteners are nickel-plated brass.
- Interlocking bases allow use of multiple terminal strips and bus bars (described below) to produce secure and neat wiring assemblies. The terminal strip bases have provisions for either #8 or #10 mounting screws, and no conductive parts in the base are exposed to the mounting surface.
- #8 screw terminals
- Bus bars rated to 100 amps

**Connector Strips**

Molded nylon encases 6 or 12 pairs of connectors that use screw compression to secure wires without use of lugs. Ideal for electronic installations. Brass barrels capture wires and are held in place with a stainless steel “finger” compressed by a screw. The screw does not make contact with the wires, protecting the copper strands from cuts and breakage. Same connector strip used in BX Series boxes.

- 3 Sizes: ranging from 6 to 16 gauge strips are easily cut to meet wiring requirements and space limitations.
RA Series Right Angle Waterproof Feed-Thru Fittings

Route cables at 90° through vertical and horizontal surfaces with wall hugging low profile design that keeps cable secured close to the surface reducing intrusion with personnel or other equipment / cables.

Molded of nylon, the Sculpted shape has no sharp edges and provides radiused 90° feed-thru bend in cables without damage.

Easy installation: slide silicone compression rings on cable, mount base piece with waterproof gasket then attach sealing end cap to create an IP 65 waterproof seal.

Note cable must be routed without end connector attached.

Three models to accommodate wide range of cable diameters.

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable Diameter Range (Inches)</th>
<th>Dimensions (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA-1</td>
<td>0.1 - 0.25</td>
<td>2.17 x 1.65 x 0.63</td>
</tr>
<tr>
<td>RA-2</td>
<td>0.27 - 0.35</td>
<td>3.23 x 2.44 x 0.95</td>
</tr>
<tr>
<td>RA-3</td>
<td>0.39 - 0.47</td>
<td>3.23 x 2.44 x 0.95</td>
</tr>
</tbody>
</table>

CCX Series Waterproof Feed-Thru Fittings

The entry hole is pre-drilled in seal with slit edge allowing feed through of cable with factory installed connector attached; multiple glands cover a wide range of cable sizes. One CCX fitting is required for each cable.

- Create a 100% waterproof seal when routing cables through communication huts, cabinets, vehicle roofs, etc.
- Entry hole predrilled in seal with slit to edge
- Allowing installation/removal with connector still attached
- Rugged weatherproof nylon housing with neoprene seal

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable Diameter Range</th>
<th>Max. Connector Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCX-R</td>
<td>.47”-.59”</td>
<td>1.57”</td>
</tr>
<tr>
<td>CCX-S</td>
<td>.35”-.55”</td>
<td>.83”</td>
</tr>
<tr>
<td>CCX-T</td>
<td>.18”-.35”</td>
<td>.83”</td>
</tr>
</tbody>
</table>

DX Series Feed-Thru Waterproof Fittings

Provided with solid neoprene cable gland, installer drills holes and slits as required to accommodate cable with or without factory installed connector. Multiple cables may be passed through a single fitting.

- Similar to CCX Series except installer drills holes in seal to accommodate cable(s)
- Multiple cables may be routed through a single fitting

<table>
<thead>
<tr>
<th>Model</th>
<th>Drill-Thru Aperture</th>
<th>Max. Connector Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>DX-2</td>
<td>1.2”</td>
<td>1.2”</td>
</tr>
<tr>
<td>DX-3</td>
<td>1.65”</td>
<td>1.65”</td>
</tr>
<tr>
<td>DX-5”</td>
<td>2.0”</td>
<td>2.0”</td>
</tr>
</tbody>
</table>

*Aluminum Housing
## Index

<table>
<thead>
<tr>
<th>Product</th>
<th>Page Numbers</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQ Series Waterproof Radio Covers</td>
<td>90</td>
<td>Commander Power System</td>
</tr>
<tr>
<td>DC Power Systems</td>
<td>2 - 19</td>
<td>Communication Accessories</td>
</tr>
<tr>
<td>12 &amp; 24 Volt Stabilizing Converters</td>
<td>78</td>
<td>Connector Strips</td>
</tr>
<tr>
<td>Adjustable Equipment Rack Shelves</td>
<td>84</td>
<td>DC Power Conditioners</td>
</tr>
<tr>
<td>Antenna/Coax Switches</td>
<td>88</td>
<td>CCX Series Waterproof Feed-Thru Fittings</td>
</tr>
<tr>
<td>Automatic Power Selector</td>
<td>79</td>
<td>DC UPS &amp; Power Control</td>
</tr>
<tr>
<td>Battery Charger - 110 VDC Wall Mount</td>
<td>56</td>
<td>DC-DC Converters - Isolated Series</td>
</tr>
<tr>
<td>Battery Chargers - ABC Series</td>
<td>54</td>
<td>DC-DC Converters - ISP Series</td>
</tr>
<tr>
<td>Battery Chargers - Phase Three Series</td>
<td>52 - 53</td>
<td>DC-DC Converters - Standard Series</td>
</tr>
<tr>
<td>Battery Chargers - PTM Series</td>
<td>51</td>
<td>Digital Instruments</td>
</tr>
<tr>
<td>Battery Disconnect Panels</td>
<td>83</td>
<td>DX Series Feed-Thru Waterproof Fittings</td>
</tr>
<tr>
<td>Battery Integrators</td>
<td>81</td>
<td>Electrical System Meter: AC &amp; DC</td>
</tr>
<tr>
<td>Battery Isolators</td>
<td>81</td>
<td>E.R.C</td>
</tr>
<tr>
<td>Battery Shelf &amp; Module System</td>
<td>48</td>
<td>EX Series Electrical Enclosures</td>
</tr>
<tr>
<td>Battery Strings</td>
<td>49</td>
<td>Fuse Distribution Panel</td>
</tr>
<tr>
<td>Battery Trays</td>
<td>84</td>
<td>Gladiator: 110VDC, 3 - 12 Kw</td>
</tr>
<tr>
<td>BM Series Battery Module</td>
<td>48</td>
<td>Guardian: 110VDC, 3 - 6 kW</td>
</tr>
<tr>
<td>Bus Bars</td>
<td>85, 93</td>
<td>Indoor/Outdoor Paging Speakers</td>
</tr>
<tr>
<td>BX Series Junction Boxes</td>
<td>92</td>
<td>Installation Accessories</td>
</tr>
<tr>
<td>Centurion II Power System</td>
<td>6 - 7</td>
<td>Integrated Power Systems</td>
</tr>
<tr>
<td>Circuit Breaker &amp; Fuse Distribution Panel</td>
<td>60 - 61</td>
<td>Inverter-Chargers</td>
</tr>
<tr>
<td>Circuit Breaker Distribution Panel</td>
<td>58 - 59</td>
<td></td>
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</table>

NEWMAR®

*Powering the Network*

Newport Beach, CA USA  •  www.newmartelecom.com  •  800-854-3906

PTN_finalcatalog.indd   95
5/1/12   12:25 PM
# Index

<table>
<thead>
<tr>
<th>Category</th>
<th>Page Numbers</th>
<th>Related Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverters - PS Series</td>
<td>41</td>
<td>Rack Mount Accessories</td>
</tr>
<tr>
<td>Junction Boxes</td>
<td>92</td>
<td>Rack Mount LVD Monitor</td>
</tr>
<tr>
<td>Low Voltage Disconnect</td>
<td>70</td>
<td>Rackmount DC Converters</td>
</tr>
<tr>
<td>Low Voltage Disconnects</td>
<td>70 - 72</td>
<td>Rackmount Inverters</td>
</tr>
<tr>
<td>Microphone Clips</td>
<td>88</td>
<td>RA Series Waterproof Feed-Thru Fittings</td>
</tr>
<tr>
<td>Mobile DC UPS: MDP-25</td>
<td>74 - 75</td>
<td>Rear Rack Covers</td>
</tr>
<tr>
<td>Mobile DC UPS: Nav-Pac</td>
<td>77</td>
<td>RPS Power Systems</td>
</tr>
<tr>
<td>Mobile DC UPS: StartGuard</td>
<td>76</td>
<td>RPS Power System Components</td>
</tr>
<tr>
<td>Ni-Cad Charger Series</td>
<td>55</td>
<td>Sentinel Power System</td>
</tr>
<tr>
<td>Noise Filters</td>
<td>79</td>
<td>Site Monitor &amp; Control</td>
</tr>
<tr>
<td>Noise Filters &amp; Automatic Power Selector</td>
<td>79</td>
<td>Site Power Monitor</td>
</tr>
<tr>
<td>Phone-Com Systems</td>
<td>89</td>
<td>Power Monitoring &amp; Control</td>
</tr>
<tr>
<td>Portable Radio Covers</td>
<td>90</td>
<td>Site Power System</td>
</tr>
<tr>
<td>Power Function Manager</td>
<td>26 - 27</td>
<td>Speakers &amp; Antenna Switches</td>
</tr>
<tr>
<td>Power Modules</td>
<td>24 - 25</td>
<td>Terminal Strips</td>
</tr>
<tr>
<td>Power Plants</td>
<td>20 - 21</td>
<td>Thru-Dex Waterproof Fittings</td>
</tr>
<tr>
<td>Power Supplies - Heavy Duty Series</td>
<td>30 - 31</td>
<td>Unity Low Voltage Disconnect &amp; Monitor</td>
</tr>
<tr>
<td>Power Timer</td>
<td>80</td>
<td>Unity Rectifier System</td>
</tr>
<tr>
<td>Power-Pac</td>
<td>32</td>
<td>USAR</td>
</tr>
<tr>
<td>PX Series Junction Boxes</td>
<td>92</td>
<td>Ventilated Equipment Rack Shelves</td>
</tr>
<tr>
<td>Quick Connect Wiring Kits</td>
<td>86</td>
<td>Voltage Stabilizers</td>
</tr>
<tr>
<td>Quick Connects &amp; Rear Rack Covers</td>
<td>86</td>
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</tbody>
</table>
Powering The Network Solutions

**AC-DC**
Voltage/Power Range:
120/240 VAC Input 12, 24, 48, or 110 VDC Output 150 Watts - 14 kW
Components: Rectifiers, Battery Chargers, Power Modules, Power Supplies, Power Management, Rack Mount, Wall Mount, Desktop
Systems: Hot Swap Rectifiers Shelves with Distribution and Monitoring
Power Plants: Rack Mount Systems with Batteries

**DC-DC**
Voltage/Power Range:
12, 24, 48, 72, 110 VDC Input 12, 24, 48 VDC Output
Configurations: Isolated/Non-Isolated, Step-Up, Step-Down, Stabilizers, Battery Charger, Rack Mount, Mobile, Wall Mount, Desktop

**DC Power Distribution**
Voltage/Power Range:
12, 24, or 48 VDC Input 200 - 900 Amp VDC
Output
Configurations: Rack Mount

**DC UPS**
Voltage/Power Range:
12.24 VDC Input / Output 5-20 amps
Configurations: Mobile Mount

**Battery Chargers**
Voltage/Power Range:
120/240 VAC Input, 12, 24, 110 VDC Output
Configurations: Wall Mount, Mobile Mount

**Monitoring/Control**
Remote and Local Monitoring; DC Voltage, AC Voltage, Alarms, Batteries, Security, Cameras
Remote Control of DC and AC Equipment

**Powering The Network Solutions**